REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PREPARATORY SURVEY FOR ROAD NETWORK DEVELOPMENT PROJECT IN CONFLICT-AFFECTED AREAS IN MINDANAO

FINAL REPORT
< VOLUME-I >

JUNE 2018

JAPAN INTERNATIONAL COOPERATION AGENCY

CTI ENGINEERING INTERNATIONAL CO., LTD.
ORIENTAL CONSULTANTS GLOBAL CO., LTD.
IC NET LIMITED

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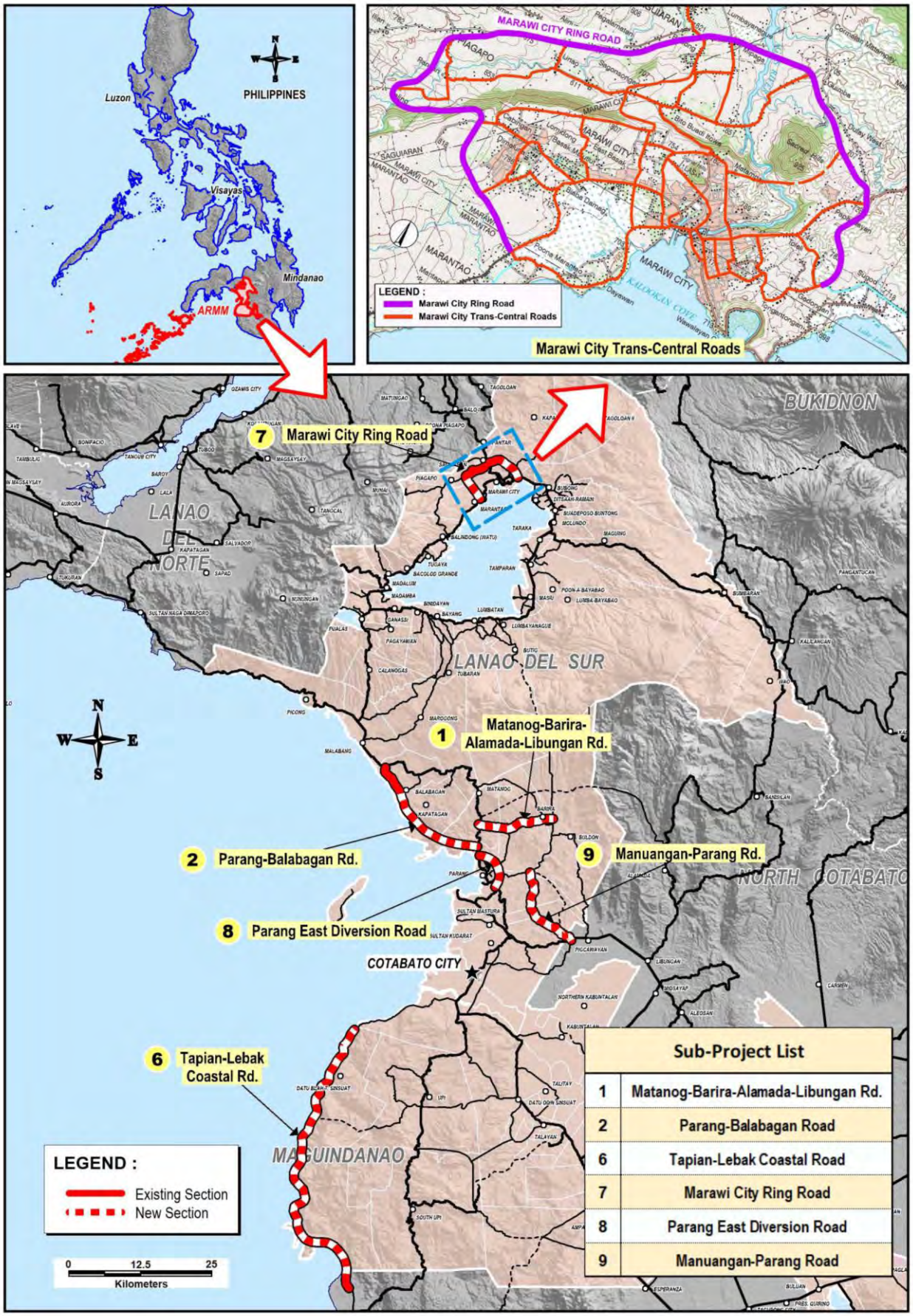

LOCATION MAP OF THE PROJECT AREA

PREPARATORY SURVEY FOR ROAD NETWORK DEVELOPMENT PROJECT IN CONFLICT-AFFECTED AREAS IN MINDANAO

Final Report

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Location Map of The Project Area

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ACRONYMS AND ABBREVIATIONS

AADT	:	Annual Average Daily Traffic
AD	:	Ancestral Domain
ADT	:	Average Daily Traffic Volume
AFP	:	The Armed Forces of the Philippines
AH	:	Affected Households
AP	:	Affected Persons
ARMM	:	Autonomous Region of Muslim Mindanao
BBL	:	Bangsamoro Basic Law
BDA	:	Bangsamoro Development Agency
BIFF	:	The Bangsamoro Islamic Freedom Fighters
BIR	:	Bureau of Internal Revenue
BOD	:	Bureau of Design
BTC	:	Bangsamoro Transition Commission
B/C	:	Benefit/Cost Ratio
CAAM	:	Conflict Affected Areas in Mindanao
CAB	:	Comprehensive Agreement on the Bangsamoro
CADC	:	Certificate of Ancestral Domain Claim
CADT	:	Certificate of Ancestral Domain Title
CALT	:	Community of Ancestral Land Title
CCA	:	Community Consultative Assembly
CCCH	:	Coordinating Committee on the Cessation of Hostilities
CCDP	:	Comprehensive Capacity Development Project for the Bangsamoro
CCP	:	The Communist Party of the Philippines
CCTV	:	Closed-Circuit-Television
CNC	:	Certificate of Non-Coverage
COI	:	Corridor of Impact
CR	:	Critically Endangered
DAO	:	DENR Administrative Order
DED	:	Detailed Engineering Design
DEO	:	District Engineering Office
DENR	:	Department of Environment and Natural Resources
DENR-ARMM	:	Department of Environment and Natural Resources- ARMM
DENR-EMB	:	Department of Environment and Natural Resources -Environmental Management Bureau
DFR	:	Final Report
DGCS	:	Design Guidelines, Criteria and Standard
DILG	:	Department of the Interior and Local Government
DND	:	Department of National Defence
DOLE	:	Department of Labour and Employment
DPWH	:	Department of Public Works and Highways
DPWH-ARMM	:	Department of Public Works and Highways – ARMM
DPWH-National	:	Department of Public Works and Highways – National
DPWH-ESSD	:	Department of Public Works and Highways – ESSD
DRAM	:	DPWH ROW Acquisition Manual
EA	:	Executing Agency
ECAs	:	Environmentally Critical Areas
ECC	:	Environmental Clearance Certificate
ECPs	:	Environmentally Critical Projects
EIA	:	Environmental Impact Assessment
EIARC	:	Environmental Impact Assessment Review Committee
EIRR	:	Economic Internal Rate of Return
EIS	:	Environmental Impact Statement
EMA	:	External Monitoring Agent
EMP	:	Environmental Management Plan

EO	:	Executive Order
ESSD	:	Environment and Social Safeguards Division
FHWA	:	Federal Highway Administration
FIRR	:	Financial Internal Rate of Return
FPA	:	Final Peace Agreement
FPIC	:	Free and Prior Informed Consent
F/R	:	Final Report
GDP	:	Gross Domestic Product
GOJ	:	Government of Japan
GOP	:	Government of the Philippines
GRDP	:	Gross Regional Domestic Product
GRM	:	Grievance Redress Mechanism
ICC	:	Investment Coordinating Committee
IC/R	:	Inception Report
IDP	:	Internally Displaced Persons
IEE	:	Initial Environmental Examination
IMT	:	International Monitoring Team
IOL	:	Inventory of Loss
IP/ ICC	:	Indigenous Peoples/ Indigenous Cultural Communities
IPP	:	Indigenous Peoples Plan
IPRA	:	Indigenous Peoples Rights Act
IRR	:	Internal Rate of Return
IS	:	Islamic State
IT/R	:	Interim Report
JICA	:	Japan International Cooperation Agency
LARRIP	:	Land Acquisition, Resettlement, Rehabilitation and Indigenous People's Policy (DPWH 2007)
LGU	:	Local Government Units
MILF	:	Moro Islamic Liberation Front
MinDA	:	Mindanao Development Authority
MNLF	:	Moro National Liberation Front
MOU	:	Memorandum of Understanding
NAMRIA	:	National Mapping and Resource Information Authority
NCIP	:	National Commission on Indigenous Peoples
NEDA	:	National Economic and Development Authority
NGO	:	Non-Government Organization
NPA	:	New Peoples' Army
NPV	:	Net Present Value
OD	:	Origin and Destination
ODA	:	Official Development Assistance
OPAPP	:	Office of the Presidential Adviser on the Peace Process
OSCC-ARMM	:	Office of Southern Cultural Communities-ARMM
O&M	:	Operation and Maintenance
PAPs	:	Project-Affected Persons
PD	:	Presidential Decree
PEISS	:	Philippine Environmental Impact Statement System
PhP	:	Philippine Peso
PNP-SAF	:	Philippine National Police -Special Action Force
PPP	:	Public-Private Partnership
RA	:	Republic Act
RAP	:	Resettlement Action Plan
RIC	:	Resettlement Implementation Committee
RIPP	:	Resettlement and Indigenous Peoples Plan
ROW	:	Right of Way
RPDO-ARMM	:	Regional Planning Development Office-ARMM
SA	:	Social Assessment
SES	:	Socioeconomic Survey
SER	:	Shadow Exchange Rate

SIDP	:	The Study on the Infrastructure (Road Network) Development Plan for ARMM
SIA	:	Social Impact Assessment
SMT	:	Safety Management Team
SPS	:	Safeguard Policy Statement
SWR	:	Shadow Wage Rate
TCT	:	Torrens Certificate of Title
TOR	:	Terms of Reference
TTC	:	Travel Time Cost
TWG	:	Technical Working Group
UNHCR	:	The United Nations High Commissioner for Refugees
UPMO	:	Unified Project Management Office
USD	:	United States Doller
UXO	:	Unexploded ordnance
VAT	:	Value Added Tax
VOC	:	Vehicle Operation Cost

Chapter 1 Introduction

1.1 Background

1.1.1 Brief Background of the Project

Mindanao for decades has lagged from the rest of the country in terms of economic development. This is despite its natural advantages such as fertile land, presence of natural resources, outside of typhoon belt, and human resource potentials. However, in recent years the region has been showing faster economic growth than the rest of the country. For instance, while the country has registered an average annual growth of 5.9% in the last five years (2010-2015), Mindanao's 6.2%. Within Mindanao, the Autonomous Region in Muslim Mindanao (ARMM) remains the poorest region with poverty incidence of 55.8% in 2012. Likewise, the region's GRDP in 2015 accounts for only 0.7% of the Philippines' GDP with annual average growth in the last five years of merely 1.13% which is the smallest among the regions. Similarly, economic structure of the region reflects its position as less developed where agriculture accounts for more than half (59.1%) of the GRDP with industry accounts only for 2.7% and services accounts for 38.2%.

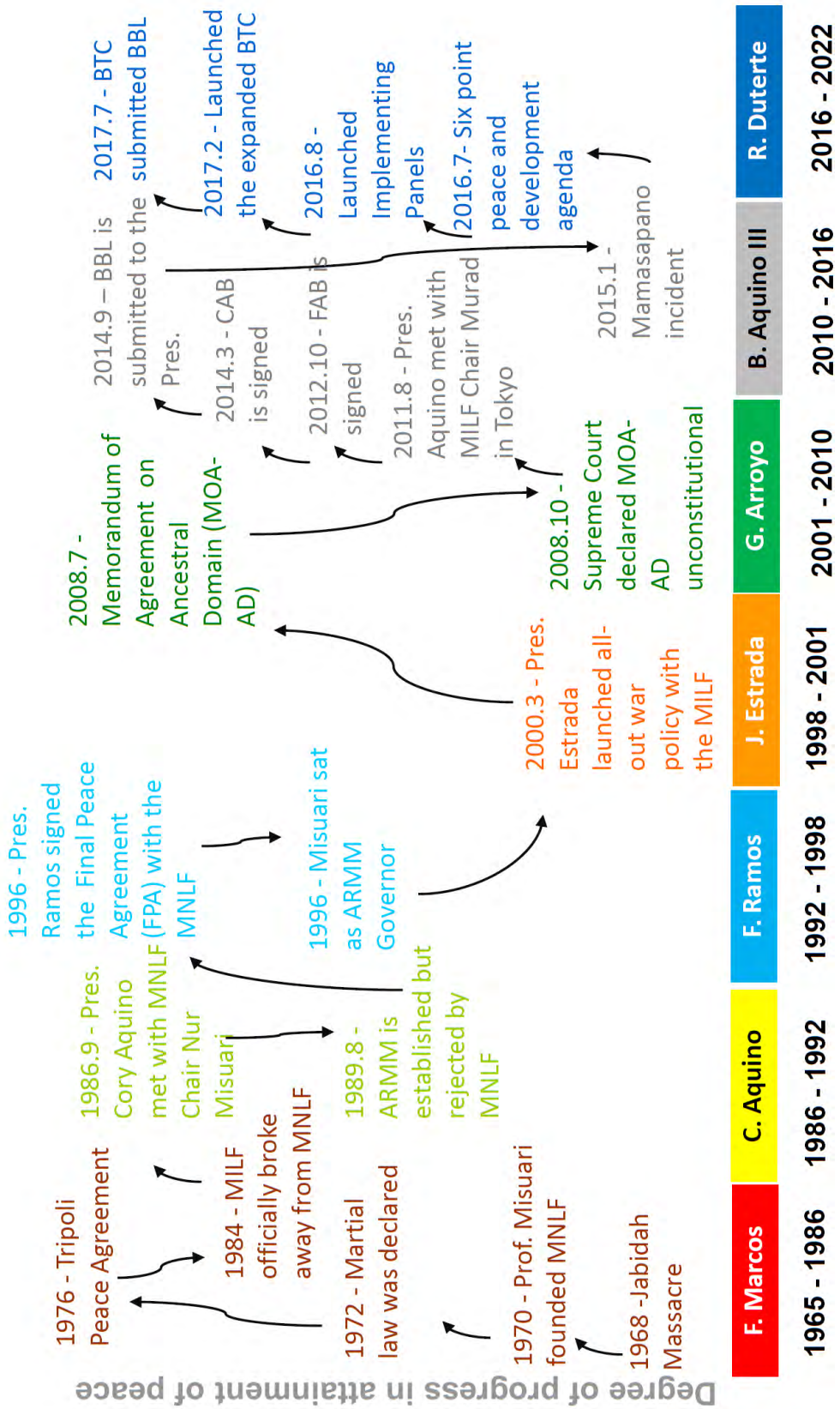
The road infrastructure of ARMM is less developed as well compared to other regions. While the country and Mindanao has an average road density of 0.25 and 0.17 respectively, ARMM has only 0.10. This means that for the ARMM to close the gap and reach the Mindanao average, at least 800 km of new roads should be constructed. The signing of the Comprehensive Agreement on Bangsamoro (CAB) between the government and the Moro Islamic Liberation Front (MILF) in March 2014 however is expected to provide extra push for social and economic development of ARMM. The project area is characterized by the following: (1) the project area has favorable natural conditions for agriculture – i.e. high temperature, plenty of rainfalls distributed throughout the year, dominant fertile soil and outside of the typhoon belt, (2) despite this natural advantage, poverty incidence is very high at 55.8% in 2012; (3) infrastructure supply is also limited – ARMM for instance needs 800km of new roads to close the gap with other regions in Mindanao; (4) one of the reasons for delay of development is the presence of protracted armed conflict between the government an different armed groups (particularly MILF); (5) in recent years however, efforts toward securing peace is gaining momentum. FB (Framework on the Bangsamoro) was signed in 2014; BBL (Bangsamoro Basic Law) was submitted to Congress in August; (6) for the region to recover, there's a need to complement the progress of the peace process by way of addressing the shortage of infrastructure supply in the region.

Recognizing the above, the Government of the Philippines (GOP) through the Department of Public Works and Highways (DPWH) has made a request to the Government of Japan (GOJ) to undertake feasibility study of nine (9) priority roads and two (2) bridges identified in the 2016 JICA-assisted Bangsamoro Development Plan-II. Part of the tasks is to study the possibility of utilizing Yen loan as one of the possible sources of fund to implement the identified projects. This Preparatory Survey started in August 2017 and is expected to complete in May 2018.

1.1.2 Brief Background of the Conflict and Peace Process in Mindanao

The protracted armed conflict centered in the ARMM is one of the major reasons for shortage of infrastructure supply including road in the region. There have been efforts to address the root cause of the conflict as illustrated in **Figure 1.1.2-1**. For instance, in 1990 the Cory Aquino administration established the ARMM as response to the grievances of Muslims in Mindanao to have their own homeland. Although this action by the government brought relative calm to some areas under the region, both the Moro National Liberation Front (MNLF) and Moro Islamic Liberation Front (MILF) continued to assert their right to self-determination by granting more meaningful autonomy. Six years after the region's birth, the Ramos administration able to conclude the 1996 Final Peace Agreement (FPA) with the MNLF leaving MILF as the only major liberation movement not in umbrella of the government.

In April 2010 however a breakthrough on the peace process between the government and MILF was achieved through the signing of Framework Agreement on Bangsamoro (FAB). Further positive developments followed and after a lengthy negotiation, another milestone in the peace process was achieved in March 2014 via the signing of the Comprehensive Agreement on Bangsamoro (CAB). However the January 2015 incident in Mamasapano Municipality which resulted to death of 44 government troops and 18 MILF troops caused major erosion of public support to the peace process. Hope for eventual peaceful settlement of armed conflict in Mindanao leased a new life when the Duterte administration took over and unveiled its Six-point Peace and Development Agenda barely a month in power. It is reported that the draft Bangsamoro Basic Law (BBL) prepared by the Bangsamoro Transition Commission (BTC) is ready for submission to the President. Once passed by the congress, this new law would establish a new political entity which would facilitate participation of the MILF to political exercises in the country.



Source: Prepared by the JICA Study Team based on various sources such as documents from the Office of the Presidential Adviser on the Peace Process

Figure 1.1.2-1 Milestones of the Peace Process in Mindanao by Different Administrations

1.2 Objectives of the Project

The project aims to achieve economic development, reduction of poverty and peace building in the conflict-affected area through improvement and construction of roads and bridges which contribute to smoother commodity flow, more active economic activities and improved accessibilities and linkages to other areas of the country.

1.3 Objectives of the Survey

The objective of the Survey is to prepare all data, information and documents necessary for JICA to appraise the "Preparatory Survey for Road Network Development Project in Conflict-Affected Areas in Mindanao" for possible Japan's Yen Loan. Data, information and construction documents including objectives of the Project, project scope of work, project costs, implementation organization, environmental and social consideration related documents, etc.

1.4 Survey Area and Sub-Projects

The survey area shall cover the provinces of Lanao Del Sur and Maguindanao.

[Original Scope of Work]

The original scope of work covered nine (9) road sub-projects and two (2) bridge projects.

JICA undertook the Bangsamoro Development Plan II in 2016, in which various road projects were identified. All nine (9) road Sub-Projects of this preparatory survey were selected from roads recommended by the Bangsamoro Development Plan II.

Sub-Projects are shown in **Table 1.4-1**.

Table 1.4-1 Original Sub-Project List

Sub-Project No.	Road Name	Length (km)		
		Existing Section	New Section	Total
1.	Matanog- Barira – Alamada - Libungan Road	-	21.2	21.2
2.	Parang - Balabagan Road	6.0	17.6	23.6
3.	Sibuto – Balensong - Nuro Road	14.0	-	14.0
4.	Nuro - Pinansaran Road	-	10.5	10.5
5.	Maganoy - Lebak Road	11.9	12.5	24.4
6.	Tapian - Lebak Coastal Road	-	50.0	50.0
7.	Marawi City Ring Road	7.0	9.7	16.7
8.	Parang East Diversion Road	-	11.3	11.3
9.	Manuangan - Parang Road	-	17.0	17.0
	Bridge Name	**38.9**	**149.8**	**188.7**
10.	Pagalungan Bridge	225m		225m
11.	Tunggol Bridge	107m		400m

Source: JICA Study Team

In the course of the study, it was found the following;

Sub-Projects No.3 and 4: DPWH-ARMM confirmed that it has secured budget to implement Sub-Projects No.3 and 4, therefore, there is no need to include both Sub-Projects in this study.

Sub-Project No.10: Pagalungan Bridge: DPWH-Central confirmed that it has secured budget for the bridge and the bidding is scheduled to start soon, therefore, there is no need to include this bridge in this study.

Sub-Project No.11: Tunggaol Bridge: Although DPWH-Central had a budget to re-build this bridge, but it returned the budget to the Department of Budget and Management (DBM) due to their inability to spend the fund inside ARMM. However, DBM returned back the fund to DPWH, therefore, DPWH has now budget for the bridge.

Sub-Project No.5: Security condition of Sub-Project No.5 was so aggravated that all works of the Sub-Project was suspended together with Sub-Project No.6 on December 22, 2017. Although all works for Sub-Project No.6 were resumed on January 26, 2018, Sub-Project No.5 was deleted from the project dur to no improvement of security conditions.

Revised scope of work and road length based on the alignment selection study of six (6) Sub-Projects are shown in **Table 1.4-2** and **Figure 1.4-1.**

Table 1.4-2 Revised Scope of Work

Sub-Project			Original JICA TOR	Selected Road Alignment Length		
No.	Road Name			Existing Section	New Section	Total
1	Matanog-Barira-Alamada-Libungan Rd		21.2 km	-	13.9 km	13.9 km
2	Parang-Balabagan Rd		23.6 km	4.1 km	31.2 km	35.3 km
3	Sibutu-Blensong-Nuro Rd		14.0 km	(Excluded from Project)		
4	Nuro-Pinansaran Rd		10.5 km	(Excluded from Project)		
5	Maganoy-Lebak Rd		24.4 km	(Excluded from Project)		
6	Tapian-Lebak Coastal Rd		50.0 km	-	62.6 km	62.6 km
7	Marawi City Ring Rd		16.7 km	1.9 km	17.9 km	19.8 km
8	Parang East Diversion Rd		11.3 km	-	7.0 km	7.0 km
9	Manuangan-Parang Rd		17.0 km	-	16.8 km	16.8 km
10	Pagalungan Bridge		400.0 m	(Excluded from Project)		
11	Tunggol Bridge		107.0 m	(Excluded from Project)		
Total		Road	188.7 km	6.0 km	149.4 km	155.4 km
		Bridge	507.0 m	-		

Source: JICA Study Team

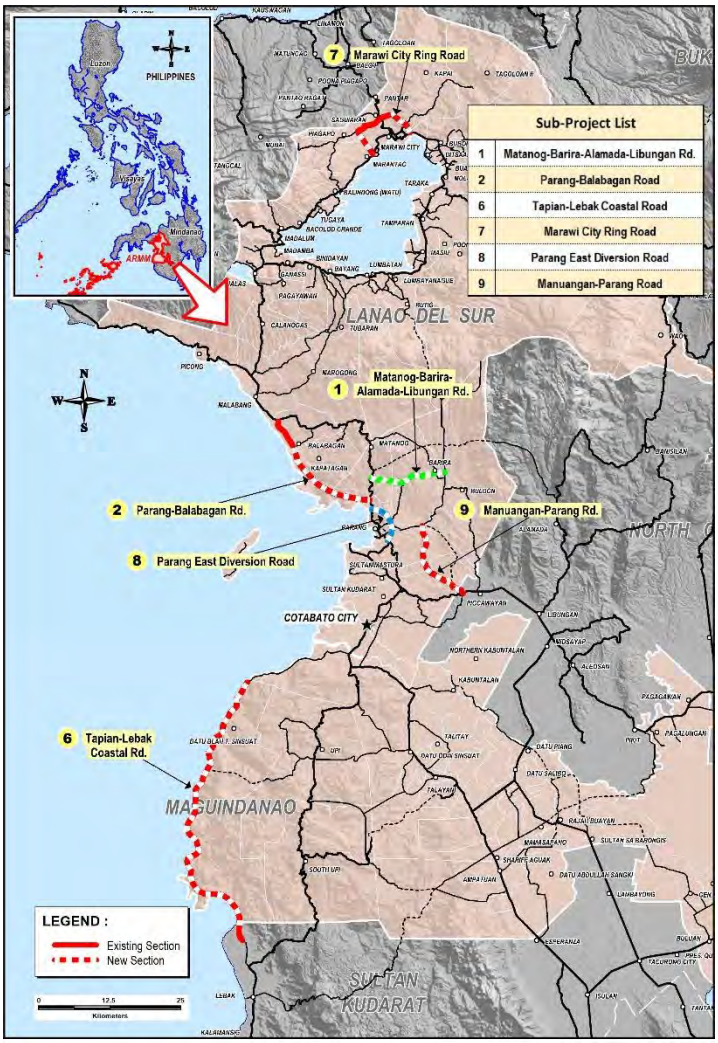


Figure 1.4-1 Revised Scope of Work

1.5 Scope of the Survey

To achieve the above objective, the Survey shall cover the following:

(1) Confirmation of Project Background
(2) Sub-Project Condition Survey and Identification of Issues
(3) Preliminary Study and Selection of Optimum Alignment
(4) Preliminary Design and Confirmation of Optimum Alignment
(5) Topographic Survey and Geotechnical Investigation
(6) Traffic Survey and Traffic Demand Forecast
(7) Socio-economic Survey of Affected Communities
(8) Preliminary Design
(9) Construction Method
(10) Project Implementation Plan
(11) Project Implementation Offices and their level of capacity
(12) Environmental Survey
(13) Resettlement Action Plan
(14) Indigenous Peoples (IP) Plan
(15) Project Cost Estimates
(16) Project Evaluation

1.6 Schedule of the Survey

The Survey commenced in August 2017 and scheduled to be completed in June 2018 as shown in **Table 1.6-1**.

Table 1.6-1 Schedule of the Study

	Work Activities	2017 7	8	9	10	11	12	2018 1	2	3	4	5	6
2.3.1	Confirmation of Project Background and Present Condition												
(1)	Inception Report Preparation and Discussion												
(2)	Confirmation of Project Background												
(3)	Sub-project Condition Survey and Identification of Issues												
(4)	Preliminary Study and Selection of Optimum Alignment												
2.3.2	Preliminary Design and Confirmation of Project Impacts												
(1)	Topographic Survey and Geotechnical Investigation												
(2)	Traffic Survey and Traffic Demand Forecast												
(3)	Social Survey of Affected Communities												
(4)	Project Outline												
(5)	Preliminary Design												
(6)	Construction Method												
(7)	Project Implementation Plan												
(8)	Project Implementation Offices and Their Capacity												
(9)	Operation and Maintenance of Project												
(10)	Environmental Survey												
(11)	Resettlement Action Plan												
(12)	Indigenous Peoples (IP) Plan												
(13)	Project Cost Estimate												
(14)	Important Matters to be Taken Care of During Implementation												
(15)	Project Evaluation												
(16)	Preparation and Discussion of Draft Final Report												
	Submission of Report		Inception Report				Interim Report			DF Report	Final Report		

Work in the Philippines
Work in Japan

1.7 Organization to Carry Out the Study

The JICA Survey Team organized by JICA in close collaboration with DPWH and other organizations concerned undertook the study. The organization of the Survey consisting of JICA and DPWH is shown in **Figure 1.7-1.**

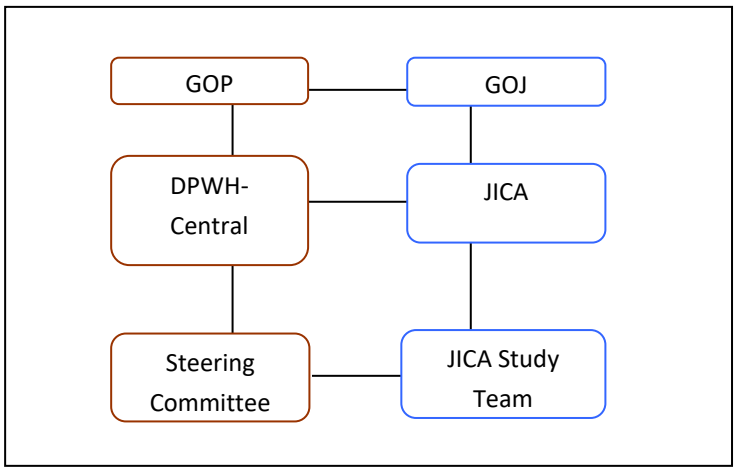


Figure 1.7-1 Organization Chart

(1) JICA

Kazuhiko UENO	Director, South Asia Division 5 (Philippines), JICA Headquarters
Takeshi SAHEKI	Deputy Director, South Asia Division 5 (Philippines), JICA Headquarters
Natsumi TANIYAMA	South Asia Division 5 (Philippines), South Asia and Pacific Department, JICA Headquarters
Tetsuya YAMADA	Senior Representative, JICA Philippine Office
Yo EBISAWA	Senior Representative, JICA Philippine Office
Atsushi SHIBATA	Representative, Economic Growth Section, JICA Philippine Office
Yukiko SANO	Project Formulation Advisor, Mindanao Section, JICA Philippine Office

(2) Steering Committee

The Steering committee consisting of members listed below for the project was organized on 27 November, 2017.

	Steering Committee Members	
1.	**Emil K. SADAIN, CESO I** Undersecretary for UPMO Operations and Technical Services, DPWH	Chairperson
2.	**Laisa M. ALAMIA** Executive Secretary, ARMM	Vice Chairperson
3.	**Don Mustapha A. LOONG** OIC-Regional Secretary, ARMM	Member
4.	**Virgilio C. CASTILLO** Project Director, Roads Management Cluster I (Bilateral)	Member
5.	**Lea N. DELFINADO** OIC-Director, Bureau of Design, DPWH	Member
6.	**Bashir M. IBRAHIM** OIC-Regional Director, DPWH Region XII	Member
7.	**Virgilio C. EDUARTE** Reginal Director, DPWH Region X	Member
8.	**Kristoffer James PURISIMA** Assistant Secretary, Civil Defense (DND)	Member
9.	National Economic Development Authority (NEDA-Region XII) Representative	Member
10.	Office of the Presidential Adviser on the Peace Process (OPAPP) Representative	Member
11.	Bangsamoro Development Agency (BDA) Representative	Member
12.	Mindanao Development Authority (MinDA) Representative	Member
13.	Japan International Cooperation Agency (JICA) Representative	Member
14.	DPWH-JICA Roads Management Expert	Member
15.	Mayor of Datu Blah Sinsuat, Maguindanao	Member
16.	Mayor of Ampatuan, Maguindanao	Member
17.	Mayor of Shariff Agual, Maguindanao	Member
18.	Mayor of Barira, Maguinadanao	Member
19.	Mayor of Buldon, Maguindanao	Member
20.	Mayor of Sultan Mastura, Maguindanao	Member

21.	Mayor of Sultan Kudarat, Maguindanao	Member
22.	Mayor of Balabagan, Maguinadanao	Member
23.	Mayor of Kapatagan, Maguindanao	Member
24.	Mayor of Matanog, Maguindanao	Member
25.	Mayor of Parang, Maguindanao	Member
26.	Mayor of Saguiaran, Lanao del Sur	Member
27.	Mayor of Piagapo, Lanao del Sur	Member
28.	Mayor of Marantao, Lanao del Sur	Member
29.	Mayor of Marawi City	Member
30.	Regional Legislative Assembly (RLA) for ARMM Representative	Member

The main purpose of the Steering Committee are as follows;

1. Oversee the conduct of the overall work program of the project in accordance with the project design activities and implementation plan;
2. Provide assistance to the Study Team in the conduct of field survey works, data collection and investigation;
3. Provide assistance to the Study Team in the coordination and consultations among stakeholders and local government units in the preparation of indicative relocation/resettlement action plan;
4. Provide guidance and resolve issues/constraints that may arise during the course of the Study;
5. Monitor the progress of the Study and evaluate the accomplishment of the targets and achievement of the objectives;
6. Review and evaluate the results and recommendations of the Study;
7. Monitor the progress of the Study; and
8. Ensure success and desired outcome of the Study.

(3) JICA Study Team

Members of the JICA Study Team are as follows:

Mitsuo KIUCHI	Team Leader/Road and Transport Plan (1)
Nashreen SINARIMBO	Deputy Team Leader/ Road and Transport Plan (2)/ Socio-economic Survey
Tomoaki TAKEUCHI	Maintenance Plan (1)/ Road Design
Mamoru OKUBO	Maintenance Plan (2)/ Bridge Design (1) (Super Structure)
Eiko KUBO	Bridge Design (2) (Substructure)
Noriaki SUNOUCHI	Route Selection
Hiroshi KANEKO	Traffic Survey/ Economic Analysis
Masayuki ISHIYA	Traffic Demand Forecast
Seiji OZAWA	Natural Condition Survey (Topographic Survey and Geological Survey)/Road Design (assistance)/ Project Coordination

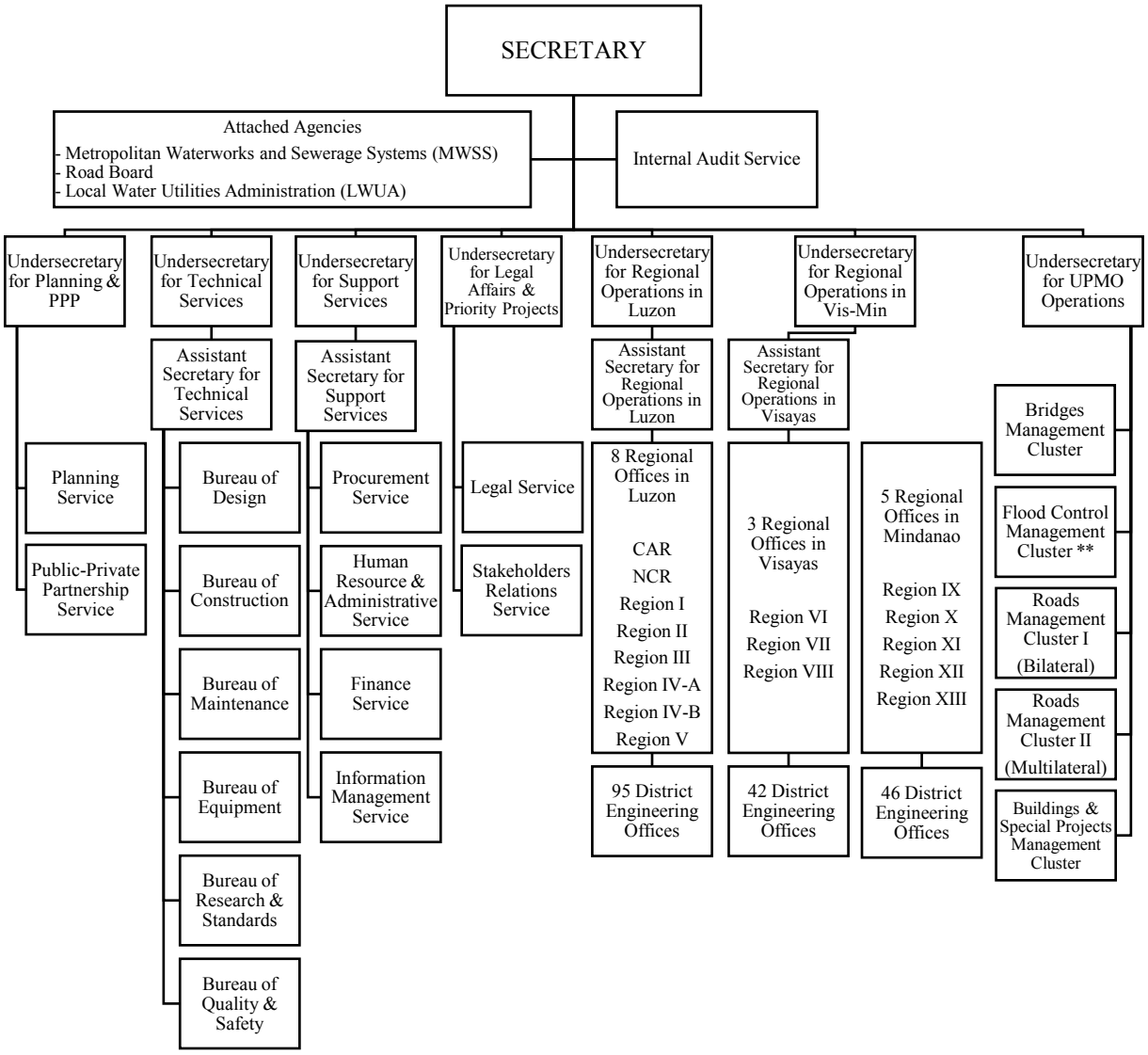
Daisuke FUJITA	Hydrologic Analysis/ River Plan
Kazuto SUZUKI	Revetment Engineer
Benito Cesario C. TINGSON	Social Consideration/ Relocation Plan
Eiji NOGUCHI	Environmental Survey (1)
Carolyn D. BARRIAS	Environmental Survey (2)
Masami TSUCHIYA	Procurement and Construction Plan
Medardo A. HABAL, JR.	GIS Expert
Michimasa NUMATA	Safety Management/Security Measures (1)
Tito T. ORIA, SR.	Safety Management/Security Measures (2)/ IP Survey
Mikayo YAMAZAKI	Agriculture Specialist
Angelita F. BALID	Socio-economic Survey, Environment Survey (assistance)

Chapter 2 Overview of Road Sector

2.1 DPWH Organization

2.1.1 DPWH National

The organization chart of the DPWH National is depicted in **Figure 2.1.1-1** Organization Chart of DPWH National. This RNDP-CAAM project is under the Unified Project Management Office (UPMO) which undertakes the overall implementation, supervision and monitoring of projects funded through bilateral agreements as well as multilateral agreements.

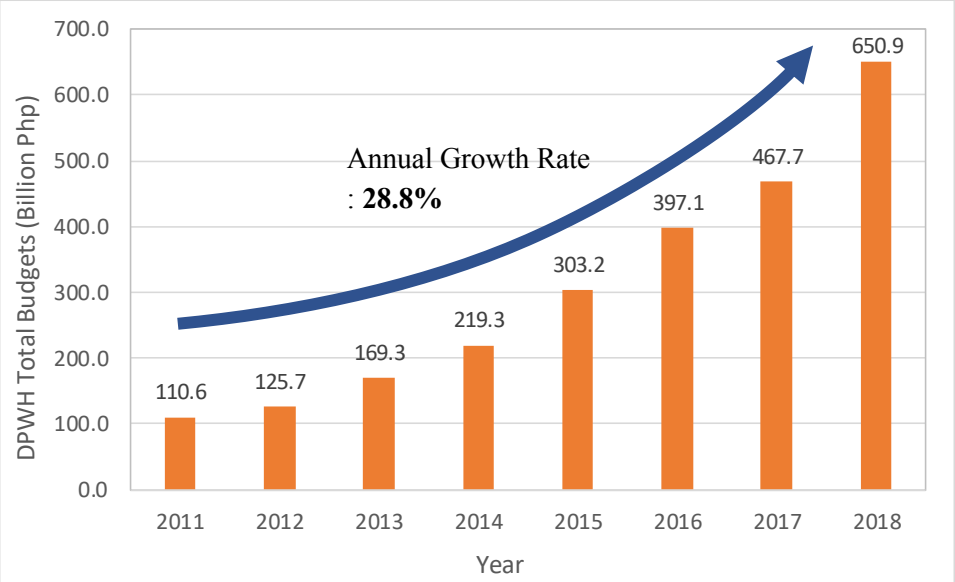


Source: DPWH National per Department Order No. 105, Series of 2017, date 22 August 2017

Figure 2.1.1-1 Organization Chart of DPWH National

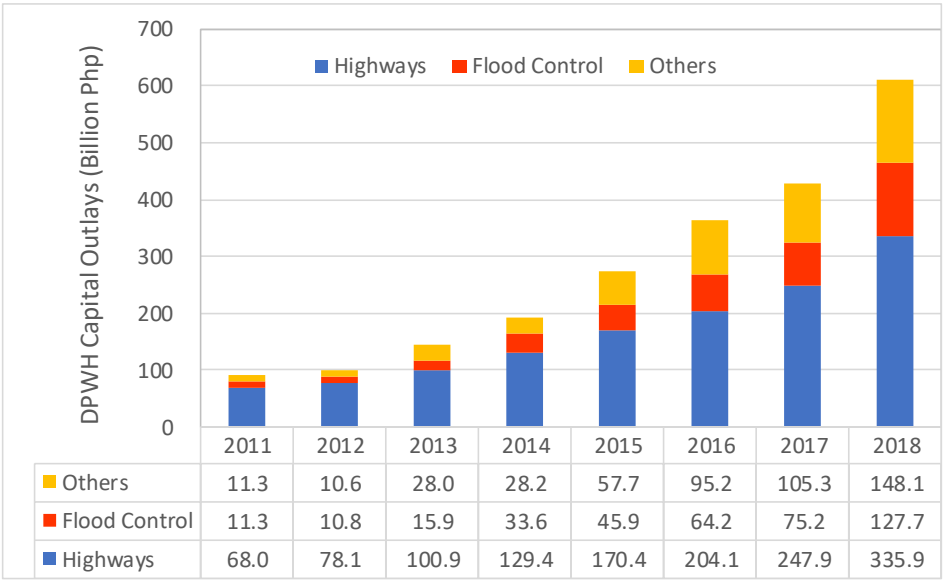
2.1.2 Budgetary Framework of the DPWH-National

The budget of DPWH-National from 2011 until 2018 is shown in **Figure 2.1.2-1**. In year 2018, the total budget has remarkably increased compared with year 2011. Annual growth rate is calculated by 28.8% from 2011 until 2018. And, the capital outlays of DPWH-National is shown in **Figure 2.1.2-2**. Highways is shared about 50% with total capital outlays in 2018.



Source: DPWH

Figure 2.1.2-1 DPWH Total Budget from 2011 until 2018



	2011	2012	2013	2014	2015	2016	2017	2018
Others	11.3	10.6	28.0	28.2	57.7	95.2	105.3	148.1
Flood Control	11.3	10.8	15.9	33.6	45.9	64.2	75.2	127.7
Highways	68.0	78.1	100.9	129.4	170.4	204.1	247.9	335.9

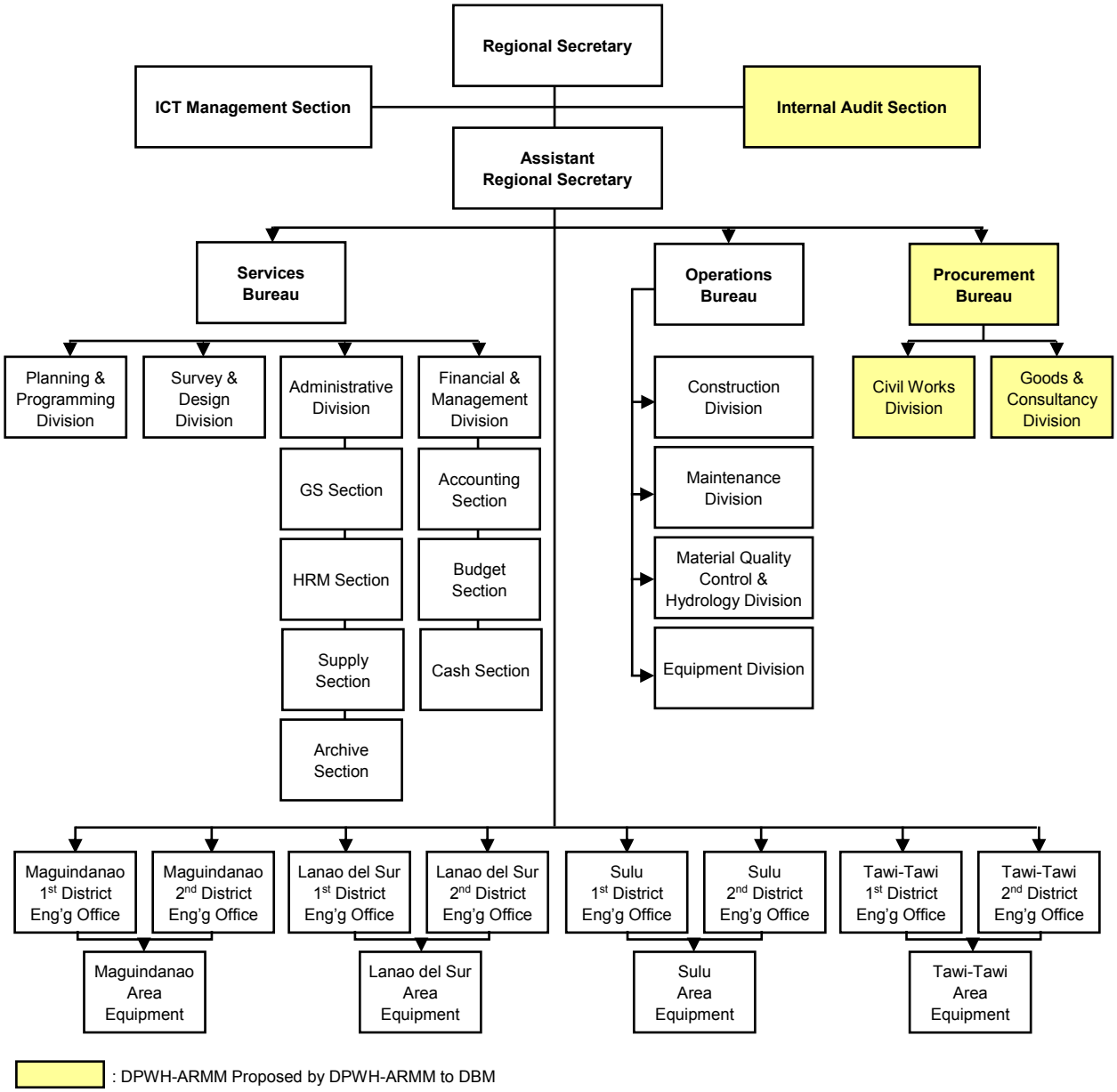
Source: DPWH

Figure 2.1.2-2 DPWH Capital Outlays from 2011 until 2018

2.1.3 DPWH-ARMM

The organizational set-up of the DPWH-ARMM is illustrated in **Figure 2.1.3-1**. The field offices, particularly the eight District Engineering Offices (DEOs), each headed by a District Engineer, who reports directly to the Secretary. DPWH-ARMM was funded to DBM to increase the size of their organization. Attached to the DEOs are four Area Equipment Services (AESs), as follows:

- Maguindanao Area Equipment Services (shared by Maguindanao I and Maguindanao II)
- Lanao del Sur Area Equipment Services (shared by Lanao I and Lanao II)
- Sulu Area Equipment Services (shared by Sulu I and Sulu II)
- Tawi-Tawi Area Equipment Services



Source: DPWH-ARMM website accessed on 6 November 2017

(http://dpwh.armm.gov.ph/discover-dpwh/organizational-structure/)

Figure 2.1.3-1 DPWH-ARMM Organization Structure

2.1.4 Budgetary Framework of the DPWH-ARMM

Since 2015, the budget of DPWH-ARMM experienced substantial increase as part of the efforts by the National Government to close infrastructure gap between ARMM and other regions in Mindanao. For instance, there was an observed 340% increase of 2015 budget compared to 2014. As seen in **Table 2.1.4-1**, bulk of the budget is dedicated to road and bridge projects which corresponds to 79% of the total budget in 2017 (PhP 8.1 Billion).

Table 2.1.4-1 DPWH-ARMM budget (2013-2017)

(Unit: '000 PhP)

	2013		2014		2015		2016		2017	
	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)
Flood control and Drainage	42	3%	60.59	2%	471.63	5%	256.50	3%	294.00	3%
Ports, light houses and harbors	37	2%	288.52	10%	670.00	7%	341.55	3%	801.50	8%
Roads and Bridges	1,279	85%	2,309.81	78%	8,106.37	80%	8,461.08	84%	8,131.02	79%
Water Supply System	127	8%	269.08	9%	745.00	7%	429.51	4%	644.70	6%
Other Infrastructure (Shore/slope protection)	25	2%	43.00	1%	110.82	1%	615.18	6%	462.30	4%
Total	1,510	100%	2,971.00	100%	10,103.82	100%	10,103.82	100%	10,333.52	100%

Source: DPWH-ARMM, 2017

The implementation of infrastructure projects of DPWH-ARMM accelerated in 2015 when its budget was significantly increased from PhP 2.956 Billion to PhP 10.104 Billion. This budget was maintained in 2016. In 2017, DPWH-ARMM's budget slightly increased to PhP 10.333 Billion. About 79.69% (PhP 8.131 Billion) of this budget was allocated for roads and bridges development both for major and local roads. This amount was transformed into improvement of about 493.643 km (211.293 Km for major roads; 282.35 km of local roads) of roads and 50 bridges. **Table 2.1-2** below shows the budget allocation of DPWH-ARMM for road network and bridges development from 2013-2017 by Engineering District.

Table 2.1-2 Budget Allocation of DPWH-ARMM for Roads and Bridges, by Engineering District, 2013-2017

(Unit: PhP Billion)

District	2013	2014	2015	2016	2017
BASILAN	1,573.20	789.22	2,170.55	2,243.822	1,573.20
SULU I	794.50	509.88	998.43	1,030.188	794.50
SULU II	874.00	86.05	959.99	742.904	874.00
TAWI-TAWI	1,095.30	249.90	942.40	628.576	1,095.30
MAGUINDANAO I	1,076.00	219.76	817.52	1,170.646	1,076.00
MAGUINDANAO II	896.50	92.16	931.92	955.260	896.50
LANAO I	914.50	187.49	666.50	822.296	914.50
LANAO II	907.02	50.94	619.06	867.389	907.02
TOTAL	**8,131.02**	**2,185.39**	**8,106.37**	**8,461.08**	**8,131.02**

Source: DPWH-ARMM

Aside from Regular Infra Program of DPWH-ARMM, the ARMM Government are also recipient of the National Government Programs and Projects on roads, such as the PAMANA of OPAPP, KALSADA Program of DILG, etc., and foreign assisted projects like the Philippine Rural Development Project (PRDP) of World Bank.

2.1.5 Priority Investment of the DPWH-ARMM (2017)

The 2017 projects of the DPWH-ARMM are shown in **Table 2.1.5-1**. Of the total PhP 8.1 Billion allocated for roads and bridges, 46% represents intervention for major roads (i.e. national road and provincial road) involving road surface upgrading from gravel/earth to concrete pavement. When these projects are completed, a total of 211.29 km (148.8 km in mainland provinces and 62.5 km island provinces) of paved road will be added to the road network of the ARMM. Likewise, improvement work for local roads (i.e. projects in support for recovery of communities affected by man-made and natural calamities, tourism development, etc.) involves surface upgrading from gravel/earth to concrete surface. A total of 282.35 km of local road is subject to this improvement.

Table 2.1.5-1 Priority Investment of the DPWH-ARMM, 2017

(Unit: '000 PhP)

	No. of Project	Length (km)	Amount
Major Roads	107	211.29	3,744.90
Local Roads	193	282.35	3,661.32
Bridges (under local roads)	50		724.800
Flood Control + Drainage Facilities	33		294.00
Water Supply Systems	194		644.700
Seaports Systems	66		801.500
Other Infrastructure	31		462.300
Total	674		10,333.52

Source: DPWH-ARMM, 2017

2.1.6 Collaboration between DPWH National and DPWH-ARMM

Due to the nature of the ARMM which enjoys autonomy, there is a need to observe the legal process when the National Government is implementing project in the region. The RA No. 9054, a law which creates ARMM, prohibited the National Government to implement projects inside the ARMM without the RLA issuing a resolution endorsing the said project. Based on the discussions with both sides (DPWH National and ARMM Government), the proposed procedure is illustrated in **Figure 2.1.6-1**.

Based on the said figure, identified projects by the DPWH National inside the ARMM will be submitted to the ARMM Government thru DPWH-ARMM for inclusion in the list of projects to be consolidated by the RPDO (Regional Planning Development Office). These lists are then discuss and approve by the REDPB (Regional Economic and Development Planning Board) and endorse to the RLA (Regional Legislative Assembly). The RLA then enact a law (Regional Assembly Public Works Act) containing the projects approved by the REDPB. Once the RAPWA is ready (where the target projects of DPWH-National are included), the ARMM Government through the DPWH-ARMM will request the DWPH-National to implement the projects identified by the DPWH-National. This can be formalized by coming up with MOA. After the MOA, the next step is to request for RLA resolution to allow DPWH National to implement the project inside the ARMM.

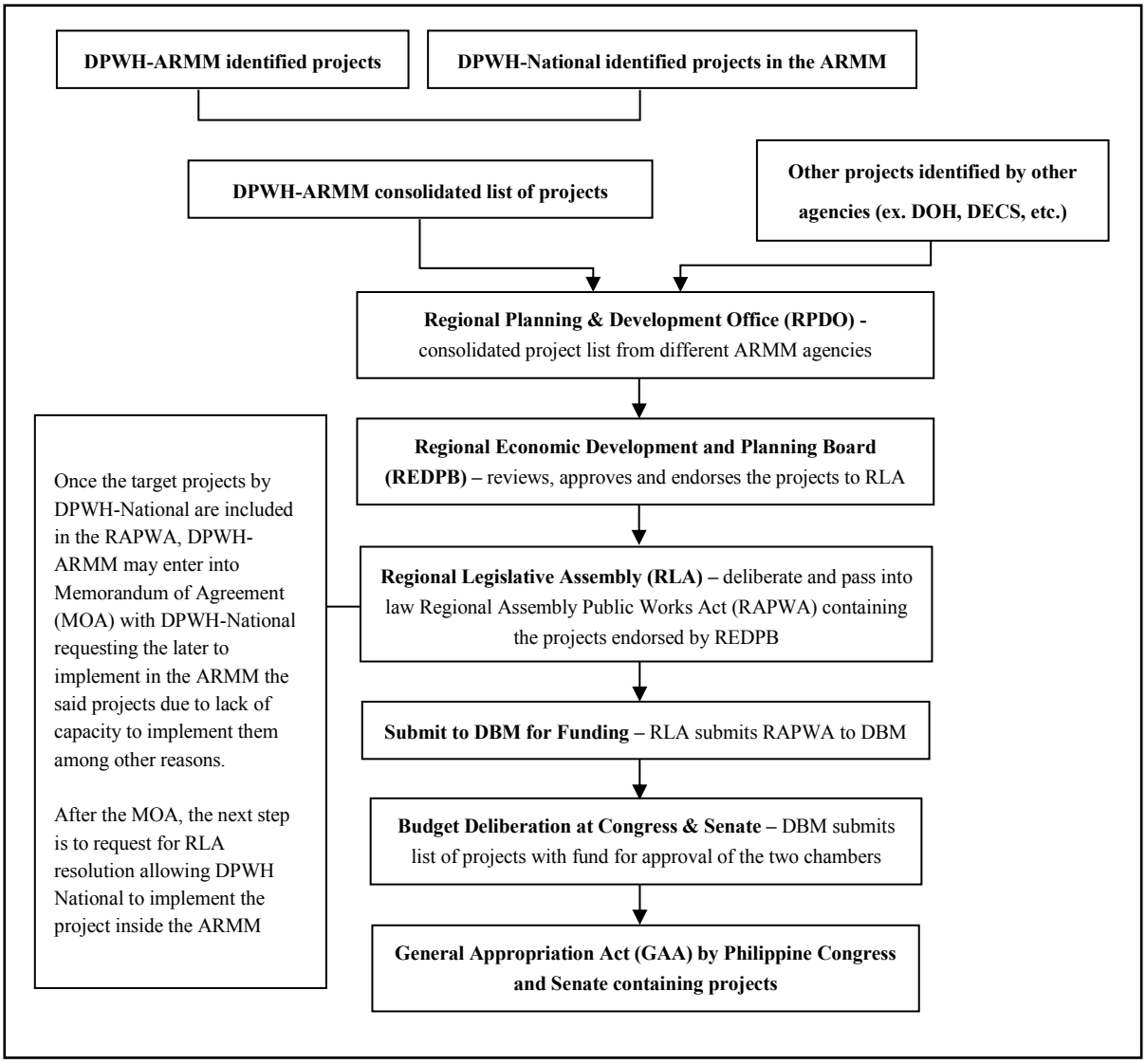


Figure 2.1.6-1 Proposed collaboration procedure between DPWH-ARMM and DPWH-National

2.2 Road Network of the ARMM

2.2.1 Road length and road density

The road network of the ARMM showing both national road and provincial road is presented in **Figure 2.2.1-1**. According to the 2016 JICA-assisted study titled "Bangsamoro Development Plan-II", the ARMM has a total road length of 891 km in 2007 and increased to 993 km in 2013. This length represents about 3% of the total national road. A closer look at **Table 2.2.1-1** reveals the following:

- ARMM is the only region in the country where its national road is less than 1,000km.
- It has the lowest road density (0.09) among the regions and way below from the Mindanao average (0.16).
- For the ARMM to close the gap (from 0.09 to 0.16), a supply of new road about 850km is necessary to achieve Mindanao average.

Table 2.2.1-1 National Road Length and Road Density per Region in Mindanao

		Population ('000) (2015)	Land Area (sq.km)	Road Length (km) (2016)	Road Density
Philippines		100,979	309,771	33,763	0.19
Mindanao (Average)		24,135	135,402	9,358	0.16
Mindanao	Region IX	3,629	17,047	1,651	0.21
	Region X	4,689	20,496	1,961	0.20
	Region XI	4,893	20,357	1,685	0.17
	Region XII	4,545	22,513	1,547	0.15
	Region XIII	2,596	21,478	1,521	0.20
	ARMM	3,781	33,511	993	0.09

Note:

$$\text{Road Density} = \frac{L}{\sqrt{P \times A}}$$

L: Road Length (km)
P: Population in 1,000
A: Land Area in sq. km

Source: DPWH Atlas, 2016 for road data and Philippine Statistics Authority for population

Source: Bangsamoro Development Plan – II, JICA, 2016

Figure 2.2.1-1 Present Road Network of the ARMM (Mainland Provinces)

2.2.2 Pavement Ratio

The total length of paved national road of the country as of December 2016 reaches 33,762 km of which 85.4% is paved. This data indicates that a total of 3,237 km road is paved between 2013 and 2016. In the ARMM region, the ratio of paved national road stands at 81.9% which means that about 179 km of national road is still surfaced with gravel. Discussion with the DPWH-ARMM reveals that most of these roads are located in the island provinces (Basilan, Sulu, Tawi-Tawi) where security condition affects road construction.

Table 2.2.2-1 Pavement Ratio of National Road per Region in Mindanao

		Total Length (km)	Paved	Unpaved
Philippines		33,762.89	85.4%	14.6%
Mindanao	Region IX	1,651.12	78.1%	21.9%
	Region X	1,961.01	86.0%	14.0%
	Region XI	1,684.98	85.6%	14.4%
	Region XII	1,547.33	85.0%	15.0%
	Region XIII	1,521.03	88.2%	11.8%
	ARMM*	992.60	81.9%	18.1%

Source: DPWH RBIA Database (as of December 2016);* DPWH-ARMM

2.2.3 Road Surface Condition

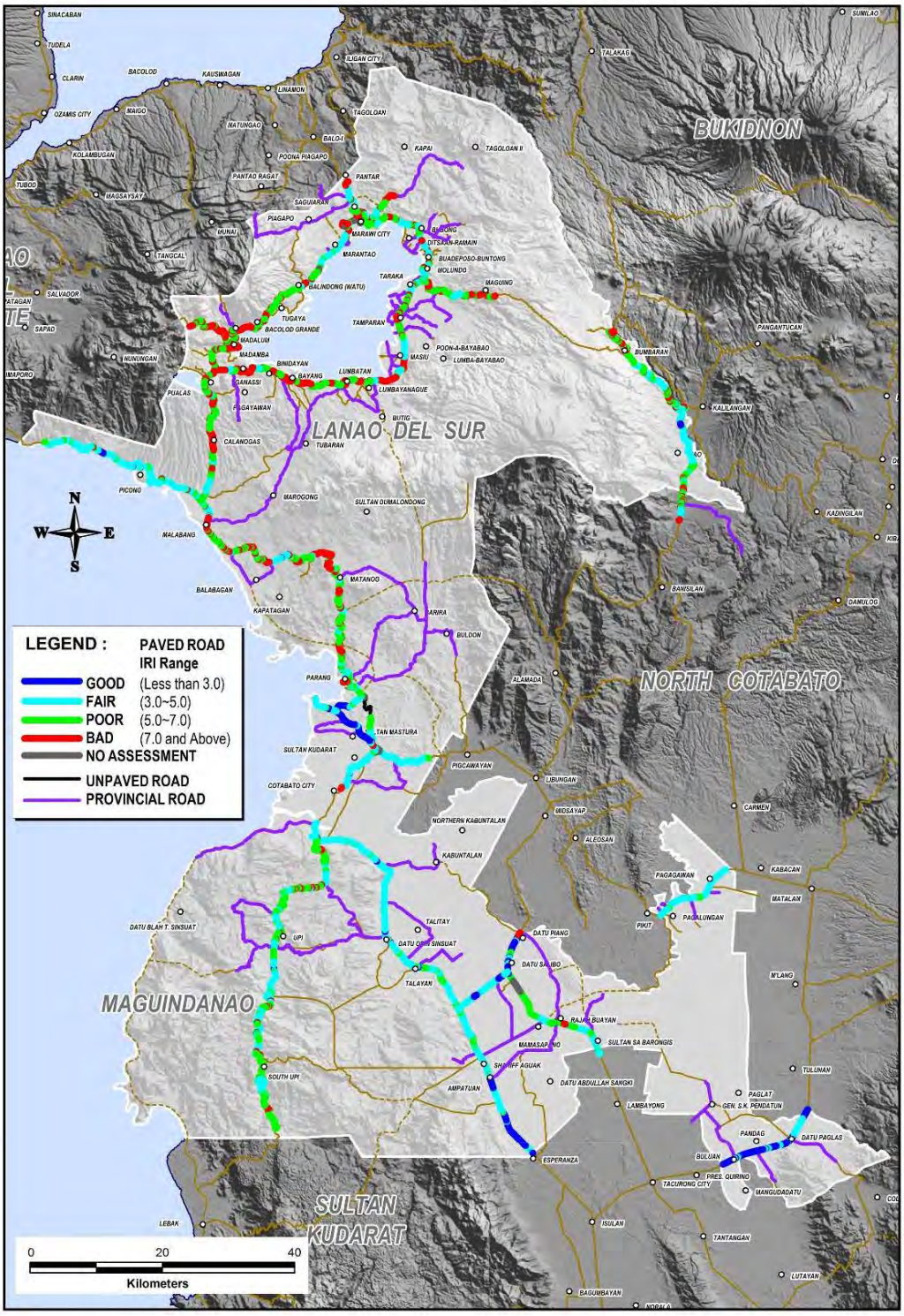
The 2016 JICA-assisted study titled "Bangsamoro Development Plan-II" undertook road surface condition survey using the Dynamic Response Intelligent Monitoring System (DRIMS) to measure International Roughness Index (IRI). DRIMS was developed by the Bridge and Structures Laboratory at the University of Tokyo and this was the first time the equipment was utilized in the Philippines. The equipment gives estimated IRI of the road as a result of measuring and calculating acceleration according to vehicle motion.

Based on this survey, the length of the national road in bad condition thus required immediate intervention is about 139.km as show in **Table 2.2.3-1**. Those in poor condition accounts for 181.0km. IRI map of the national road (mainland ARMM only) is presented in **Figure 2.2.3-1**.

Table 2.2.3-1 Road Condition of Paved National Roads

	Level	Good	Fair	Poor	Bad	Total
	IRI Range	3<IRI	3<IRI<5	5<IRI<7	7>IRI	
Mainland ARMM	Maguindanao (km)	5.35	73.75	104.20	106.99	290.29
	Lanao del Sur (km)	41.15	131.35	76.85	32.50	281.85
	Sub-total (km)	46.5	205.1	181.05	139.49	572.14
	Percentage (%)	8.1%	35.8%	31.6%	24.4%	100.0%

Note: IRI = International Roughness Index
Source: Bangsamoro Development Plan – II, JICA, 2016



Source: Bangsamoro Development Plan – II, JICA, 2016

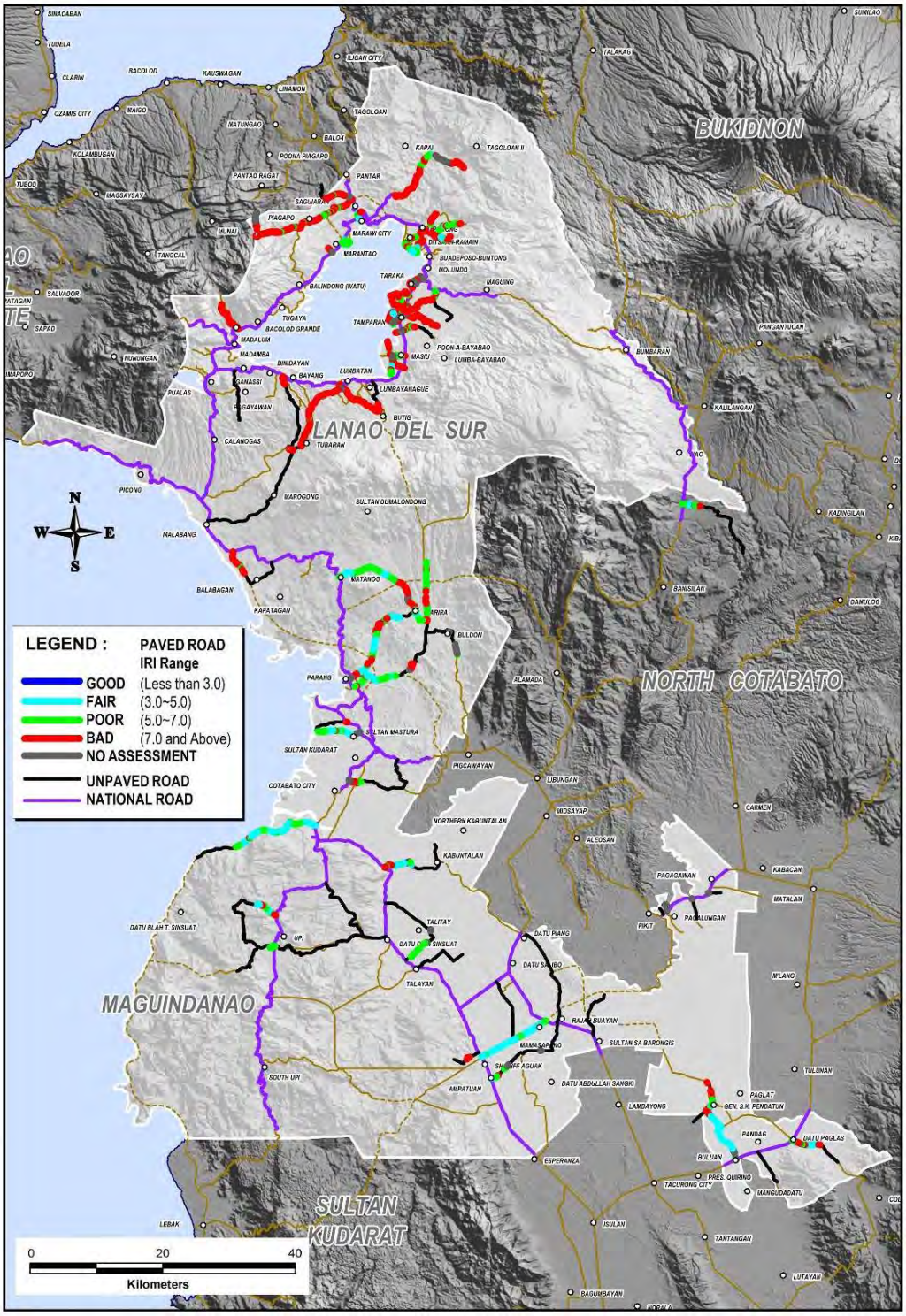
Figure 2.2.3-1 **National Road's Surface Condition in the ARMM (Mainland Provinces)**

Paved provincial road in good and fair condition in the region is very limited which is just 45.80 km out of the 260 km provincial road. Lack of maintenance of these roads led to the poor condition of large section of the provincial road as indicated in **Table 2.2.3-2** where more than 50% of the provincial road is in bad condition. This is significantly high compared to road in bad condition along the national road which is just 24% of the network (**Figure 2.2.3-2**).

Table 2.2.3-2 Road Condition of Paved Provincial Roads

	Level	Good	Fair	Poor	Bad	Total
	IRI Range	3<IRI	3<IRI<5	5<IRI<7	7>IRI	
Mainland ARMM	Maguindanao (km)	0.70	38.70	44.00	25.80	109.20
	Lanao del Sur (km)	-	6.40	24.30	120.20	150.90
	Sub-total (km)	0.70	45.10	68.30	146.00	260.10
	Percentage	0.3%	17.3%	26.3%	56.1%	100.0%

Note: IRI = International Roughness Index
Source: Bangsamoro Development Plan – II, JICA, 2016



Source: Bangsamoro Development Plan – II, JICA, 2016

Figure 2.2.3-2 **Provincial Road's Surface Condition in the ARMM (Mainland Provinces)**

2.2.4 Summary of Road Issues

Based on the initial assessment of the road development of the region and as well as freight transport operation, the following issues were identified:

a. Road Density

By reflecting the 2015 population data, it was found out the Bangsamoro region's road density (0.09) remains lowest in the country which is not even half of the national average (0.19). A supply of 850km of national road is necessary to reach Mindanao average (0.16).

b. Pavement Ratio

Pavement ratio of national road in 2016 is 85.4%. ARMM's pavement ratio is at 81.9% indicating that there are still 179 km of national road with gravel or earth surface.

According to the 2016 JICA assisted titled Bangsamoro Development Plan – II, provincial road of the ARMM is mostly surfaced with gravel or earth which accounts for 79% (1,680 km). This remains a major development issue to be addressed in the coming years.

Municipal road is also mostly surfaced with gravel or earth (80% or 1,680 km).

Barangay road / Farm-to-market road is also mostly surfaced with gravel or earth road (4,824 km of which only 0.2% has gravel surface).

c. Road Surface Condition of Paved National Road

The Dynamic Response Intelligent Monitoring System (DRIMS) survey undertaken during the BDP-II reveals that 139 km of the national road in the ARMM is in bad condition. Those in poor condition accounts for 181.0km.

2.3 Road / Bridge Operation and Maintenance

2.3.1 Executive Organization of Road/Bridge Maintenance in ARMM

Executive Order No. 426 (October 12, 1990), Section 1 prescribes that "The Offices of the Department of Public Works and Highways (DPWH) within the Autonomous Region in Muslim Mindanao (ARMM) including their function, powers and responsibilities, personnel, equipment, properties, budgets and liabilities are placed under the control and supervision of the Autonomous Regional Government (ARG)".

Also, Section 2 of Executive Order No. 426 has specified that the ARG shall be responsible for highways, flood control and water resource development systems, and other public works within the ARMM and shall exercise the maintenance of the infrastructure facilities within the ARMM and supervise the maintenance of such local roads and other infrastructure receiving financial assistance from the National Government.

Therefore, DPWH-ARMM is mandated to undertake:

(a) the planning of infrastructure, such as roads and bridges, flood control, water resources projects and other public works; and
(b) the design, construction, and maintenance of national roads and bridges, and major flood control systems

2.3.2 Roads and Bridges Maintained by DPWH-ARMM

Responsible organizations for the road maintenance of each road classification are presented in **Table 2.3.2-1**.

Table 2.3.2-1 Road Classification and Responsible Organization

Road Maintenance Classification	Responsible Organization for Road Maintenance
1) National Road	DPWH-ARMM
2) Provincial Road	Provincial Government
3) City Road	City Government
4) Municipal Road	Municipal Government
5) Barangay Road	City or Municipal Government

Source: DPWH-ARMM

DPWH-ARMM has full responsibility for the maintenance of National Roads and Bridges. The total road length of the National Roads by the pavement type in the area of ARMM is shown in **Table 2.3.2-2**.

Table 2.3.2-2 Total Road Length by Pavement Types Maintained by DPWH-ARMM

Pavement Types	Length (km)				
	Year 2008		Year 2017		Differences
PCC	603.92	(63%)	802.61	(81%)	198.69
AC	18.72	(1%)	10.35	(1%)	-8.37
Sub-Total	622.64		812.96		190.32
Gravel	321.85	(18%)	179.62	(18%)	-142.23
Earth	7.3	(1%)	-	-	-7.3
Total	951.80	(100%)	992.58	(100%)	40.78

Source: Data in 2008: Infrastructure (Road Network) Development Plan for ARMM, JICA, March 2010
Data in 2017: DPWH-ARMM

The total road length of the National Roads as of 2017 is approximately 993 km long, and approximately 803 km (81% of total) is paved by the Portland Cement Concrete (PCC). Compared with the pavement length as of 2008 and 2017, total concrete paved road length has been increased around 190 km, while total road length was increased only 40 km because 45 % of gravel roads (142 km) have been improved to concrete pavement last decade.

Inventory of the roads and bridges maintained by DPWH-ARMM are shown in Appendix 2-2. The length of the roads and number and length of the bridges are summarized in **Table 2.3.2-3** by District Engineering Offices (DEOs). Around 60 % of the total road length and 65 % of total number of the bridges are under jurisdiction of Maguindanao (I and II) and Lanao del Sur (I and II) DEOs.

Table 2.3.2-3 Roads and Bridges Maintained by DPWH-ARMM

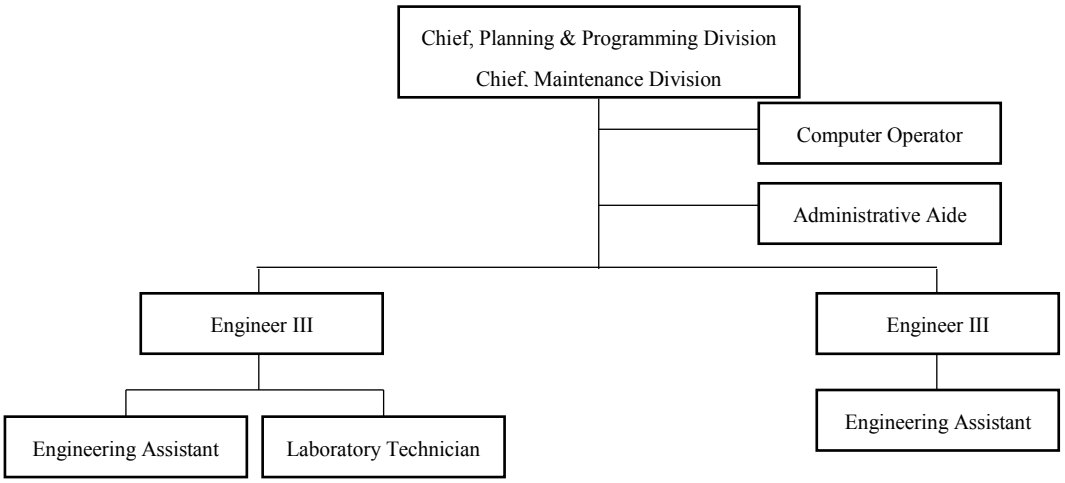
DEOs	Year 2017				Year 2008	Year 2017/Year 2008
	Roads (km)	Bridges		Total Roads & Bridges Length (km)	Total Roads & Bridge Length (km)	
		No.	Length (Km)			
Maguindanao I	144.599	22	1.054	145.653	246.46	1.16
Maguindanao II	137.676	36	1.572	139.248		
Lanao del Sur I	145.935	43	1.438	147.373	119.48	1.23
Lanao del Sur II	160.585	35	1.004	161.589	161.59	1.00
Sub-total	588.795	136	5.068	593.863	527.53	1.13
Sulu I	89.875	24	0.195	90.070	90.99	0.99

Sulu II	44.900	5	0.04	44.940	78.54	-0.57
Tawi-Tawi	115.099	10	0.399	115.498	93.72	1.23
Basilan	153.921	35	1.021	154.942	133.79	1.16
Total	**992.589**	**210**	**6.72388**	**999.313**	**924.57**	**1.08**

Source: Data in 2008: Infrastructure (Road Network) Development Plan for ARMM, JICA, March 2010
Data in 2017: DPWH-ARMM

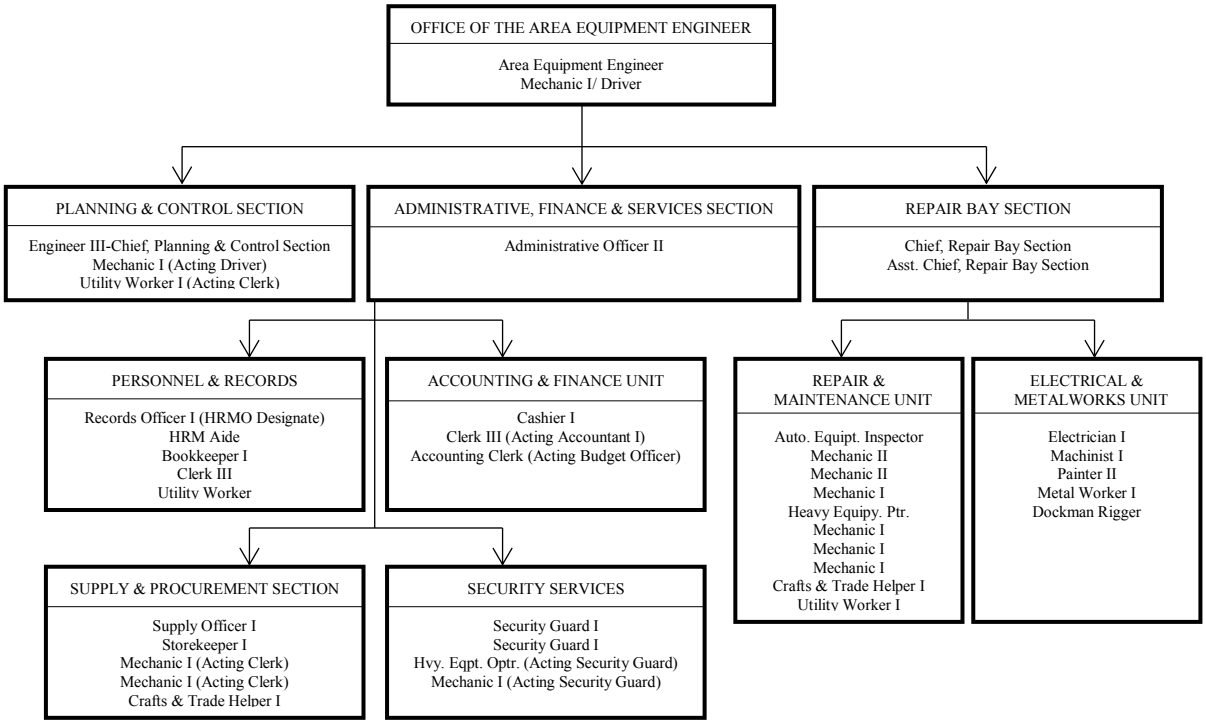
2.3.3 Organization Structure for Maintenance of Infrastructure in ARMM

Maintenance Division is organized in Operations Bureau in Regional Office as shown in **Figure 2.3.3-1**. The organization structure of Maguindamnao I DEO and Maguindanao Area Equipment Services (AES) are illustrated in **Figure 2.3.3-2** and **Figure 2.3.3-3** as the one of the case of organization structure for DEO and AES. Maintenance Section in DEO is organized under the Assistant District Engineer.



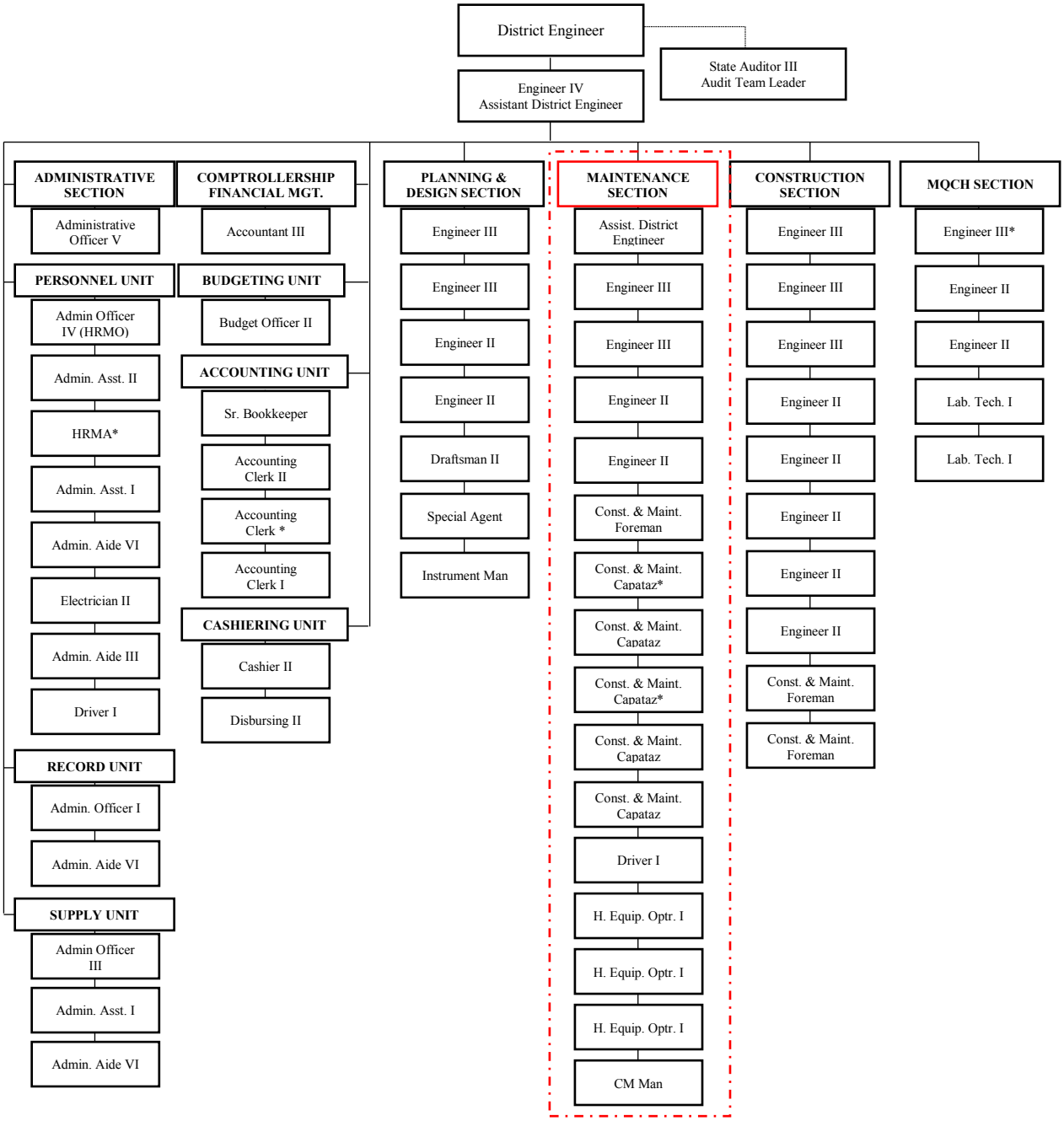
Source: DPWH-ARMM

Figure 2.3.3-1 Organization Structure of Maintenance Division in Regional Office of DPWH-ARMM



Source: Maguindanao AES, DPWH-ARMM

Figure 2.3.3-2 Organization Structure of Maguindanao AES



Source: Maguindanao I DEO, DPWH-ARMM

Figure 2.3.3-3 Organization Structure of Maintenance Section in Maguindanao I DEO

2.3.4 Specific Duties and Responsibilities

(1) Maintenance Division

DPWH-ARMM is headed by the Regional Secretary who is responsible to the ARMM Governor and consists of three Bureaus in the Regional Office. Among the three bureaus, the Operations Bureau is a technical bureau in charge of the infrastructure development and performs its duties through four Divisions and the Maintenance Division is under the Operations Bureau as shown in **Figure 2.1.3-1**.

The staff in the Maintenance Division does not undertake actual maintenance works, but they are responsible for technical supervision of the maintenance works undertaken by the DEOs. The

Maintenance Division recommends the allocation of maintenance funds to the DEOs for approval of the Regional Secretary/Assistant Regional Secretary, based on the Equivalent Maintenance Kilometer (EMK) formula which is the budget allocation formula applied in DPWH-ARMM, and reviews maintenance programs submitted by the DEOs. The specific duties and responsibilities of the Maintenance Division in the Regional Office are shown in Appendix 2-1.

(2) District Engineering Office (DEO)

Eight DEOs serve as the main implementing units of DPWH-ARMM. Each DEO is headed by a District Engineer/Assistant District Engineer. DEO is responsible for the actual operation of the maintenance of National Roads, and the specific duties and responsibilities of DEO are shown in Appendix 2-1.

(3) Maintenance Section

The Maintenance Section is organized under an Assistant District Engineer and it is made up of some engineers, capatazs and heavy equipment operators. The Maintenance Section plays a central role in the actual operation of the maintenance of National Roads. The functions, responsibilities and tasks of each staff in the Maguindanao I DEO are shown in Appendix 2-1 as an example.

(4) Area Equipment Service (AES)

There are four AESs under DEOs. The organizational structure of the Maguindanao AES is shown in **Figure 2.3.3-3** as an example, and also, the organizational structure of the remaining three AESs is almost the same as the one of the Maguindanao AES. There are three Sections under the Office of the Area Equipment Engineer and almost mechanics and electricians are working under the Chief of the Repair Bay Section. The substantial function of the AES is maintenance of their own machines and the details are shown in Appendix 2-1.

2.3.5 Personnel Organization of DPWH-ARMM

Inventory of Personnel as of December 31, 2017 is shown in Appendix 2-3, and its summary is shown in **Table 2.3.5-1** in contradistinction to the personnel as of November 15, 2008.

DPWH-ARMM has a total of 702 permanent personnel, as of December, 31 2017, and it increased by 97 personnel from 2008. The personnel proportion of the Regional Office against the Field Offices is 19 to 81. The proportion of the Field Offices has been slightly increased, compared with the one in 2008 that was 21 to 79.

Of 91 staff increased in the Field Offices, 40 personnel are in the Basilan DEO which newly established in 2012 (E.O. No.14 12 April 2012), while 4 AESs are decreased compared with the number of staffs as of 2008. The number of staffs in the Field Offices, technical and non-technical personnel, technical personnel in Regional Office and 8 DEOs and maintenance personnel of Maguindanao I and II DEOs are shown in Appendix 2-1.

Table 2.3.5-1 Permanent Personnel of DPWH-ARMM

Offices	Year 2008		Year 2017		2017-2008
	Number	%	Number	%	Increased Number
Regional Office	127	21.0	133	18.8	+ 6
Field Offices	478	79.0	569	81.2	+ 91
8 DEOs	(345)	(57)	(450)	(64.2)	(+105)
4 AESs	(133)	(22)	(119)	(17.0)	(-14)
Total	605	100	702	100	+97

Source: Data in 2008: Infrastructure (Road Network) Development Plan for ARMM, JICA, March 2010
Data in 2017: DPWH-ARMM

2.3.6 Budgetary Framework for Maintenance of the Roads and Bridges

(1) Maintenance Funds For Infrastructure in ARMM

The funds for infrastructure programs and projects implemented by DPWH-ARMM are:

(a) the General Appropriations Act (GAA) which is authorized yearly by Congress; and
(b) the Special Funds from the Motor Vehicle User's Charge (MVUC) under RA 8794.

The GAA includes the Capital Outlays (CO) and the Maintenance and Other Operating Expenses (MOOE).

The MVUC Funds is used for the routine maintenance and preventive maintenance of National Roads. However, it has not been allocated from 2016 for the almost DEOs, DPWH-ARMM. Therefore, the budget for the maintenance of infrastructure in ARMM is basically the funds from GAA in 2017.

(2) Maintenance Funds under GAA in ARMM

In the GAA, the funds for the maintenance of roads and other infrastructures are provided under the MOOE. The funds was amounted to PhP 180.6 million in 2006, PhP 215.2 million in 2008, and it was modestly increased to PhP 322.5million in 2017, which is around 1.8 and 1.5 times increase, respectively, as shown in **Table 2.3.6-1**.

On the other hand, the CO in 2017 is significant increased by around 16 times compared to the CO in 2006 and 2008. Especially, there was a sharp increase from 2014 to 2015,

The proportion of the MOOE to the CO has declined from 25:75 in 2008 to 3:97 in 2015 through 2017, and recently the budget for maintenance for infrastructures is only 3 % of GAA funds. All this appears to reflect the low priority given to the maintenance of the existing infrastructure and the asset preservation, compared to the construction of infrastructure.

Table 2.3.6-1 MOOE for Infrastructure under GAA Budget in ARMM

Year	*1)MOOE for Infrastructure (PhP)	*1) CO for Infrastructure (PhP)	(MOOE) : (CO)
2006	180,609,000	650,000,000	22 : 78
2007	210,214,000	650,000,000	24 : 76
2008	215,230,000	650,000,000	25 : 75
2009	221,701,000	1,000,000,000	18 : 82
2010	N/A	N/A	-
2011	N/A	N/A	-
2012	176,712,000	1,096,630,000	14 : 86
2013	275,380,000	1,510,181,000	15 : 85

Year	*1)MOOE for Infrastructure (PhP)	*1) CO for Infrastructure (PhP)	(MOOE) : (CO)
2014	317,289,000	5,023,400,000	6 : 94
2015	306,768,000	10,153,816,000	3 : 97
2016	313,771,000	10,243,816,000	3 : 97
2017	322,529,000	10,333,516,000	3 : 97
2017/2006	1.79	15.90	
2017/2008	1.50	15.90	

Source: *1): Data in 2008 to 2009; Infrastructure (Road Network) Development Plan for ARMM, JICA, March 2010
Data in 2012; Comprehensive Capacity Development Project for the Bangsamoro, JICA, April 2016
Data in 2013 to 2017: DPWH-ARMM

With the MOOE appropriations, DPWH-ARMM prepares programs for the repair and maintenance of infrastructure by project category. These are summarized in **Table 2.3.6-2**.

Table 2.3.6-2 Breakdown of MOOE , 2013-2017

(Unit: Million PhP)

Item \ Year	2013	2014	2015	2016	2017	2017/2013
Total MOOE	275.4	317.3	306.8	313.8	322.5	1.17
Of which: Net Expense for Maintenance of Infrastructure	228.8 (83.1%)	228.8 (72.1%)	240.3 (78.3%)	247.5 (78.9%)	250.7 (77.7%)	1.10
National Roads & Bridges	130.1 (56.9%)	130.1 (56.9%)	137.6 (57.3%)	141.8 (57.3%)	141.8 (56.6%)	1.09
Port Shore Protection	12.5 (5.5%)	12.5 (5.5%)	12.5 (5.2%)	12.8 (5.2%)	13.2 (5.3%)	1.06
Flood Control	15.2 (6.6%)	15.2 (6.6%)	18.7 (7. 8%)	19.3 (7.8%)	19.8 (7.9%)	1.30
Office Buildings	38.3 (16.7%)	38.3 (16.7%)	38.3 (16.0%)	39.4 (15.9%)	40.6 (16.2%)	1.06
School Buildings	30.7 (13.4%)	30.7 (13.4%)	30.7 (12.8%)	31.7 (12.8%)	32.6 (13.0%)	1.06
Water Supply	2.0 (0.9%)	2.0 (0.9%)	2.5 (1.0%)	2.6 (1.1%)	2.7 (1.1%)	1.35

Source: DPWH-ARMM

Out of the total MOOE appropriations for ARMM infrastructure, the net amount of actual expense for the maintenance of infrastructure has slightly increased from PhP 228.8 million in 2013 to PhP 250.7 million in 2017. Also, the ratio of the net amount of actual expense for the maintenance of infrastructure has varied between 72 % and 83 % of total MOOE.

However, the increasing ratio of the net amount of actual expense for the maintenance of infrastructure in the last five years from 2013 to 2017 is only 10 %, while the increasing ratio of MOOE is 17 %.

Out of the net expense for the maintenance of infrastructure in ARMM, the maintenance for National Roads & Bridges has been allocated around 60 % constantly every year and it has slightly increased from PhP 130.1 million to PhP 141.8 million from 2013 to 2017.

According to DPWH-ARMM, the total amount of PhP 141.8 million was allocated to the eight districts based on the EMK formula which had been used by DPWH-National as shown in Appendix 2-1. Based on these distributions, each DEO prepares the Annual Maintenance Work Program (AMWP) for the maintenance of National Roads. These are reviewed and clarified by the Maintenance Division in

DPWH-ARMM before funds are allotted to the DEOs. The AMWP-CY-2017 of the Maguindanao I DEO as an example is shown in Appendix 2-1.

(3) O&M Cost for Sub-Projects

For cost of road and bridge maintenance in this study, it is estimated using actual maintenance budget and operational road length in 2017 by DPWH-ARMM. In particular, the unit cost per kilometer is the amount obtained by dividing the budget of 141.8 Million PhP by the road and bridge length of 999.313 km. Therefore, PhP 141,897 is applied as the unit cost per kilometer for maintenance in this project.

Table 2.3.6-3 O&M Cost for Sub-Project

Sub-Project	Unit Cost (PhP/km)	Road Length (km)	O&M Cost (Php/year)
1	141,897	13.9	1,972,368
2	141,897	35.3	5,008,964
6	141,897	62.6	8,882,752
7	141,897	19.8	2,809,561
8	141,897	7.0	993,279
9	141,897	16.8	2,383,870

Source: JICA Study Team

(4) Maintenance Funds under DPWH Budget from MVUC Fund

The MVUC Fund is divided into four Special Trust Account, namely; 1) Special Road Support Fund (SRSuF); 2) Special Local Road Fund (SLRF); 3) Special Road Safety Fund (SRSaF) and 4) Special Vehicle Pollution Control Fund (SVPCF) by the purpose as shown in Appendix 2-1.

The three funds intended for road maintenance and installation of traffic lights/road safety devices are managed by the DPWH-National, while SVPCF for air pollution control is managed by the Department of Transportation and Communications (DOTC).

DPWH-National provides the funds to DEOs through the Region Office IX, X and XII based on the DEO's request which was approved by the Road Board.

MVUC fund by DPWH-National had been allocated to each DEO from 2013 to 2015 as shown in **Table 2.3.6-4**. However, it had not been allocated to all DEOs from 2016 and it had been allocated to the Basilan DEO only in 2017. The reasons of that are assumed that DEOs didn't request fund allocation or the request from DEOs were not approved by the Road Board according to DPWH-National.

Table 2.3.6-4 DPWH-National Allotment of MVUC Fund for Maintenance of National Roads in ARMM, 2013-2017

(Unit: PhP)

Implementing Offices		2013	2014	2015	2016	2017
Maguindanao I (thru RO-XII)	Routine	7,076,742	5,225,272	4,427,016	-	-
	Preventive	-	-	-	-	-
Maguindanao II (thru RO-XII)	Routine	5,915,869	3,891,160	4,966,896	-	-
	Preventive	-	-	-	-	-
Lanao del Sur I (thru RO-X)	Routine	5,636,609	3,779,984	3,671,184	-	-
	Preventive	-	-	-	-	-
Marawi City (thru RO-X)	Routine	1,181,458	845,878	863,808	-	-
	Preventive	-	-	-	-	-
Lanao del Sur II (thru RO-X)	Routine	7,143,640	5,114,096	4,966,896	-	-
	Preventive	-	-	-	-	-

Sulu I & II (thru RO-IX)	Routine	6,593,672	4,335,864	4,319,040	-	-
	Preventive	10,000,000	-	10,365,000	-	-
Tawi-Tawi (thru RO-IX)	Routine	6,661,327	4,335,864	3,455,232	-	-
	Preventive	-	-	-	-	-
Basilan (thru RO-IX)	Routine	7,292,047	4,322,664	4,427,013	-	5,396,681
	Preventive	-	-	-	-	-
Total	Routine	47,501,364	31,860,782	31,097,085	-	5,396,681
	Preventive	10,000,000	-	10,365,000	-	-
	Total	57,501,364	31,860,782	41,462,085	-	5,396,681

Sources: DPWH-National

(5) Total Budget for Maintenance of National Roads and Bridges

The total budget for the maintenance of the National Roads and Bridges are summarized in **Table 2.3.6-5**.

Table 2.3.6-5 Total Budget for Maintenance of National Roads and Bridges in ARMM, 2006-2017

(Unit: '000 PhP)

Year	MOOE	MVUC Fund	Total Budget for Maintenance	Proportion to 2006
2006	110,581	143,656	254,237	1.00
2007	110,581	122,266	232,847	0.92
2008	188,452	117,754	306,206	1.20
2013	130,096	57,501	187,597	0.73
2014	130,096	31,860	161,956	0.63
2015	137,623	41,462	179,085	0.70
2016	141,752	0	141,752	0.56
2017	141,752	5,397	147,149	0.58

Source: 2006 to 2008: Infrastructure (Road Network) Development Plan for ARMM, JICA, March 2010
MOOE 2013 to 2017: DPWH-ARMM, MVUC 2013 to 2017: DPWH-National

Compared to MVUC fund allocated to DEOs from 2006 to 2008, allocation in 2013 to 2015 was drastically reduced to less than a half. Also, the total amount of the budget for the maintenance of the roads and bridges in 2017 is around half of 2006 and less than half of 2008.

2.3.7 Maintenance Activity

According to DPWH-ARMM, the routine inspection of the roads and bridges is carried out by the daily monitoring of DEO's personnel and the works for the routine maintenance and the periodic maintenance of roads and bridges in ARMM are carried out by administration (MBA).

Activities of the routine maintenance and the periodic maintenance are summarized below.

(1) Routine Maintenance

According to DPWH-ARMM, the activities of the routine maintenance carried out by each DEO are classified into seven work categories and the detail activities of each category are shown in **Table 2.3.7-1**.

Table 2.3.7-1 Activities of Routine Maintenance

ACT. NO.	ACTIVITY NAME	ACT. NO.	ACTIVITY NAME	ACT. NO.	ACTIVITY NAME
Work Category 10 – Pavement Maintenance		**Work Category 11 - Regravelling**		**Work Category 16 – Drainage Maintenance**	
111	Premix Patching Bituminous Pavements	61x	Resurfacing Of Unpaved Road Surfaces	141	Resurfacing Of Unpaved Road Surfaces

112	Penetrating Patching Bituminous Pavements	**Work Category 12 – Bridge And Structure Maintenance**		142	Manual Inlet/Outlet Cleaning
113	Sealing Bituminous Pavements			143	Culvert Line Cleaning
114	Replacement Of Bituminous Pavements	151	Cleaning Bridges	199	Other Maintenance To Roadside
121	Patching Concrete Pavements	152	Patching Concrete Decks	**Work Category 17 – Vegetation Control**	
122	Crack And Joint Sealing Of Concrete Pavements	153	Repairs To Concrete Bridges	202	Erosion Repair And Control On Roadside
123	Replacement Of Concrete Pavements	154	Repairs To Steel Bridges	209	Other Roadside Maintenance
101	Manual Repairing Of Unpaved Road Surfaces	155	Repairs To Bailey Bridges	**Work Category 18 – Traffic Services Maintenance**	
102	Manual Patching Of Unpaved Road Surfaces	156	Repairs To Timber Bridges	301	Sign Maintenance
103	Machine Patching Of Unpaved Road Surfaces	157	Cleaning Bridges Waterways	302	Centreline And Lane Line Repainting
104	Machine Grading Of Unpaved Road Surfaces	158	Repainting To Steel Bridges	303	Guardrails Maintenance
171	Temporary Patching	159	Temporary Patching	304	Sign Distance Mowing
401	Initial Response To Emergencies-Roadways	402	Initial Response To Emergencies-Bridges	309	Other Traffic Services
41x	Emergency Projects	**Work Category 15 – Shoulder Maintenance**			
503	Indirect Cost Work Expenses	131	Machine Grading Unpaved Shoulders		
504	Other Work Of Expenses	132	Machine Patching Of Shoulders		
509	Foreman Supervision				

Source: Maguindanao I DEO, DPWH-ARMM

(2) Periodic Maintenance

The periodic maintenance is also carried out by administration (MBA) and its activities are categorized into five: a) AC overlay, b) Re-blocking of PCC slabs, c) Large area resealing of pavement, d) Re-graveling of shoulders, e) On bridges, parapet repairs, deck sealing, repairs of scour protection, repainting, etc. and f) Backlog reduction, such as installation of new pipe-culvert, riprap/concrete side ditches, etc. The work activities of the periodic maintenance scheduled in Maguindanao I DEO in 2017 are shown in Appendix 2-1 which is extracted from Annual Maintenance Work Program in 2017 (AMWP-CY-2017) of Maguindanao I DEO.

(3) Maintenance by Contractor (MBC)

As mentioned in the above **Section 3.3.7 (2)**, around 60 % of EMK allocation is supposed to be the budget for this maintenance works which is carried out by contract (MBC). The budget for maintenance done by MBC is shown in Appendix 2-1.

2.3.8 Summary of Maintenance Issues by DPWH-ARMM

Based on the assessment of the road maintenance by DPWH-ARMM, the following issues were identified:

a) Road Maintenance Budget Issues

In the last decade, the total length for National Roads and Bridges extended approximately 75 km, corresponding to 8 %, and also total length of concrete surface for National Roads increased 190 km, accounting for 82 % of the total length in 2017. However, the total road length of road surface condition with poor and bad ratings reached 56.0 % in 2016, while it was 23.3 %[1] in 2008. On the other hand, the maintenance budget shrank by less than half in the same period.

b) Manpower Issues

Regarding human resources, the personnel of DPWH-ARMM increased by 97 in the last 10 years, corresponding to 16%; especially, the personnel of DEOs expanded 105, corresponding to 30 %.

[1] 71.1 % with good and fair conditions, 23.3 % with poor and bad conditions and 6.6 % was unknown due to security reason, according to "Infrastructure (Road Network) Development Plan for ARMM, JICA, March 2010"

Technology transfer on road maintenance method to younger generation is important in order to ensure proper maintenance.

c) Road Maintenance Implementation Issues

The maintenance system does not work well, i.e. a) inconsistent inventory formats, b) lack of maintenance records, c) lack of proper maintenance manual, etc. Sufficient road and bridge inspection and the preparation of proper database have not been conducted. Effective planning and programming, scheduling and design works for road maintenance implementation is not undertaken.

From the above issues, DPWH-ARMM needs to enhance their capacity development for maintenance.

2.3.9 Capacity Development for Maintenance in DPWH-ARMM

JICA has implemented "the Project on Improvement of Quality Management for Road and Bridge Construction and Maintenance Phase III" from February 2016. It will be continued up to February 2019. Also, JICA had conducted Phase I from February 2007 to February 2010 and Phase II from October 2011 to September 2014. These series of projects are implemented for DPHW-National, but not for DPWH-ARMM.

On the other hand, staffs of DPWH-ARMM had been received capacity development for maintenance under ARMM Human Capacity Development Project (AHCDP) which had implemented by JICA in 2013. Those who were trained are now practicing road maintenance. Therefore, it is unnecessary to conduct further training to those staffs in this project. However, young staffs of DPWH-ARMM who joined in the last 4 to 5 years may need some training for maintenance.

This project area is located at the conflicted-affected areas and it is difficult to dispatch Japanese experts for a long period due to the security reason. Therefore, it will be more practical DPWH-National to conduct technical transfer for maintenance to such young staffs of DPWH-ARMM.

It is desirable to include the following technical transfer for road and bridge maintenance by DPWH-National;

- **Trainer:**
  DPWH-National
- **Trainee:**
  Young staffs of DPWH-ARMM
- **Overall Goal:**
  Roads and bridges in ARRM are properly maintained.
- **Project Purpose:**
  Maintenance capacity for roads and bridges in DPWH-ARRM is improved.
- **Outputs:**
  Road and bridge inspection/diagnosis manuals are transferred and be used.
  Road and bridge rehabilitation/retrofitting manuals are transferred and be used.
  Necessity knowledge of road and bridge management is enhanced.
  Maintenance planning ability for road and bridge maintenance is enhanced.

Chapter 3 Review of Regional Development Plans

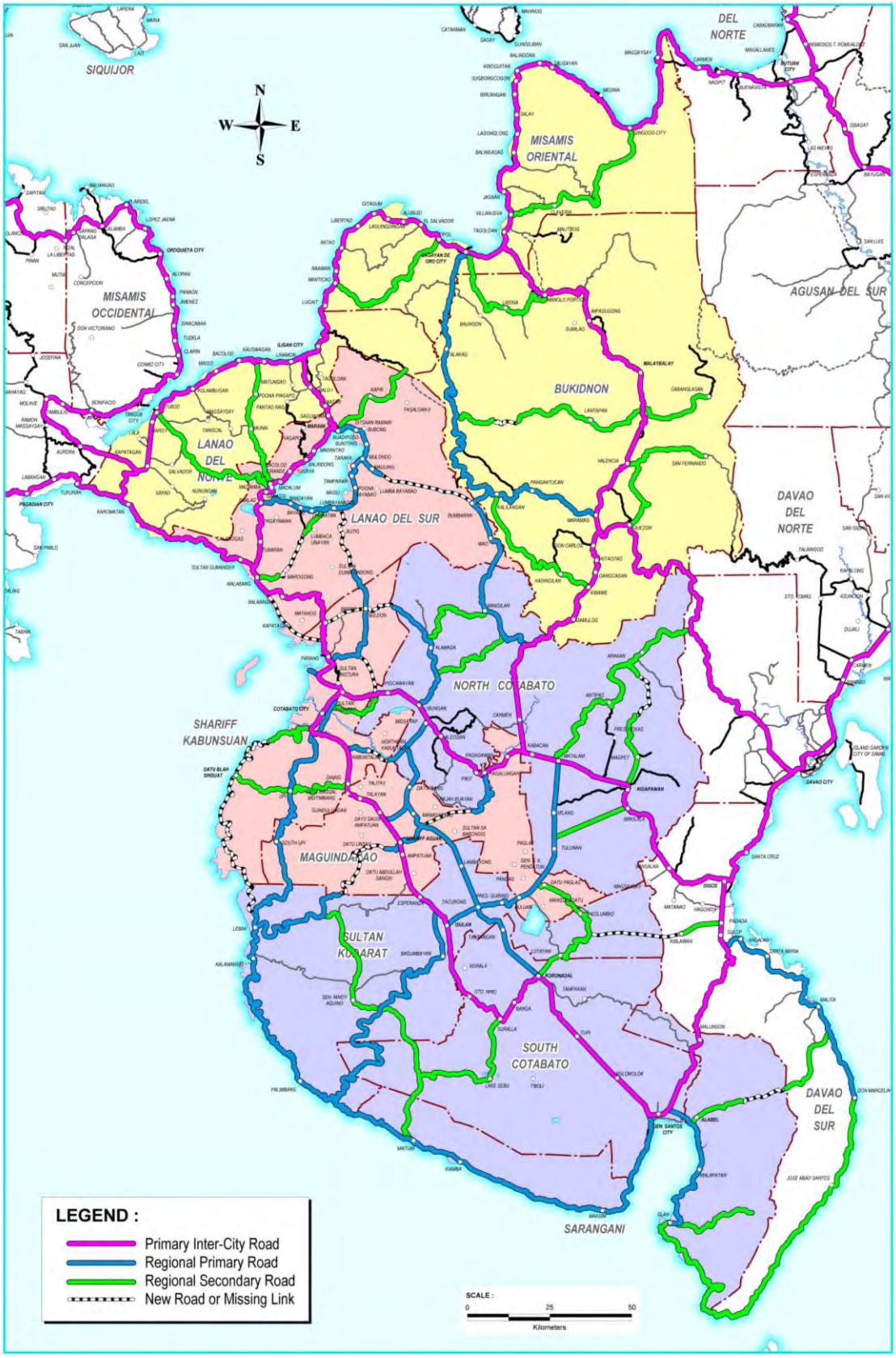
3.1 The Study on the Infrastructure (Road Network) Development Plan for ARMM

Although the ARMM region has high development potentials with rich natural resources, the region is the poorest in the country and suffers serious poverty problems due to low level of economic development which mainly caused by the long-lasting conflicts. Deteriorated infrastructure brought by the long-lasting conflicts is serious bottleneck for urgent economic recovery and sustainable development.

With the creation of ARMM, the National Government devolved maintenance of national roads and other powers and functions to ARMM, however, the ARMM Government still needs to develop capacity for planning, programming, construction, operation and maintenance of infrastructure for better management of infrastructure.

In view of above, the Government of Philippines (GOP), requested the conduct of "The Study on Infrastructure (Road Network) Development Plan for the Autonomous Region in Muslim Mindanao (ARMM Master Plan) to the Government of Japan (GOJ). In response to the request of GOP, GOJ has decided to conduct ARMM Master Plan since 2008, and exchanged Notes Verbales with GOP concerning the implementation of the Study. GOJ has launched the initiative "J-BIRD (Japan-Bangsamoro Initiatives for Reconstruction and Development)" in 2006. This study was implemented under the umbrella of this initiative.

In the ARMM Master Plan, future road network was proposed in ARMM, Region X and Region XII as shown in Figure 3.1-1. Projects was identified based on the results of the road/bridge inventory and condition survey.



Source: ARMM Master Plan

Figure 3.1-1 Proposed Road Network for ARMM, Regions X and XII in ARMM Master Plan

3.2 Bangsamoro Development Plan II

Following the signing of Framework Agreement on the Bangsamoro (FAB) in 2012 between the Philippine Government and MILF of which both sides have agreed to establish a new Bangsamoro Autonomous Government, JICA has taken the initiative for the Comprehensive Capacity Development Project for the Bangsamoro (CCDP-B) which has been implemented since July 2013.

Through this initiative, the medium to long term development plan was formulated thru the preparation of Bangsamoro Development Plan (BDP II) on April 2016. The said plan would serve as a development blueprint for the Bangsamoro government. BDP II is the continuation and extension of efforts for the Bangsamoro Development Plan Phase I (BDP I) that covers the transition period from 2013 up to 2016.

The Bangsamoro Development Plan II consists of development programs and projects structured into four (4) initiatives and associated institutional measures. The four initiatives are:

1) Broad-based Inclusive Development Initiative, a continuation and extension of BDP I consisting of projects responding to imminent needs of the people for various social services and livelihood activities. Most projects under this initiative will continue to be implemented through 2022;
2) Concerted Pump Prime Initiative, this initiative responds to the rapid development of Bangsamoro to catch up with the national average given the existing gaps in socio-economic conditions in the Bangsamoro territory and the rest of the country. Under this initiative is the spatial structure strengthening program with projects consisting of upgrading artery roads, missing links development project, ring roads/bypass roads development project, Polloc port upgrading project, Cotabato airport improvement, and new Bangsamoro airport establishment;
3) Alternative Socio-economy Promotion Initiative, this initiative pursues the main theme of the Bangsamoro development by encouraging effective use of indigenous resources for new economic activities. Projects under this initiative include those to improve and extend the existing economic activities such as integrated and mixed farming, and those to introduce innovative economic activities such as industrial clusters and halal industry; and
4) Enhanced Resources Management Initiative, this will enhance the resource capacity of Bangsamoro and improve the resource management by community involvement to support sustainable development.

The list of programs and projects under the four (4) initiatives are shown below.

Table 3.2-1 Development programs and projects under the four (4) initiatives

I. Broad-based inclusive development initiative (BDP I additional Projects)
1. Agrarian reform communities strengthening
*2. Agricultural cooperatives empowerment
3. Small water purification distribution
4. Power supply system maintenance improvement
5. Island airports security improvement
6. Efficient waste collection and recycling
*7. Labor-based road rehabilitation and maintenance
II. Concerted pump prime initiative
1. Pioneer focus area development program *1 Abubakar integrated area development 2 Central Mindanao integrated area development 3 Basilan integrated area development
2. Spatial structure strengthening program *1 Artery roads upgrading 2 Missing links development 3 Ring roads/bypass roads development *4 Polloc port upgrading *5 Cotabato airport improvement 6 New Bangsamoro airport establishment

3.	Comprehensive urban development program
*1	Greater Cotabato City urban infrastructure development
*2	Jolo and Bongao urban functions upgrading
3	Urban hierarchy establishment
4.	Irrigated paddy development program
1	Bangsamoro national irrigation systems improvement
*2	Communal irrigation systems support
5.	Economic corridor development program
1	Bangsamoro economic corridor development
2	Corridor link roads improvement
*3	Polloc freeport and ecozone development
*4	Special employment zone development
III.	**Alternative socio-economy promotion initiative**
6.	Agro-based industrial clusters development program
*1	Abaca industrial cluster development
*2	Coco products industrial development
3	Coffee industrial cluster development
4	Rubber industrial cluster development
7.	Integrated farming promotion program
*1	Goat-based integrated farming
2	Poultry-based integrated farming
8.	Mixed farming diversification program
1	Plantation crops mixed farming
*2	Mixed field crops farming
*3	Open pollinated seed production center establishment
9.	Innovative production and distribution program
*1	Halal industry promotion
2	Organic agriculture promotion
*3	Open market establishment
10.	Fishery products processing and distribution program
*1	Cold chain facilities installation
2	Solar powered fish market development
11.	Aquaculture development program
1	Fresh water aquaculture development
*2	Marine culture development
3	Seaweed culture development
IV.	**Enhanced resources management initiative**
12.	Forest and watershed management program
*1	National Greening program enhancement
2	Bamboo planting project
3	Dimapatoy watershed management
4	Non-wood forest products research
*5	Community-based forest management
13.	Marine resources management program
*1	Community-based coastal resources management
2	Marine surveillance strengthening
14.	Renewable energy development program
*1	Mini hydro power development
2	Aquamarine farming with solar power pilot
3	Biomass power generation
15.	Small scale irrigation program
*1	Small scale irrigated crop intensification
2	Multi-purpose small scale irrigation development
16.	Disaster risk reduction and management program
1	Bangsamoro disaster risk reduction and management
*2	Mindanao basin integrated watershed & flood management

The anchor projects are designated by asterisk (*) before their titles.

The Bangsamoro Development Plan has 54 projects in 16 programs under the four initiatives. Twenty-seven (27) of these projects are earmarked as anchor projects that will characterize the Bangsamoro development throughout the three phases. They have been selected on the basis of the following criteria and considerations:

a) Projects have well defined characteristics consistent with the Bangsamoro development objectives, strategy and vision.

b) Projects will establish alternative systems for production, marketing or service delivery.

c) Projects have strategic importance in transforming the spatial and socio-economic structure of the Bangsamoro.

d) Projects have broad coverage of people in specific segments of the society to improve their livelihood.

Below are the list of anchor projects that have been selected. 9 Sub-Projects in this study was selected from 4) Artery roads upgrading project as shown in **Table 3.2-2** and **Figure 3.2-1**.

1) Agricultural cooperatives empowerment project
2) Labor based road rehabilitation and maintenance project
3) Abubakar integrated area development project
4) **Artery roads upgrading project**

Table 3.2-2 Artery roads upgrading project in BDP II Related to This Study

Project No.	Project Name	Sub-Project No.
RA-M2	Matanog-Barira-Alamada-Libungan Rd	Sub-Project 1
ML-M1	Parang-Balabagan Road	Sub-Project 2
CL-M1	Sibutu-Blensong-Nuro Road	Sub-Project 3
	Nuro-Pinansaran Road	Sub-Project 4
CL-M3	Maganoy-Lebak Road	Sub-Project 5
CL-M7	Tapian-Lebak Coastal Road	Sub-Project 6
BR-L1	Marawi City Ring Road	Sub-Project 7
BR-M1	Parang East Diversion Road	Sub-Project 8
BR-M4	Manuangan-Parang Road	Sub-Project 9

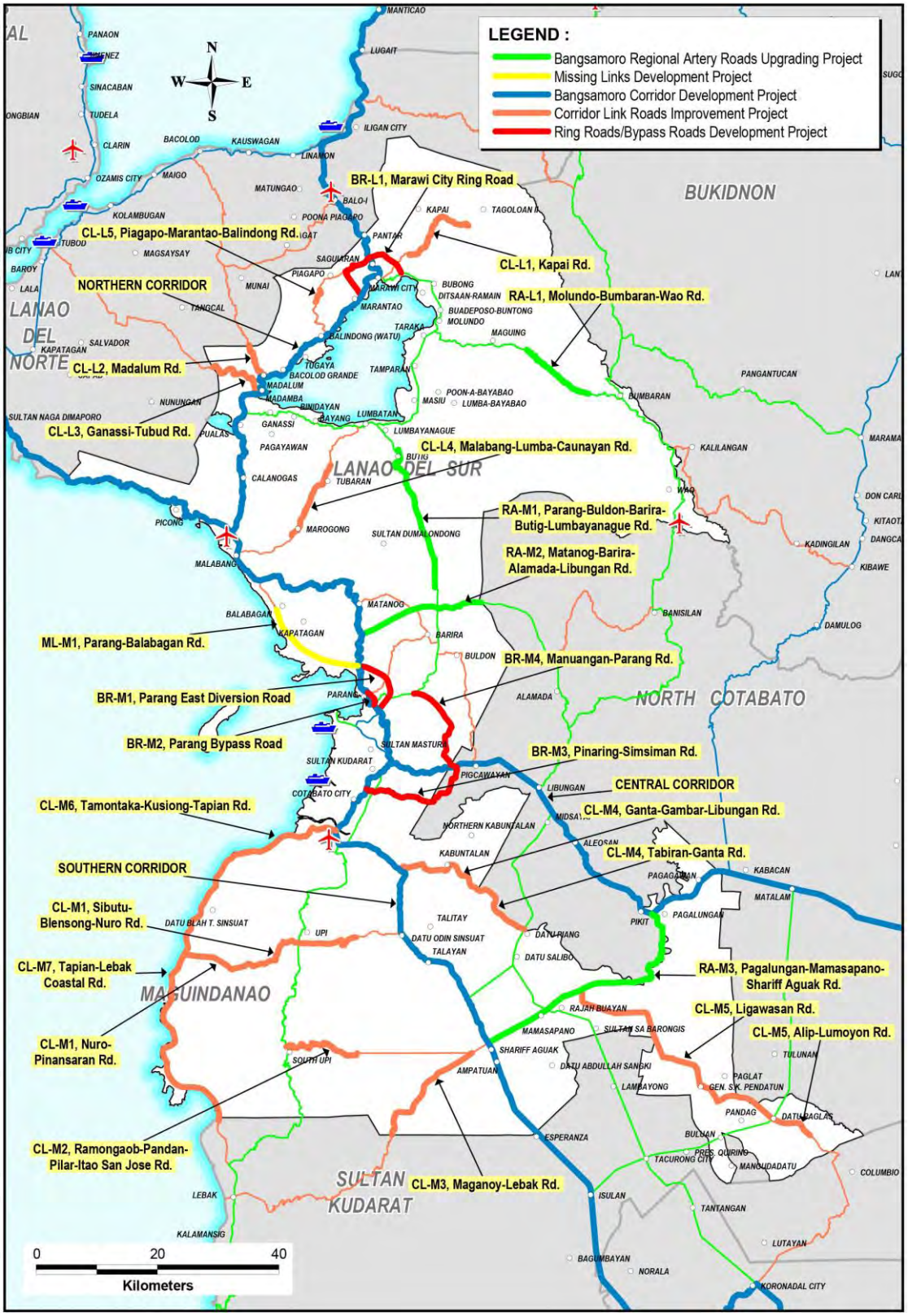
5) Polloc port upgrading project
6) Awang airport improvement project
7) Greater Cotabato City urban infrastructure development project
8) Jolo and Bongao urban functions upgrading project
9) Communal irrigation (CISs) support project
10) Bangsamoro economic corridor development project
11) Polloc port and ecozone development project
12) Special employment zone development project
13) Abaca industrial cluster development project
14) Coco and sugar industrial cluster development project
15) Goat-based integrated farming project
16) Mixed field crops farming project
17) Open pollinated seed production center establishment
18) Halal industry promotion project
19) Open market establishment project
20) Cold chain facilities installation project
21) Marine culture development project
22) National greening program enhancement project
23) Community-based forest management project

24) Community based coastal resources management project

25) Mini hydro power development project

26) Small-scale irrigation crop intensification project

27) Mindanao River basin integrated watershed and flood management project



Source: Bangsamoro Development Plan II, JICA, 2016

Figure 3.2-1 Locations of Bangsamoro Artery Roads for Improvement: Mainland Provinces

3.3 ARMM Regional Development Plan (2017-2022)

The ARMM Regional Development Plan for the period 2017-2022 was formulated consistent with the long-term vision of the Philippine Government entitled "Ambisyon Natin 2040" and the long term vision and mission of the Bangsamoro that "*By 2040, the people in the Bangsamoro are self-governing with predominantly middle class society living in safe communities, having a dynamic economy including a Halal ecosystem, enjoying inclusive peace and diverse cultures, who shall enhance sustainable development ensuring that responsibilities and benefits are shared by all".*

This long term vision are translated into actions by identifying development directions and priorities of the region for the next medium term RDPs. The development directions are directed in improving its current state by utilizing its strengths and comparative advantages in five (5) possible prospects that can be maximized, namely: 1)Strengthening the ARMM Reform Agenda; 2) Harnessing the region's development potentials and comparative advantages; 3) Emerging global and regional opportunities for *Halal* and Islamic finance; 4) President's Commitment to Develop Mindanao and Reduce Poverty; and 5) Support of the National Government and Non-State Actors to Peace and Security Initiatives.

The development goal of the plan in infrastructure for 2017-2022 is to accelerated infrastructure development for socio-economic growth in the region. Its strategy is to expand road systems and rehabilitate and upgrade existing roads and bridges for regional, provincial and municipal connectivity. A review of the plan was carried out to confirm the strategic directions of the Preparatory Survey for Road Network Development Project in Conflict-Affected Areas in Mindanao in terms of triggering infrastructure development in the region.

The ARMM RDP identified its priority on the following roads:

Mainland Provinces of ARMM

1. Rehabilitation of Narciso Ramos Highway
2. Completion of Lumbatan-Morogong-Malabang Road
3. Sultan Kudarat-Davao Highway (Buluan-Datu Paglas Section)
4. Midsayap-Makar Road (Datu Piang-SSB Section)
5. Barira-Butig Road
6. Tamontaka-Tapian-DBS-Lebak Road
7. Kabuntalan-Pigcawayan Road
8. Nituan-Parang-Manuangan Road
9. SSB-Pagalungan Road
10. Talayan-South Upi Road
11. South Upi-Shariff Aguak Road
12. Maganoy-Lebak Road
13. Ramain-Masiu Lakeshore Road
14. Saguiaran-Piagapo-Munai Road

Island Provinces

1. Upgrading of Jolo Transcentral Road
2. Completion of Tawi-Tawi Circumferential Road
3. Widening of Jolo Circumferential Road

Bangsamoro Arterial Roads Upgrading

1. Molundo-Bumbaran Road
2. Parang-Buldon-Barira-Butig-Lumbayanague Road
3. Pagalungan-Mamasapano-Shariff Aguak Road
4. Lapid-lapid-Batu-batu National Road
5. **Matanog-Barira-Alamada-Libungan Road**
6. Kamagong Road
7. Languyan Coastal Road
8. Biraddali-Parangan Road
9. Seratang-Dungon Road

Corridor Link Roads Improvement Project

1. Kapai Road
2. Malabang-Lumbaca Unayan Road
3. Piagapo-Marantao-Balindong Road
4. Madalum Road
5. Ganassi-Tubod Road
6. **Parang-Balabagan Road**
7. Tamontaka-Kusiong-Tapian Road
8. Ganta-Gambar-Libungan Road
9. Tabiran-Ganta Road
10. Sibuto-Blensong-Nuro Road
11. **Tapian-Lebak Coastal Road**
12. Nuro-Pinansaran Road
13. Ramongaob-Pandan-Pilar-Itao-San Jose Road
14. Ligawasan Road
15. Alip-Lumoyon Road
16. **Maganoy-Lebak Road**
17. Baluno-Balas Coastal Road
18. Kulay Bato-Tuburan Proper Road
19. Parangbasak-Guinanta Road
20. Tipo-tipo-Al Barka Circumferential Road
21. Kanas-Baiwas Road
22. Lumbang-Mahayahay Road
23. Kumalarang-Lumbang Road
24. Kumalarang-Pangasaan Road
25. Sumagdang-Kumalarang Road
26. Taglibi-Pansol Road
27. Seit-Kansipat-TanduBatu Road
28. Seit-Tayugan-Camp Andres Road
29. TanduBatu-LahingLahing Road
30. Camp Andres-LahingLahing Road
31. Sucuban-LahingLahing Road
32. Camp-Andres-Sucuban Road
33. Karungdong-NiyogNiyog Road
34. Pitogo-NiyogNiyog Road
35. KulayKulay-Karungdong Road
36. Punay-Seit Road
37. Kabungkol-KulayKulay Road
38. Bilaan-Panglima Estino Road
39. Patao-Kabungkol Road
40. Parang-Talipao Road
41. Silangkan-Poblacion Indanan Road
42. Jolo-Silangkan Road
43. Mampallam-Jolo Road
44. Pahut-Swangkang Road

Ring Roads/Bypass Roads Development Projects

1. **Parang East Diversion Road**
2. Parang Bypass Road
3. **Manuangan-Parang Road**
4. Pinaring-Simsiman Road
5. Isabela City Bypass Road
6. **Marawi City Ring Road**

Missing Links Development Projects

1. Sta. Clara-Tumahubong-Sumisip Road
2. Kamanggang-Tumahubong Road
3. Dungon-Parangan Road
4. BatuBatu-Dungon Road
5. New Port Access Road

Among the list, seven (7) road projects were identified in the RNDP in CAAM. One (1) is identified under the Bangsamoro Arterial Road, three (3) each under the Corridor Link Roads and Ring Roads/Bypass Roads Development. These are the following:

1. Matanog-Barira-Buldon-Alamada-Libungan Road
2. Parang-Balabagan Road
3. Maganoy-Lebak Road
4. Tapian-Lebak Coastal Road
5. Marawi Ring Road
6. Parang East Diversion Road
7. Manuangan-Parang Road

3.4 DPWH-ARMM's Road Planning

DPWH-ARMM launched its Flagship Projects entitled "Connectivity Roads". The objective is to provide a network of roads that will connect municipalities to major urban areas of ARMM that will provide easy and fast access to the different services needs of the community, particularly the less opportune communities.

One project identified by the ARMM flagship project is the SP-6 (Tapian – Lebak Coastal Road) as shown in the table below (named "Tapian – Daut Blah Sinsuat – Lebak Coastal Road) and illustrated in the map below.

Table 3.4-1 Flagship Projects of DPWH-ARMM, by Engineering District

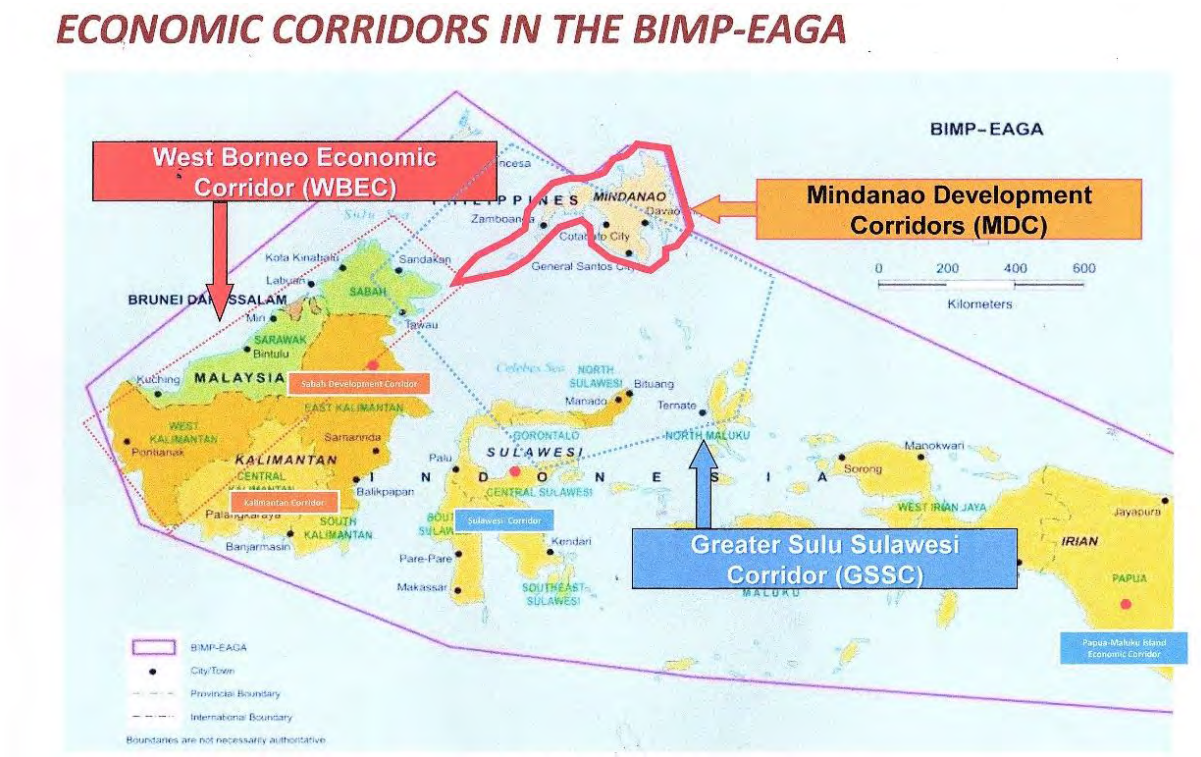
District/Name of Project	Total Length (Km)	Cost (PhP Million)
Maguindanao 1st Engineering District		
Pigcawayan-Buldon-Barira-Butig Road	34.85	150.00
Tapian-Datu Blah Sinsuat-Lebak Coastal Road	70.00	1,718.00
Upi-Datu Blah Sinsuat Road	22.50	
Datu Odin Sinsuat-Upi Road	22.00	
Datu Piang-Kabuntalan-Pigcawayan Road	13.50	577.50
Maguindanao 2nd Engineering District		
Ligawasan Provincial Road	34.05	612.75
SPMS Box Road (Datu Saudi, Datu Salibo, Datu Piang, Mamasapano, Datu Unsay, Shariff Aguak, Shariff Saydona)	80.75	1,610.40
Datu Anggal Midtimbang-Talitay Road	10.18	127.50
Columbio-Paglas Road	9.05	154.03
South Upi Road	11.35	225.50
Datu Piang-Kabuntalan Road	15.09	204.12
Lanao del Sur 1st Engineering District		
Marawi-Kapai-Tagoloan Road	41.13	
Lanao del Sur 2nd Engineering District		
Dapao-Illana Road	23.00	444.00
Malabang-Morogong Road	33.71	512.00
Butig-Barira Road	20.50	415.00

Source: DPWH-ARMM

Figure 3.4-1 DPWH-ARMM Flagship Projects (Mainland Provinces)

3.5 Mindanao Development Corridors by MinDA

The Mindanao Development Corridors (MDC) was formulated as a strategy for a more inclusive, balanced and sustainable growth in Mindanao. The development strategy uses the 5i's approached, which stands for the development of Infrastructure, Industries, Investments, Institutions and Innovations. The MDC will link to the development of economic corridors in BIMP-EAGA, which include the West Borneo Economic Corridor (WBEC) and the Greater Sulu Sulawesi Corridor (GSSC). See **Figure 3.5-1**.



Source: BIMP-EAGA Secretariat

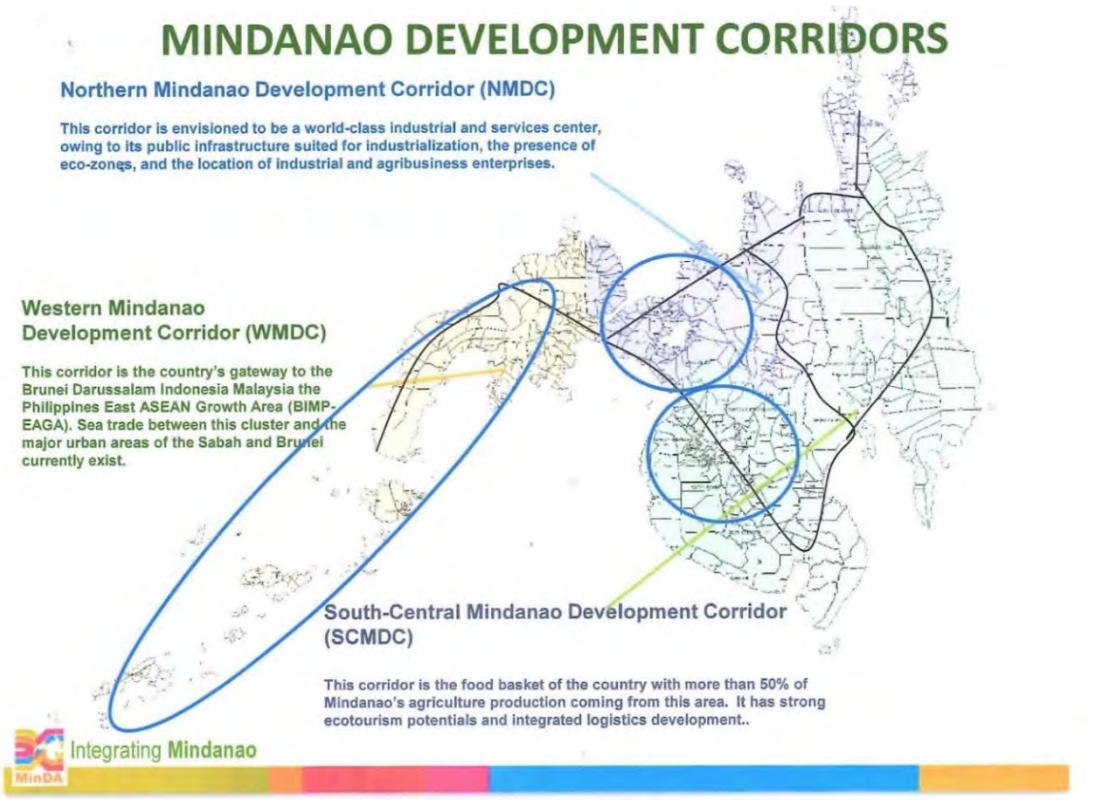
Figure 3.5-1 Economic Corridors in the BIMP-EAGA

The MDC intends to focus on three clustered areas in Mindanao, namely:

- Northen Mindanao Development Corridor (NMDC)
- Western Mindanao Development Corridor (WMDC)
- South-Central Mindanao Development Corridor (SCMDC)

Figure 3.5-2 shows the specific roles of each corridor based on its economic potentials and geographical locations. It is envisioned that these corridors will work complementary to each other in terms of bringing development in Mindanao.

In terms of Infrastructure Development **Table 3.5-1** shows the ongoing and proposed programs and projects in each corridor. The main objective is to provide connectivity and access to economic opportunities and trade in the three (3) corridors through the development of an efficient road network and high speed railway system. The improvement and expansion of ports and airports as gateway to BIMP-EAGA and other international and domestic markets.



Source: MinDA

Figure 3.5-2 Mindanao Development Corridors

Table 3.5-1 Ongoing and Proposed Programs and Projects

Name of Program/Project	Location	Agency	Status	Requirement
South Central Mindanao Development Corridor				
Polloc Freeport and Ecozone	Maguindanao	REZA	Operational	Development investments to expand/improve services
TransMindanao HighSpeed Railway System Project	Mindanao-wide	DOTr	FS for TDD Completed	Funding and implementation of remaining segments
Mindanao River Basin Flood Control Project	Central Mindanao	DPWH; DPWH-ARMM	DED done	Full funding in the immediate term to address destructive flooding
Mindanao Tourism and Cultural Village Center	Davao City	TIEZA	Phase 1 completed	Funding and implementation of Phase 2 to complete the project
General Santos City Aerotropolis	Gen. Santos City	DOTr	Ongoing work at PTB	Development investments to develop as aerotropolis
Mindanao Road Network Missing Links	Sarangani-Sultan Kudarat, Sarangani-Davao Occidental	DPWH	Ongoing construction of short segments	Need funding and implementation of missing links in the immediate term
Western Mindanao Development Corridor				
Western Mindanao Corridor Roads	West Coast Road, Tawi-Tawi	DPWH, DPWH-ARMM	Submitted to NEDA ICC	Full funding in the immediate term to support corridor priorities
New Zamboanga International Airport	Zamboanga City	DOTr	FS ongoing	For priority implementation in the immediate term

Name of Program/Project	Location	Agency	Status	Requirement
Zamboanga Ecozone Port Project	Zamboanga City	DOTr	FS funding under PPP PDF	Accelerate procurement of consultancy to enable implementation in the immediate term
Tawi-Tawi Special Economic Zone and Freeport	Tawi-Tawi	REZA	For FS	Completion of studies to support resource mobilization
TransMindanao HighSpeed Railway System Project	Mindanao-wide	DOTr	FS for TDD completed	Funding and implementation of remaining segments
Northern Mindanao Development Corridor				
TransMindanao HighSpeed Railway System Project	Mindanao-wide	DOTr	FS for TDD completed	Funding and implementation of remaining segments
Panguil Bay Bridge Project	Misamis Occ-Lanao del Norte	DPWH	Loan agreement signed	Accelerate implementation
Bukidnon Airport Development Project	Don Carlos, Bukidnon	DOTr	FS completed	Accelerate completion in the immediate term
Picong Integrated Development Project	Picong, Lanao del Sur	REZA	For FS	Conduct of FS and master Plan
Balo-I Flood Control Project	Baloi-Lanao del Norte	DPWH	Implementation deferred due to ROW	Proceed with implementation as a package with provision for ROW acquisition

The Mindanao Development Corridors by the MinDA transcends regions in Mindanao hence the project's impact will be felt by greater number of people. Likewise, it will facilitate faster integration of Mindanao's economy through provision of much needed regional infrastructure. As seen in the figure below, this JICA-assisted project complements the corridor development project of the said agency by direct connection between two road infrastructure. In essence, through the six (6) Sub-Projects, the reach of Mindanao Development Corridors - particularly (i) Northern and (ii) South-Central- extended deeper to the communities of ARMM.

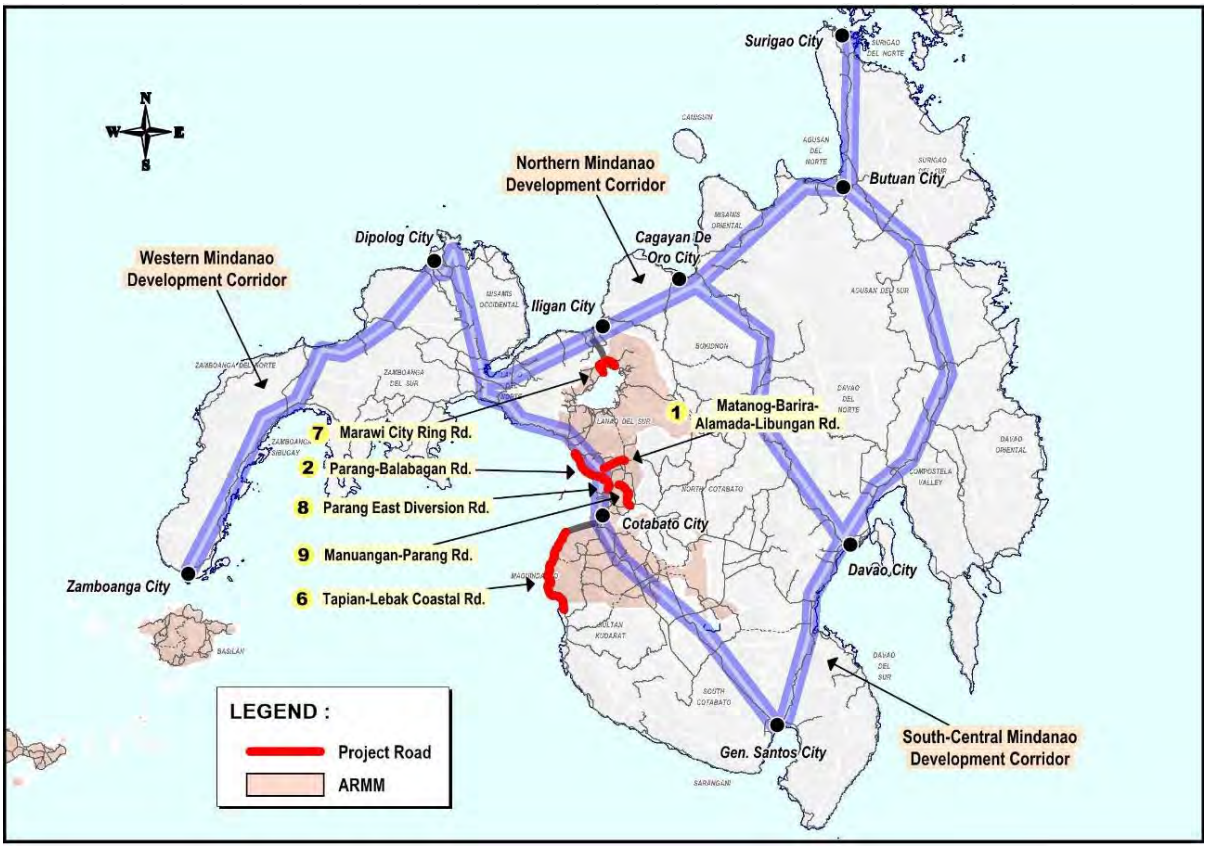


Figure 3.5-3 Relationship of the six (6) Sub-Projects with the Mindanao Development Corridor

Chapter 4 Physical Profile of the Study Area

4.1 Topography

The Study Area is divided into five (5) physiographical areas, namely: the gently sloping to undulating, undulating to rolling, rolling to moderately steep, steep, and very steep as shown in **Table 4.1-1** and **Figure 4.1-1**.

The gently sloping to undulating area consists of the coastal and alluvial plains. These areas have nearly flat ground slope of 0 to 8 degree. The topography is characterized by lower elevations that are commonly developed into agricultural lands. The terrain is generally flat to nearly flat and the groundwater table is expected at relatively shallow depth. The area forms the transition between the coastal plain and the undulating to rolling area.

The undulating to rolling area is underlain by volcanic and/or sedimentary rock formation that gave rise to undulating to rolling ground. The ground slope ranges from 8 to 18 degree. The groundwater table is expected to be fairly deep. Most areas are covered with assorted secondary growth trees, coconuts, and grasses.

The rolling to moderately steep terrain has a ground slope range from 18 to 30 degree. It is generally found on the mountain foot slope formed by volcanic and/or sedimentary rock formation. This topography includes rolling hills, ridges and elevated inland valley.

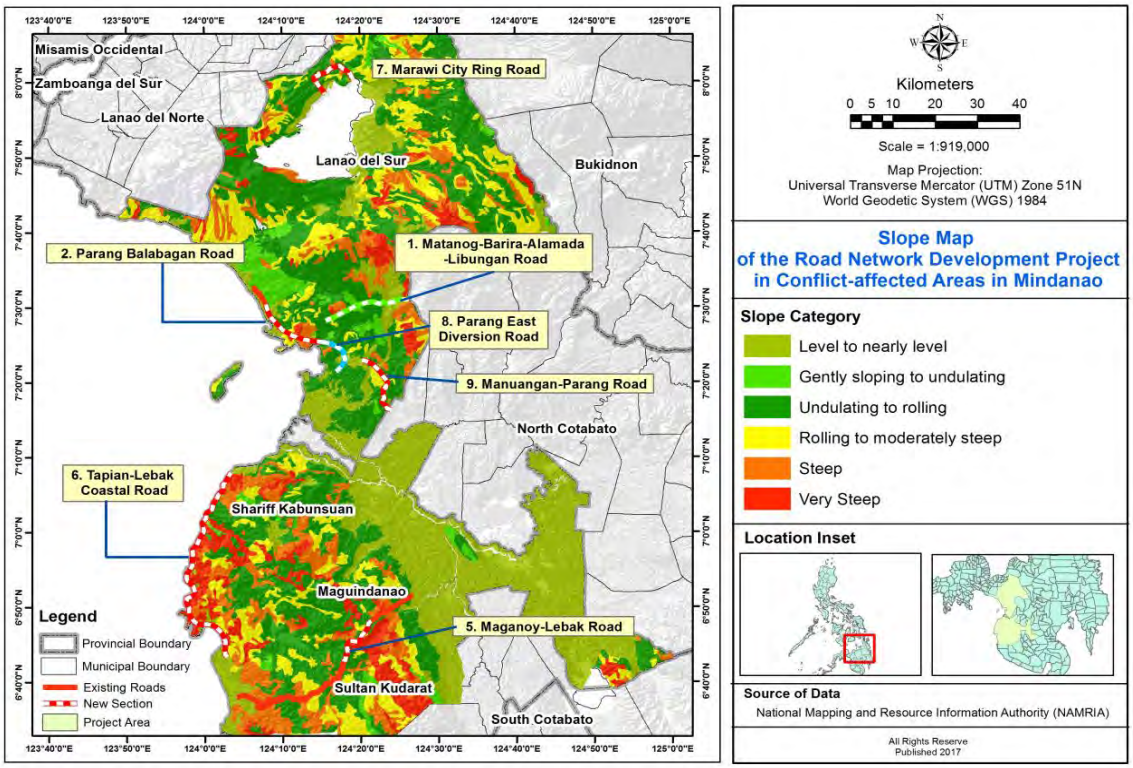
The last topography type is upland mountainous areas characterized by steep to very steep ground slope ranges from 30 to more than 50 degrees.

Table 4.1-1 Slope Classification of the Project Area

Slope Ranges(°)	Description
0-8	Gently sloping to undulating
8-18	Undulating to rolling
18-30	Rolling to moderately steep
30-50	Steep
50 and above	Very steep

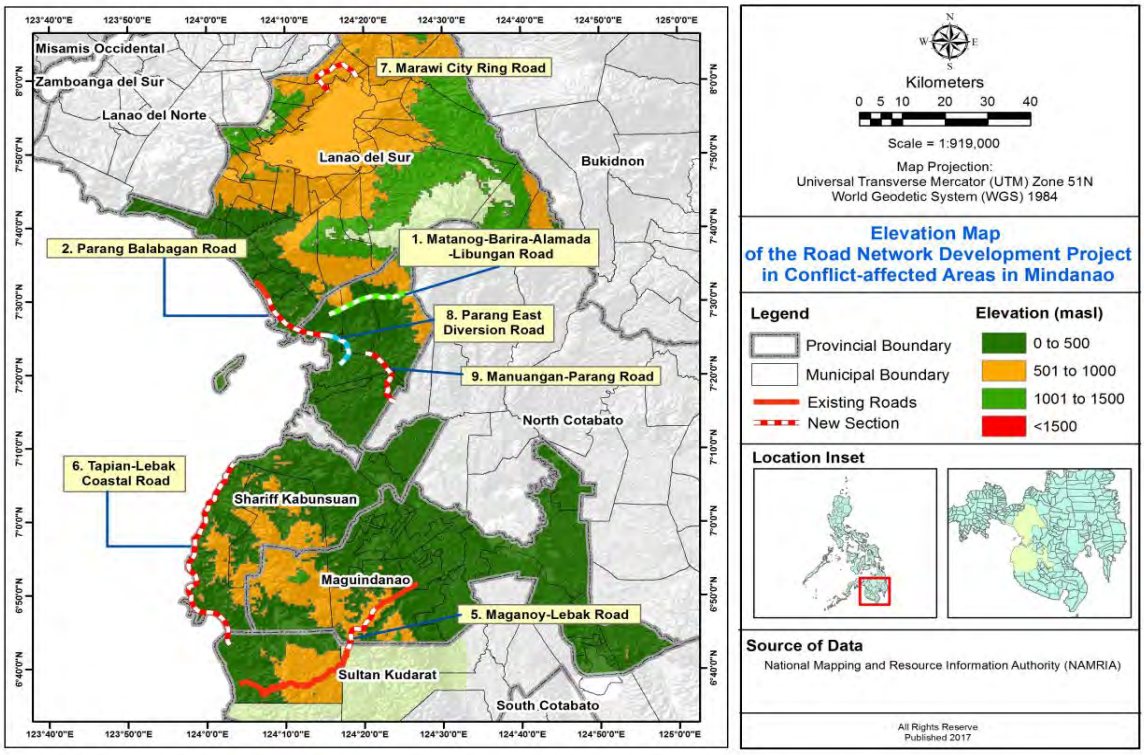
Source: JICA Study Team

Generally, the elevation within the project area varies from 0 to 500 meter above sea level (masl) and from 501 to 1000 masl. The lower elevation is concentrated mainly in (Sub-Project 1) Matanog-Barira-Almada-Libungan Road, (Sub-Project 2) Parang-Balabagan Road, (Sub-Project 8) Parang East Diversion Road, (Sub-Project 9) Manuangan-Sultan Kudarat-Sultan Mastura-Parang Road, (Sub-Project 6) Tapian-Lebak Coastal Road and portion of (Sub-Project 5) Maganoy-Lebak Road Sub-Projects, while the (Sub-Project 7) Marawi City-Saguiaran-Piagapo-Marantao Ring Road has elevation ranges from 501 to 1000 meter above sea level as shown in **Figure 4.1-2**.



Source: JICA Study Team

Figure 4.1-1 Slope Map of the Project Area



Source: JICA Study Team

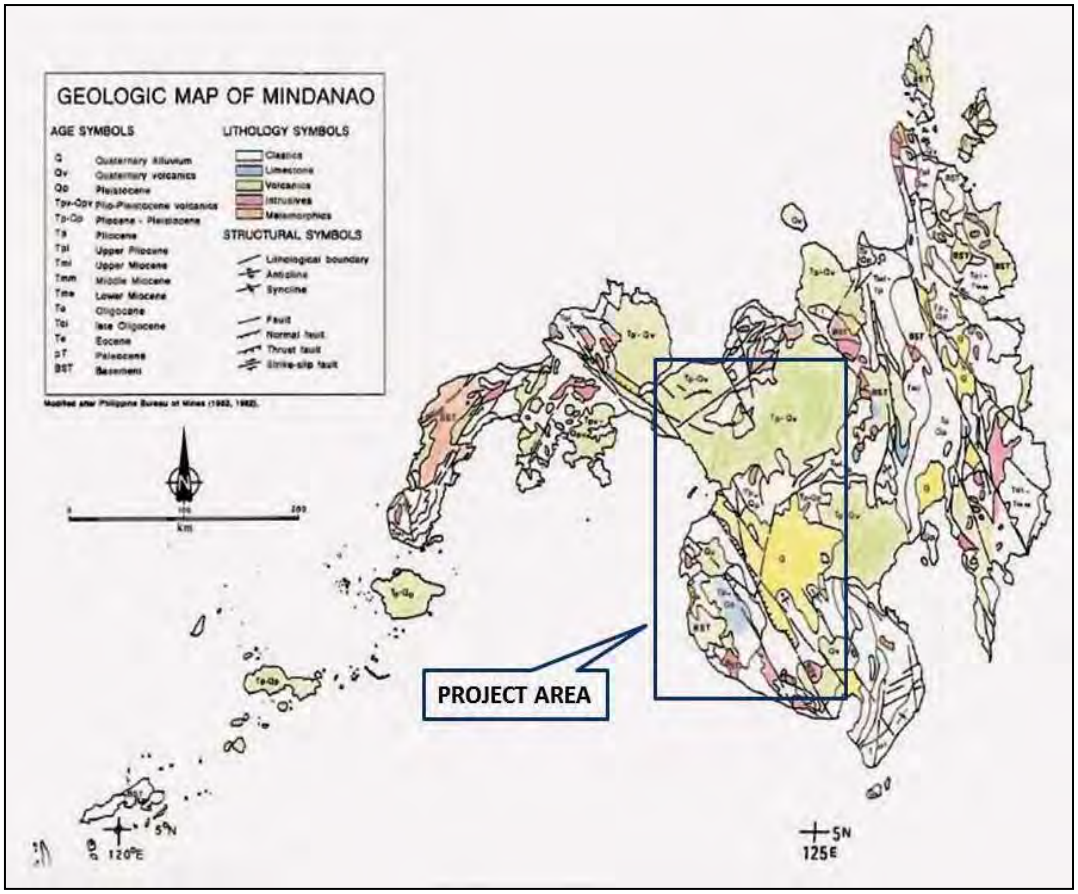
Figure 4.1-2 Elevation Map of the Study Area

4.2 Geology

4.2.1 General Geology

The MGB classified the island of Mindanao into western, central and eastern geologic provinces. Previous geologic studies have identified three (3) main physiographic-structural units in Mindanao as follows:

1. Pacific Cordillera, Mindanao Central Cordillera and Agusan-Davao Basin that trend N – NNW;
2. Tiruray-Daguma Range and Cotabato Basin that trend NW; and.
3. NE-trending Zamboanga Peninsula and Sulu Islands.



Source: MGB, as cited in Corpuz, 1992

Figure 4.2.1-1 General Geology of Mindanao

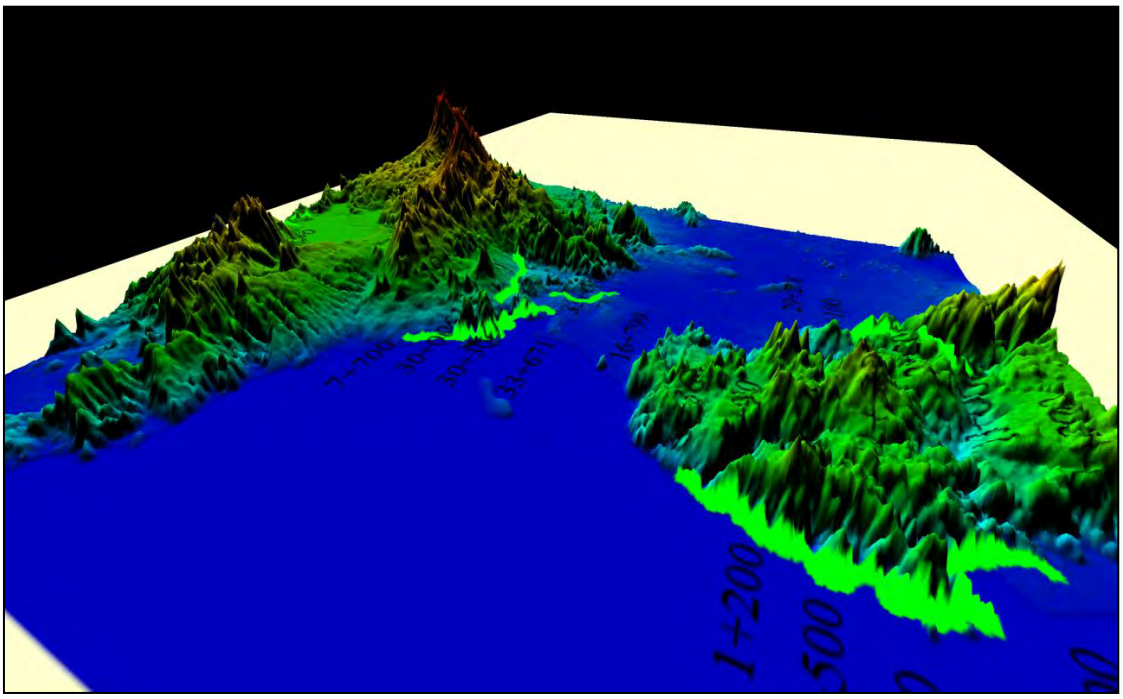
The provinces of Lanao del Sur and Maguindanao belong to the Mindanao Central Cordillera and Tiruray-Daguma Range physiographic-structural units, respectively. The subduction zones south of Cotabato and east of Surigao are considered most significant in the geologic development of both provinces.

In Lanao del Sur, the oldest rocks are the Cretaceous mica and chlorite schists, slates and ultramafics (Pacis, 1966), which correlate with intensely folded and faulted basement schists and quartzites described as thrusted rocks in the central part of the range (Ranneft et. al, 1960). In Maguindanao, the oldest rocks are the partly metamorphosed Cretaceous to Paleogene tuffaceous mudstone and greywacke which are intercalated with lava flows. The geologic map of Mindanao is shown in **Figure 4.2.1-1.**

4.2.2 Geologic Setting

A. Geomorphology

The mountainous areas in the region consist chiefly of basement and Tertiary volcanic rocks; while Tertiary sedimentary rocks predominate in lowland areas. A cluster of inactive volcanoes with associated volcanic lakes in Lanao del Norte and Lanao del Sur is collectively called the Lanao Volcanic Complex. The volcanoes include Mt. Gadungan, Dos Hermanos Peaks, Mt. Cabugao, Mt. Iniaoan, Lake Nunungan, Mt. Catmon, Mt. Sagada, Mt. Puerai and Gurain Mountains. The Lanao Volcanic Complex is assigned an age range of Pliocene – Pleistocene on the basis of available information. **Figure 4.2.2-1** shows the type of rock transected by the proposed roads.



Source: JICA Study Team

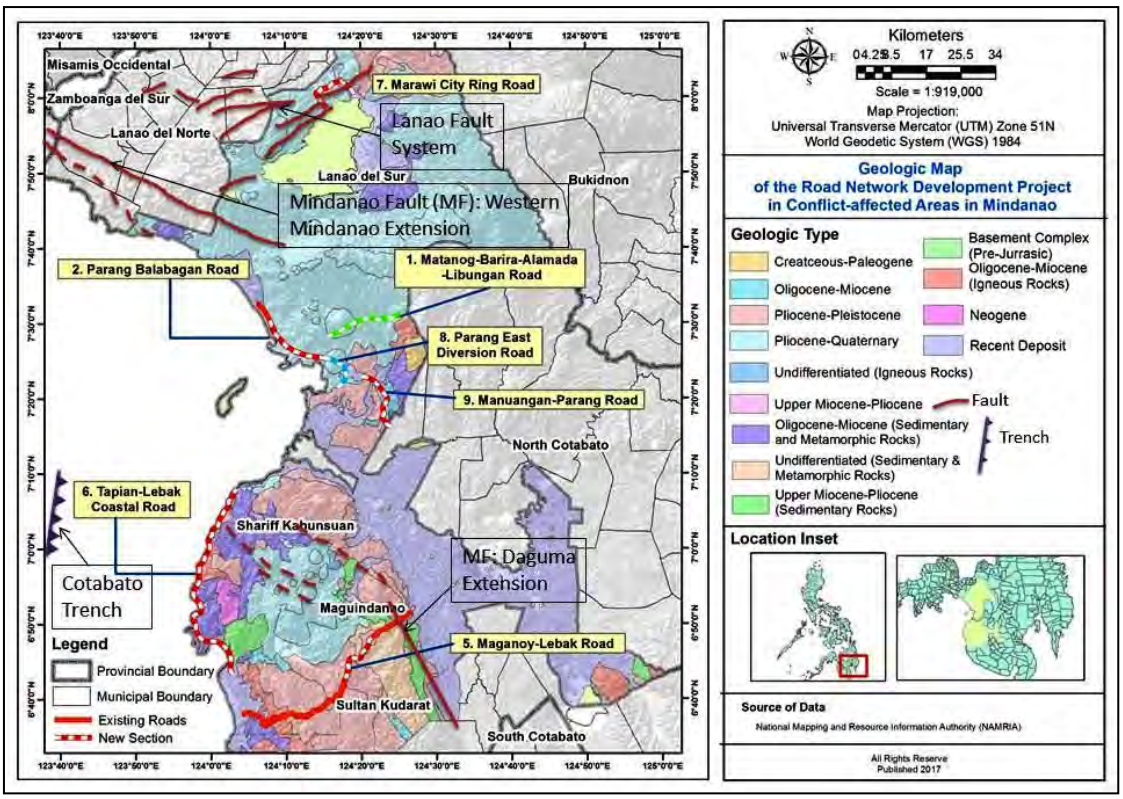
Figure 4.2.2-1 Three-dimensional (3D) View of Type of Rock (pyroclastics/volcaniclastics/submarine rocks) Transected by the Proposed Roads

B. Site Geology

The Study Area is dominated by volcanic plain or volcanic piedmont deposits, chiefly pyroclastics and/or volcanic debris usually found at the foot of volcanoes. Plateau basalt in Pagadian and Lanao regions, and non-active cones (generally pyroxene andesite) are also present.

The most recent deposits, Quaternary Alluvium, is composed of alluvium, fluviatile, lacustrine and beach deposits, raised coral reefs, and beachrock. Other lithological facies are composed mostly of submarine andesite and basaltic flows intercalated with pyroclastics and clastic sedimentary rocks; and reef limestone lenses largely confined within the axial zones Mindanao.

Thick, extensive, transgressive mixed shelf marine deposits, largely wackes, shales and reef limestone are also present. These are underlain by conglomerate and associated with coal measures in places. Sometimes the rock unit is associated with basic to intermediate flows and pyroclastics. They are largely arkosic and quartzitic clastics, generally well-indurated, folded and locally intruded by quartz-diorite. It is the most common epidermal cover of many folded mountains in the country.



Source: JICA Study Team

Figure 4.2.2-2 Geologic Map of the Project Area

4.2.3 Tectonic and Seismicity

Mindanao Island is prone to seismic events emanating from major earthquake generators in the Philippine Arc System. Active trenches mark out large areas of mainland Mindanao, as well as major fault systems, sub faults and lineaments (PHIVOLCS). In the ARMM, the major earthquake generators include the Cotabato Trench and Mindanao Fault as shown in **Figure 4.2.3-1**.

A. Cotabato Trench

The Cotabato Trench is a deep depression approximately 4 km deep at the northeastern edge of the Celebes Sea Basin. This geological structure is considered responsible for the Moro Gulf earthquake of August 17, 1976 that registered a computed magnitude of 7.9 in the Richter Scale. The Palimbang earthquake of 2002 with a registered a magnitude of 7.5 was also attributed by PHIVOLCS to subduction along the Cotabato Trench.

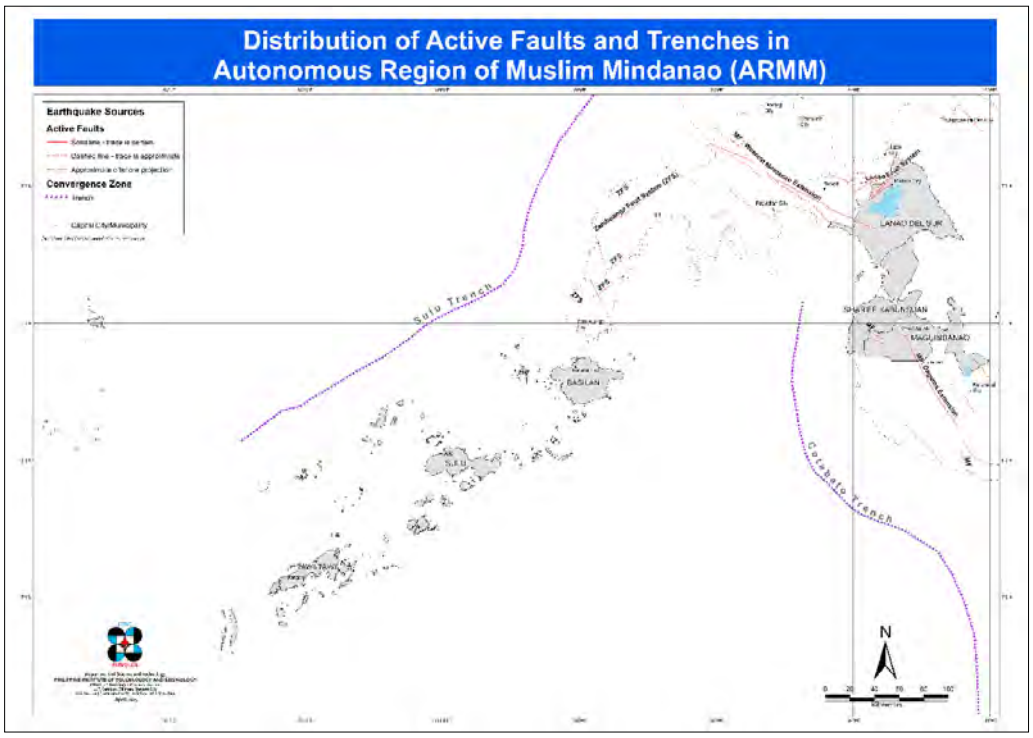
A left-lateral strike-slip feature known as the Cotabato Fault that cuts across the Zamboanga Peninsula appears to link the Cotabato Trench with the Negros Trench (Pubellier, et al., 1993).

B. Mindanao Fault

The Mindanao Fault is a NW trending fault extending from northern Zamboanga Peninsula to eastern Cotabato. The fault is physically traceable to approximately 400 km long on the western third of Mindanao Island. It has two distinct segments including that which separates the Daguma Range from the Cotabato Basin corresponding to the Cotabato Fault segment (MGB, 2010). This segment is highly linear and has features suggestive of normal faulting although it may have been a sinistral fault during its early history. The Sindangan Fault segment, on the other hand, represents the northern continuation of the fault towards Zamboanga. Focal mechanism solutions of earthquakes offshore and narrow shear zones transection recent gravel deposits suggest active sinistral faulting (Pubellier & others, 1991).

C. Other Earthquake Generators

Small to moderate earthquakes could be generated by the Sulu Trench, the Zamboanga Fault System, and the Lanao Fault System. The Sulu Trench has been seismically inactive for the last 120 years but PHIVOLCS considers it potentially capable of triggering a major earthquake due to stress build up.

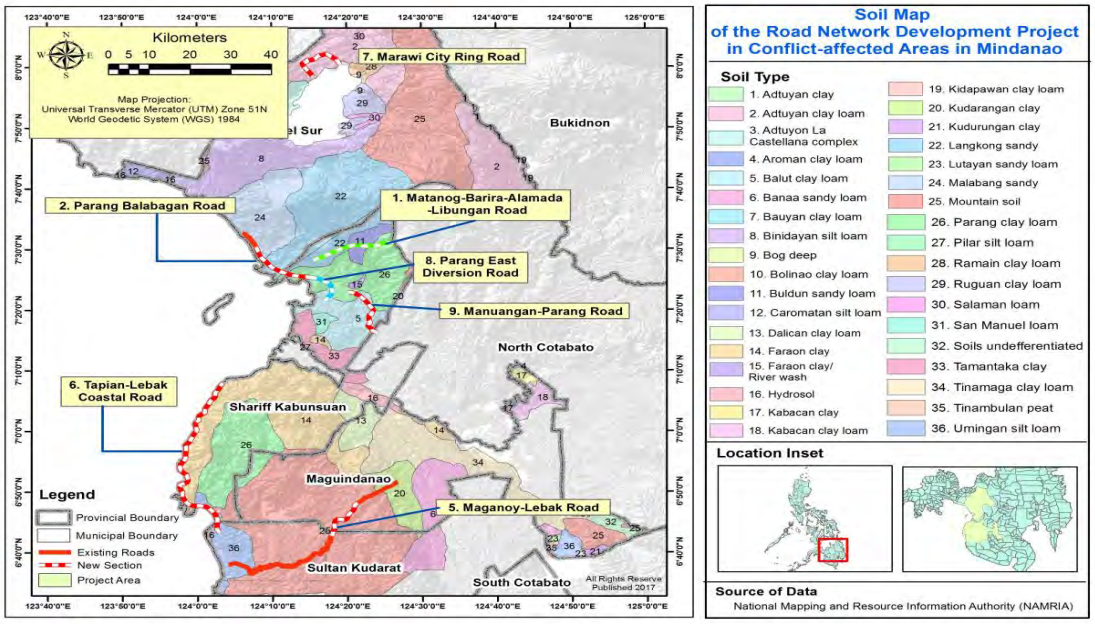


Source: PHIVOLCS

Figure 4.2.3-1 Distribution of Active Faults and Trenches in ARMM

4.2.4 Soil

The geographical representation of the soils in the Study area shows diversity of soil types ranging rom loam, peat and clay (**Figure 4.2.4-1)**.



Source: JICA Study Team

Figure 4.2.4-1 Soil Map of the Study Area

The presence, distribution, and formation of these soils can be useful in determining the land drainage capabilities of the Sub-Projects, including their properties as engineering foundations of the proposed Sub-Projects road alignments.

4.3 Meteorology

The nearest PAGASA synoptic station is in Cotabato City. Based on the data from this station the average annual rainfall from a 30-year record is 2,487.8 millimeters.

The rainiest months are from May to October.The annual mean temperature is 27.8ºC with high temperature of 28.6ºC in April and low temperature of 27.3ºC in July.

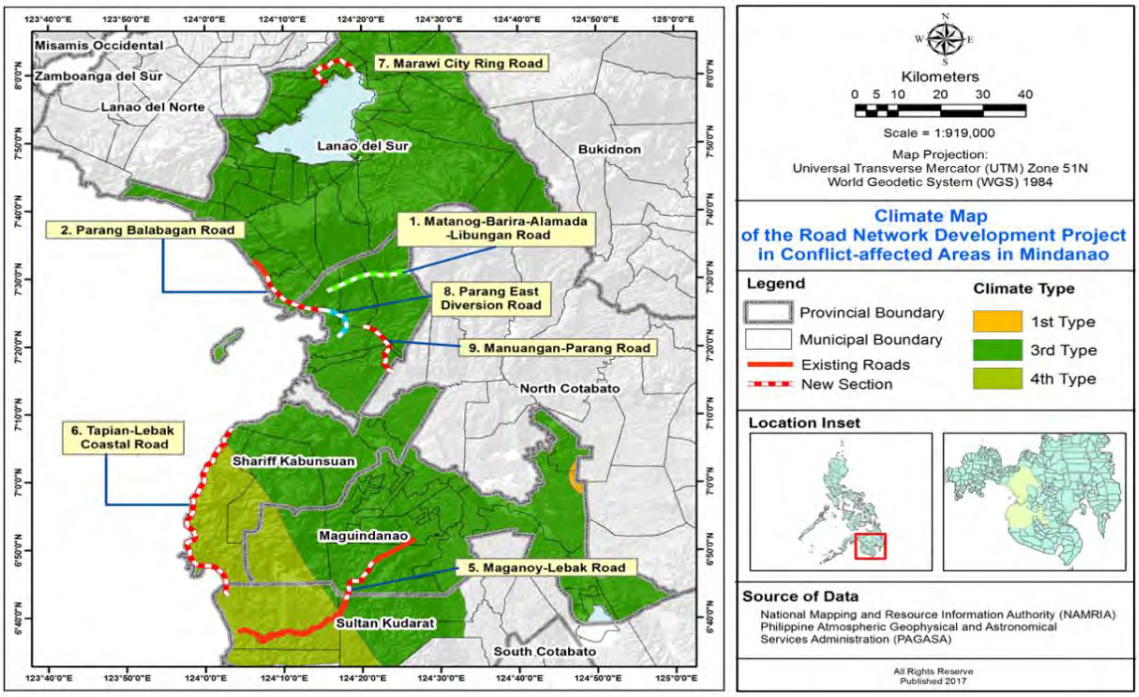
The lowest recorded temperature of 18.9ºC occurred on 26 January 2014 while the highest recorded temperature was 37.7ºC which occurred on 28 March 1997.The average wind speed is 2 meters per second distributed over the whole year at NNW direction.Relative humidity averages from 73% to 76% and vapor pressure averages from 28.4 millibars to 29 millibars. Mean sea level atmospheric pressure varies from 1,012.6 millibars to 1,011.2 millibars, with higher value in February then lower in October.

The climates within the study area are categorized as Type III and Type IV according to the Modified Coronas Classification as shown in **Table 4.3-1** and **Figure 4.3-1** Climate Map of the Study Area.

Table 4.3-1 Climatic Category Passing Through Each Project

Type	Description	Sub-Project
Type I	Two pronounced season: dry from November to April and wet during the rest of the year.	
Type II	No dry season with a pronounced rainfall from November to January	
Type III	Seasons are not very pronounced, relatively dry from November to April, and wet during the rest of the year.	Sub-Project 2 Parang-Balabagan Road Sub-Project 8 Parang East Diversion Road Sub-Project 1 Matanog-Barira-Alamada-Libungan Road Sub-Project 7 Marawi City-Saguiaran-Piagapo-Marantao City Ring Road Sub-Project 9 Manuangan-Sultan Kudarat-Sultan Mastura-Parang Road
Type IV	Rainfall is more or less evenly distributed throughout the year.	Sub-Project 6 Tapian-Lebak Coastal Road Sub-Project 5 Maganoy-Lebak Road

Source: JICA Study Team



Source: JICA Study Team

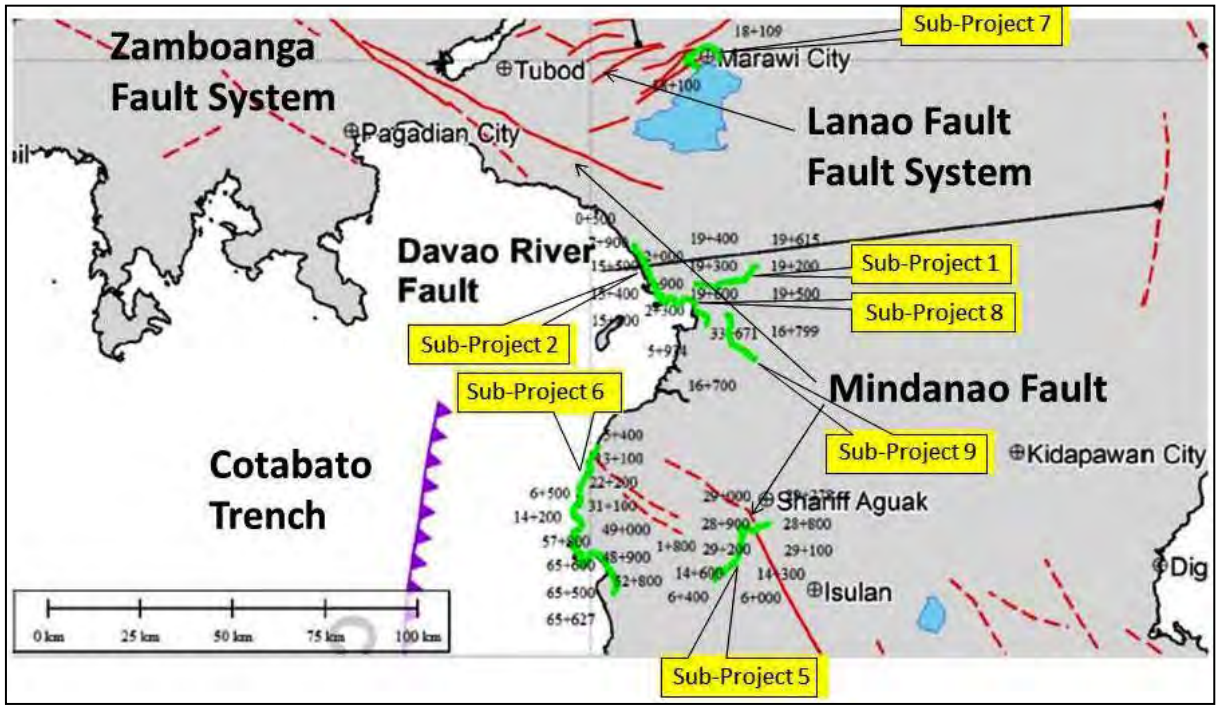
Figure 4.3-1 Climate Map of the Study Area

4.4 Natural Calamities

The Study Area may be affected by natural hazards caused either by **geophysical** or **hydrological** events. In this report, the discussion of hazards covers earthquake risk, ground shaking, ground rupture, tsunami, liquefaction, soil erosion, landslide and flooding.

4.4.1 Earthquake Risk

The most likely source of destructive earthquakes within the Study Area are the Mindanao Fault and Cotabato Trench. Historically, the Study Area and neighbouring provinces have experienced strong earthquakes in the memory. The 7.9 magnitude 1976 Moro Gulf Earthquake was generated by Cotabato Trench. The 2002 Palimbang Earthquake with a registered a magnitude of 7.5 was also attributed by PHIVOLCS to subduction along the Cotabato Trench. The road Sub-Projects transacted by active faults is shown in **Figure 4.4.1-1**.



Source: PHIVOLCS

Figure 4.4.1-1 Active Faults in Western Mindanao Transecting the Project Area

Other potential earthquake generators that could generate small to moderate earthquakes are the Sulu Trench, Zamboanga Fault System, and the Lanao Fault System. The Sulu Trench located west of Mindanao has been seismically inactive for the last 120 years but PHIVOLCS considers it potentially capable of triggering a major earthquake due to stress build up.

4.4.2 Ground Shaking

Ground-shaking is measured by ground acceleration, and the peak ground acceleration (PGA) is equal to the maximum ground acceleration that occurred during earthquake shaking at a particular location. Regional ground motion hazards emanating from earthquakes were studied by Thenhaus et. al in 1994. The ground acceleration within the Project Area has been estimated to be about 0.21g for bedrock and about 0.60g for soft soils. These values should be taken into account for determining the seismic coefficient to be applied for the design of foundation of the proposed road project.

4.4.3 Ground Rupture

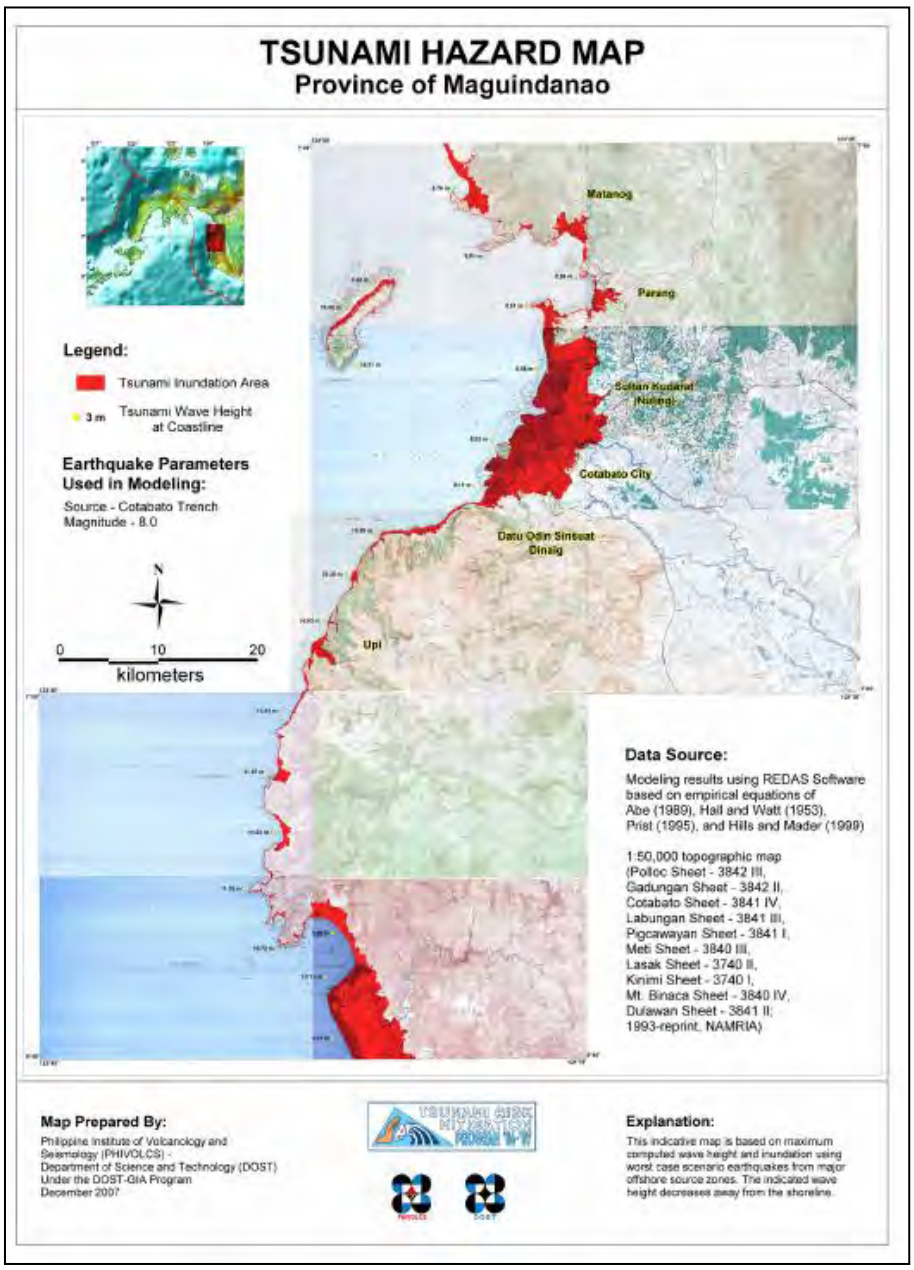
Ground rupture is the visible breaking and displacement along the trace of the fault during major earthquakes. The Sub-Projects that directly straddle or located within a narrow zone of the active fault traces are (Sub-Project 5) Maganoy-Lebak Road, (Sub-Project 6) Tapian-Lebak Coastal Road, and (Sub-Project 7) Marawi City Ring Road.

4.4.4 Tsunami

A tsunami is a series of sea waves commonly generated by under-the-sea earthquakes and whose heights could be greater than 5 meters. Tsunamis can occur when the earthquake is shallow-seated and strong enough to displace parts of the seabed and disturb the mass of water over it.

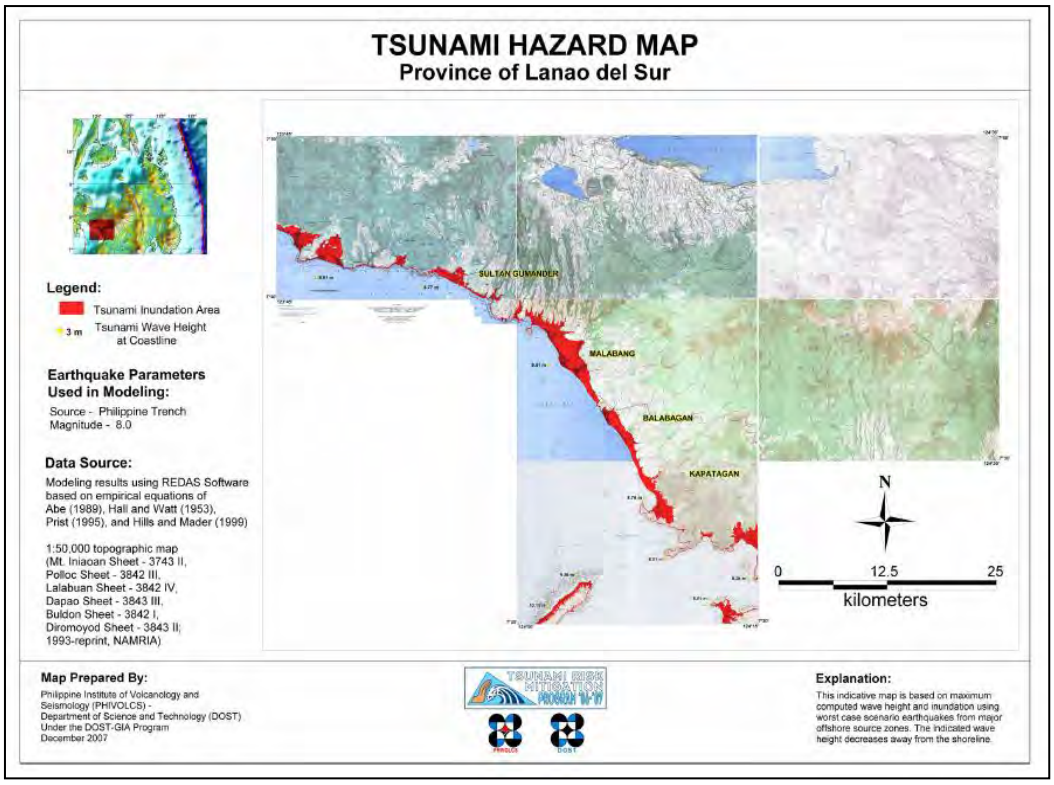
The Moro Gulf earthquake of August 17, 1976 spawned a tsunami that damaged more than 700 km of coastline bordering Moro Gulf (PHIVOLCS). The tsunami generated devastated the provinces bordering Moro Gulf especially on the shores of Pagadian City. After the sea rolled back to its natural flow, thousands of people were left dead, others homeless or missing and millions of pesos lost due to damages to properties.

PHIVOLCS has prepared tsunami hazard maps for Lanao del Sur and Maguindanao using a magnitude 8.0 tsunamigenic (tsunami-generating) earthquake generated by the Philippine Trench and Cotabato Trench, respectively, as parameters (**Figure 4.4.4-1** and **Figure 4.4.4-2**). The maps indicate that coastline of Kapatagan, Balabagan, Matanog and Parang in (Sub-Project 2) Parang-Balabagan Road, is prone to tsunami. In Maguindanao, the coastline traversed by (Sub-Project 6) Tapian-Lebak Coastal Road is likewise considered prone to tsunami. The historical tsunami occurrences within the region is shown in **Figure 4.4.4-3**.



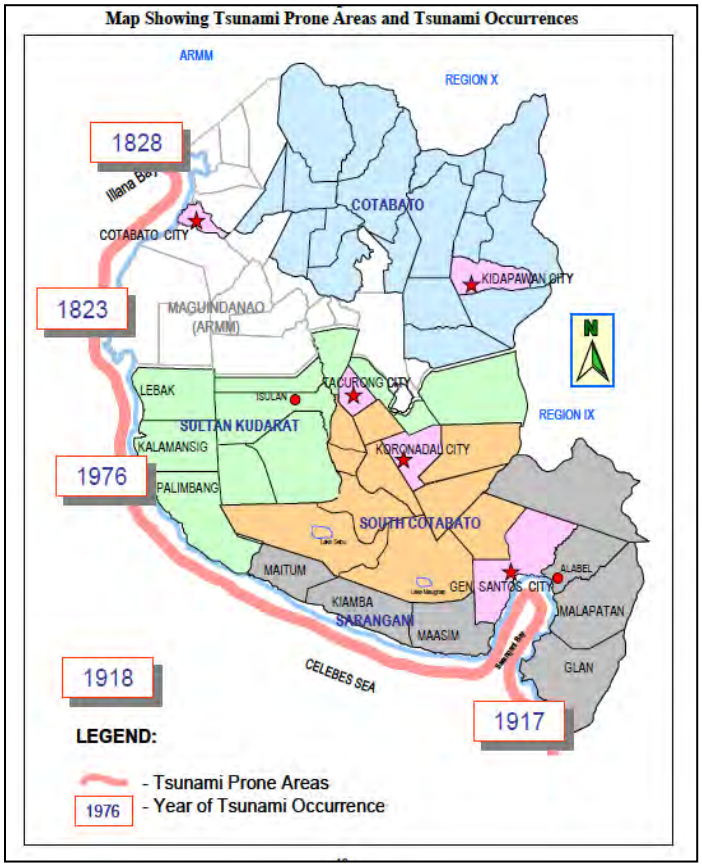
Source: PHIVOLCS

Figure 4.4.4-1 Tsunami Hazard Map of Maguindanao



Source: PHIVOLCS

Figure 4.4.4-2 Tsunami Hazard Map of Lanao del Sur



Source: PHIVOLCS

Figure 4.4.4-3 Map showing Tsunami Prone Areas and Historical Tsunami Occurrences in Western Mindanao

4.4.5 Liquefaction

Sections of (Sub-Project 6) Tapian-Lebak Coastal Road which are underlain by thick, extensive, transgressive mixed shelf marine deposits may be susceptible to liquefaction.

4.4.6 Soil Erosion

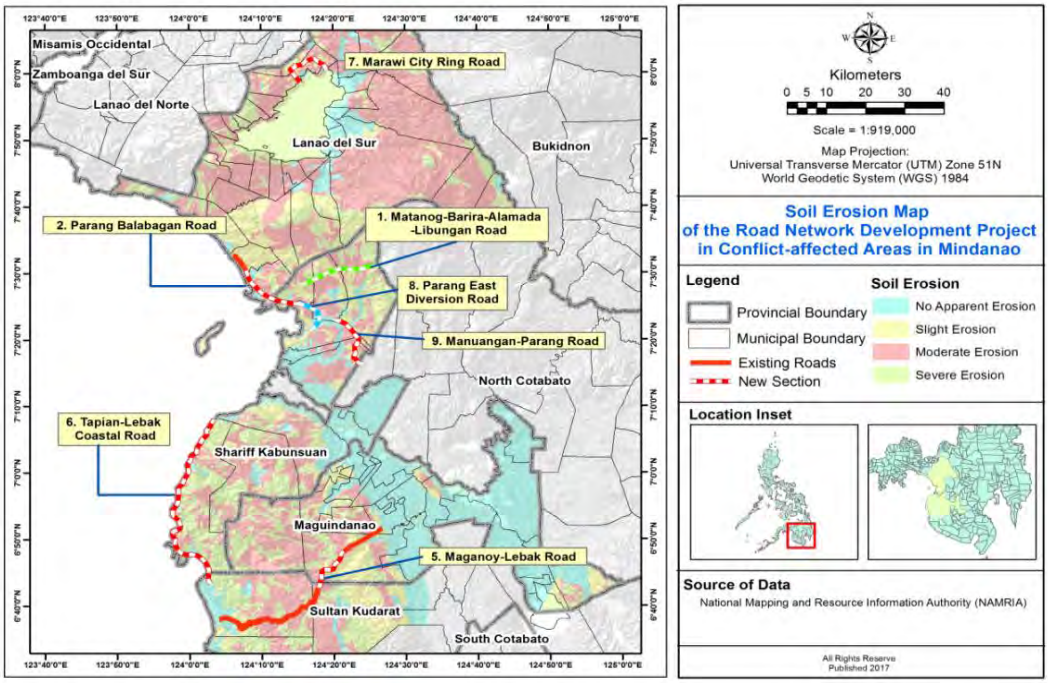
Soil erosion is a naturally occurring process that involves the wearing away of the topsoil by the natural physical forces of water and wind. Human activities that significantly contribute to soil erosion include intensive agriculture, deforestation, roads, anthropogenic climate change and the uncontrolled expansion of urban areas. The erosion process involves soil detachment, movement and deposition.

Excessive soil erosion is one of the most significant environmental problems worldwide as it reduces crop land productivity and contributes to the pollution of adjacent watercourses, wetlands and lakes. In the Study Area, severe to moderate soil erosion has been noted in (Sub-Project 1) Matanog-Barira-Alamada-Libungan Road and (Sub-Project 6) Tapian-Lebak Coastal Road; whereas moderate erosion characterizes the rest of the Sub-Project areas at (Sub-Project 2) Parang-Balabagan Road, (Sub-Project 5) Maganoy-Lebak Road, (Sub-Project 7) Marawi City-Saguiaran-Piagapo-Marantao Ring Road Sub-Project, (Sub-Project 8) Parang East Diversion Road, and (Sub-Project 9) Manuangan-Sultan Kudarat-Sultan Mastura-Parang Road as shown in **Table 4.4.6-1** and **Figure 4.4.6-1**.

Table 4.4.6-1 Soil Erosion category passing through each Sub-Project*

Road Sub-Project	Area (ha)			
	No apparent	Slight	Moderate	Severe
1. Matanog-Barira-Alamada-Libungan Road	-	19.01	33.06	11.27
2. Parang-Balabagan Road	20.84	15.74	21.39	11.27
5. Maganoy-Lebak Road	16.89	37.00	116.67	40.82
6. Tapian-Lebak Coastal Road	47.86	1.83	43.55	73.74
7. Marawi City-Saguiran-Piagapo-Marantao Ring Road	0.87	28.52	19.67	3.00
8. Parang East Diversion Road	9.81	3.26	20.80	-
9. Manuangan-Sultan Kudarat-Sultan-Mastura-Parang Road	13.24	-	19.67	18.12

Source: JICA Study Team *assumption: width=30m



Source: JICA Study Team

Figure 4.4.6-1 Soil Erosion Map of the Study Area

4.4.7 Landslide

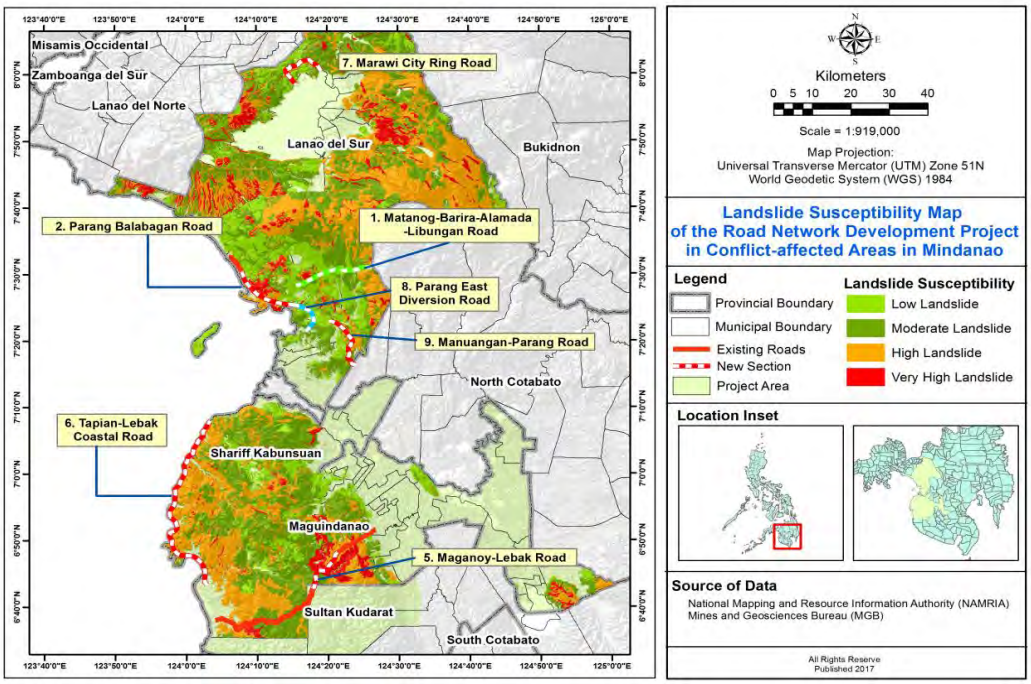
Landside can be triggered by the occurrence of earthquake or induced by excessive surface run-off during rainfall. Historical landslides have occurred in the southwestern areas of Maguindanao and the western and southwestern areas of Lake Lanao.

Low susceptibility landslide rating has been assigned to (Sub-Project 8) Parang East Diversion Road. The areas traversed by (Sub-Project 1) Matanog-Barira-AlamadaLibungan and (Sub-Project 7) Marawi City-Saguiaran-Piagapo-Marantao Ring Road have low to moderate rating. The hilly to mountainous part of (Sub-Project 6) Tapian-Lebak Coastal Road and (Sub-Project 9) Manuangan-Sultan Kudarat-Sultan Mastura-Parang Road have high and moderate to high rating, respectively. Landslide prone areas with high to very high susceptibility have been identified at (Sub-Project 2) Parang-Balabagan Road and (Sub-Project 5) Maganoy-Lebak Road as shown in **Table 4.4.7-1** and **Figure 4.4.7-1**.

Table 4.4.7-1 Landslide category passing through each Sub-Project*

Road Sub-Project	Area (ha)			
	Low Landslide	Moderate Landslide	High Landslide	Very High Landslide
1. Matanog-Barira-Alamada-Libungan Road	30.71	21.92	9.98	-
2. Parang-Balabagan Road	2.51	2.25	19.66	7.28
5. Maganoy-Lebak Road	4.38	103.61	56.36	18.19
6. Tapian-Lebak Coastal Road	1.45	24.82	79.01	1.09
7. Marawi City Ring Road	22.01	23.03	0.05	0.58
8. Parang East Diversion Road	16.34	10.74	1.42	1.05
9. Manuangan-Parang Road	6.19	20.52	19.58	0.38

Source: JICA Study Team *assumption: width=30m



Source: JICA Study Team

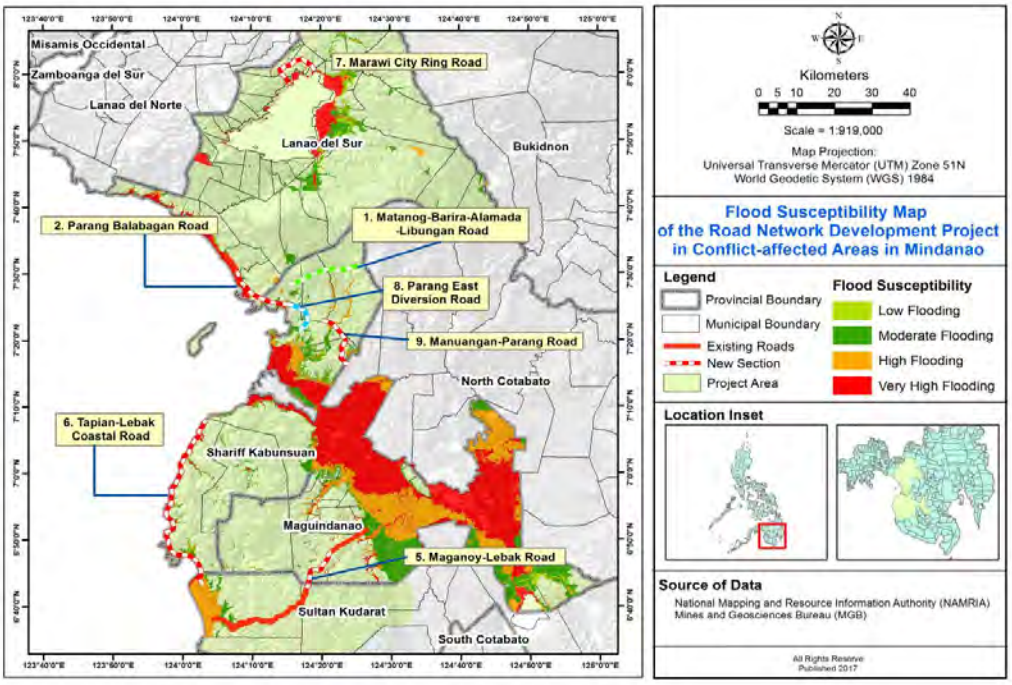
Figure 4.4.7-1 Landslide Susceptibility Map of the Study Area

4.4.8 Flooding

The Office of Civil Defense (OCD)-ARMM has reported that Lanao del Sur and Maguindanao are more susceptible to disasters than the other provinces of the Bangsamoro region.

Flooding in the study area is usually associated with the occurrence of typhoons, thunderstorms and/or monsoon rains that create inland floods due to stagnant water from storm and rainfall triggering the overflow of the local drainage channel.

In general, the proposed roads are located in areas with low susceptibility to flooding (**Figure 4.4.8-1**). However historical floods have occurred in low-lying areas, floodplains and near the major rivers of the Mindanao River Basin within the ARMM territories. Areas prone to moderate to high flooding have been also identified in the eastern periphery areas of Lake Lanao and some parts of the coastline.



Source: JICA Study Team

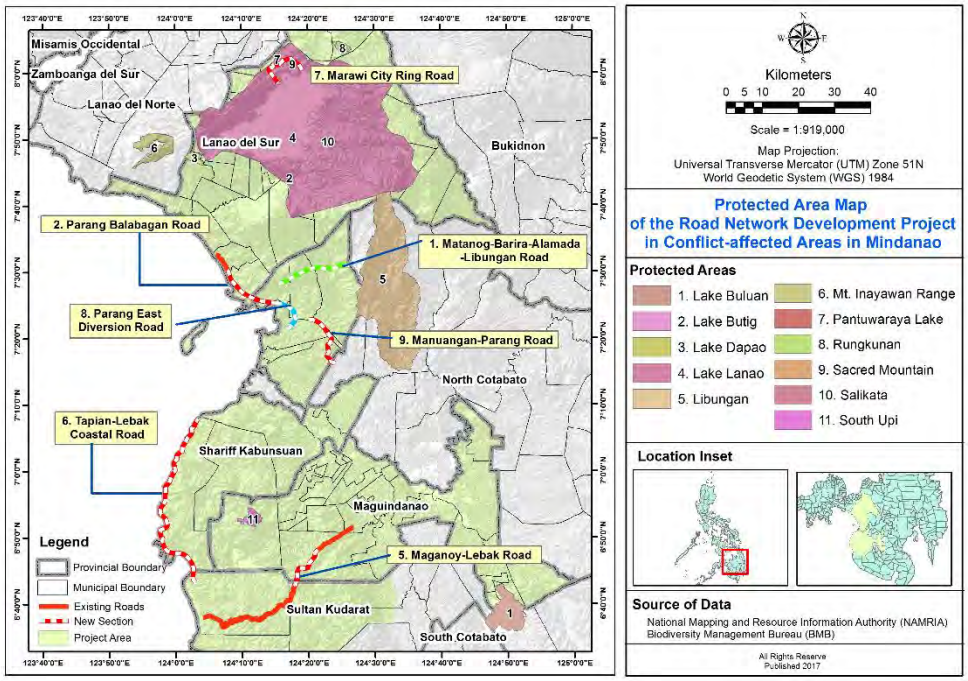
Figure 4.4.8-1 Flood Susceptibility Map of the Study Area

4.5 Protected Area

A protected area is a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values. Based on the Protected Area Map of the study area as shown in **Figure 4.5-1**, there are several protected areas within Maguindanao and Lanao del Sur, however only the (Sub-Project 7) Marawi Ring Road Sub-Project falls within a protected area, covered by the Lake Lanao Watershed Reservation, by virtue of Presidential Proclamation No. 871, s. 1992 Establishing as the Lake Lanao Watershed Reservation for Purposes of Protecting, Maintaining and Improving Its Forest Cover and Water Yield for Hydropower, Irrigation and Domestic Use.

Lake Lanao watershed reservation is considered as a critical watershed, because it serves as a source of water for hydropower and irrigation. The whole reservation is under the administrative jurisdiction of the Department of Environment and Natural Resources. The watershed reservation supports the Lake Lanao and Agus Hydropower Plants of the National Power Corporation in Mindanao.

There are also two proclaimed protected areas in Marawi City and Saguiran, Lanao del Sur, the Sacred Mountain National Park and the Pantuwaraya Lake National Park both under Republic Act No. 4190 of 1965 respectively. However, these aforementioned protected areas are outside the proposed Sub-Project alignment.

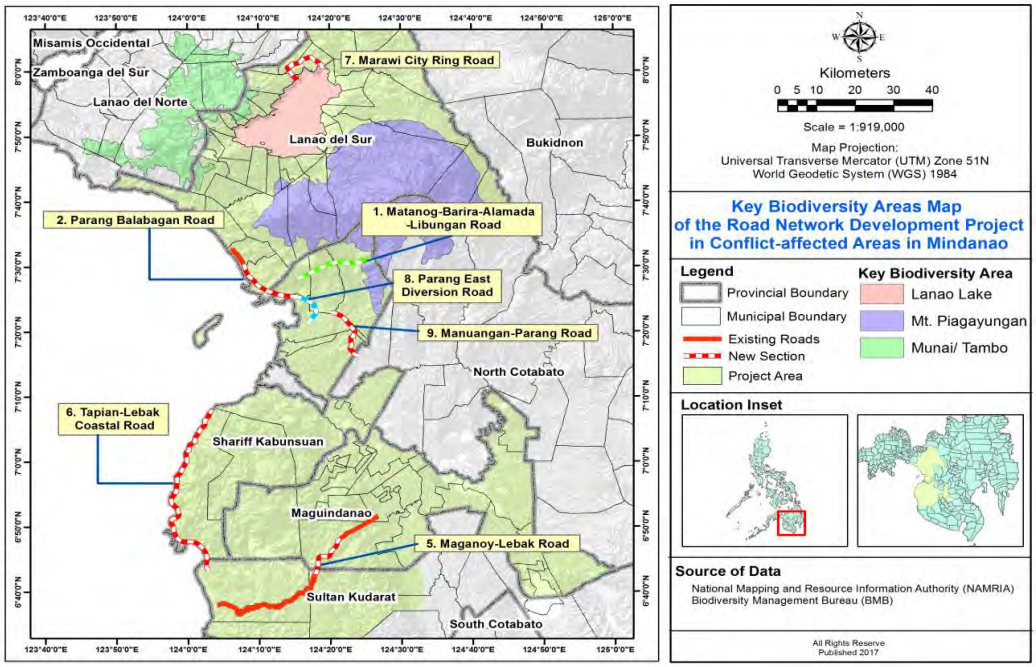


Source: JICA Study Team

Figure 4.5-1 Protected Area Map of the Study Area

4.6 Key Biodiversity Area

Key Biodiversity Areas (KBAs) are nationally identified sites of global significance. The identification of KBAs is an important approach to address biodiversity conservation at the site scale i.e. at the level of individual protected areas, concessions and land management units. Although, there are KBAs identified within Maguindanao - the Mt. Piagayungan and Lanao del Sur - the Lake Lanao, no road Sub-Project intersects any of these identified Key Biodiversity Areas (KBA) as shown in **Figure 4.6-1**.



Source: JICA Study Team

Figure 4.6-1 Key Biodiversity Area Map of the Study Area

Chapter 5 Socio-Economic Condition of Mainland ARMM

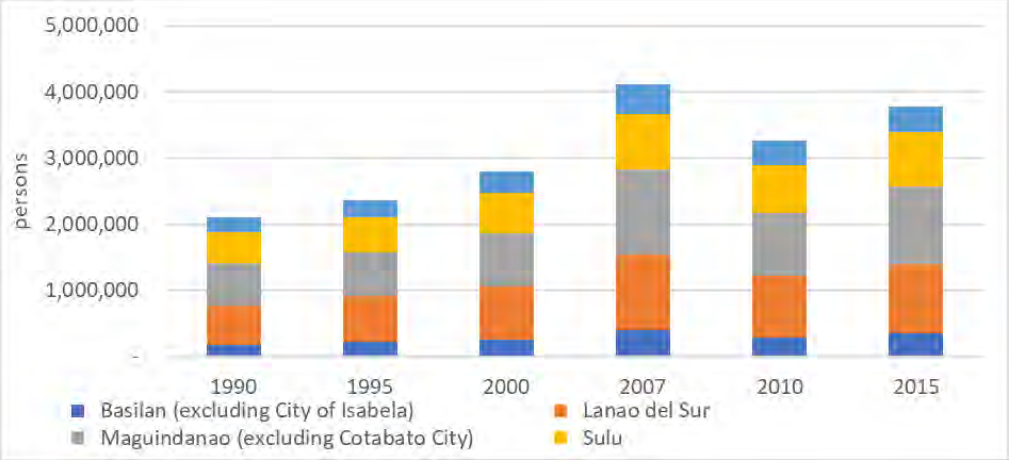
5.1 Social Conditions

5.1.1 Demographic Trend

As of 2015, the total population of ARMM is 3,781,387. Lanao del Sur province has a population of 1,045,429, while Maguindanao province has 1,173,933. The population of the two provinces accounts for 59% of the total population of ARMM.

Table 5.1.1-1 Population of ARMM and Provinces in the Region

Region, Province	1990	1995	2000	2007	2010	2105
ARMM	2,108,061	2,362,300	2,803,045	4,120,795	3,256,140	3,781,387
Basilan (excluding City of Isabela)	179,230	227,008	259,796	408,520	293,322	346,579
Lanao del Sur	599,982	686,193	800,162	1,138,544	933,260	1,045,429
Maguindanao (excluding Cotabato City)	630,674	662,180	801,102	1,273,715	944,718	1,173,933
Sulu	469,971	536,201	619,668	849,670	718,290	824,731
Tawi-Tawi	228,204	250,718	322,317	450,346	366,550	390,715



Source: 2016 Philippine Statistical Yearbook. Philippine Statistics Authority

The average household size is 6.5 persons for Lanao del Sur and 6.0 persons for Maguindanao. Five provinces of ARMM have a similar average household size, and the regional average is 6.1 persons. The regional and provincial average household size is much larger than the national average of 4.4 persons.

Table 5.1.1-2 Household Population, Number of Households, and Average Household Size

Region, Province	Household population	Number of households	Average household size
ARMM	3,771,249	620,385	6.1
Basilan (excluding City of Isabela)	346,288	59,860	5.8
Lanao del Sur	1,038,883	160,132	6.5
Maguindanao (excluding Cotabato City)	1,172,381	194,507	6.0
Sulu	823,983	138,357	6.0
Tawi-Tawi	389,714	67,529	5.8

Source: 2015 Census of Population and Housing. Philippine Statistics Authority

The annual average population growth rate of ARMM was 1.51% for the ten years from 2000 to 2010, which was lower than the national average of 1.90%. It increased to 2.98% for the years from 2010 to 2015, which is much higher than the national average of 1.72%. In particular, Maguindanao province has experienced fast population growth at an annual average growth rate of 4.22%.

Table 5.1.1-3 Annual Average Population Growth Rate of ARMM and Provinces in the Region

Region, Province	Annual Average 2000-2010	Growth Rate 2010-2015	(in%) 2000-2015
ARMM	1.51	2.89	1.98
Basilan (excluding City of Isabela)	1.22	3.23	1.91
Lanao del Sur	1.55	2.18	1.77
Maguindanao (excluding Cotabato City)	1.66	4.22	2.54
Sulu	1.39	2.66	1.89
Tawi-Tawi	1.29	1.22	1.27

Source: 2016 Philippine Statistical Yearbook. Philippine Statistics Authority

As population grew, the population density of ARMM has also increased from 62 persons/km^2 in 1990 to 103 persons/km^2 in 2015. Still, it is much lower than the national average of 337 persons/km^2 in 2015. Among the five provinces, Lana del Sur has been the least densely populated. Its population density is only 69 persons/km^2 in 2015.

Table 5.1.1-4 Population Density of ARMM and Provinces in the Region

Region, Province	Density (persons/km^2)					
	1990	1995	2000	2007	2010	2105
ARMM	62	70	76	123	89	103
Basilan (excluding City of Isabela)	74	70	75	127	85	100
Lanao del Sur	38	51	53	84	62	69
Maguindanao (excluding Cotabato City)	65	68	80	131	95	118
Sulu	137	156	136	247	158	181
Tawi-Tawi	63	69	89	124	101	108

Source: 2016 Philippine Statistical Yearbook. Philippine Statistics Authority

5.1.2 Poverty and Displacement

The Philippine Statistics Authority defines poverty incidence as the proportion of families and individuals with per capita income less than the per capita poverty threshold to the total number of families and individuals. Poverty threshold is the minimum income required for a family or individual to meet the basic food and non-food requirements.

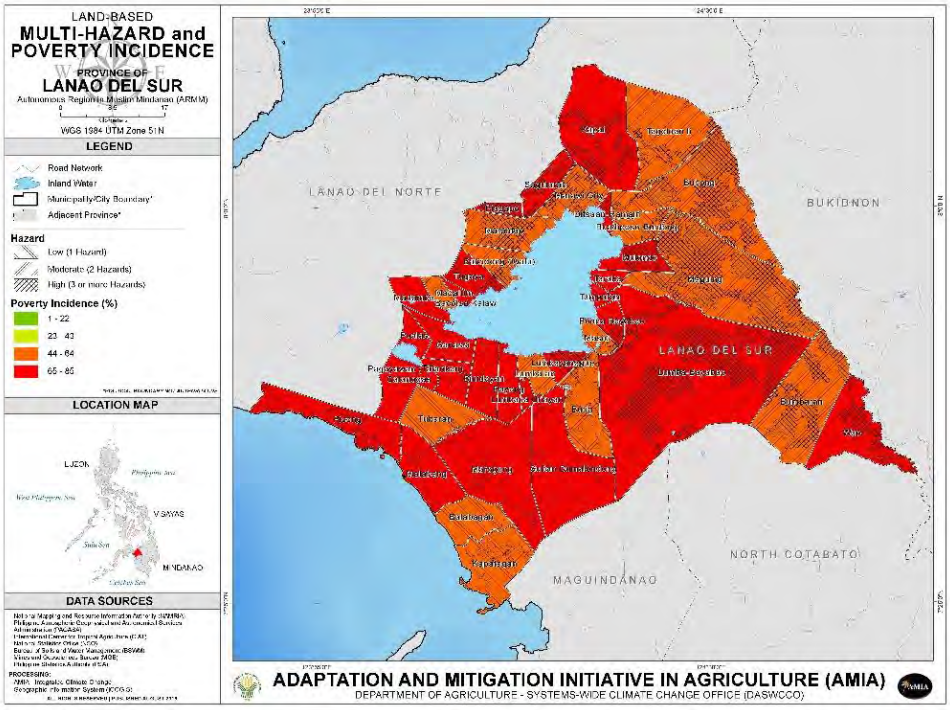
The table below summarizes annual per capita poverty threshold and poverty incidence among the population of ARMM and its provinces. The poverty incidence of ARMM has increased from 47.1% in 2006 to 53.7% in 2015. For Lanao del Sur, poverty incidence has dramatically increased from 44.7% in 2006 to 71.9% in 2015. Poverty incidence has also increased for Maguindanao, but at a slower pace, from 54.6% in 2006 to 57.2% in 2015. The poverty incidence of ARMM and the two provinces of Lanao del Sur and Maguindanao has always been much higher than the national average, and shows a contrasting trend with the national poverty incidence that has declined from 26.6% in 2006 to 21.6% in 2015.

Table 5.1.2-1 Poverty Threshold and Poverty Incidence of ARMM and Provinces in the Region

Region, Province	Annual per capita poverty threshold (PhP)				Poverty incidence among population (%)			
	2006	2009	2012	2015	2006	2009	2012	2015
ARMM	12,647	16,683	20,517	21,563	47.1	47.4	55.8	53.7
Basilan	12,538	16,256	19,368	20,678	39.0	36.6	41.2	37.0
Lanao del Sur	13,116	17,024	22,665	22,802	44.7	56.6	73.8	71.9
Maguindanao	12,877	16,701	18,837	21,423	54.6	52.2	63.7	57.2
Sulu	13,330	17,240	20,477	20,778	40.7	41.6	45.8	54.9
Tawi-Tawi	11,557	14,659	17,406	16,586	52.4	35.3	28.6	12.6

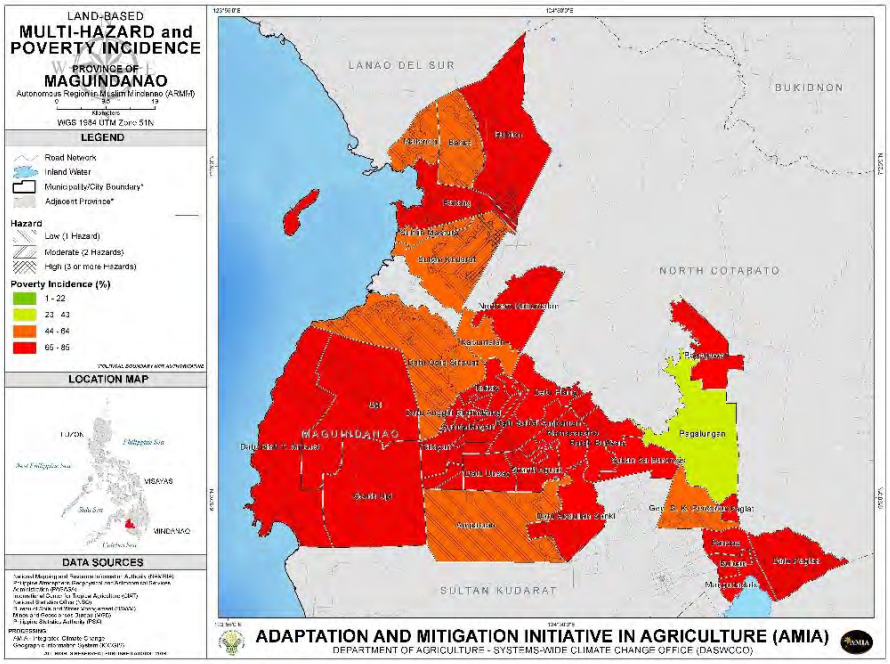
Source: Official Poverty Statistics of the Philippines 2015 Full Year, Philippine Statistics Authority

With regard to the poverty incidence at the municipality level, the National Color-Coded Agricultural Guide Map of the Department of Agriculture contains a municipal poverty database created in 2010. The maps below show poverty incidence of municipalities in Lanao del Sur and Maguindanao. The maps are color-coded by group. There are four groups: green indicates municipalities with poverty incidence between 1 and 22%; yellow, those with poverty incidence between 23 and 43%; orange, those with poverty incidence between 44 and 64%; and red means those with poverty incidence between 65 and 85%. Only one municipality in Maguindanao is coloured yellow. All other municipalities in the two provinces are coloured either orange or red.



Source: Godilano, E.C. (2017). Department of Agriculture. Integrated Climate Change and Geospatial Information Systems (ICCGIS). Adaptation and Mitigation Initiative in Agriculture (AMIA) Project 1.

Figure 5.1.2-1 Poverty Incidence at Municipality Level in Lanao del Sur Province



Source: Godilano, E.C. (2017). Department of Agriculture. Integrated Climate Change and Geospatial Information Systems (ICCGIS). Adaptation and Mitigation Initiative in Agriculture (AMIA) Project 1.

Figure 5.1.2-2 Poverty Incidence at Municipality Level in Maguindanao Province

Besides poverty incidence, displacement is another serious issue in ARMM. The region has seen multiple displacement incidents which are mostly caused by armed conflict and clan feud involving internally displaced persons (IDPs) who fled their homes often and for a long period. According to the United Nations High Commissioner for Refugees (UNHCR), around 860,000 persons have been displaced in Mindanao since January 2012, and 21% or 187,000 of them remain displaced mostly in ARMM as of June 2015. These IDPs are among the poorest of the poor mostly belonging to minority groups. Their protection is at risk as they continue to struggle in a vulnerable environment where access to basic services is inadequate: temporary shelters are in most cases in decrepit state, source of livelihood is absent, children's education is interrupted, women's privacy is lacking, and most of all safety and security is uncertain.[1]

UNCHR also reports that, as of 15 August 2017, the Marawi Crisis, which began in the afternoon of 23 May 2017, has displaced a total of 78,466 families and 359,680 individuals. IDPs come from 98% of the total population of Marawi city and residents from nearby municipalities. They were compelled to leave because of food shortage and constriction of local economies. About 95% of the total displaced persons have sought shelter with their relatives or to community-based evacuation centres, while about 5% have gone to evacuation centres.[2] UNHCR's survey has revealed that 91% of IDPs have access to relief assistance for meeting basic needs, but home-based IDPs and those in community-based facilities receive assistance less often than those staying in evacuation centres.[3]

[1] UNHCR Philippines website http://www.protectionclusterphilippines.org/?page_id=255#
[2] Thematic Protection Bulletin, Closing the Gaps, Issue No. 2 http://www.protectionclusterphilippines.org/?p=1255
[3] SNAPSHOT: Amplifying the voice of IDPs http://www.protectionclusterphilippines.org/?page_id=1227

5.1.3 Food Security and Nutrition

The Philippine Statistics Authority defines food threshold as the minimum income required for a family/individual to meet the basic food needs, which satisfies the nutritional requirements for economically necessary and socially desirable physical activities. Subsistence incidence is the proportion of families/individuals with per capita income less than the per capita food threshold to the total number of families/individuals.

The table below summarizes annual per capita food threshold and subsistence incidence among population of ARMM and provinces. The subsistence incidence of ARMM has increased from 14.0% in 2006 to 17.0% in 2015. Lanao del Sur has the worst subsistence incidence among five provinces, which has grown from 14.1% in 2006 to 33.2% in 2015. Maguindanao is the second worst province, whose subsistence incidence has increased from 19.1% in 2006 to 22.0% in 2015.

Table 5.1.3-1 Food Threshold and Subsistence Incidence of ARMM and Provinces in the Region

Region, Province	Annual per capita food threshold (PhP)				Subsistencey incidence among population (%)			
	2006	2009	2012	2015	2006	2009	2012	2015
ARMM	8,875	11,725	14,747	15,421	14.0	10.8	19.5	17.0
Basilan	8,788	11,335	13,495	14,485	3.7	1.8	2.2	4.6
Lanao del Sur	9,151	11,880	15,826	15,920	14.1	20.2	41.6	33.2
Maguindanao	8,989	1,1680	13,195	14,982	19.1	13.3	19.0	22.0
Sulu	9,395	12,040	14,263	14,512	7.5	3.6	9.2	5.6
Tawi-Tawi	7,883	10,237	12,299	11,847	21.3	4.5	4.3	0.0

Source: Official Poverty Statistics of the Philippines Full Year 2015, Philippine Statistics Authority

Poverty keeps people from attaining improvement in their health and nutrition. ARMM registered the highest prevalence of food insecurity, especially in children, which to a large degree can be attributed to the recurrent armed conflict often resulting in displacement and dislocation of families.[4]

The table below presents prevalence of undernourishment of children less than five years old with three indicators: underweight, stunting, and wasting. Underweight is an index based on weight for age. The figures show the percentage of children with weight below the standard for child's age. Underweight captures both the past and present nutritional status. Stunting is an index based on height for age. The figures show the percentage of children with height below the standard for child's age. Stunting reflects chronic undernutrition or past nutritional status caused by prolonged inadequate intake, recurrence of illness or improper feeding practices. Wasting is an index based on weight for height. The figures show the percentage of children with weight below the standard for child's height. Wasting is a sensitive index of current nutritional status.[5]

Table 5.1.3-2 Prevalence of Undernourishment of Children Less Than Five Years Old

Region, Province	Underweight (%)		Stunting (%)		Wasting (%)	
	2013	2015	2013	2015	2013	2015
ARMM	22.5	24.9	38.8	45.2	8.8	8.2
Basilan	11.9	26.6	35.1	48.1	5.3	4.4
Lanao del Sur	25.2	21.1	42.0	49.0	7.0	5.2
Maguindanao	22.4	25.8	33.9	45.6	11.7	5.9
Sulu	21.0	27.9	39.8	40.9	8.5	14.2
Tawi-Tawi	26.5	27.2	43.3	41.2	9.5	14.2

Source: National Nutrition Survey 2015 Updating Survey Result. Food and Nutrition Research Institute, Department of Science and Technology.

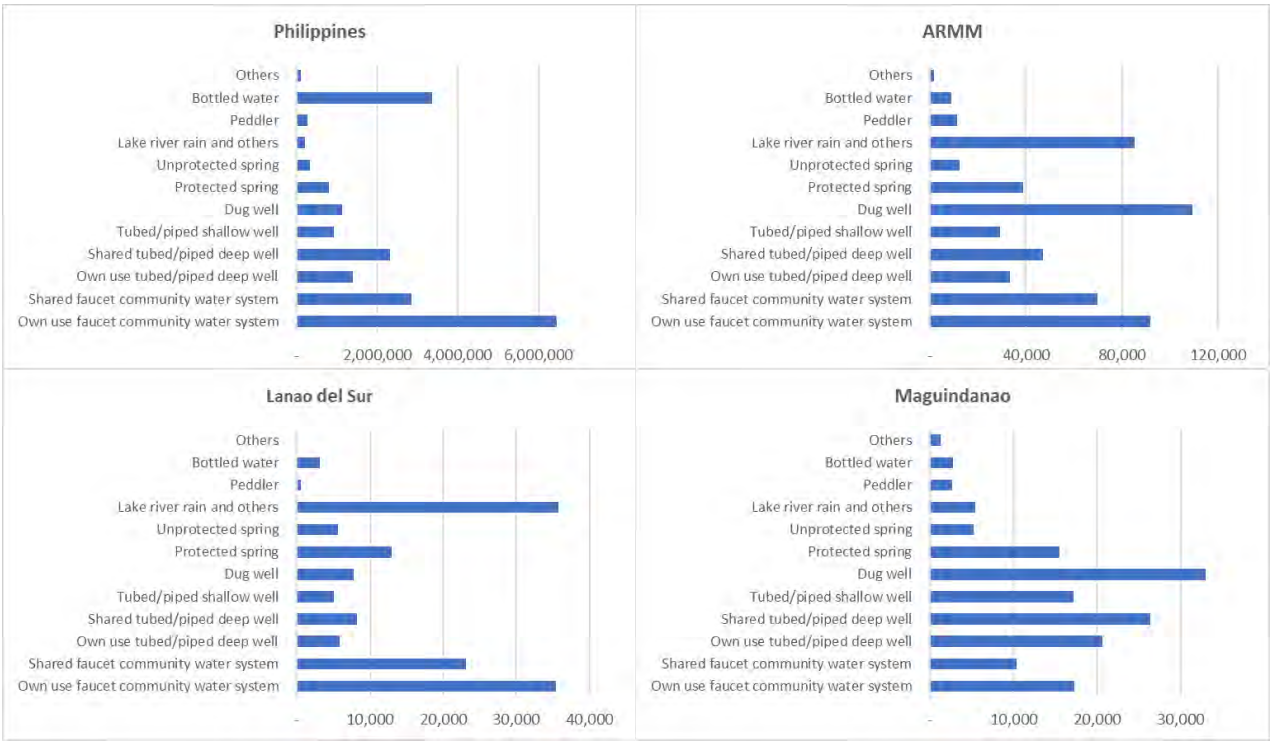
[4] Save the Children. (2015). Sizing Up: The Stunting and Child Malnutrition Problem in the Philippines.
[5] National Nutrition Survey 2015 Updating Survey Result. Food and Nutrition Research Institute, Department of Science and Technology.

The Philippines is one of the countries that account for most of the global burden of malnutrition. It ranks 9th in the countries with the highest burden of stunting, and 10th in the countries with the highest burden of wasting.[6] The situation of ARMM is worse than the national average. As of 2015, ARMM registered 24.9% of underweight while the national average was 21.5%. For stunting, ARMM registered 45.2% while the national average was 30.3%. For wasting, ARMM registered 8.2% whereas the national average was 7.9%. Lanao del Sur and Maguindanao have very high incidence of stunting, 49.0% and 45.6% for 2015, which indicate chronic undernutrition or past nutritional status.

5.1.4 Access to Basic Social Services

Access to basic social services such as drinking water and education is essential for inclusive growth. Access to drinking water and education as examples shows the situation of limited access to social services in ARMM and two provinces of Lanao del Sur and Maguindanao.

With regard to drinking water, the 2010 Census of Population and Housing surveyed sources of drinking water used by households. In the Philippines as a whole, a majority of households use water from sources such as "community water system," "tubed/piped deep well," and "bottled water." By contrast, in ARMM, "dug well" and "lake, river, rain and others" are major sources of drinking water besides community water system. The most popular source is "lake, river, rain and others" in Lanao del Sur and "dug well" in Maguindanao.



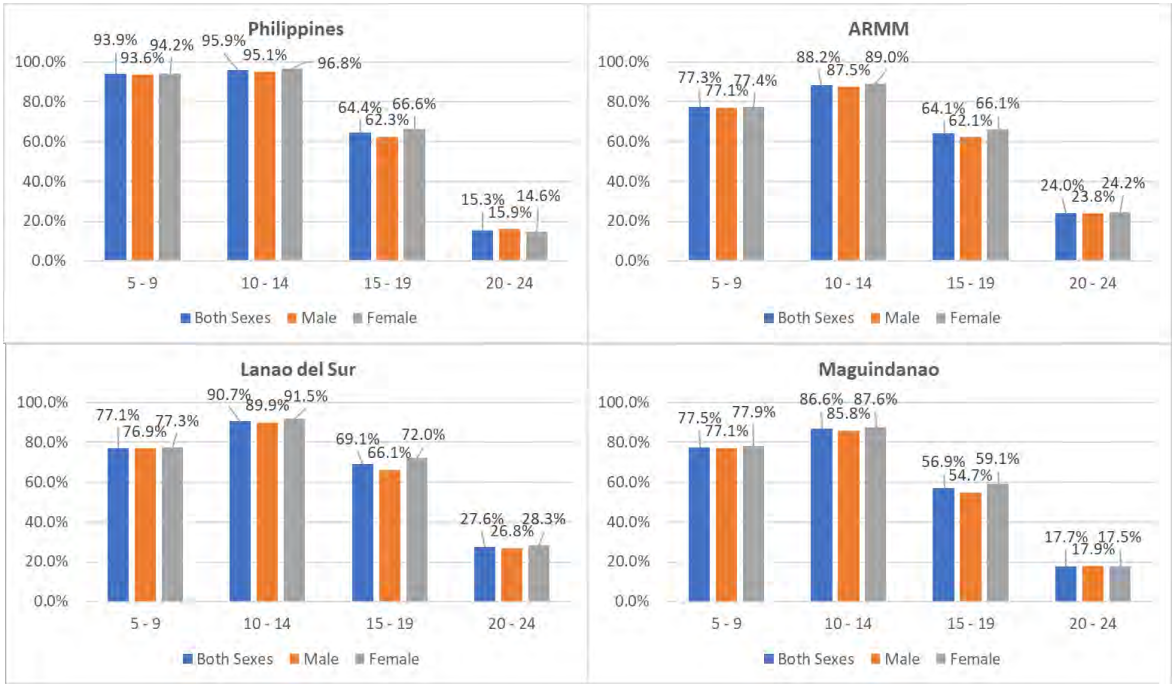
Source: 2010 Census of Population and Housing. Philippine Statistics Authority

Figure 5.1.4-1 Households by Main Source of Water Supply for Drinking

Regarding education, the 2015 Census of Population and Housing surveyed household population attending school by age group and sex. In the entire Philippines, over 90% of age groups of 5–9 and 10–14 are attending school. On the other hand, for age group 5–9 in ARMM, population attending school is 77.3% for both sexes, which is lower than the national average by 16.6%. For the age group

[6] Save the Children. (2015). Sizing Up: The Stunting and Child Malnutrition Problem in the Philippines.

10–14 in ARMM, population attending school is 88.2% for both sexes, or 12.3% lower than the national average. Lanao del Sur and Maguindanao have percentages similar to ARMM, indicating limited access to primary and secondary education for children.



Source: 2015 Census of Population and Housing. Philippine Statistics Authority

Figure 5.1.4-2 Household Population 5 to 24 Years Old Who Were Currently Attending School

5.1.5 Gender Equity

Expanding employment opportunities for women is a key for attaining inclusive growth for women. However, employment growth in the Philippines has not been inclusive for women. The estimated proportion of women's annual earnings to those of men stands at less than 60%.[7] Women's labour market participation has been lower than men because of multiple factors including inadequate employment and decent work opportunities, domestic labour and care constraints, and social norms.[8] Thus, in the Philippines, women's labour force participation rate (LFPR), defined as proportion of total labour force to the total household population 15 years and over, is lower than men's. ARMM has the lowest LFPR of all regions. The table below shows that women's LFPR for ARMM has been much less than the national average while the one of men is slightly higher than the national average.

Table 5.1.5-1 Labour Force Participation Rate by Sex for the Philippines and ARMM

(Unit: %)

	2011	2012	2013	2014	2015
Both Sexes					
Philippines	64.6	64.2	63.9	64.6	63.7
ARMM	55.7	56.5	56.0	56.8	54.4
Men					
Philippines	79.0	78.5	78.1	78.6	77.3
ARMM	79.0	79.7	79.5	80.0	77.5
Women					
Philippines	50.4	50.0	49.9	50.7	50.1
ARMM	31.7	33.7	33.0	34.0	31.6

Source: 2016 Gender Statistics on Labour and Employment. Philippine Statistics Authority

[7] Asian Development Bank. (2013). Gender Equity in the Labor Market in the Philippines.
[8] Philippine Statistics Authority. (2016). 2016 Gender Statistics on Labor and Employment.

5.1.6 Human Development Index

The Human Development Index (HDI) is a summary measure of human development. It measures the average achievement in a country in three basic dimensions of human development: longevity or a long and healthy life, access to knowledge, and a decent standard of living. These dimensions are measured by a set of indicators that are aggregated into indices. HDI 2012 for the Philippines used life expectancy at birth as an indicator for longevity, mean years of schooling, and expected years of schooling as indicators for knowledge, and per capita income 2012 as an indicator for standard of living. The table below shows HDI 2012 for the Philippines and ARMM provinces. HDI of ARMM provinces are all much lower than the national average of 0.644. Among all the provinces in the country, Lanao del Sur, Sulu, and Maguindanao are the worst three with regard to HDI.

Table 5.1.6-1 Human Development Index 2012 of the Philippines and ARMM Provinces

Region, Province	Life Expenctancy at birth (years) 2012	Mean years of Schooling 2012	Expected years of Schooling 2012	Per Capita Income 2012 (PPP NCR 2012 PhP)	Life Expectancy Index	Education Index	Income Index	HDI 2012
Philippines	73.4	9.2	12.2	49,903	0.822	0.880	0.369	0.644
ARMM								
Basilan[a/]	63.5	6.7	10.8	30,989	0.669	0.705	0.155	0.419
Lanao del Sur	60.7	7.3	11.2	19,139	0.627	0.752	0.022	0.217
Maguindanao	59.5	6.3	11.1	23,464	0.608	0.691	0.070	0.309
Sulu	58.0	6.7	12.5	22,773	0.585	0.76	0.063	0.303
Tawi-Tawi[a/]	54.4	8.1	10.7	31,489	0.529	0.769	0.161	0.403

Notes: a. Coefficient of variation of 2012 mean years of schooling is greater than 10%.

Source: Philippine Statistics Authority. PSA and HDN Jointly Release the Preliminary Estimates of the 2012 Human Development Index. http://www.psa.gov.ph/human-development-index-press-releases

5.2 Economic Conditions

5.2.1 GRDP and Economic Structure

The gross regional domestic product (GRDP) of ARMM in 2016 was PhP 103.93 billion at current prices, which accounts for 0.7% of the Philippines' GDP. ARMM's economy rebounded in 2016 after a negative growth in the previous year. Nevertheless, the growth rate of 0.3% for 2015–2016 is the lowest among the regions, and -0.4% for 2014–2015 was the only negative growth recoded. The region's annual growth in the last several years has been slower than the rest of the Philippines.

Agriculture, hunting, forestry and fishing are the key industries in ARMM. The agriculture sector contributes 56.3% of GRDP of the region in 2016, while the industry sector accounts for 5.7% and the service sector accounts for 38.0%. ARMM remains an agriculture-based economy. However, over the last several years, growth rates of the agriculture sector have been lower than the industry and service sectors. The agriculture sector's contribution to the regional economy has come down from 64.4% in 2009 to 56.3% in 2016, leading to slow economic growth of the region.

Meanwhile, GRDP growth rates and GRDP % distribution by sector from 2009 through 2016 show that the economic growth of ARMM has been driven by the service sector. The service sector consists of various service industries including the following: warehousing and truck transportation services; information sector services; commodities, securities and other investment services; and professional, technical and scientific services.

Table 5.2.1-1 ARMM GRDP Percent Distribution at Constant 2000 Prices

(Unit: %)

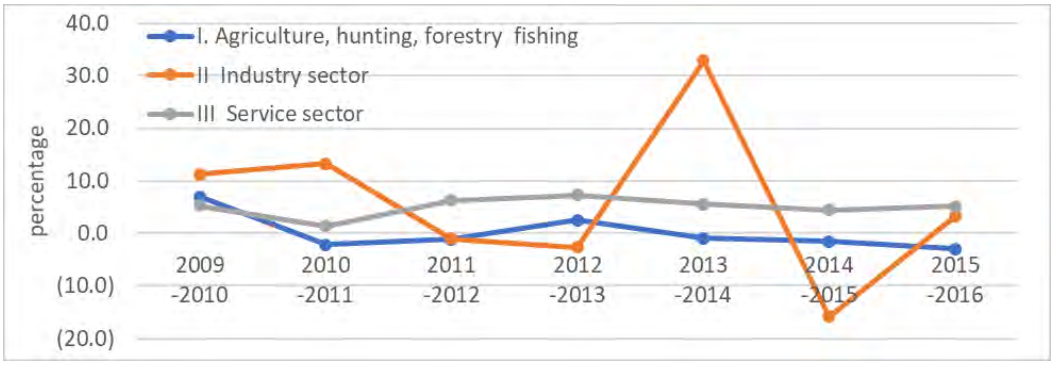
Industry/Year	2009	2010	2011	2012	2013	2014	2015	2016
I. Agriculture, hunting foresty & fishing	64.4	64.5	63.4	61.9	61.1	58.8	58.2	56.3
II. Industry sector	4.6	4.8	5.4	5.5	5.1	6.6	5.6	5.7
III. Service sector	31.1	30.7	31.2	32.7	33.8	34.5	36.2	38.0
Gross domestic product	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Philippine Statistics Authority. https://psa.gov.ph/regional-accounts/grdp/data-and-charts

Table 5.2.1-2 ARMM GRDP Growth Rates at Constant 2000 Prices

(Unit: %)

Industry/Year	2009 -2010	2010 -2011	2011 -2012	2012 -2013	2013 -2014	2014 -2015	2015 -2016
I. Agriculture, hunting foresty & fishing	7.0	(2.1)	(1.1)	2.5	(0.9)	(1.5)	(3.0)
II. Industry sector	11.2	13.3	(1.0)	(2.7)	32.9	(15.9)	3.2
III. Service sector	5.3	1.4	6.3	7.3	5.6	4.4	5.2
Gross domestic product	6.7	(0.3)	1.2	3.8	3.0	(0.4)	0.3



Source: Philippine Statistics Authority. https://psa.gov.ph/regional-accounts/grdp/data-and-charts

5.2.2 Income and Expenditure

In 2015, the average annual family income of ARMM was approximately PhP 139,000. In comparison, the average annual family expenditure for the same year was PhP 111,000. Hence, families in ARMM have annual savings of PhP 28,000 on average. The family income, expenditure and savings of ARMM are the lowest among all the regions, and far below the national average of PhP 267,000 for income, PhP 215,000 for expenditure, and PhP 52,000 for savings.

Adjusted for the inflation for the two reference years using the 2006 prices, the average annual family income in 2015 would be PhP 89,000, while the average annual family income in 2012 would be PhP 91,000. ARMM and Caraga (Region XIII) are the only two regions that have the adjusted average family income in 2015 below the one in 2012.

Table 5.2.2-1 Average Income, Expenditure, and Savings of Families in ARMM at Current Prices and at 2006 Prices

	2012 ('000 PhP)			2015 ('000 PhP)		
	Income	Expenditure	Savings	Income	Expenditure	Savings
Current prices	130	114	16	139	111	28
At 2006 prices	91	80	11	89	71	18

Source: 2012 and 2015 Family Income and Expenditure Survey, Philippine Statistics Authority

In 2015, on average, 59.0% of the total annual family expenditures in ARMM was spent on food. The lowest income class families and the highest income class ones spent lower percentage of income on

food compared to middle income class ones. For the lowest income class families, their expenditure on other basic needs such as house rent/rental value, water, electricity, gas and other fuels had higher percentages than other income classes.

Table 5.2.2-2 Total Annual Family Expenditure by Major Expenditure Group and by Income Class in ARMM in 2015

Major expenditure group	All income class	Income class				
		Under 40,000	40,000-59,999	60,000-99,999	100,000-249,999	250,000 and over
Total family expenditure (in millions)	68,397	40.0	1,337.0	14,829.0	40,716.0	11,474.0
Percentage to the total expenditure (%)	100.0	100.0	100.0	100.0	100.0	100.0
Food expenditure (%)	59.0	53.5	61.9	62.9	61.3	45.4
House rent/rental value (%)	8.5	13.9	10.8	9.3	8.5	7.0
Water electricity gas and other fuels (%)	6.5	15.2	7.9	7.0	6.2	6.8
Transport (%)	4.3	4.4	4.0	3.7	4.2	5.8
Education (%)	3.8	-	0.6	1.4	4.1	6.1
Communication (%)	1.2	0.6	1.0	1.0	1.1	1.7
Health (%)	0.8	0.4	0.8	0.6	0.7	1.2
Others (%)	15.9	12.2	13.0	14.1	13.9	26.0

Source: 2015 Family Income and Expenditure Survey, Philippine Statistics Authority

5.2.3 Labour Force and Employment

In January 2017, the total number of employed persons in ARMM was 974,000 with 769,000 men and 205,000 women. Workers in the agriculture sector comprised the largest proportion of the population who were employed, making up 60.3% of the total employed population. Workers in the service sector registered the second largest group accounting for 35.1% of the total employed. Workers in the industry sector made up the smallest group registering 4.6% of the total employed population.

Table 5.2.3-1 Percentage Distribution of Employed Persons by Sex and Major Industry Group in ARMM in 2017

Region, Province	Total	Male	Female
ARMM (number in thousands)	974	769	205
Total (%)	100.0	100.0	100.0
Agriculture (%)	60.3	67.0	35.0
Agriculture, hunting and forestry (%)	45.7	49.2	32.7
Fishing (%)	14.6	17.8	2.2
Industry (%)	4.6	5.0	3.3
Mining and quarrying (%)	0.3	0.3	-
Manufacturing (%)	1.3	0.9	3.1
Electricity, gas, steam and air condition activities (%)	-	-	-
Water supply, sewerage, waste management and remediation activities (%)	0.1	0.1	-
Construction (%)	2.9	3.7	0.2
Service (%)	35.1	28.0	61.7
Wholesale and retail trade; repair of motor vehicles and motorcycles (%)	15.6	10.2	35.7
Transportation and storage (%)	7.8	9.9	-
Accommodation and food service activities (%)	0.6	0.5	1.2
Information and communication (%)	0.1	0.1	0.1
Financial and insurance activities (%)	0.1	0.1	0.1
Real estate activities (%)	-	-	-
Professional, scientific and technical activities (%)	-	-	-
Administrative and support service activities (%)	1.0	1.2	-
Public administration and defense; compulsory social security (%)	6.0	4.5	11.5
Education (%)	2.2	0.8	7.7

Region, Province	Total	Male	Female
Human health and social work activities (%)	0.2	-	0.7
Arts, entertainment and recreation (%)	0.1	-	0.3
Other service activities including activities of households as employers; undifferentiated goods and services-producing activities of households for own use (%)	1.4	0.7	4.4
Activities of extraterritorial organizations and bodies (%)	-	-	-

Note: 0.0 - less than 0.05%
Details may not add up to totals due to rounding.
Source: January 2017 Labour Force Survey. Philippine Statistics Authority

In 2015, about half of the families in ARMM earned more than 75% of the family income from agriculture. Middle income classes of PhP 60,000–99,999 and PhP 100,000–249,999 have higher percentages of families whose agriculture income accounts for over 75% of total family income.

Table 5.2.3-2 Number of Families by percentage of Total Income from Agriculture by Income Class In 2015

Region Income Class	Number of Families (thousands)	Percent of Total Income from Agriculture				
		75%-100%	50%-74.9%	25%-49.9%	Below 25.0%	None
ARMM	616	308	79	41	121	67
Under 40,00	1	-	0	-	1	0
40,000 - 59,999	24	8	7	1	6	2
60,000 - 99,999	187	117	22	11	26	10
100,000 - 249,999	357	181	47	27	68	35
250,000 and over	47	3	3	2	19	20

Source: 2015 Census of Population and Housing. Philippine Statistics Authority

Chapter 6 Current Situation of Agriculture and Fisheries in the Study Area

6.1 Agricultural Land Use and Land Holdings

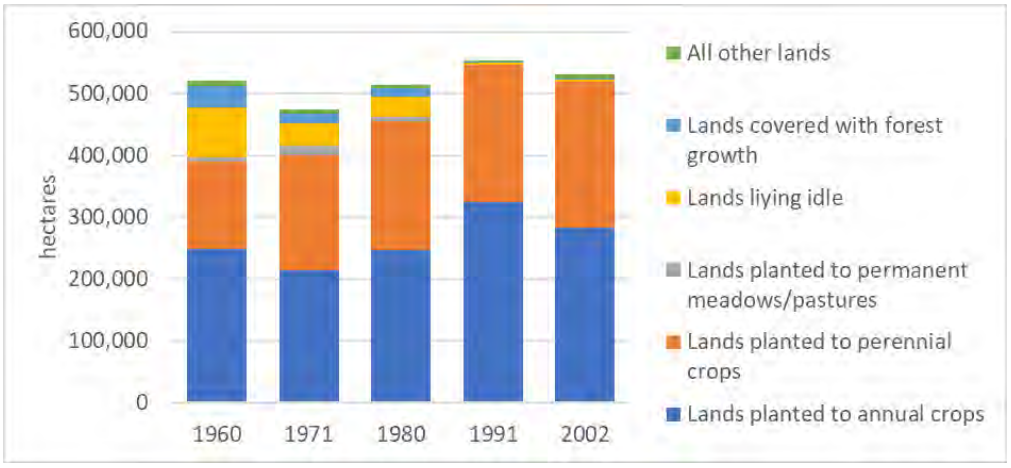
6.1.1 Current Agricultural Land Use

The total area of farms in ARMM has increased from 520,726ha in 1960 to 533,410ha in 2002. The expansion of land cultivated with perennial crops has the highest share among all the land use classes. The total area of land cultivated with perennial crops increased by 94,506ha between 1960 and 2002. On the other hand, unused land decreased from 80,003ha in 1960 to 1,924ha in 2002, implying that most of the idle land has been cultivated.

In 2002, the total area of farms of ARMM was 533,410ha, which comprised of 282,678ha or 53.0% of land cultivated with annual crops such as palay, corn, and cassava; 235,761ha or 44.2% of lands cultivated with perennial crops such as banana, coconut, and coffee; and a small percentage of land for other uses.

Table 6.1.1-1 Area of Farms in Hectares by Land Use in ARMM 1960-2002

	1960	1971	1980	1991	2002
Lands planted to annual crops	248,646	213,530	246,138	323,599	282,687
Lands planted to perennial crops	141,255	186,571	209,560	221,852	235,761
Lands planted to permanent meadows/pastures	7,066	15,631	6,805	752	922
Lands liying idle	80,003	35,941	32,267	3,969	1,924
Lands covered with forest growth	34,493	15,036	13,292	1,257	2,407
All other lands	9,260	7,678	5,764	1,873	6,919
All classes	520,726	474,389	514,124	553,301	533,410

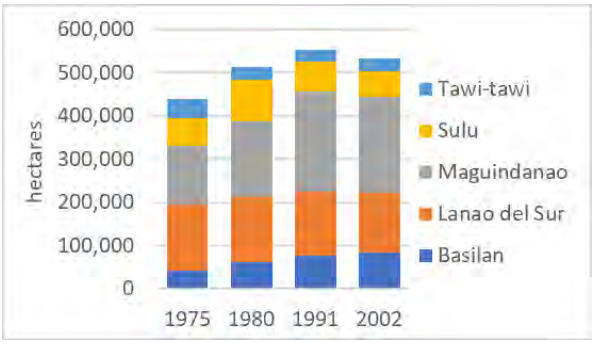


Source: CountrySTAT Philippines, Philippine Statistics Authority

Among the ARMM provinces, the mainland provinces of Lanao del Sur and Maguindanao have larger farm areas compared to the island provinces of Basilan, Sulu, and Tawi-Tawi. For Lanao del Sur, the total farm area has decreased from 152,254ha in 1975 to 140,111ha in 2002. On the other hand, Maguindanao indicated a significant expansion by 86,475ha in farm area between 1975 and 2002.

Table 6.1.1-2 Area of Farms in Hectares in ARMM and Its Provinces

	1975	1980	1991	2002
ARMM	438,833	514,124	553,301	533,410
Basilan	42,620	60,459	75,374	82,480
Lanao del Sur	152,254	151,892	149,660	140,111
Maguindanao	134,699	174,789	230,371	221,174
Sulu	64,132	95,384	68,709	59,501
Tawi-tawi	45,128	31,600	29,187	30,144

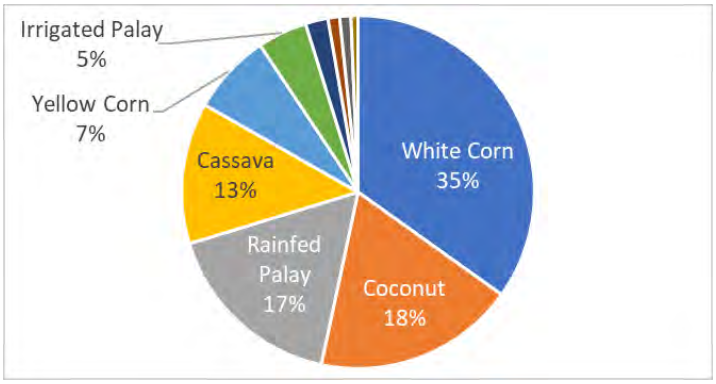


Source: Agriculture and Fisheries Philippine Yearbook 2013, Philippine Statistics Authority

In the Lanao del Sur province, the major crops cultivated in the farm areas include corn, coconut, palay, and cassava. Among the top ten most cultivated crops in the province, white corn covers the largest area of 87,492ha or 35% of the areas cultivated with the top ten crops. This is followed by coconut and rainfed palay.

Table 6.1.1-3 Top Ten Most Planted Crops in Lanao del Sur Province in 2016

	Crops	Hectare
1	White Corn	87,492
2	Coconut	46,381
3	Rainfed Palay	42,483
4	Cassava	32,500
5	Yellow Corn	18,575
6	Irrigated Palay	11,419
7	Banana	5,208
8	Coffee	2,691
9	Abaca	2,570
10	Sugarcane	1,612

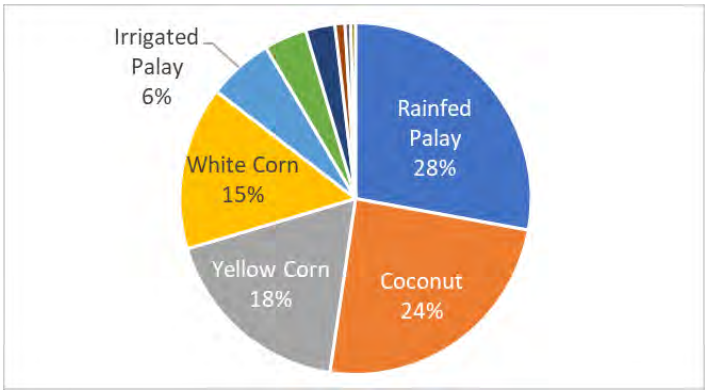


Source: CountrySTAT Philippines, Philippine Statistics Authority

In Maguindanao province, the major crops cultivated in the farm areas include palay, coconut, corn, and banana. Among the top ten most cultivated crops in the province, rainfed palay covers the largest area of 128,765ha or 28% of the area cultivated with the top ten crops. This is followed by coconut, yellow corn, and white corn.

Table 6.1.1-4 Top Ten Most Planted Crops in Maguindanao Province in 2016

	Crops	Hectare
1	Rainfed Palay	128,765
2	Coconut	113,045
3	Yellow Corn	83,337
4	White Corn	69,605
5	Irrigated Palay	27,789
6	Banana	18,225
7	Mango	12,465
8	Coffee	4,258
9	Oil Palm	2,450
10	Rubber	2,015



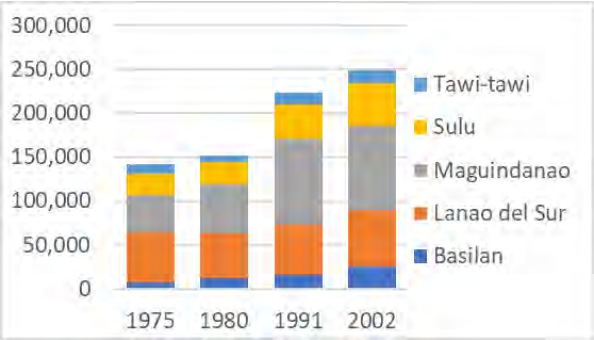
Source: CountrySTAT Philippines, Philippine Statistics Authority

6.1.2 Agricultural Land Holdings

The total number of farms in ARMM has increased from 142,430 in 1975 to 248,528 in 2002. Among the five provinces, Maguindanao experienced the fastest growth in the number of farms, which may be due to the fast expansion of farm area in the province over the same period. In contrast, the number of farms in Lanao del Sur increased at a much slower rate. According to the Special Report – Highlights of the 2012 Census of Agriculture published by the Philippine Statistics Authority, the number of farms in ARMM is 282,692, and the average farm size in ARMM is 1.23 ha.

Table 6.1.2-1 Number of Farms in ARMM and Its Provinces

	1975	1980	1991	2002
ARMM	142,430	152,040	223,605	248,528
Basilan	7,894	12,006	16,137	25,344
Lanao del Sur	56,242	50,701	56,438	64,813
Maguindanao	43,319	56,317	98,223	95,089
Sulu	23,491	25,389	38,769	49,392
Tawi-tawi	11,484	7,627	14,038	13,890

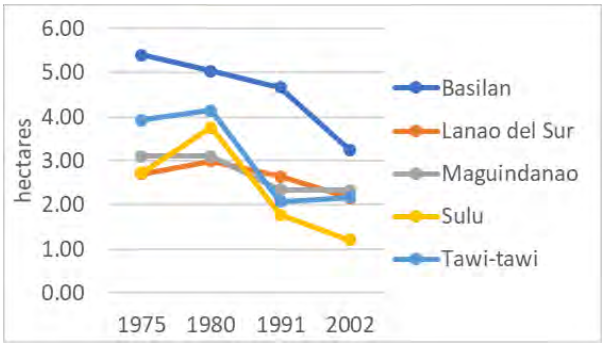


Source: Agriculture and Fisheries Philippine Yearbook 2013, Philippine Statistics Authority

Despite the increase in the number of farms, the average farm size in ARMM has decreased in all the provinces. In 1975, the average farm size in Maguindanao was 3.11ha, while that in Lanao del Sur was 2.71ha. In 2002, the average farm size in Maguindanao and Lanao del Sur decreased to 2.33 and 2.16ha, respectively. However, these figures are still above the national average of 2.01ha.

Table 6.1.2-2 Average Farm Size in Hectares in ARMM and Its Provinces

	1975	1980	1991	2002
ARMM	2.95	3.24	2.30	2.15
Basilan	5.40	5.04	4.67	3.25
Lanao del Sur	2.71	3.00	2.65	2.16
Maguindanao	3.11	3.10	2.34	2.33
Sulu	2.73	3.76	1.77	1.20
Tawi-tawi	3.93	4.14	2.08	2.17



Source: Agriculture and Fisheries Philippine Yearbook 2013, Philippine Statistics Authority

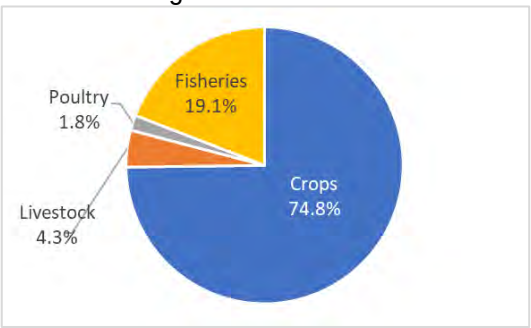
6.2 Agricultural and Fishery Production

6.2.1 Output by Subsectors

The value of agricultural production of ARMM was PhP 72,018.46 million in 2016, with crops accounting for PhP 53,866 million or 74.8% of the total value. It is followed by fisheries, which contributed PhP 13,771 million or 19.1% to the total production value.

Table 6.2.1-1 Value of Production in Agriculture of ARMM in 2016

Subsector	Value in million PhP	Percentage
Crops	53,866	74.8%
Livestock	3,097	4.3%
Poultry	1,284	1.8%
Fisheries	13,771	19.1%
Total	72,018	100.0%



Source: CountrySTAT Philippines, Philippine Statistics Authority

The value of agricultural production of ARMM at constant 2000 prices has been slightly declining in all the subsectors of crops, livestock, poultry, and fisheries over the last several years, resulting in a smaller share of agriculture in its economy.

Table 6.2.1-2 Value of Production in Agriculture of ARMM 2010–2016 at Constant 2000 Prices

(Unit: PhP)

	2010	2011	2012	2013	2014	2015	2016
Crops	24,014	23,134	23,409	24,161	23,593	22,834	22,563
Livestock	1,684	1,740	1,474	1,407	1,356	1,341	1,346
Poultry	683	645	639	646	607	593	545
Fisheries	7,556	7,677	7,331	7,552	7,754	7,950	7,248
All	33,937	33,195	32,852	33,766	33,310	32,718	31,702

Source: CountrySTAT Philippines, Philippine Statistics Authority

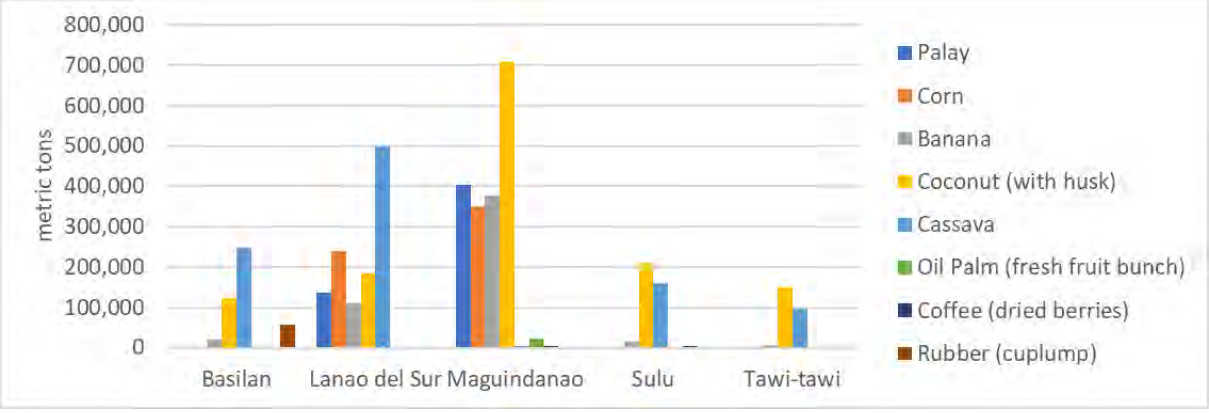
6.2.2 Crop Production

Among the ARMM provinces, the mainland provinces of Lanao del Sur and Maguindanao produce most of the palay and corn, which are the first and the second most important staple grains of the region. ARMM has also developed several commercial farm products, which play a major role in the national as well as the world markets. Lanao del Sur is a leading producer of cassava, whereas Maguindanao contributes to more than half of the coconut and banana production of ARMM. Maguindanao is also the only province to have a significant volume of oil palm production.

Table 6.2.2-1 Volume of Production of Major Crops in ARMM in 2016

(Unit: Metric tons)

	Palay	Corn	Banana	Coconut (with husk)	Cassava	Oil Palm (fresh fruit bunch)	Coffee (dried berries)	Rubber (cuplump)
ARMM	544,486	590,580	533,677	1,376,545	1,007,822	23,101	10,342	59,364
Basilan	2,156	165	20,970	123,594	248,248	..	1,733	57,597
Lanao del Sur	137,666	238,625	110,767	185,224	497,803	..	322	553
Maguindanao	402,536	350,133	378,487	706,927	4,235	23,101	3,402	1,215
Sulu	1,850	1,037	15,429	210,186	161,001	..	4,802	..
Tawi-tawi	278	620	8,025	150,614	96,534	..	82	..



Source: CountrySTAT Philippines, Philippine Statistics Authority

Production characteristics and trends of potential crops of Lanao del Sur and Maguindanao are described in **section 6.2.5**.

6.2.3 Livestock and Poultry Production

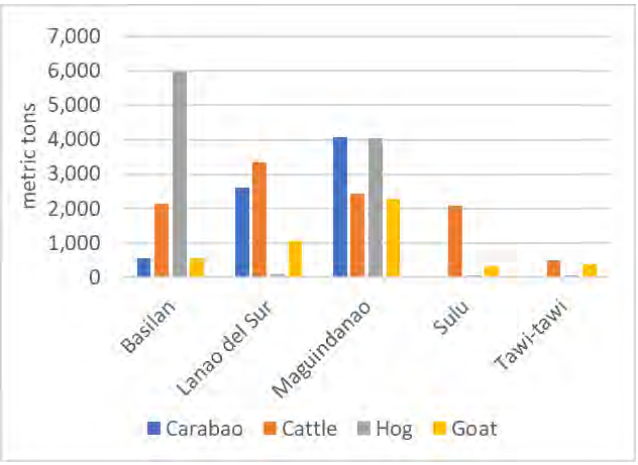
Livestock and poultry production account for smaller shares of agricultural production in ARMM. In 2016, the value of livestock production in ARMM was PhP 3,097 million or 4.3% of the total value of agricultural production. Poultry production accounts for an even smaller share than livestock production. In 2016, the value of poultry production was PhP 1,284 million or 1.8% of the total agricultural production.

Livestock production in ARMM includes four major animals: carabao, cattle, hog, and goat. In 2016, cattle accounted for the highest volume of production of 10,483 metric tons live weight or 3.9% of the national production, followed by hog, carabao, and goat, with very small shares of 0.5%, 5.1%, and 6.0%, respectively.

Table 6.2.3-1 Volume of Livestock Production in ARMM in 2016

(Unit: Metric tons)

	Carabao	Cattle	Hog	Goat
ARMM	7,316	10,483	10,208	4,636
Basilan	565	2,127	5,984	569
Lanao del Sur	2,614	3,345	81	1,060
Maguindanao	4,084	2,439	4,033	2,290
Sulu	7	2,084	52	338
Tawi-tawi	45	488	58	379



Source: CountrySTAT Philippines, Philippine Statistics Authority

Most livestock production in ARMM is categorized as backyard production by farms or households that are raising at least one head of animal. On the other hand, commercial production refers to production by a livestock operator or farm that satisfies at least one of the following conditions: a) at

least 21 head of adults and no young animals; b) at least 41 head of young animals; and c) at least 10 head of adults and 22 head of young animals.[1]

The livestock inventory below indicates the actual number of domesticated animals present in the farm as of January 1, 2017. Except for cattle, which commercial farms raise several hundred head of, all livestock animals are raised in backyard farms. Rural households may have a few cattle or goats that can be sold whey they need cash. Carabaos are used as draft animals. They yield milk for household consumption and slaughtered for meat when they grow old.

Table 6.2.3-2 Livestock Inventory in Head in ARMM as of 1 January 2017

	Carabao		Cattle		Goat		Hog	
	Backyard	Commercial	Backyard	Commercial	Backyard	Commercial	Backyard	Commercial
ARMM	123,969	..	69,321	622	153,021	..	43,632	..
Basilan	24,186	..	18,286	..	34,190	..	39,395	..
Lanao del Sur	15,936	..	18,895	503	73,500	..	565	..
Maguindanao	82,353	..	6,358	..	8,259	..	3,020	..
Sulu	1,012	..	23,000	..	17,800	..	105	..
Tawi-tawi	482	..	2,782	119	19,272	..	547	..
.. Data not available								

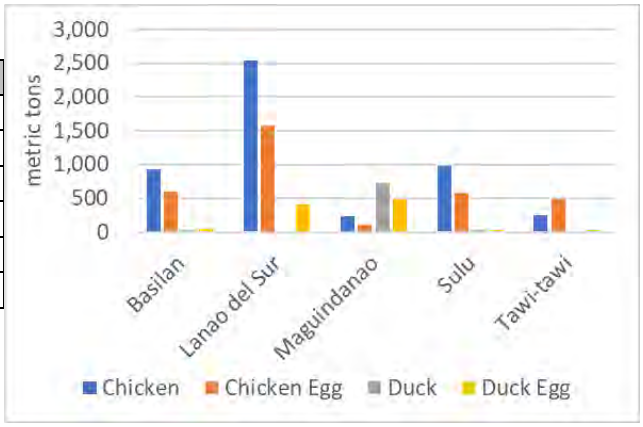
Source: CountrySTAT Philippines, Philippine Statistics Authority

Poultry production comprises of four major categories: chickens, chicken eggs, ducks, and duck eggs. Their production volume is very small, with 4,943 metric tons of chicken produced in 2016, accounting for only 0.30% of the national production. Similarly, chicken egg, duck, and duck egg production contribute to 0.73%, 2.50%, and 2.33% of the national production, respectively.

Table 6.2.3-3 Volume of Poultry Production in ARMM in 2016

(Unit: Metric tons)

	Chicken	Chicken Egg	Duck	Duck Egg
ARMM	4,943	3,371	804	1,028
Basilan	936	607	27	51
Lanao del Sur	2,534	1,571	20	406
Maguindanao	245	110	725	491
Sulu	977	591	28	41
Tawi-tawi	252	492	5	40



Source: CountrySTAT Philippines, Philippine Statistics Authority

The chicken and duck inventory indicates that poultry production in ARMM is similar to livestock production in that most of it is produced by backyard farms that keep at least one bird. Commercial poultry production refers to production by any poultry farm or operator that satisfies at least one of the following conditions: a) 500 layers or 1,000 broilers; b) 100 layers and 100 broilers if raised in combination; and c) 100 head of ducks regardless of age.[2]

[1] Metadata for National Agricultural Statistics of the Philippines. CountrySTAT Philippines http://countrystat.psa.gov.ph/.
[2] Metadata for National Agricultural Statistics of the Philippines. CountrySTAT Philippines http://countrystat.psa.gov.ph/.

Table 6.2.3-4 Chicken and Duck Inventory in Birds in ARMM as of 1 January 2017

Chicken				
	Total	Broiler	Layers	Native
ARMM	1,866,485	..	500	1,865,985
Basilan	346,846	..	500	346,346
Lanao del Sur	853,405	..	..	853,405
Maguindanao	53,819	..	..	53,819
Sulu	458,072	..	..	458,072
Tawi-tawi	154,343	..	..	154,343

Duck			
	Total	Backyard	Commercial
ARMM	105,524	105,524	..
Basilan	10,553	10,553	..
Lanao del Sur	15,922	15,922	..
Maguindanao	54,770	54,770	..
Sulu	17,384	17,384	..
Tawi-tawi	6,895	6,895	..

.. Data not available

Source: CountrySTAT Philippines, Philippine Statistics Authority

6.2.4 Fisheries production

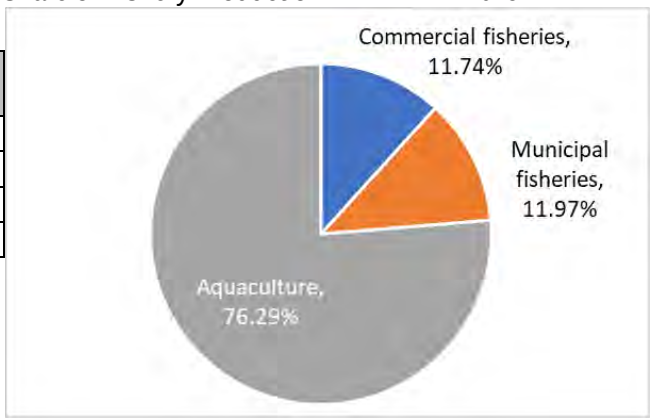
Fisheries production can be categorized into three subsectors: commercial fisheries, municipal fisheries, and aquaculture. Commercial fishing involves catching more than three gross tons of fish using fishing boats with a capacity for trade, business, or profit, which is beyond subsistence or sports fishing. On the other hand, municipal fishing involves fishing three gross tons or less within municipal waters either with or without fishing vessels. Aquaculture refers to fishery operations involving all forms of raising and culturing of fish and other fishery species in fresh, brackish, and marine water areas.[3]

In ARMM, aquaculture production is the dominant form of fishery production. In 2015, the volume of aquaculture production accounted for 76.29% of the total volume of fishery production in ARMM. Commercial fisheries and municipal fisheries contribute 11.74% and 11.97%, respectively, to the total production.

Table 6.2.4-1 Volume and percentage Share of Fishery Production in ARMM in 2015

(Unit: Metric tons)

	Volume	Percentage share
Commercial fisheries	98,238	11.74%
Municipal fisheries	100,236	11.97%
Aquaculture	638,636	76.29%
Total	837,110	100.00%



Source: Fisheries Profile 2015. Bureau of Fisheries and Aquatic Resources-ARMM

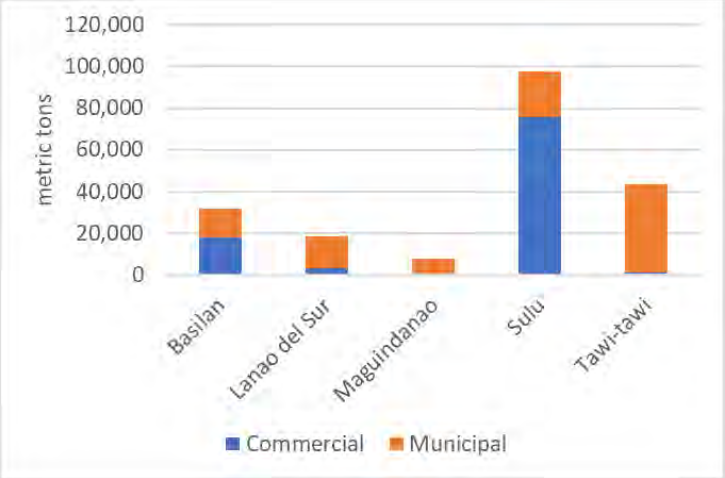
Among the ARMM provinces, Sulu province accounts for a large share of the commercial fisheries. As regards municipal fisheries, Tawi-Tawi and Sulu provinces are the two leading producers. Lanao del Sur and Maguindanao have very limited commercial fisheries production and some municipal fisheries production.

[3] Metadata for National Agricultural Statistics of the Philippines. CountrySTAT Philippines http://countrystat.psa.gov.ph/.

Table 6.2.4-2 Volume of Production of Commercial and Municipal Fisheries in 2015

(Unit: Metric tons)

	Commercial	Municipal
ARMM	98,238	100,236
Basilan	17,699	13,787
Lanao del Sur	3,043	15,472
Maguindanao	567	7,027
Sulu	75,893	21,627
Tawi-tawi	1,035	42,332



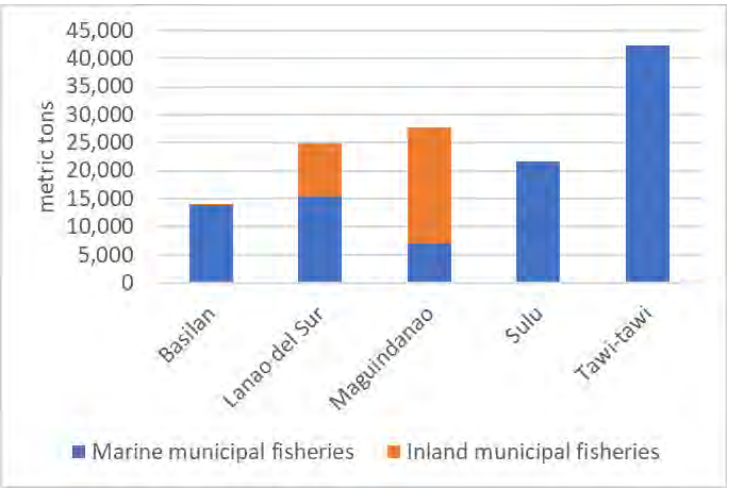
Source: Fisheries Profile 2015. Bureau of Fisheries and Aquatic Resources-ARMM

Municipal fisheries can be divided into two categories: marine municipal fisheries and inland municipal fisheries. The two mainland provinces of Lanao del Sur and Maguindanao have inland municipal fisheries, while the island provinces of Basilan, Sulu, and Tawi-Tawi have more marine municipal fisheries.

Table 6.2.4-3 Volume of Production of Marine and Inland Municipal Fisheries in 2015

(Unit: Metric tons)

	Marine municipal fisheries	Inland municipal fisheries
ARMM	100,156	30,242
Basilan	13,779	8
Lanao del Sur	15,466	9,451
Maguindanao	6,969	20,783
Sulu	21,621	-
Tawi-tawi	42,322	-



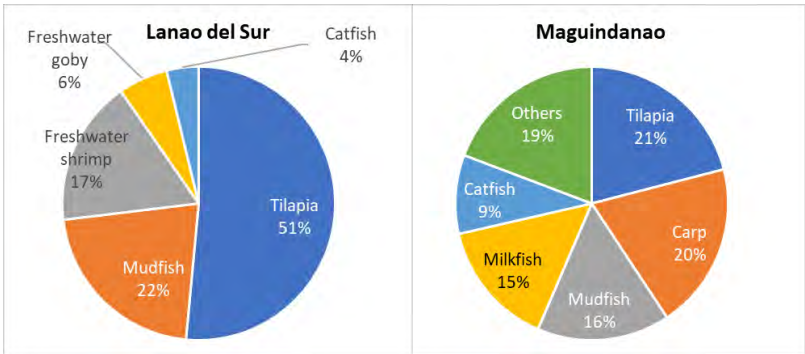
Source: Fisheries Profile 2015. Bureau of Fisheries and Aquatic Resources-ARMM

In 2015, the value of total production of inland municipal fisheries was PhP 1,620,466,000 for Maguindanao, which was nearly twice that of Lanao del Sur. The value of inland municipal fisheries production by species indicates some characteristics of Lanao del Sur and Maguindanao. In Lanao del Sur, tilapia accounts for half of the value of total production, followed by milkfish and freshwater shrimp. In contrast, Maguindanao produces a greater variety of species including tilapia, carp, mudfish, milkfish, and catfish.

Table 6.2.4-4 Value of Inland Municipal Fisheries Production by Species in 2015

(Unit: '000 PhP)

	Lanao del Sur	Maguindanao
Carp	..	319,454
Catfish	33,268	151,064
Climbing perch	..	101,025
Freshwater goby	51,598	68,858
Gourami	..	112,586
Milkfish	..	242,569
Mudfish	189,673	255,355
Tilapia	452,195	340,058
Freshwater shrimp	151,457	9,179
Other fishes	..	20,319
Total	878,190	1,620,466



.. No reported data

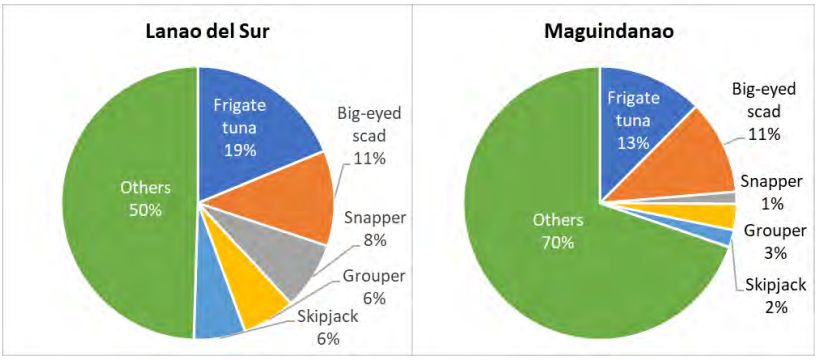
Source: CountrySTAT Philippines, Philippine Statistics Authority

As regards marine municipal fisheries, Lanao del Sur has a larger value of production vis-à-vis Maguindanao. In 2015, the total value of Lanao del Sur was PhP 1,229,802,000, while that of Maguindanao was PhP 710,966,000. In both the provinces, frigate tuna makes the contribution towards the total value, followed by bigeye scad.

Table 6.2.4-5 Value of Marine Municipal Fisheries Production by Species in 2015

(Unit: '000 PhP)

	Lanao del Sur	Maguindanao
Frigate tuna	230,816	88,559
Big-eyed scad	139,278	79,657
Snapper	98,427	10,194
Grouper	77,408	21,948
Skipjack	74,877	14,535
Others	608,996	496,073
Total	1,229,802	710,966



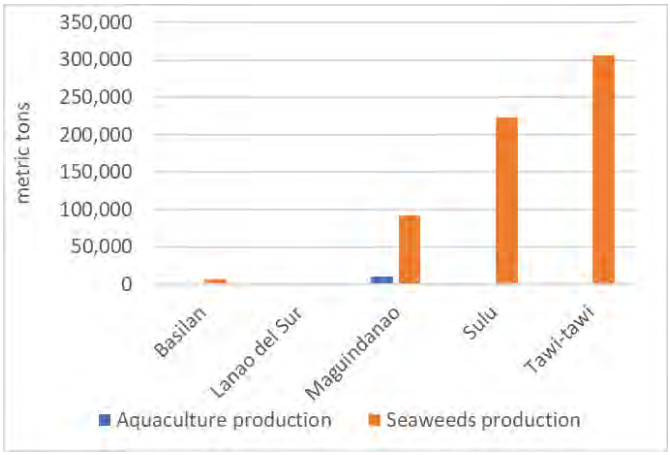
Source: CountrySTAT Philippines, Philippine Statistics Authority

Aquaculture production in ARMM is dominated by seaweed production in Sulu and Tawi-Tawi. The volume of aquaculture production, excluding seaweed production, in 2015 was only 11,200 metric tons, most of which was contributed by Maguindanao province.

Table 6.2.4-6 Volume of Aquaculture and Seaweed Production in Metric Tons in 2015

(Unit: Metric tons)

	Aquaculture production	Seaweeds production
ARMM	11,200	627,436
Basilan	299	6,478
Lanao del Sur	17	0
Maguindanao	10,885	92,219
Sulu	0	222,835
Tawi-tawi	0	305,903

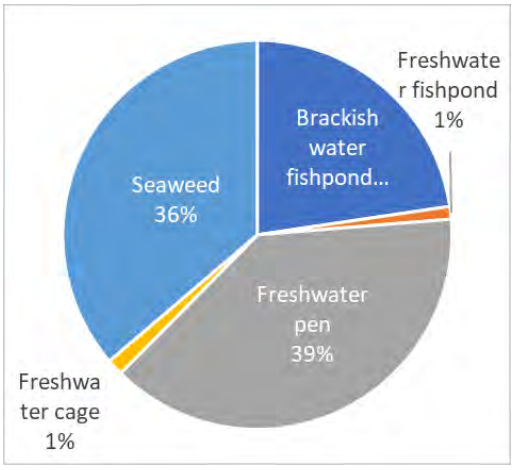


Source: Fisheries Profile 2015. Bureau of Fisheries and Aquatic Resources-ARMM

The value of aquaculture production, including the production of seaweed and other species, of Maguindanao in 2015 indicates that seaweeds, freshwater pen, and brackish water fishpond are the three major categories of environment. Freshwater pens culture milkfish and tilapia, while brackish water fishponds mainly culture milkfish.

Table 6.2.4-7 Value of Aquaculture Production by Environment and Species in Maguindanao in 2015

Environment/species	Value ('000 PhP)
Brackish water fishpond	421,235
BF - Milkfish	279,899
BF - Tilapia	11,669
BF - Tiger prawn	78,436
BF - Mudcrab	22,397
BF - White shrimp	28,833
Freshwater fishpond	19,569
FF - Tilapia	5,417
FF - Catfish	14,152
Freshwater pen	719,410
FP - Milkfish	141,846
FP - Tilapia	577,563
Freshwater cage	25,228
FC - Milkfish	6,660
FC - Tilapia	18,568
Seaweed	673,651
Total	1,859,092



Source: CountrySTAT Philippines, Philippine Statistics Authority

6.2.5 Potential Crops

(1) Palay

Maguindanao and Lanao del Sur produce most of the palay in the region. In Maguindanao, palay is mostly cultivated in lowland plains. Production in irrigated areas has been declining in both the provinces due to several reasons, which include the damage of irrigation systems, shift to cassava cultivation because of high demand for processing, shift from rice to banana production in Maguindanao.[4]

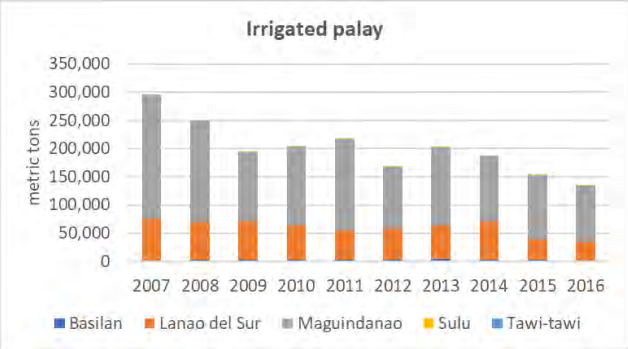
The average yield of palay in ARMM has been much lower than the national average as well as the average yield of other regions in Mindanao. In 2017, the average yield of ARMM was 2.70 metric tons per hectare, while the national average was 4.01 metric tons per hectare. However, compared to the previous years, the average yield of palay in ARMM has indicated progress as it rose from 2.51 metric tons in 2015 and 2.56 metric tons in 2016 to 2.70 metric tons in 2017.[5] The relatively low yield can be attributed to several factors such as low productivity of upland palay using native varieties and inadequate use of inputs such as fertilizers and farming practices.[6] In addition, there may be problems during postharvest operations such as harvesting, threshing, drying, storage, and milling, which can result in the reduction of yield.

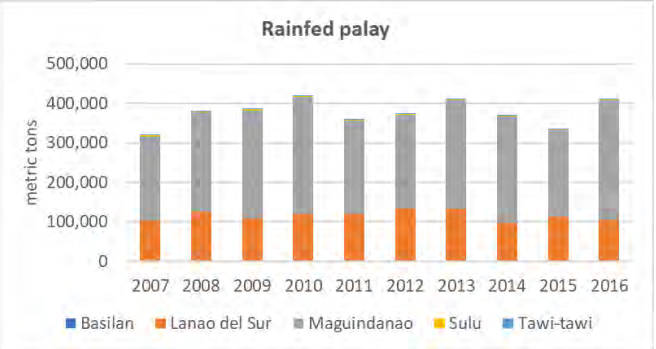
[4] Regional Planning Development Office – ARMM. Draft Regional Development Plan, 2017–2020
[5] Rice and Corn Situation and Outlook, July 2017 Round, Philippine Statistics Authority
[6] RECS International Inc., et al., 2016. Comprehensive Capacity Development Project for Bangsamoro: Final Report Sector Report 1: Economy.

Table 6.2.5-1 Volume of Irrigated and Rainfed Palay Production in ARMM

(Unit: Metric tons)

		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Irrigated Palay	ARMM	296,043	250,400	193,966	203,331	216,608	168,256	201,911	187,071	153,237	134,403
	Basilan	1,648	2,535	2,184	3,020	2,797	3,146	4,789	3,397	2,360	2,002
	Lanao del Sur	73,432	67,285	67,854	59,864	52,399	54,190	58,784	67,191	37,028	33,282
	Maguindanao	220,963	180,580	123,640	140,292	161,187	110,620	138,043	116,483	113,549	98,919
	Sulu	..	..	288	155	225	300	295	..	300	200
	Tawi-tawi	..	..	..	..	..	..	..	..	..	..
Rainfed Palay	ARMM	319,737	381,291	385,781	420,012	360,265	374,504	410,172	370,078	334,978	410,083
	Basilan	1,328	1,922	1,119	1,720	1,449	970	389	402	350	154
	Lanao del Sur	101,250	123,011	107,825	117,896	118,551	132,490	131,069	96,926	112,326	104,384
	Maguindanao	212,803	252,009	273,079	296,665	236,910	237,503	276,017	270,051	219,709	303,617
	Sulu	3,400	3,450	2,914	2,770	2,397	2,645	2,054	2,050	2,102	1,650
	Tawi-tawi	956	899	844	961	958	896	643	649	491	278





Source: CountrySTAT Philippines, Philippine Statistics Authority

(2) Corn

Corn is one of the major crops in the region in terms of cultivated area and production. Despite decreasing production and fluctuating trends in the total harvested area, it remains one of the main crops of the region. Corn production is concentrated in Lanao del Sur and Maguindanao. There are two broad categories of corn: white corn and yellow corn. White corn is grown and used mainly for human consumption and the manufacture of corn by-products such as corn-starch, corn oil and syrup. Yellow corn is used mainly as feed grain.

The average yield of corn in ARMM is 2.75 metric tons per hectare, which is smaller than the national average of 3.10 metric tons, but greater than that of the two other regions in Mindanao: Zamboanga Peninsula and Davao.[7] Corn is usually grown by small farmers, whose inadequate application of fertilizer and use of poor planting materials contribute towards a low yield. This is particularly true with white corn production.[8]

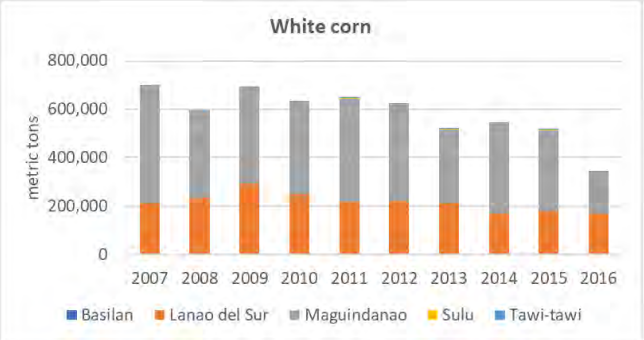
Table 6.2.5-2 Volume of White Corn and Yellow Corn Production in ARMM in Metric Tons

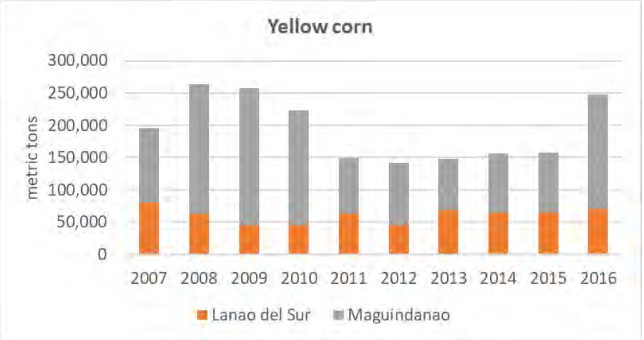
(Unit: Metric tons)

		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
White Corn	ARMM	698,943	593,117	692,633	632,745	647,909	622,829	519,099	543,597	515,725	343,342
	Basilan	1,452	1,627	433	316	344	338	160	186	197	165
	Lanao del Sur	208,259	236,218	292,643	250,040	219,303	223,782	211,421	168,935	176,046	168,277
	Maguindanao	486,812	352,548	396,809	379,667	425,741	396,468	305,509	372,568	337,478	173,243

[7] Rice and Corn Situation and Outlook, July 2017 Round, Philippine Statistics Authority
[8] RECS International Inc., et al., 2016. Comprehensive Capacity Development Project for Bangsamoro: Final Report Sector Report 1: Economy.

		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	Sulu	1,061	1,120	1,149	1,025	1,064	1,021	1,042	1,104	1,167	1,037
	Tawi-tawi	1,359	1,604	1,599	1,697	1,457	1,220	967	804	837	620
Yellow Corn	ARMM	196,081	263,556	257,796	222,921	148,752	141,945	148,005	155,994	157,311	247,238
	Basilan	..	..	..	..	..	..	..	..	..	..
	Lanao del Sur	81,482	62,816	45,559	46,030	62,415	45,676	68,602	63,578	65,625	70,348
	Maguindanao	114,599	200,740	212,237	176,891	86,337	96,269	79,403	92,416	91,686	176,890
	Sulu	..	..	..	..	..	..	..	..	..	..
	Tawi-tawi	..	..	..	..	..	..	..	..	..	..





Source: CountrySTAT Philippines, Philippine Statistics Authority

(3) Coconut

Coconut production contributes a substantial share to the economy of ARMM. It is one of the top agricultural commodities produced in ARMM, accounting for 12.3% of total agricultural output.[9] For the last ten years, the volume of coconut production has progressively increased from 1,243 thousand metric tons in 2007 to 1,377 metric tons in 2017. Among the five provinces, Maguindanao is the only province that has indicated a steady increase in the volume of production. This production growth is due to the expansion of plantation area and increase in average yield. Plantation area in Maguindanao increased from 93,271ha in 2007 to 113,045ha in 2016, while the average yield improved from 5.0 metric tons per hectare in 2007 to 6.3 metric tons per hectare in 2016.

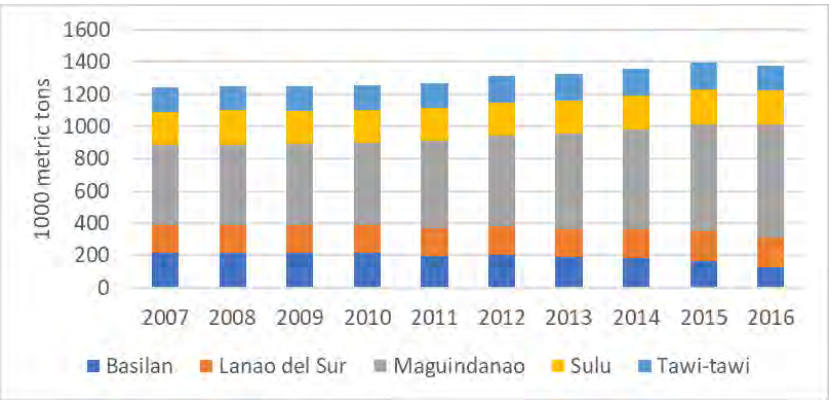
Lanao del Sur, together with Sulu and Tawi-Tawi, has maintained an almost stable volume of production over the last ten years, while production in Basilan has decreased from 218 thousand metric tons in 2007 to 124 thousand metric tons in 2016.

Table 6.2.5-3 Volume of Coconut Production in ARMM in Thousand Metric Tons

(Unit: Metric tons)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
ARMM	1,243	1,250	1,251	1,255	1,269	1,311	1,327	1,356	1,393	1,377
Basilan	218	215	215	213	196	204	193	182	163	124
Lanao del Sur	170	171	171	174	175	174	171	177	185	185
Maguindanao	499	502	502	510	541	563	590	621	664	707
Sulu	206	213	209	207	200	207	208	210	215	210
Tawi-tawi	150	149	152	151	156	163	165	165	166	151

[9] Regional Planning Development Office – ARMM. Draft Regional Development Plan, 2017–2020



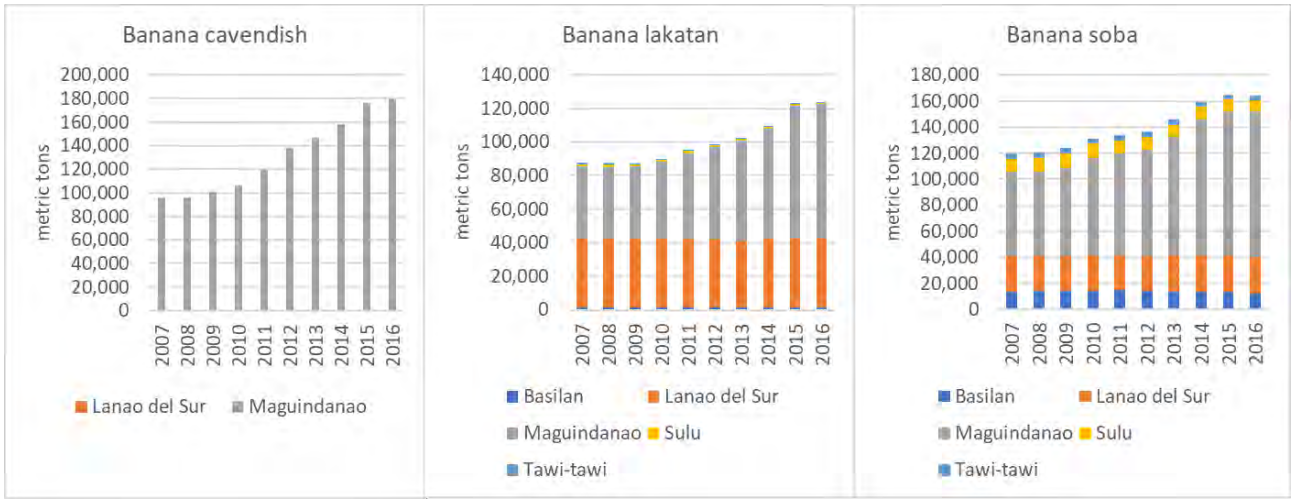
Source: CountrySTAT Philippines, Philippine Statistics Authority

(4) Banana

The Philippines is a world supplier of Cavendish banana, and most banana plantations are concentrated in Mindanao. As compared to other regions such as Davao, which is the largest banana producer, Cavendish banana production is relatively new in ARMM. A large share of Cavendish banana is produced in Maguindanao. The annual volume of production of ARMM has nearly doubled in the last ten years from 96,249 metric tons in 2007 to 179,681 metric tons in 2016. Maguindanao accounts for the largest share of the growth in banana production. Besides Cavendish, two other varieties of banana, Lakatan and Saba, are grown in ARMM. The production of Lakatan banana has increased from 87,549 metric tons in 2007 to 123,771 metric tons in 2016, while the production of Saba banana increased from 119,566 metric tons in 2007 to 164,319 metric tons in 2017. The growth in production of both varieties is attributed the increase in production in Maguindanao.

Table 6.2.5-4 Volume of Banana Production in ARMM in Metric Tons

		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Banana Cavendish	ARMM	96,249	96,388	100,508	105,912	119,274	138,487	146,876	158,472	176,418	179,681
	Basilan	..	..	..	..	..	..	..	..	..	..
	Lanao del Sur	89	88	88	88	88	103	113	620	633	638
	Maguindanao	96,160	96,300	100,420	105,824	119,186	138,384	146,763	157,852	175,785	179,043
	Sulu	..	..	..	..	..	..	..	..	..	..
	Tawi-tawi	..	..	..	..	..	..	..	..	..	..
Banana Lakatan	ARMM	87,549	87,503	87,449	90,015	95,264	98,913	102,443	109,405	123,105	123,771
	Basilan	1,584	1,621	1,645	1,644	1,650	1,606	1,555	1,576	1,530	1,415
	Lanao del Sur	41,085	40,881	40,800	41,045	40,500	40,002	39,206	40,763	41,338	41,684
	Maguindanao	42,690	42,757	43,007	45,465	51,352	55,718	60,260	65,677	78,901	79,396
	Sulu	1,447	1,518	1,328	1,210	1,120	965	860	842	812	736
	Tawi-tawi	743	726	669	652	642	622	561	548	524	541
Banana Saba	ARMM	119,566	120,228	123,782	131,333	134,063	136,544	145,613	159,168	164,989	164,319
	Basilan	13,697	14,136	14,557	14,532	14,814	14,123	13,517	13,886	13,424	12,315
	Lanao del Sur	27,610	27,480	27,435	27,410	27,140	27,149	27,983	28,229	28,257	28,412
	Maguindanao	64,160	64,097	66,761	74,491	77,976	81,292	90,879	103,909	110,266	111,338
	Sulu	10,020	10,415	10,877	10,831	10,030	10,028	9,414	9,388	9,379	8,610
	Tawi-tawi	4,078	4,100	4,152	4,069	4,103	3,952	3,821	3,757	3,663	3,644



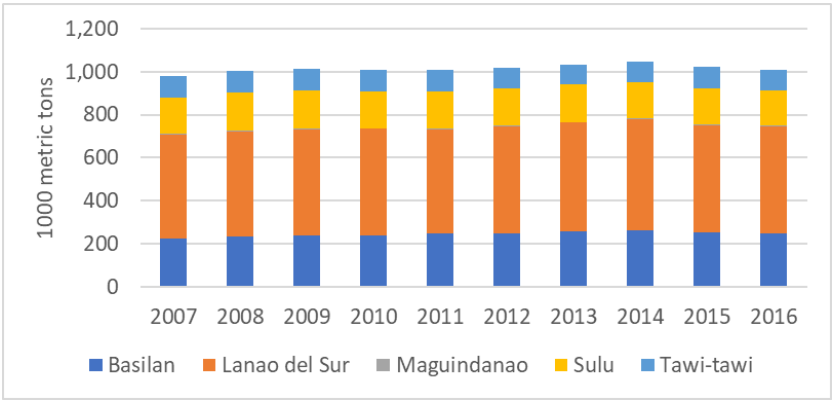
Source: CountrySTAT Philippines, Philippine Statistics Authority

(5) Cassava

Cassava production in ARMM indicated an increasing trend for years until the volume started decreasing in 2015. Nevertheless, ARMM continues to be one of the major cassava producers in the Philippines, contributing 37% to the total production. Lanao del Sur is the top producer in ARMM with an average annual production of about 500 thousand metric tons in the last decade. The production volume in Lanao del Sur indicated an increasing trend between 2012 and 2014, with the expansion of the cultivating area. It started decreasing from 2015, which is consistent with the regional trend. There has been very little cassava production in Maguindanao in the last ten years.

Table 6.2.5-5 Volume of Cassava Production in ARMM in Thousand Metric Tons

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
ARMM	978	1,004	1,012	1,009	1,007	1,019	1,035	1,045	1,024	1,008
Basilan	223	232	237	240	246	250	258	260	254	248
Lanao del Sur	482	491	494	494	486	496	505	518	498	498
Maguindanao	4	4	4	4	4	4	4	4	4	4
Sulu	170	178	178	173	174	173	173	168	169	161
Tawi-tawi	98	98	99	98	98	96	96	95	100	97



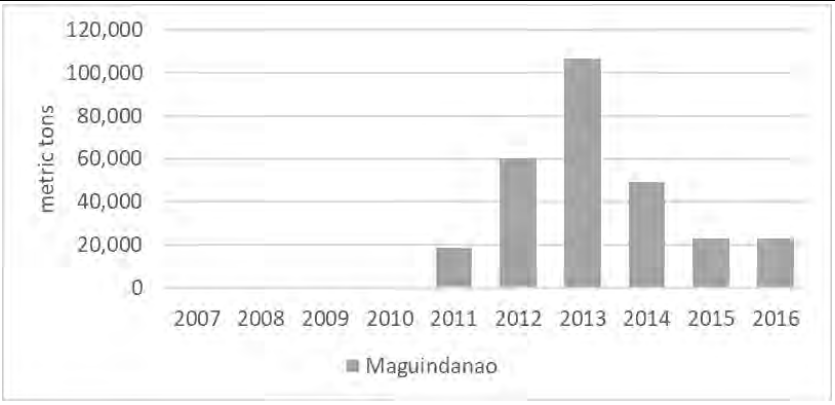
Source: CountrySTAT Philippines, Philippine Statistics Authority

(6) Oil Palm

Maguindanao is the only oil palm producing province in ARMM. The oil palm cultivating area has grown rapidly in the last ten years. In 2007, the total cultivated area was only 200ha. It has expanded to 2,450ha by 2016. The production volume of Maguindanao in 2016 was 23,101 metric tons, accounting for 5% of the national production. Neighbouring provinces of North Cotabato and Sultan Kudarat are major producers of oil palm, contributing 13% and 20%, respectively, towards the national production in 2016. Maguindanao Provincial Commodity Investment Plan, 2014–2016 for Oil Palm aims at further promotion of oil palm production in the province.

Table 6.2.5-6 Volume of Oil Palm Production in ARMM in Metric Tons

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
ARMM	132	220	288	664	18,795	60,427	106,528	49,064	22,760	23,101
Basilan	..	..	..	..	..	..	..	..	..	..
Lanao del Sur	..	..	..	..	..	..	..	..	..	..
Maguindanao	132	220	288	664	18,795	60,427	106,528	49,064	22,760	23,101
Sulu	..	..	..	..	..	..	..	..	..	..
Tawi-tawi	..	..	..	..	..	..	..	..	..	..



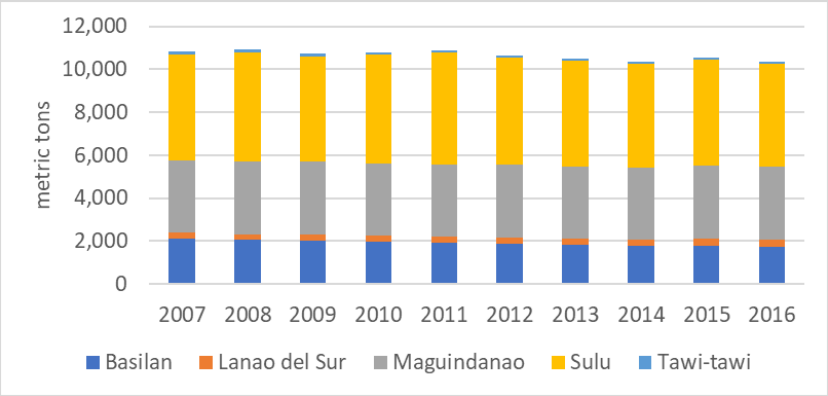
Source: CountrySTAT Philippines, Philippine Statistics Authority

(7) Coffee

ARMM produced 10,342 metric tons of coffee in 2016, accounting for 15% of the national production. The volume of production has been stable for the last ten years with a slight decreasing tendency. Sulu is the leading coffee producer in ARMM, followed by Maguindanao. The annual volume of production of Maguindanao has been around 3,400 metric tons for the last ten years. As regards Lanao del Sur, although the current production is small, there are suitable areas for coffee production in the province, mainly around Lake Lanao.

Table 6.2.5-7 Volume of Coffee (Dried Berries) Production in ARMM

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
ARMM	10,844	10,922	10,737	10,803	10,890	10,629	10,491	10,349	10,526	10,342
Basilan	2,105	2,050	2,032	1,981	1,939	1,879	1,827	1,783	1,781	1,733
Lanao del Sur	294	279	297	286	291	292	301	303	318	322
Maguindanao	3,360	3,363	3,370	3,364	3,355	3,369	3,359	3,349	3,432	3,402
Sulu	4,942	5,092	4,911	5,051	5,187	4,985	4,911	4,831	4,907	4,802
Tawi-tawi	143	137	128	122	118	103	94	83	88	82



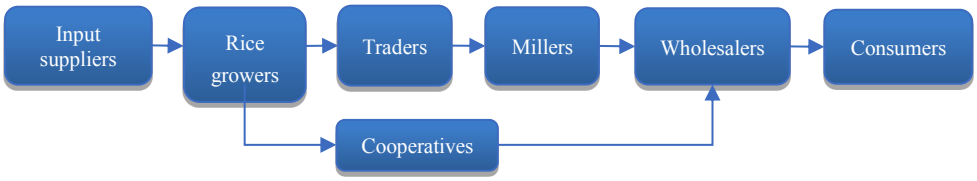
Source: CountrySTAT Philippines, Philippine Statistics Authority

6.3 Marketing and Major Flow of Agricultural Commodities

6.3.1 Palay

The Philippines is one of the largest palay producing and importing countries in the world. In 2015, it imported 1.48 million metric tons of palay mainly from Vietnam and Thailand.[10] Within the country, there are palay surplus areas and palay deficit areas. Mindanao has many palay producing areas, while Maguindanao is one of the top 20 palay producing provinces that can provide palay to other parts of the country.[11]

After harvest, farmers usually dry the paddy under the sun and sell it to traders. Some farmers may sell it to cooperatives that trade for their members. Traders who do not have mills sell paddy to millers. Millers have warehouses for store paddy and palay until they are sold to wholesalers and retailers. A study identified the farm to market road linking farmers, traders, millers, and wholesalers as a serious constraint on the palay value chain of Mindanao.[12]



Source: based on Digal, L. N. and Balgos, C. Q. (2017). Potential for Employment Generation of the Palay Value Chain in Mindanao, Philippines. and Pena, B. D. (2014). Rapid Appraisal of the State of Competition in the Palay Value Chain.

Figure 6.3.1-1 Palay Value Chain

6.3.2 Corn

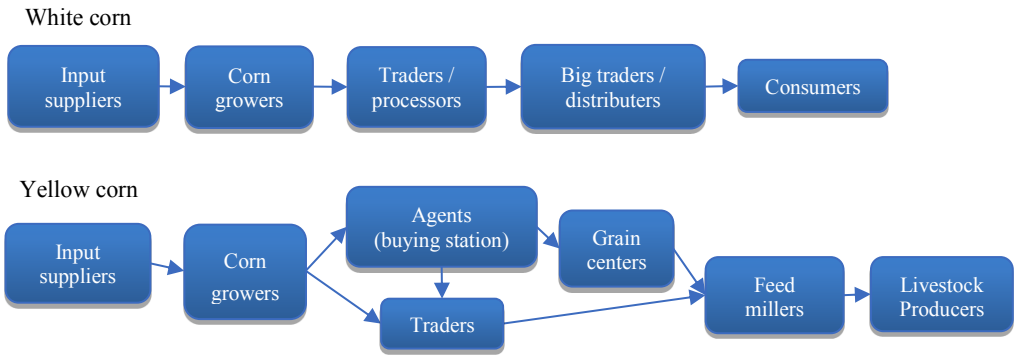
White corn is consumed as a staple in the form of milled white corn grits by about 20% of Filipinos, mostly from the Visayas islands.[13] Mindanao has many corn producing areas, and ARMM has been consistently ranked first in white corn production in the Philippines. Most of the white corn produced is consumed locally. A surplus of white corn is shipped for consumption as food to corn eating areas

[10] Philippine Statistics Authority. (2016). Selected Statistics on Agriculture 2016.
[11] Exconde, B. A. (2016). Rice Production and Consumption Trends in the Philippines from 2000 to 2015.
[12] Digal, L. N. and Balgos, C. Q. (2017). Potential for Employment Generation of the Rice Value Chain in Mindanao, Philippines.
[13] Philippine Agribusiness Competitiveness and Benchmarking Study: Component on Trade Facilitation and Logistics. Final Report.

such as Cebu. White corn is also used for industrial purposes in forms such as starch, syrup, gluten, and cooking oil.[14] In Maguindanao, there are two companies processing corn products like corn starch.

Yellow corn is predominantly used as a feed ingredient. In the Philippines, it accounts for about 70% of livestock mixed feeds, and 25% is processed as corn starch, corn oil, gluten, and snack foods.[15] The primary driver of growth in the corn industry is the expansion of meat, processed meat, and chicken egg industries. Yellow corn is widely traded locally between producing regions and regions where livestock raisers and feed mills are located. Mindanao has the largest surplus of yellow corn. The majority of the corn from Mindanao goes to Visayas, which has the largest deficit.[16] The Philippines has been a net importer of yellow corn to meet the domestic demand. However, according to the Department of Agriculture, it might be ready to export corn to neighbouring countries in the region as corn harvests this year will breach the 5.6 million tons domestic requirement.[17]

Corn is sold by farmers to traders who have warehouses on both ends of the value chain, that is, in areas near the farms or near the consumers' area. After harvest, farmers are normally the ones undertaking postharvest treatment including de-husking, shelling, and sun-drying the corn grains. Traders who buy corn from farmers often provide cash advances to the farmers for different needs including production related expenses. During the harvest time, farmers sell their corn to the traders and settle their debt.[18]



Source: based on Clarete, R. L. (2012). Structured Trade and Commodity. and Salazar, A. M. (2012). Maize Value/Supply Chain and Postharvest Management in the Philippines.

Figure 6.3.2-1 Value Chain of White and Yellow Corn

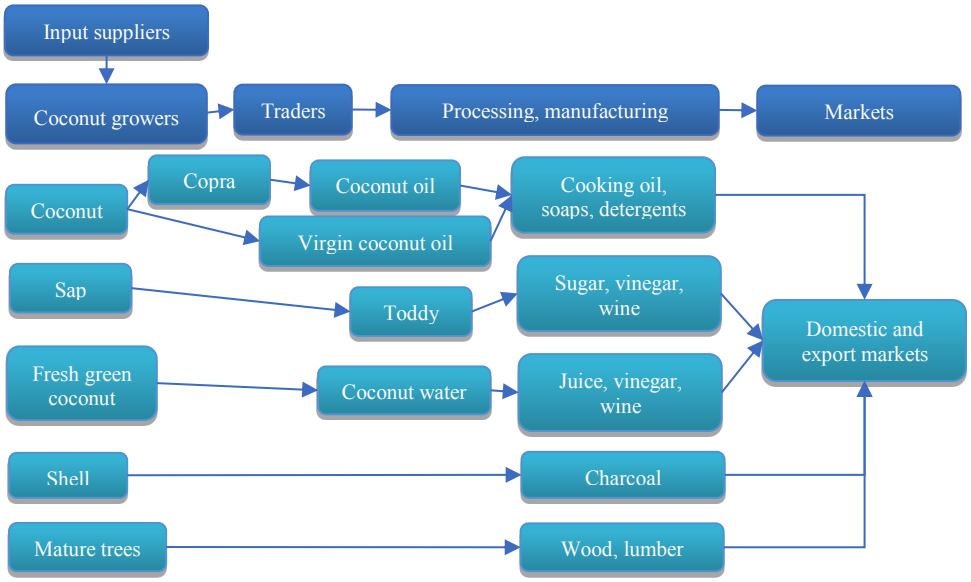
6.3.3 Coconut

Coconut is an important crop in the Philippines. ARMM is one of the important coconut growing regions in the Philippines, contributing to about 10% of the national coconut production. Many products, both food and non-food, are produced through processing. Food products include sugars and various health food preparations. Non-food products include coco-diesel as engine fuel and oleo-chemicals used for the production of various cosmetics and domestic products such as soaps and other cleaning agents.[19] Coconut oil is one of the top ten export commodities of the Philippines. In 2016, the total value of coconut oil exports was USD 1.152 billion, a 2.0% increase from USD 1.129 billion in

[14] Ibid.
[15] Eleria, N. L. and Calical, G. B. (2014). Economic Analysis on Bulk Handling of Mindanao Corn to manila and Cebu, Philippines.
[16] Philippine Agribusiness Competitiveness and Benchmarking Study: Component on Trade Facilitation and Logistics. Final Report.
[17] Department of Agriculture website. http://www.da.gov.ph/philippines-ready-to-export-corn-surplus-harvest-seen-in-2017/.
[18] Philippine Agribusiness Competitiveness and Benchmarking Study: Component on Trade Facilitation and Logistics. Final Report.
[19] Philippine Coconut Authority. Coconut Industry Production Status, Growing Zones, Productivity and Potential to Increase Nut Supply in Coconut Farms through Practical and Efficient Farming Technologies (PEFT). http://www.pca.da.gov.ph/coconutrde/.

2015. [20] The major coconut oil importing countries are the United States and Netherland, accounting for 46.53% and 35.32% of the total export value in 2015.[21]

After harvest, coconut is converted into copra and assembled and crushed into crude coconut oil for export. The coconut value chain is long as farmers are small, fragmented, and unorganized. The poor condition of roads increases logistics costs, reducing farm gate prices of copra and increasing prices of farm inputs for growing coconut.[22] In ARMM, virgin coconut oil is produced by small to medium-scale processors with relatively low levels of technology. There is no coconut oil refinery in the region and local copra traders collect dried copra to sell to refineries outside ARMM.[23] Aside from coconut oil, there are various ways of value addition. The sap or toddy can be made into sugar, vinegar, and wine. Vinegar and wine can be also made from the coconut water. The shell can be used to produce charcoal, activated carbon, and handicrafts.[24]



Source: based on Philippine Coconut Authority. Coconut Industry Production Status, Growing Zones, Productivity and Potential to Increase Nut Supply in Coconut Farms through Practical and Efficient Farming Technologies (PEFT). And Pacific Agribusiness Research and Development Institute. (2012). Coconut Value Chain Review.

Figure 6.3.3-1 Coconut Value Chain for Various Products

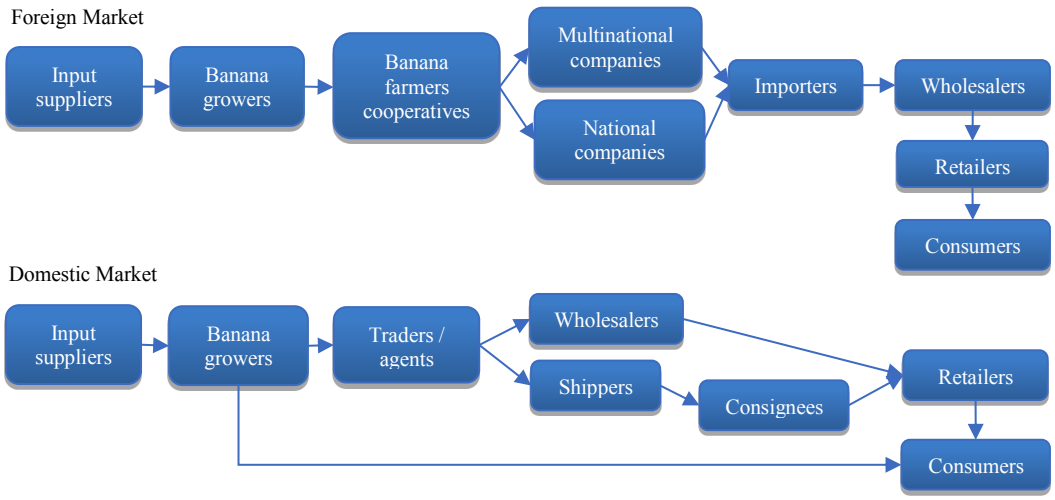
6.3.4 Banana

The Philippines is a global banana exporter. In 2016, the export value of bananas was USD 618.8 million, a 40.7% increase from USD 439.9 million in 2015. The Philippines is the sixth-leading exporter of bananas behind Ecuador, Costa Rica, Belgium, Colombia, and Guatemala. In 2015, Asian countries bought 98.5% of Filipino bananas, with Japan being the top importer, purchasing about 40% of the total exported bananas.[25]

Among the various varieties of banana, mostly Cavendish banana is sold fresh in the export market. Maguindanao produces most of the Cavendish banana in ARMM. On the other hand, other varieties

[20] Philippines Statistics Authority website. https://psa.gov.ph/content/foreign-trade-statistics-philippines-2016.
[21] Philippine Statistics Authority. (2016). Selected Statistics on Agriculture 2016.
[22] Dy, R.T. (2012). 3 Mindanao Economic Policy Papers. Priming the ARMM through Agribusiness Development.
[23] RECS International Inc., et al. (2016) Comprehensive Capacity Development Project for the Bangsamoro Development Plan for the Bangsamoro. Final Report. Sector Report 1: Economy.
[24] Briones, R.M. (2014). Compilation and Synthesis of Major Agricultural Value Chain Analysis in the Philippines.
[25] Santiago, D. Philippines Bananas Exports by Country. (August 12, 2017) http://www.philippinesaroundtheworld.com/philippines-bananas-exports-by-country/.

such as Lakatan, which is produced in Maguindanao and Lanao del Sur, are sold in the domestic market. There are two distribution channels of bananas: one is for the foreign market and the other for the domestic market.



Source: Based on De los Reyes, J. H., & Pelupessy W. (2009). Agrarian Reform in the Philippine Banana Chain., and De los Reyes, J. H., & Pelupessy W. (2009). Agrarian Reform in the Philippine Banana Chain. Discussion Paper / 2009.03. Institute of Development Policy and Management. University of Antwerp.

Figure 6.3.4-1 Banana Value Chain for Foreign and Domestic Markets

Cavendish banana is grown either by members of banana cooperatives or individual farming families who own large plantations. They sell bananas to multinational or national exporting firms. The increasing volume of Cavendish banana export is supported by an increase in contract farming between banana cooperatives or family-owners of banana plantations and exporting companies as their business counterparts. After the bananas are harvested, they are transported either by trucks or by cable way to the packaging house, where they are cleaned, sorted, inspected, and packed. From the packing house, the boxes are transported by trucks to the container yard where they are transferred to refrigerated containers. The road network is an important factor of the Cavendish banana value chain, connecting the farms to the packing house, warehouse, container yard, and ports.[26]

On the other hand, growers of Lakatan bananas are usually individual farmers. They can sell the harvest to anyone, including traders, or directly to local consumers. Traders gather large quantities of bananas until they reach a given volume, and sell them to those traders who transport them in their ships to Manila or Cebu.[27] The bananas reach Manila and Cebu mostly through ports in Cagayan de Oro, Agusan, Ozamis, Iligan, and Surigao.

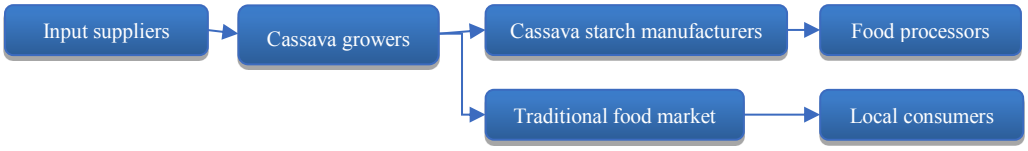
6.3.5 Cassava

More than 15 million Filipinos eat cassava, making it one of the staple foods of the Philippines. It is also used as a raw material in the production of feeds, alcohol, and other industrial products. According to the Department of Agriculture, 51% of the cassava produced in the Philippines is used for processed feeds, 28% for starch, and 10% for food; only 0.2% is exported. The Philippines is a net importer of

[26] Center for Advancement Trade Integration and Facilitation. (2012). Philippine Agribusiness Competitiveness and Benchmarking Study: Component on Trade Facilitation and Logistics.
[27] De los Reyes, J. H. and Pelupessy, W. (2009). Agrarian Reform in the Philippine Banana Chain. Discussion Paper, 03/2009.

cassava products. Thailand and Vietnam are the two major countries that export cassava products such as cassava chips, pellets, and starch to the Philippines.[28]

In 2013, ARMM contributed to 44% of the national cassava production.[29] Lanao Del Sur and Maguindanao are the top cassava producing provinces. The cassava produced in these two provinces is mainly sold for industrial consumption. On the other hand, the cassava produced in Basilan and Tawi-Tawi is generally used as food.[30] The high production volume of cassava in the region is attributed to two factors: cassava is a staple food crop in Sulu and among Muslim population in Lanao and Cotabato; and the presence of Matling Industrial & Commercial Corporation which has been producing cassava starch for many decades. In Lanao del Sur, farmers can choose to sell either to Matling or the local market. The multiple marketing channels provide farmers with a certain level of bargaining and negotiation powers.[31]



Source: based on Department of Agriculture, Mindanao Regions. (2014). Value Chain Analysis and Competitiveness Strategy: Cassava.

Figure 6.3.5-1 Cassava Value Chain for Starch Processing and Food Market

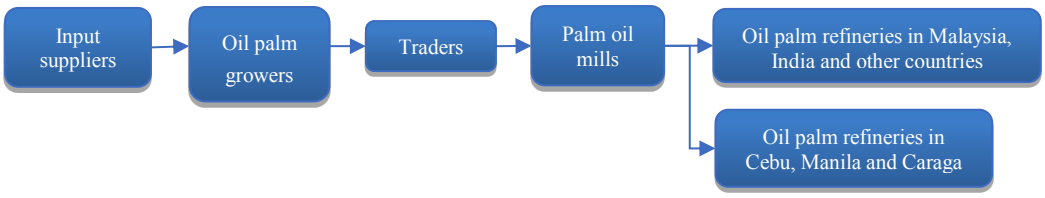
The cassava starch value chain is very short because starch manufacturing companies deal directly with cassava growers. The companies buy fresh tubers. Bulk of their supply is sourced from contract growers within the provinces where the processing plants are located or neighbouring municipalities. Independent farmers can deliver directly to the companies.[32]

6.3.6 Oil Palm

Oil palm is the raw material for palm oil which is traditionally used as edible oil in foodstuffs such as fried oil, margarine, and snack confectionery and as non-edible oil for products such as detergent, paint, and cosmetics. Historically, oil palm production was concentrated in Malaysia and then, Indonesia. The Philippines imports about 85% to meet its total palm oil requirement, mostly from Malaysia. The remaining 15% is locally produced.[33]

Maguindanao is the sole oil palm producing province in ARMM. The end products produced in Maguindanao are crude palm oil, crude palm kernel oil, and palm kernel cake. Around 70% of the palm oil products from Maguindanao are exported and the remaining 30% are sold to refineries in Manila, Cebu, and Caraga for processing and refining into multiple products. With the growing number of small farmers participating in oil palm production, buying stations have started to emerge. These buying stations help small farmers save transportation costs. Fresh fruit bunch of palm oil trees need to be heated immediately after harvest and transported with caution. That is why oil palm mills are located near oil palm plantations. Farmers are encouraged to organize cooperatives so that palm oil mills can collect stable amounts of the fresh fruit bunch from the farmers.[34]

[28] Department of Agriculture, Philippines. (2016). The Philippine Department of Agriculture and its Cassava Industry Roadmap.
[29] Department of Agriculture, Mindanao Regions. (2014). Value Chain Analysis and Competitiveness Strategy: Cassava.
[30] Official website of the Bureau of Public Information – ARMM. http://www.armm-info.com/2017/08/armms-cassava-output-rising.html
[31] Department of Agriculture, Mindanao Regions. (2014). Value Chain Analysis and Competitiveness Strategy: Cassava.
[32] Ibid.
[33] Department of Agriculture, Mindanao Regions. (2014). Value Chain Analysis and Competitiveness Strategy: Oil Palm in Maguindanao.
[34] Nozawa, K. (2011). Oil Palm Production and Cooperatives in the Philippines.



Source: based on Department of Agriculture, Mindanao Regions. (2014). Value Chain Analysis and Competitiveness Strategy: Oil Palm in Maguindanao.

Figure 6.3.6-1 Oil Palm Value Chain in Maguindanao

In 2016, Maguindanao devoted a total land area of 12,550 ha to oil palm. Its harvest is transported to a nearby oil mill located in Buluan in Maguindanao and adjacent oil mills in Sultan Kudarat and North Cotabato. Agumil oil mill in Buluan has a capacity of processing 60 tons per day.[35]

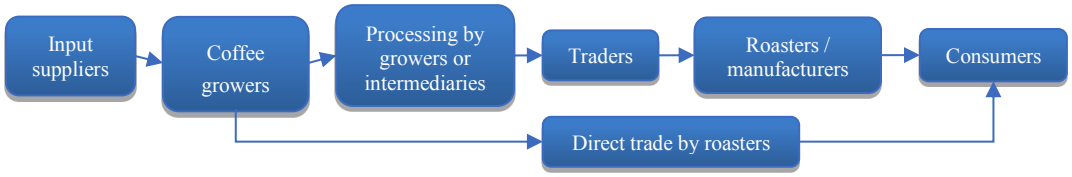
6.3.7 Coffee

The Philippines is one of the few countries in the world that produce all four varieties of coffee: Robusta, Arabica, Liberica, and Excelsa. Robusta and Arabica are the two main varieties grown for commercial markets. In the Philippines, production of those two varieties accounts for over 90% of the total volume of coffee production. Each variety has its own characteristics and requirement for cultivation. The tropical uplands and sub-tropic areas, where the optimal rainfall is from 1,000 to 2,000 mm, are suitable for Arabica cultivation. Arabica is valued for its superior taste, and its beans fetch a higher market price relative to Robusta. On the other hand, Robusta is a high-yielding variety with a high level of tolerance to pests and diseases. It grows in lowland areas and requires 1,500 to 2,500 mm of rainfall. Robusta coffee beans are mainly used in instant coffee and lower grade commodity coffee.[36]

The national production of coffee is insufficient relative to the demand and the gap is filled by imports. In 2013, the Philippines exported 99 metric tons of green coffee and 14 metric tons of roasted coffee. On the other hand, the country imported 25,161 metric tons of green coffee and 474 metric tons of roasted coffee.[37] The Philippines has a growing coffee market. Domestic demand for instant coffee is especially high as 90% of the coffee consumed in the Philippines is instant coffee. The country has been a leading importer of instant coffee in terms of volume since 2011.[38]

The coffee value chain includes several stages of transformation from production, processing, trading, and roasting or manufacturing to final marketing. Each actor has respective roles and in some cases, one actor may play several roles within the value chain. For instance, processing after harvesting coffee cherries can be conducted by coffee growers or some intermediaries before the processed outputs are sold to traders. Some roasters may purchase harvest directly from coffee growers, process and roast the coffee beans, and market the final products to consumers.

[35] Regional Planning Development Office – ARMM. Draft Regional Development Plan 2017–2020
[36] A Primer on PEF's Priority Commodities: Industry Study on Coffee.
[37] FAO Stat. http://www.fao.org/faostat/.
[38] Bamber, P. et al. (2017) The Philippines in the Coffee Global Value Chain (final draft for review).



Source: based on Bamber, P. et al. (2017) The Philippines in the Coffee Global Value Chain. Final draft for review; and A Primer on PEF's Priority Commodities: Industry Study on Coffee.

Figure 6.3.7-1 Coffee Value Chain

Most of the coffee grown in Lanao del Sur and Maguindanao is Robusta. In 2016, Lanao del Sur produced 315.25 metric tons and 7.22 metric tons of Robusta and Arabica coffee in dried berries, respectively. Maguindanao produced 2,967.55 metric tons of Robusta coffee and 420 metric tons Arabica coffee.[39] As the international market for Arabica coffee is strict about quality, export of Arabica coffee cannot be achieved through the existing coffee value chain, which has been developed mainly for Robusta coffee used in instant coffee. Therefore, establishing different distribution channels would be indispensable to the promotion of export of Arabica coffee.[40]

6.4 Agribusiness Investment

6.4.1 Overview

The Regional Board of Investments (RBOI) of ARMM has prepared its first Investment Priorities Plan (IPP) for 2017, and it will serve as the blueprint for guiding investors to match their business capacities with the opportunities identified by the plan. The 2017 IPP ARMM List is a three-year rolling plan that is applicable until 2019, with agriculture and aquaculture listed as priority activities. Investments in ARMM remain resilient despite the conflict in Marawi city that started in May 2017. The figures for the first half of 2017 reported by the RBOI are higher than the total registration of PhP 2.1 billion in 2016 by almost 74%.[41]

The table below summarizes agribusiness firms sourcing materials from Lanao del Sur and Maguindanao province.

Table 6.4.1-1 Major Agribusiness Firms Sourcing Materials from Lanao del Sur and Maguindanao Provinces

Name	Location	Product	Location of source of materials	Farm size
Unifrutti	Davao City	Cavendish banana	Talayan, Guindulungan, Buldon, Maguindanao	2,600 ha
		Cavendish banana	Datu Paglas, Buluan, Maguindanao	1,500 ha
La Frutera, Inc.	Buluan, Maguindanao	Cavendish banana	Maguindanao	2,700 ha
Alip River Development Export Corporation	Datu Paglas, Maguindanao	Cavendish banana	Datu Paglas, Maguindanao	500 ha
Mt. Kalatungan Agri-Ventures	Bumbaran, Lanao Del Sur	Cavendish banana	Bumbaran, Lanao del Sur	
Delinanas Development Corporation	Datu Abdullah Sangki Municipality, Province of Maguindanao	Cavendish banana	Datu Abdullah Sangki, Maguindanao	

[39] CountrySTAT Philippines website. http://countrystat.psa.gov.ph/.
[40] RECS International Inc., et al. (2016) Comprehensive Capacity Development Project for the Bangsamoro
[41] Official website of ARMM. https://armm.gov.ph/.

Name	Location	Product	Location of source of materials	Farm size
Al-Mujahidun Agro-Resources & Development	Brgy. Salman, Ampatuan, Maguindanao	Cavendish banana	Ampatuan, Maguindanao	550 ha
Al Sahar Agri Ventures	Mangudadatu, Talayan, Guindulungan, Barira, Maguindanao	Cavendish banana	Talayan, Guindulungan, Buldon, Barira, Mangudadatu	2,600 ha
Del Monte Fresh Produce (Philippines)	Bo Pampange, Davao	Cavendish banana	Datu Abdullah Sangki, Maguindanao	1,000 ha
		Pineapple		23,000 ha
Wao Development Corporation	Balatin, Wao, Lanao del Sur	Pineapple		
Franklin Baker	Sta. Cruz, Davao del Sur	Coconut products	Maguindanao	
Agumil Philippines	Buluan, Maguindanao	Palm oil, palm Kernel oil, palm kernel copra		
Gintong Agri Corp.	Bajada, Davao city	Oil palm	Datu Odin Sinsuat, Maguindanao	5,000 ha
Itil Plantation	Itil, Balabagan, Lanao Del Sur	Cassava starch	Balabagan, Lanao del Sur	
Philippine Trade Center	Brgy. Kalsada, Sultan Kudarat, Maguindano	Cassava starch	Sultan Kudarat, Maguindano	
Matling Industrial and Commercial Corporation	Malabang, Lanao del Sur	Cassava starch	Lanao del Sur	
Lamsan	Sultan Kudarat, Maguindanao	Corn starch, corn products	Parang, Libungan, Midsayap, Pikit, Upi	
Newtech Pulp	Balo-i, Lanao del Norte	Abaca fiber	Lanao del Sur and del Norte	
Rocky Mountain Arabica Coffee Company	Davao City	Coffee	Wao, Lanao del Sur	

Source: Prepared by the Study Team

6.4.2 Corn Industry

There are two companies that process corn starch in the municipality of Sultan Kudarat, Maguindanao: Lamsan Inc. and Philippine Trade Center Inc. Lamsan is the foremost corn wet milling company in the Philippines and it has been in the business since 1971. The company produces corn products including corn-starch, corn gluten feed, corn gluten meal, and corn germ. Its plant capacity has been expanded twice since 2008 to boost production capacity.[42] Lamsan sources a large volume of corn directly from farmers groups, which enables farmers to stay away from traders controlling farm gate prices in exchange for provision of fertilizers and seeds on credit.[43]

Lamsan Inc. is one of the Lamsan group companies under Lamsan Holdings Corporation. The other companies include Lamsan Power Corp. in renewable power generation, Maguindanao Energy Farms Inc. in energy crop farming, and Bangsamoro Terminal Services Inc. in port services.[44]

[42] Lamsan Incorporated website. http://lamsan.com.ph/.
[43] RECS International Inc., et al. (2016) Comprehensive Capacity Development Project for the Bangsamoro Development Plan for the Bangsamoro. Final Report. Sector Report 1: Economy.
[44] Lamsan Holdings Corp. website. http://lamsanholdings.com.ph/.

6.4.3 Coconut Industry

Small to medium-scale processors produce virgin coconut oil with relatively low levels of technology. Matling Industrial and Commercial Corporation, located in the municipality of Malabang, Lanao del Sur is one such processor. Other than these processors, there is no coconut oil refinery in ARMM.[45]

Franklin Baker is one of the companies sourcing coconuts from ARMM. It is a company located in San Pablo, Laguna, and Davao in Mindanao and is one of the largest global suppliers of desiccated coconut products. It produces various coconut products including coconut concentrate, creamed coconut, coconut chips, coconut water, virgin coconut oil, coconut flour, and organic coconut sugar. It is a leading supplier of desiccated coconut to major food manufacturers in the United States, accounting for about 50% of the total coconut exports of the Philippines to the United States. Its processing plants are in Davao del Sur province.[46]

6.4.4 Banana Industry

The major players in the Cavendish banana industry are the multinational companies such as Dole-Stanfilco, Del Monte Fresh Produce, Smifru, and Unifrutti. Historically, these multinational companies promoted banana production in the Davao region.[47] Although ARMM is relatively new to the production of Cavendish banana in the regions of Mindanao, it has become one of the major export products of the region. ARMM has registered six firms engaged in banana production with a combined area of about 3,500ha.[48]

Since 2015, Unifrutti has become the largest investor in ARMM after registering its PhP 3.7 billion Cavendish plantation project with RBOI-ARMM in the municipalities of Talayan, Guindulungan, and Buldon, which are all in the Maguindanao province. The project covers 2,600ha of land in the three municipalities. This is in addition to its existing investments in 1,500ha in the municipalities of Datu Paglas and Buluan in the same province.[49] Unifrutti also manages other companies, including Wao Development Corporation and Mount Kalatungan Agri Ventures Inc., which are operating in ARMM.[50]

Unifrutti was founded in 1983 in Chile by an Italian fruit business man. Unifrutti has become a fresh fruit grower and exporter, with shipments of over 140 thousand tons of fresh fruit traded globally. At present, the Unifrutti group has production operations in South Africa, the Philippines, and Chile.[51] It was in the early 1990s when Unifrutti began focusing on investments in Mindanao. It was looking to expand its activities in the region via a joint venture with U.S. based Chiquita Brands and created La Frutera in 1997. La Frutera invested in a 1,000 hectare farm in Maguindanao province, in partnership with the Paglas family. The bananas produced by La Frutera are exported by Unifrutti-Chiquita to the Middle East, Japan, Korea, and China.[52] In 2013, La Frutera expanded to 300ha of Cavendish banana plantation in the municipality of Pandag, Maguindanao, investing PhP 300 million to increase its banana production by as much as 1.2 million boxes per year.[53]

[45] RECS International Inc., et al. (2016) Comprehensive Capacity Development Project for the Bangsamoro Development Plan for the Bangsamoro. Final Report. Sector Report 1: Economy.
[46] Website of Franklin Baker. http://www.franklinbaker.com/.
[47] Boquet, Y. (2017). The Philippine Archipelago.
[48] Regional Planning and Development Office – ARMM. Draft Regional Development Plan 2017–2020.
[49] Official website of ARMM. https://armm.gov.ph/armm-plantations-to-supply-bananas-to-japanese-supermarket-chain/.
[50] Official website of ARMM. https://armm.gov.ph/rboi-registers-p3-7-billion-investment-project-the-biggest-in-armm-history/.
[51] Unifrutti. http://www.unifrutti.com/en/.
[52] Tuminez, A.S. (2009). The "Paglas Experience": Extraordinary Leadership in a Zone of Conflict.
[53] Official website of ARMM. https://armm.gov.ph/two-companies-put-up-p390-investment-in-armm/.

6.4.5 Cassava Industry

Lanao del Sur has two cassava flour and starch processing companies: the Matling Industrial and Commercial Corporation based in Malabang and the Itil Plantation Corporation in Balabagan. The two companies account for almost 90% of the cassava production of the province.[54]

Matling Industrial and Commercial Corporation is the largest cassava starch company in Mindanao. The company sources cassava tubes from its own cassava plantation and cassava farmers in Lanao del Sur. It is the main market for the harvest of the cassava growing municipalities in Lanao del Sur.[55] In 2015, the company invested PhP 194 million for an expansion and modernization project by setting up a new cassava starch milling plant. The new plant was expected to produce an annual yield of approximately 13,216 metric tons or 260,000 bags of cassava starch. According to the company, around 70% of cassava starch supply in the domestic market was imported to meet the increasing demand, with the decrease in local supply leading to the closure and non-operational state of local mills. The new milling plant is meant to fill in the supply and demand gap of the industry through expansion and modernization.[56]

In July 2017, RBOI-ARMM stated that ARMM is eager to supply the need for cassava and cassava flour to Nestle's MILO malt plant in Lipa, Batangas, which was expected to be completed in October 2017. The main ingredients for the MILO drink processing plant are barley and cassava. The chairman and managing head of RBOI-ARMM said "in line with the rehabilitation and recovery of Marawi city and Lanao del Sur after the Marawi Siege and considering that cassava in ARMM is mainly produced in Lanao del Sur, the government can support our cassava farmers to expand their production and encourage new planters by building the logistics supply chain to meet the huge demand from Nestle and other end buyers."[57]

6.4.6 Oil Palm Industry

Agumil Philippines Inc. is a Filipino-Malaysian company that started operations in ARMM in 2000. Agumil mainly exports its products to Malaysia. It is operating an oil palm mill in Buluan, Maguindanao. It has also accumulated a sizable amount of palm kernels to process into palm kernel oil for exports and palm kernel cake for animal feeds. The company has constructed a crushing plant near the milling plant to make profitable use of these kernels.[58]

Apart from Agumil, RBOI-ARMM registered a new oil palm plantation development project of Gintong Agri Corporation in the first quarter of 2016. The company is a subsidiary of Agricola Holdings that operates oil palm and rubber estates across Central America, West Africa, and Southeast Asia. Gintong Agri Corporation has committed to initially develop 5,000ha of oil palm in Datu Odin Sinsuat in Maguindanao. The company aims to expand its operations up to 20,000ha in Talayan and Guindulungan in Maguindanao in the next decade.[59]

[54] RECS International Inc., et al. (2016) Comprehensive Capacity Development Project for the Bangsamoro Development Plan for the Bangsamoro. Final Report. Sector Report 1: Economy.
[55] Department of Agriculture, Mindanao Regions. (2014). Value Chain Analysis and Competitiveness Strategy: Cassava.
[56] Official website of ARMM. https://armm.gov.ph/armm-stability-brings-p600-m-more-investments-in-the-4th-quarter/.
[57] Official Website of ARMM. https://armm.gov.ph/armm-wants-supply-cassava-marawi-lanao-nestles-p2-b-milo-plant/.
[58] Official website of ARMM. https://armm.gov.ph/armm-investment-of-p1-621-b-in-first-semester-of-2014-tops-last-year/.
[59] Mindanao Development Authority. http://www.minda.gov.ph/news/171-armm-welcomes-entry-of-p1-3b-new-investment.

6.4.7 Coffee Industry

Nestlé Philippines, Inc. accounts for 80% of the instant coffee market in the Philippines.[60] It is one of the biggest coffee processors in Mindanao, with a manufacturing facility for Nescafé in Cagayan de Oro. Nestlé sources coffee through two channels: trade and direct sourcing. The company has Nescafé Plan, which combines on-the-ground support for farmers, compliance with its responsible sourcing guideline and improving the environmental impact of Nescafé factories, focusing on improving livelihoods of farmers and their communities, and assisting on the sustainable management of landscapes. To secure high quality supply of coffee, various support measures are provided to tackle issues that threaten the livelihoods of small farmers such as ageing or diseased trees, declining yields, volatile prices, and climate change.[61]

There are several processors of Arabica coffee in the Philippines such as Rocky Mountain Arabica Coffee Company Inc. The company's head office is in Manila and it has a regional office in Davao City in Davao del Sur. It sources coffee from its own plantations and farmers in different regions of the Philippines. It produces 60 metric tons of Arabica coffee per year.[62] In Lanao del Sur, the company is producing coffee under a joint venture agreement with the municipality of Wao.[63] It has established its coffee nursery, plantation, mill, and grading centre in Wao, while its roasting plant and packing plant are in Manila. The company sells Wao Wonderland Coffee as one of its specialty coffees. This coffee meets the highest standards of the Specialty Coffee Association of America in term of defects, size of the coffee beans, and humidity control. All beans are handpicked and sundried.[64]

6.5 Government Policies and Programs

6.5.1 ARMM

The ARMM Regional Development Plan 2017–2022, which is prepared by the Regional Planning and Development Office of ARMM, identifies four strategic outcomes to achieve increased economic opportunities in agriculture, fishery, and forestry in ARMM. In line with the strategic outcomes and close coordination with partner agencies at the national level, the Regional Development Plan also identifies 19 priority programs and projects for agriculture, fishery, and forestry.

(1) Strategic outcomes:

(i) Agri-fishery production increased

(ii) Availability of nutritious food ensured

(iii) Land tenure of poor farmers secured

(iv) Climate change adaptation in agri-fishery promoted

(2) Priority programs and projects:

a) Rice Expansion Area Project for Peace/Palayan, Palawakin Tungo sa Kapayapaan

[60] A Primer on PEF's Priority Commodities: Industry Study on Coffee.
[61] Nestle website. http://www.nestle.com/csv/communities/coffee.
[62] A Primer on PEF's Priority Commodities: Industry Study on Coffee.
[63] Joint venture agreement (Municipality of Wao Mill)
[64] Rocky Mountain Arabica Coffee Company website. http://www.rmacc.ph/sp-wao-coffee.html.

b) Corn Program: Maunlad na Maisan sa Konayunan

c) Livelihood Enhancement Projects of High Value Crop Development Program

d) Regional Coffee Industry Development Project

e) Livestock: Sustainable and Affordable Meat and Eggs for Bangsamoro

f) Palaw 2022 as banner program for Sustainable Integrated Area Development

g) Program for the Enhancement of Agriculture towards Community Empowerment

h) Seaweeds Development Program

i) ARMM Seaweeds Research Center

j) Fisherfolks Scholarship Program

k) Fisheries, Coastal Resources, and Livelihood Project

l) Fishery Law Enforcement Quick Response Team

m) National Stocks Assessment Program

n) Philippine National Aqua-silviculture Program

o) Convergence for Cooperative Development

p) Accelerated Technology Adoption Project

q) Cassava and Hot Moro Chili Integrated Farming System in Tawi-Tawi

r) ABACAYAMAN Model Farm

s) Ligawasan Agriculture Industry Development

6.5.2 Department of Agriculture and Fisheries of ARMM

The Department of Agriculture and Fisheries of ARMM implements the following programs among various other programs for agricultural development and rural livelihood improvement.[65]

(1) Rice program

Rice program is one of the banner components of the Department of Agriculture and it is mainly concerned with palay farming and uplifting the lives of Filipino farmers. The program aims to strengthen national resilience in staples production with three key strategies: (1) raising farmers' productivity and competitiveness, (2) enhancing economic incentives and enabling mechanisms, and (3) managing food staples consumption. The program provides interventions in the form of support of

[65] Department of Agriculture and Fisheries ARMM website. http://daf.armm.gov.ph/.

palay production, irrigation, postharvest and other infrastructure facilities, market development services, research and development, and extension, education, and training services.

(2) Corn program

Corn program is one of the banner programs of the Department of Agriculture and it promotes white and yellow corn production in the region. The program provides services including production support services, irrigation network services, and equipment and facility support services. Production support services cover various issues such as seed production, extension, marketing development, and research and development. Equipment and facilities support services include farm mechanization and post-harvest facilities.

(3) High value crops development program

High value crops development program is also one of the banner programs of the Department of Agriculture and it contributes towards the achievement of food self-sufficiency, economic growth, and enhancement of consumer's health and welfare. The program promotes production, processing, marketing, and distribution of high value crops. Priority commodities include vegetables (lowland, upland, and indigenous vegetables and spices), major fruits (mango, banana, and pineapple), industrial/plantation crops (coffee, cacao, and rubber), and alternative staple food crops (saba banana and root crops). The program provides technical support services in production, market development, research and development, and extension, education, and training.

(4) Philippine Rural Development Project

Philippine Rural Development Project is a six-year national project under the Department of Agriculture that aims to establish a modern, value-chain oriented and climate resilient agriculture and fisheries sector. The project is jointly funded by the World Bank, the national government, and the local government units (LGUs). In partnership with the LGUs and private sector, the project provides key infrastructure, facilities, technology, and information to raise productivity and competitiveness of agriculture and fisheries in the region. The project targets smallholder farmers and fishers to increase their marketable surpluses and their access to markets.

6.5.3 Department of Trade and Industry of ARMM

The Department of Trade and Industry (DTI) of ARMM has been working closely with the JICA to strengthen the six model industry clusters composed of micro, small, and medium enterprises for economic growth in the region. The DTI, together with the JICA, has identified the rubber, seaweeds, palm oil, abaca, coffee, and coconut industry clusters in the ARMM provinces as model industries where the region can succeed through investments in technology transfer.[66]

The DTI implemented the ARMM Industry Clustering Capacity Enhancement Project from 2014 to ¥2016 with the assistance of the JICA, to develop and enhance the regional capacity for industry cluster approach through the establishment of the model industry clusters. The project consisted of four modules: cluster approach for industrial development (understanding the cluster approach), strategic business planning (learning the business planning process), formulation of implementation plans

[66] Department of Trade and Industry ARMM website. http://dtiarmmgov.ph/index.php/10-news/132-jica-partners-with-dti-armm-to-boost-mindanao-economy.

(preparing action projects for implementation), and project monitoring (regular review of the action projects).[67]

6.5.4 Department of Agrarian Reform of ARMM

The Department of Agrarian Reform (DAR) of ARMM leads the implementation of agrarian reform and sustainable rural development in the region through land tenure improvement and provision of integrated development services to landless farmers, farm workers, small landowners, and cultivators, and the delivery of agrarian justice. The DAR implements the following agrarian reform projects among many other projects.[68]

(1) Agrarian Reform Communities Project II

The project aims at improving socio-economic conditions and increasing the income of agrarian reform beneficiaries and other farmers in the 152 agrarian reform communities (ARCs) and ARC Clusters in 19 provinces of the southern Philippines. The project is expected to improve access to livelihood assets for the rural poor including the landless farm workers and develop agribusinesses and improvements in the well-being of the poor and marginalized groups in the target communities. The project is assisted by the Asian Development Bank and the OPEC Fund for International Development.

(2) Agrarian Reform Infrastructure Support Project III

This is a six-year development project with the primary goal of reducing poverty through agri-enterprise development, food security, and enhancement of economic activities in 136 ARCs throughout the country. The project support includes the provision of rural infrastructures such as irrigation facilities, farm-to-market roads, post-harvest facilities, and rural water supply systems. The project is assisted by the Government of Japan and JICA.

(3) Italian Assistance to the Agrarian Reform Community Development Support Program

The program aims at poverty reduction and sustainable development in 35 ARCs in four provinces of Region XII and ARMM including Sultan Kudarat, Lanao del Sur, and Maguindanao. The project includes community infrastructure development, agriculture and enterprise development, local capacity building, and project management. It is funded by the Italian Government.

[67] JICA Philippines. ARMM Industry Clustering Capacity Enhancement Project (AICCEP).
[68] Department of Agrarian Reform ARMM website. http://dar.armm.gov.ph/foreign-assisted-projects-faps/.

Chapter 7 Environmental and Resettlement Considerations

7.1 Philippine Environmental Assessment Procedure and Related Laws

7.1.1 Philippines Environmental Impact Assessment System

In the Philippines, all private or public projects or activities which are envisaged to potentially have a negative impact on the environment are subject to environmental impact assessment (EIA) by Philippine Environmental Impact Statement System (PEISS). EIA is the preliminary analysis of the potential impacts of the project on the environment. Aware of the possible negative effects of the implementation of industrial and other activities, the Philippine government has instituted measures to encourage the use of EIA as a planning and decision-making tool.

PEISS is a set of laws, regulations, administrative orders and guidelines concerned with the EIA. **Table 7.1.1-1** shows some of the important laws and guidelines.

Table 7.1.1-1 Laws and Regulations Regarding EIA in the Philippines

Title	Outline
Environmental Impact Statement System (EISS), Presidential Decree No. 1586 (1978)	An act establishing and centralizing the Environmental Impact Statement (EIS) System under the National Environmental Protection Council (NEPC), which merged with the National Pollution Control Commission (NPCC) in June 1987 to become the Environmental Management Bureau (EMB).
Presidential Proclamation No. 2146 (1981) and No. 803 (1996)	It proclaims Environmentally Critical Projects (ECPs) to have significant impact on the quality of environment and Environmentally Critical Areas (ECAs) as environmentally fragile areas within the scope of the EIS System.
DAO 96-37 (revised to become DAO 92-21)	Devolved responsibility for EIS to the EMB-Regional Office and further strengthened the PEISS. Placed emphasis on promoting maximum public participation in EIA process to validate the social acceptability of the Project.
DENR Administrative Order No. 2017 - 15 (DAO 17-15)	Consistent with the thrust of the Department of Environment and Natural Resources (DENR) to promote social justice and the 1992 Declaration of United Nations Conference on Environment and Development (UNCED) emphasizing that environmental issues are best handled with the participation of all concerned citizens, the guidelines on Public Participation are hereby promulgated.

Source: JICA Study Team

The procedures of EIA process are shown in **Figure 7.1.1-1**. The process stages are categorized as: (1) pre-study stage (screening, scoping and public consultation/stakeholders meeting, (2) EIA study stage and (3) post-study stage (review, decision-making and monitoring). This study conducted three (3) stakeholders/public consultations, two (2) municipal level and one (1) barangay level.

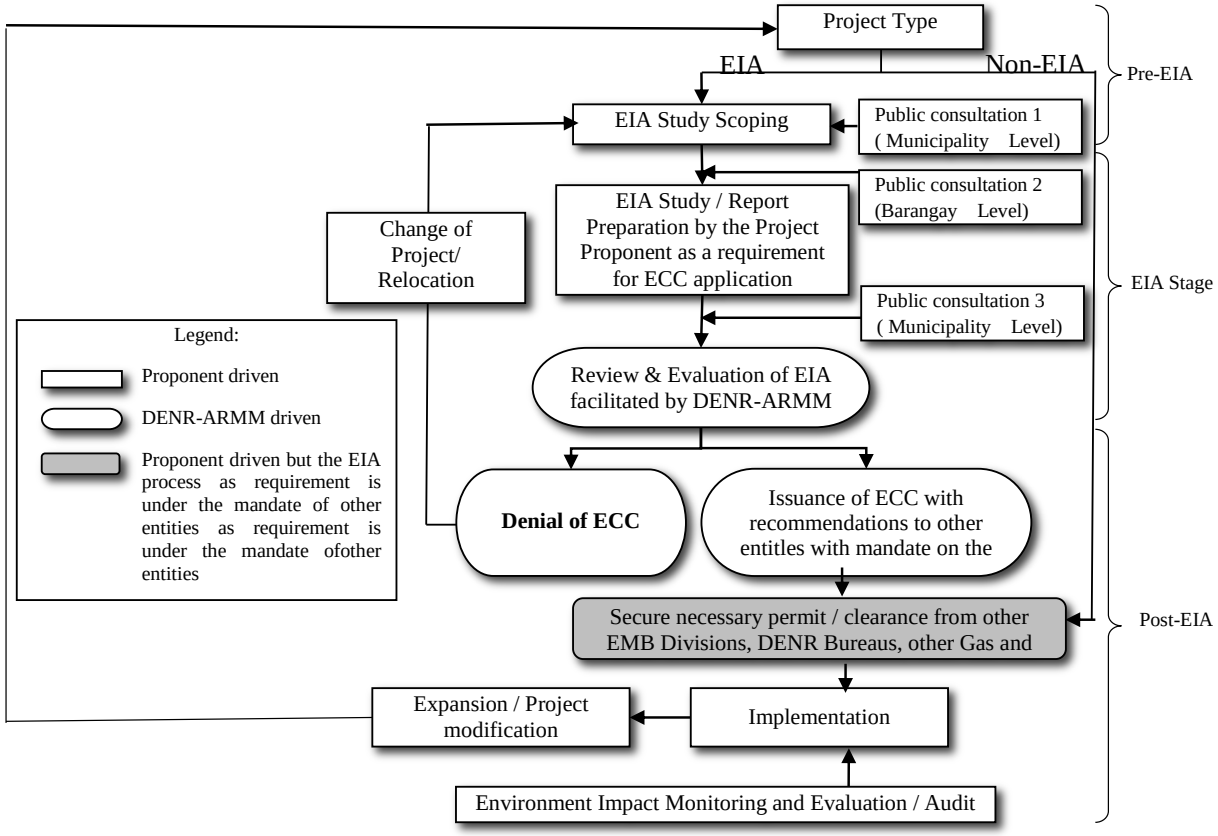


Figure 7.1.1-1 EIA Process Procedures

7.1.2 Screening of the Project

According to the Presidential Decree (PD) 1586 (1978), the EIA process covers project which have been originally declared as Environmentally Critical Projects (ECPs) or projects in Environmentally Critical Areas (ECAs) presumed to have significant impacts on the quality of the environment. On the other hand, non-covered projects are required environmental safeguard if deemed necessary by DENR. The project components are consisting of 7 Sub-Projects with approximate combined length of 181.7 km. Sub-projects 2, 5 and 6 are classified under Category A (EIS) and Sub-projects 1, 7, 8 and 9 have been classified as Category B (IEE). Both categories are required to secure Environmental Compliance Certificates (ECCs) under DENR-ARMM. **Table 7.1.2-1** shows the summary of EIA category per Sub-Projects while **Table 7.1.2-2** shows the criteria of ECPs and Non-ECPs.

Table 7.1.2-1 Summary of EIA Project Type, Category, Requirements and Required Documents

Sub-Project	Length (km)	Project Type	Category	Requirements	Required Documents
1	14.0	C4b Minor Roads and Bridges (new construction)	II-Non-ECP in ECAs	IEER/IEEC	ECC
2	33.9	D3c Major Roads and Bridges (new construction)	I-ECP	EIS	ECC
5	27.8	D3c Major Roads and Bridges (new construction)	II-ECP	EIS	ECC
6	65.0	D3c Major Roads and Bridges (new construction)	II-ECP	EIS	ECC
7	18.1	C4b Minor Roads and Bridges (new construction)	II-Non-ECP in ECAs	IEER/IEEC	ECC
8	5.9	C4b Minor Roads and Bridges (new construction)	II-Non-ECP in ECAs	IEER/IEEC	ECC
9	17.0	C4b Minor Roads and Bridges (new construction)	II-Non-ECP in ECAs	IEER/IEEC	ECC

Notes:
IEER – Initial Environmental Examination Report
IEEC - Initial Environmental Examination Checklist
EIS – Environmental Impact Statement
ECP - Environmentally Critical Project
ECA- Environmentally Critical Area
Source: Revised Procedural Manual for DENR Administrative Order No. 30 Series of 2002 (DAO 03-30) and JICA Survey Team

Table 7.1.2-2 EIS and IEE Requirements for Road Projects

Project Description	Covered (Required to secure ECC)			Not covered (may secure CNC)
	Category A: ECP	Category B: Non-ECP		Category D
	EIS	EIS	IEE Checklist	PD (Part I only)
3.4.1 Roads, new construction	NATIONAL ROAD: >= 20 km (length with no critical slope)OR>= 10 km (length with critical slope)	PROVINCIAL ROAD and OTHER TYPES OF ROADS: >= 20 km (length with no critical slope) OR >= 10 km (length with critical slope)	ALL TYPES OF ROADS: > 2 km but <20 km, (length with no critical slope) OR > 2 km but < 10 km (length with critical slope)	<=2 km
3.4.2 Roads, widening, rehabilitation and/or improvement	None	> 50 % increase in capacity (or in terms of length/width) AND >= 20.0 km, (length with no critical slope) OR >= 10.0 km (length with critical slope)	> 50 % increase in capacity (or in terms of length/width) AND > 2 km but < 20.0 km, (length with no critical slope) OR > 2 km but < 10.0 km (length with critical slope)	<= 50 % increase in capacity (or in terms of length/width) but <= 2 km increase in length
3.4.5 Roads-flyover/ cloverleaf/ interchanges	None	None	Regardless of length and width	None

Notes:
ECC - Environmental Compliance Certificate
ECP - Environmentally Critical Project
CNC- Certificate of Non-Coverage
PD – Project Description
Source: JICA Study Team, based on "Revised Guidelines for Coverage Screening and Standardized Requirements, p24 APPENDIX A , EMB MC# 005, July 2014"

7.2 Baseline of the Environmental and Social Condition

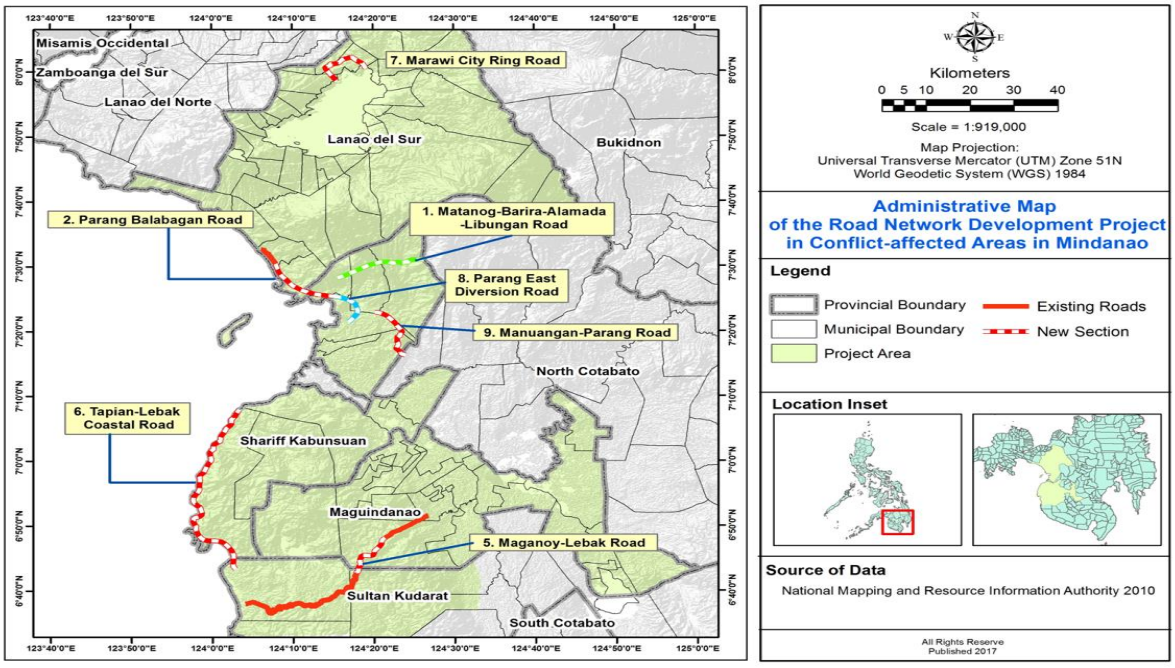
Baseline environmental survey including social and Indigenous People (IP) survey are ongoing. Detailed information will be contained in the main Environmental Impact Statement (EIS) Report and in the main Initial Environmental Examination (IEE) Report.

EIA will be undertaken in accordance with JICA Environmental and Social Consideration Guideline (2010) and Revised Procedural Manual (RPM) for DENR Administrative Order No. 30 Series of 2003 laws and guidelines of the Philippines. EIA Report will cover the following: Category A - Environmental Impact Statement (EIS) for Sub-Project 2, 5, 6 and Category B - Initial Environmental Examination (IEE Report) for Sub-Project 1, 7, 8, 9. Environmental Compliance Certificate (ECC) will be issued by DENR-ARMM.

7.2.1 Land

(1) Administrative Area

The study area is located within the provinces of Maguindanao, Lanao del Sur and portion of Sultan Kudarat and North Cotabato, comprising of 19 municipalities and 82 barangays.

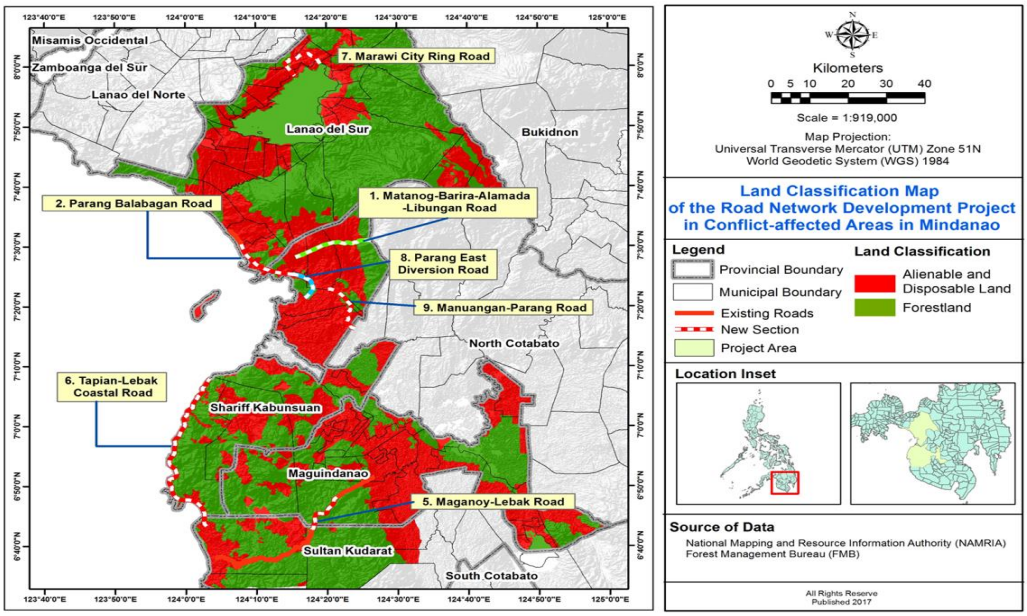


Source: JICA Study Team

Figure 7.2.1-1 Administrative Map of the Study Area

(2) Land Classification

Based on the National Mapping and Resource Information Authority (NAMRIA) and Forest Management Bureau (FMB), the land classification of the study area is categorized into two, these are the Alienable and Disposable and the Forest land as shown in **Figure 7.2.1-2**.

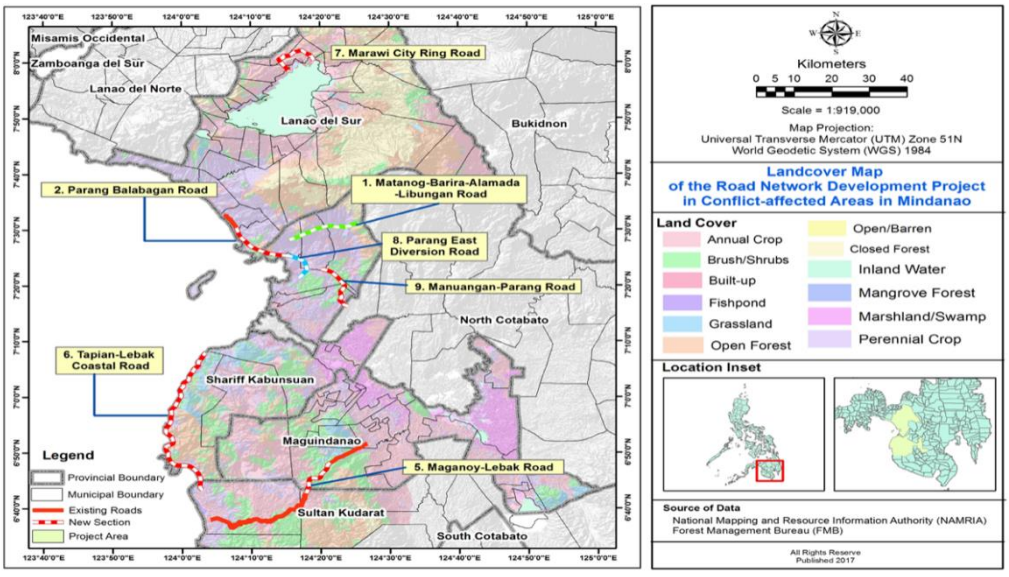


Source: JICA Study Team

Figure 7.2.1-2 Land Classification Map of the Study Area

(3) Land cover

Land cover of the study area are classified into annual crop, brush/shrubs, fishpond, grassland, open forest, open/barren, closed forest, inland water, mangrove forest, perennial crop and built-up. Built-up areas include residential, industrial, commercial, infrastructures/utilities, institutions among others as shown in **Figure 7.2.1-3**.



Source: JICA Study Team

Figure 7.2.1-3 Land Cover Map of the Study Area

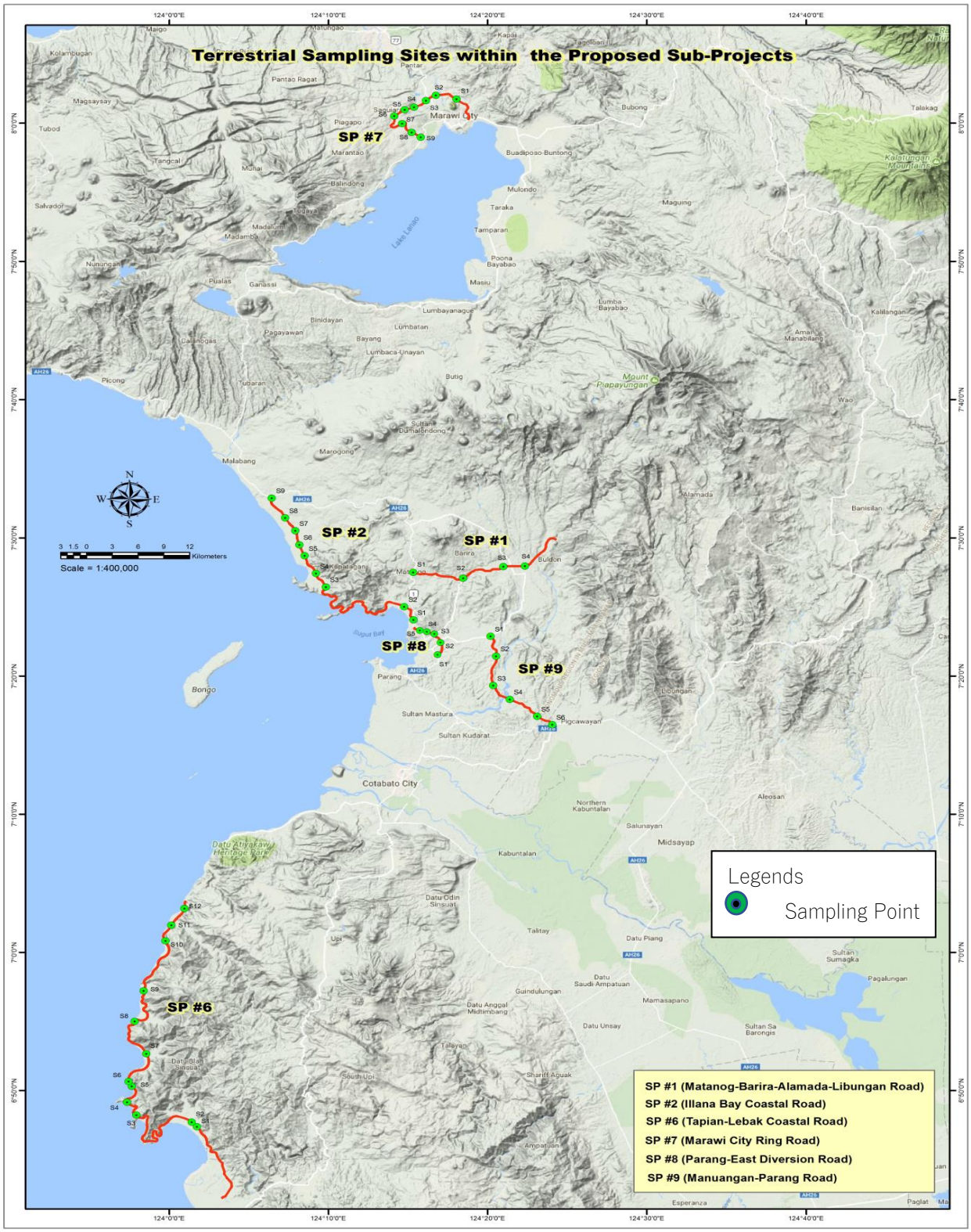
(4) Terrestrial Ecology

Terrestrial Ecology Assessment provides a baseline data relative to biodiversity composition of the proposed alignment. It is an important part of the study to evaluate the significant project impacts to flora and fauna within the ecosystem covered by the project development. Predicted impacts of the project to terrestrial ecosystem will be identified and able to recommend appropriate mitigating measures which will form part of this study to minimize negative impact to the remaining flora and fauna species.

The terrestrial ecology assessment was conducted after the desk review of the proposed project alignment, project orientation on the field, identification of sampling sites, coordination with the authorities, preparation of instruments, and field work proper. **Figure 7.2.1-4** shows the map of terrestrial ecology sampling plots within the Sub-Projects proposed alignment. **Figure 7.2.1-5** to **Figure 7.2.1-10** are the photos of samplings plots per Sub-project.

Based on the result of terrestrial ecology assessment, floristic composition in the alignment comprise a combination of naturally growing species of trees and agro- ecosystem, dominated by common fruit trees interspersed with residential houses and other built-up areas.Relative to the International Union for Conservation of Nature (IUCN) result showed that only two species are identified as critically endangered in category, these species are Narra (*Pterocarpus indicus*) **Figure 7.2.1-11** observed in Sub-Project 2, Sub-Project 6 & Sub-Project 9 and Kamagong (*Diospyros blancoi*) located in Sub-Project 2. For the vulnerable in the category listing, these species include Magabuyo (*Celtis luzonica*) in Sub-Project 7, Amugis (*Koordersiodendron pinnatum*) located in Sub-Project 9, Puso-puso (*Neolitsea vidalii*) in Sub-Project 9, Dalinsi (*Terminalia pellucida*) in Sub-Project 6 and Sub-Project 9, Hamindang (*Macaranga bicolor)* in Sub-Project 5, Anislag (*Securinega flexuosa*) in Sub-Project 6, Dao (*Dracontomelon dao*) in Sub-Project 6 (**Figure 7.2.1-12**) and Is-is (*Ficus ulmifolia*) in Sub-Project 6 and for least concern in category listing, these species are Binunga (*Macaranga tanarius*) in Sub-Project 6 and Pagsahingin (*Canarium asperum*) in Sub-Project 8. The computed biodiversity index of the study area reveals a very low diversity composition.

In the faunal dimension, most of the species observed are locally common and sited in different ecosystems in the lowland including agricultural areas, shrub lands, grass lands and settlements areas. These species also thrive even in highly disturbed areas including cities. With reference to the International Union for Conservation of Nature (IUCN) (2017), no Critically endangered nor endangered species observed. There is one (1) species of near threatened in avifauna species observed in Sub-Project 2 and Sub-Project 6 the Grey-Hooded Sunbird (*Aethopyga primigenia*). One (1) species of avifauna and two (2) herpeto-fauna were identified as vulnerable in category. For avifauna, it is the Java Sparrow (*Lonchura oryzivora*) observed in Sub-Project 5, Sub-Project 6 and Sub-Project 9, while the herpeto-fauna species include Philippine Wild Deer (*Rusa sp*.) in Sub-Project 5 and Mindanao Flying Lizard (*Draco Mindanensis*) in Sub-Project 7 and Sub-Project 9. The assessed area has a very low biodiversity with very high species evenness. **Table 7.2.1-1** and **Table 7.2.1-2** shows the floral and faunal compositions and conservation status of the study area. The conservation status and description is described in **Table 7.2.1-3**.



Source: JICA Study Team

Figure 7.2.1-4 Terrestrial survey sampling plots within the Study Area

Table 7.2.1-1 The floristic composition and conservation status of the Study Area

Terrestrial Flora							
Road Section	**Sub-Project 1**	**Sub-Project 2**	**Sub-Project 5**	**Sub-Project 6**	**Sub-Project 7**	**Sub-Project 8**	**Sub-Project 9**
No. of species	46	88	38	97	63	46	64
No. of Genera	41	77	38	84	54	43	59
Families	22	35	22	44	33	24	27
Plant Form/Habitat							
Grass	5	4	0	7	5	0	1
Herb	7	10	6	6	9	3	6
Fern	0	10	4	11	4	7	9
Palm Tree	1	2	2	3	2	1	2
Shrub	4	8	3	9	5	4	5
Tree	26	48	19	55	37	25	36
Vine	3	6	4	6	1	6	5
Remarks							
Planted/Crop	13	14	5	23	7	8	9
Naturally growing	33	74	33	74	56	38	55
Conservation Status (IUCN)							
Critically endangered	0	1	0	2	0	0	1
Endangered	0	0	0	0	0	0	0
Near Threatened	0	0	0	0	0	0	0
Vulnerable	0	0	1	1	1	0	3
Least Concern	0	0	0	1	4	1	0

Source: JICA Study Team

Table 7.2.1-2 The Faunal Composition and Conservation Status of the Study Area

Terrestrial Fauna														
SUB-PROJECT	**Sub-Project 1**		**Sub-Project 2**		**Sub-Project 5**		**Sub-Project 6**		**Sub-Project 7**		**Sub-Project 8**		**Sub-Project 9**	
Composition	**Avifauna**	**Herpetofauna**	**Avifauna**	**Herpetofauna**	**Avifauna**	**Herpetofauna**	**Avifauna**	**Herpetofauna**	**Avifauna**	**Herpetofauna**	**Avifauna**	**Herpetofauna**	**Avifauna**	**Herpetofauna**
No. of species	24	4	30	6	28	5	44	8	22	3	19	3	25	4
Families	17	3	21	6	21	5	28	8	20	3	18	3	20	4
Endemic	0	1	5	1	3	2	10	2	3	1	3	2	2	1
Conservation Status (IUCN)														
Critically Endangered	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Endangered	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Near Threatened	0	0	1	0	0	0	1	0	0	0	0	0	0	0
Vulnerable	0	3	0	0	1	1	1	0	0	1	0	0	1	1
Least Concern	22	3	26	5	25	2	42	6	20	1	17	2	22	2
Not Evaluated	2	1	3	1	2	2	0	2	2	1	2	1	2	2

Source: JICA Study Team

Source: JICA Study Team

Figure 7.2.1-5 Sampling site no. 3 in Lipawan, Barira, Maguindanao in Sub-Project 1

Source: JICA Study Team

Figure 7.2.1-6 Photo of sample plots no. 3 in Brgy. Matimos, Kapatagan, Maguindanao in Sub-Project 2

Source: JICA Study Team

Figure 7.2.1-7 Photo of sample plot no 6 in Brgy. Macalag, Datu Unsay, Maguindanao in Sub-Project 5

Source: JICA Study Team

Figure 7.2.1-8 Photo of sample plot no. 4 in Brgy. Lapaken, Datu Blah Sinsuat, Maguindanao in Sub-Project 6

Source: JICA Study Team

Figure 7.2.1-9 Photo of sample plot no. 6 in Brgy. Making, Parang, Maguindanao in Sub-Project 8

Source: JICA Study Team

Figure 7.2.1-10 Photo of sample plot no. 4 in Brgy. Matengan, Sultan Kudarat, Maguindanao in Sub-Project 9

Figure 7.2.1-11 A Narra (Pterocarpus indicus), is among the Critically Endangered species in the category set by the IUCN found adjacent the sample plot no. 3 following the alignment of Sub-Project 2 in barangay Bakikis in the municipality of Kapatagan, Maguindanao

Figure 7.2.1-12 The Dao (Dracontamelon dao) is among the vulnerable species in the category of IUCN located adjacent the sample plot no. 11 in Sub-Project 6 in Brgy. Tubuan in the municipality of Datu Blah, Maguindanao

Source: JICA Study Team

Table 7.2.1-3 Conservation Categories and Description

Category	Abbreviation	Description
Critically Endangered	(CR)	A taxon is Critically Endangered when it is facing an extremelyhigh risk of extinction in the wild in the immediate future.
Endangered	(EN)	A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future.
Vulnerable	(VU)	A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future.
Near threatened	(NT)	Taxa which do not qualify for Conservation Dependent, but whichare close to qualifying for Vulnerable.

Source: IUCN

(5) Geology

The Study Area is dominated by volcanic plain or volcanic piedmont deposits, chiefly pyroclastics and/or volcanic debris. The most recent deposits, Quaternary Alluvium, is composed of alluvium, fluviatile, lacustrine and beach deposits, raised coral reefs, and beachrock. Other lithological facies are composed mostly of submarine andesite and basaltic flows intercalated with pyroclastics and

clastic sedimentary rocks; and reef limestone lenses largely confined within the axial zones Mindanao. Thick, extensive, transgressive mixed shelf marine deposits, largely wackes, shales and reef limestone are also present.

The Study Area may be affected by natural hazards caused either by **geophysical** or **hydrological** events. The most likely source of destructive earthquakes are the Mindanao Fault and Cotabato Trench. The subprojects that directly straddle or located within a narrow zone of the active fault traces are Sub-Project 5 Maganoy-Lebak Road., Sub-Project 6 Tapian-Lebak Coastal Road, and Sub-Project 7 Marawi City Ring Road. The coastal municipalities within the Project Area are considered highly prone to tsunami. Sections of Sub-Project 6 Tapian-Lebak Coastal Road may be susceptible to liquefaction. As observed during the fieldwork, some sections of Sub-Project 2 Parang-Balabagan Road and Sub-Project 8 Parang East Diversion Road which are adjacent to areas of high gradient may encounter landslide hazards. Flooding in the area is usually associated with the occurrence of typhoons, thunderstorms and/or monsoon rains. It is recommended that hazard-prone areas be assessed in detail in order to determine the respective engineering mitigations that may be done.

Geotechnical investigation by drilling with Standard Penetration Test (SPT) is recommended to determine the type and succession of the underlying materials and their geotechnical properties needed for the appropriate engineering design and construction of the road project.

7.2.2 Water

(1) Hydrology

The river systems that affect the proposed roads is shown in **Table 7.2.2-1** shows the river/creek in the study area.

Table 7.2.2-1 List of River/Creek in the Study Area

Route No.	Name	River/Creek
Lanao del Sur		
1	Matanog-Barira-Alamada-Libungan	Nituan River, Simuay River
2	Parang-Balabagan Road	Diarong Creek, Muda River, Abunabun River, Salanga River, Matimus River, & Tigatan River
7	Marawi- Saguiaran- Piagapo-Marantao Ring	Tributaries of the Agus River
8	Parang East Diversion	Nituan River
9	Manuangan-Sultan Kudarat-Sultan Mastura-Parang	Simuay River
5	Maganoy-Lebak	Tubuan River, Tran River, some creeks
6	Tapian-Lebak Coastal	Mata Creek & Bagong Creek

Source: JICA Survey Team

During the conduct of field investigation, the proposed road alignment was validated on ground and inspected for natural hazards and/or water bodies such as swamps or springs that could possibly affect the project. No ground water wells were found affected by the project based on the data from the National Water Resources Board (NWRB) or from the Local Water Utilities Administration (LWUA).

All proposed road alignment as far as hydrological parameters is concerned, pass the required criterion. Road design can easily consider the bridges across rivers and culverts across creeks that the road traverses. There are no large bodies of water or swamps that can make the road

construction difficult. Considering the minor hydrological factors, the construction of the road project will greatly improve the livelihood of the people in the area.

(2) Baseline on Water Quality

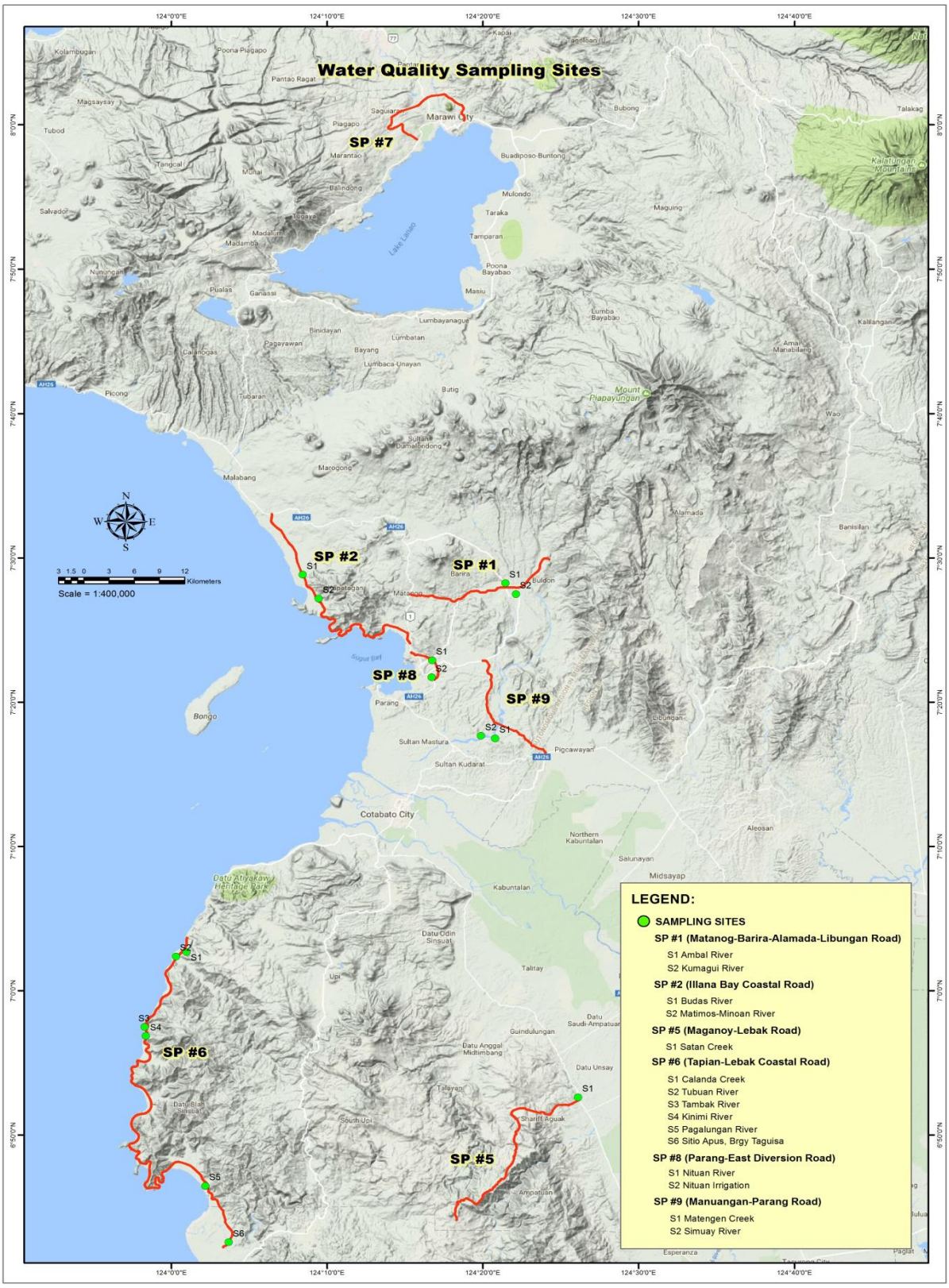
Grab sampling was used for surface water quality measurement. Stainless pale and rope were used to collect surface water samples. Samples were put in glass and plastic containers, properly sealed, labeled and preserved with ice at lower temperature inside coolers and transported to the laboratory. On-site measurement was done for pH, temperature and dissolved oxygen. Samples were submitted for laboratory testing to CRL Environmental Corporation, a recognized DENR and DOH accredited laboratory.

Based on the results, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), pH and TSS meet the criteria guidelines of the DENR Administrative Order No. 2016-08, Water Quality Guidelines and General Effluent Standards of 2016. It should be noted that DENR does not have regulatory standard for Turbidity. **Table 7.2.2-2** show the water quality results and **Figure 7.2.2-1** shows the Map of water quality sampling point.

Table 7.2.2-2 Water Quality Results Summary

No	Item	Baseline Survey(Standard Value)					
		Sub-Project	St.	Location	BOD (7 mg/l)	TSS (80 mg/l)	DO (5 mg/l)
2	Water pollution (Water quality)	1	1	Ambal River	<1	10	7
			2	Kumagui River	2	3	9
		2	1	Budas River	2	23	8
			2	Matimos-Minoan River	<1	12	8
		5	1	Satan Creak	1	229	8
		6	1	Sitio Calanda Creek	2	4	7
			2	Tubuan River	<1	7	8
			3	Tambak River	3	5	8
			4	Kinimi River	1	3	7
			5	Pagalungan River	1	17	7
			6	Sitio Apus,Brgy.Taguisa	2	195	9
		7	1	Agus River	1	5	7
		8	1	Nituan River	1	11	8
			2	Nituan Irrigation	2	21	6
		9	1	Matengen Creak	3	25	7
			2	Simuay River	2	62	8

Source: JICA Study Team



Source: JICA Study Team

Figure 7.2.2-1 Map Showing the Water Quality Sampling Sites

(3) Marine Ecology

The study area covers two (2) coastal Sub-Project alignments, the Sub-Project 2 Parang-Balabagan Road and Sub-Project 6 Tapian-Lebak Coastal Roads. Generally, the coastline of Sub-Project 2 developed shallow fringing reefs that extend narrow strips along the shores. Most of the reefs sloped abruptly towards the deep water except the coral reef of barangay Sapadin the municipality of Matanog are gradually sloped down to silty bottom. The results of marine ecology survey showed that the coral reefs in these areas have a mean live hard coral cover of 41.5% and categorized to be in "fair" condition, which is high above the average live coral cover (32.3%) of the Philippines. The non-*Acropora* species dominated the reef areas, represented mostly of massive *Porites.* Some encrusting *Porites* and mushroom *Fungia* genera were also observed. On the average, dead coral with algae has 31.2% cover, while other fauna, abiotic component and algae have only 13.3%, 11.8% and 1.5%, respectively. Furthermore, the coral reefs along Sub-Project 6 Tapian Lebak Road developed on shallow coastal waters as well. Most of the reefs have narrow strips. The coral reefs of Pura and Sedem are sloping gradually while the reefs of Nalkan, Kenimi and Reza terminated abruptly to deep waters.

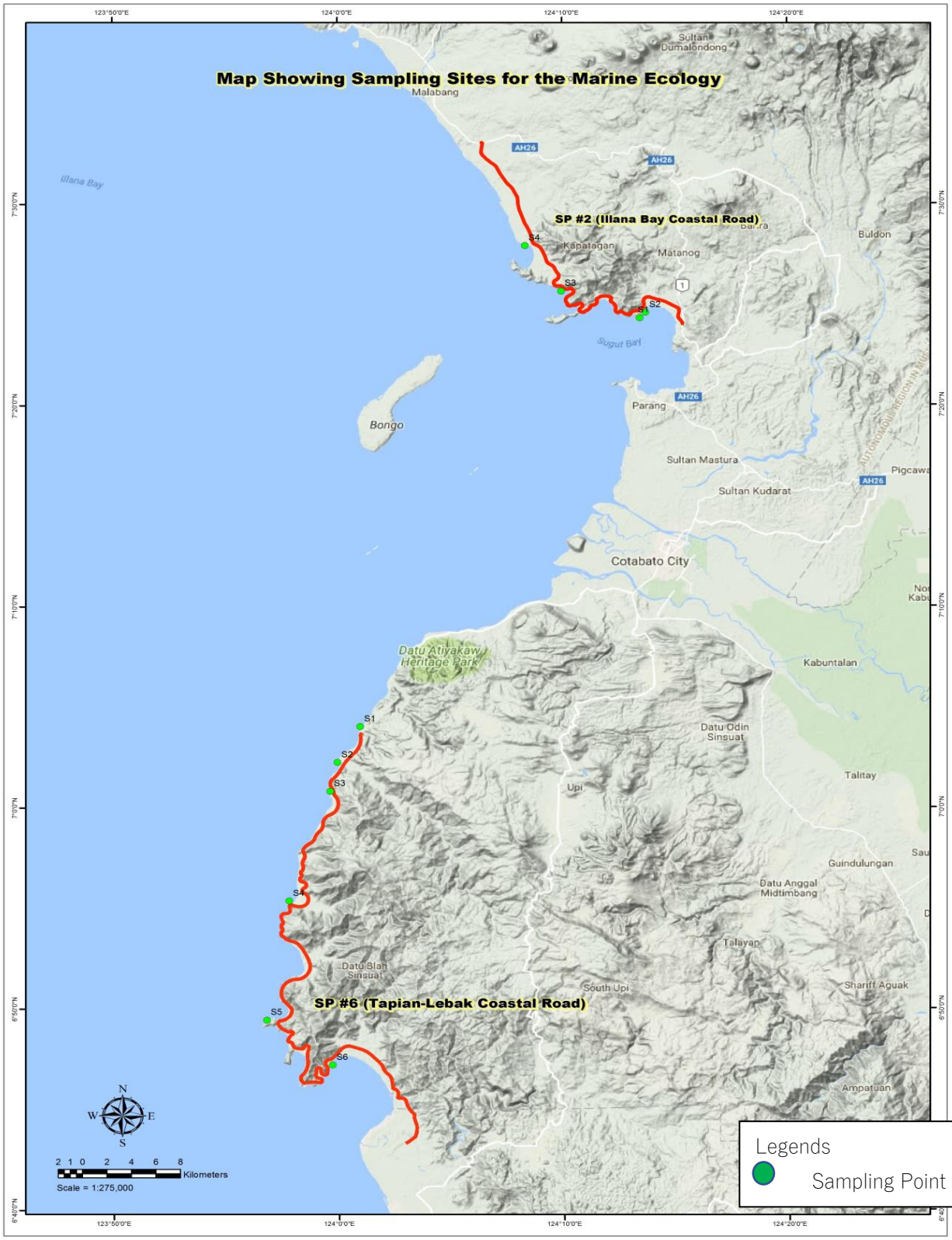
Source: JICA Study Team

Figure 7.2.2-2 Coral reef Parang-Balabagan Road (Sub-Project 2)

Source: JICA Study Team

Figure 7.2.2-3 Coral reef Tapian-Lebak Coastal (Sub-Project 6)

The seagrass ecosystem along Sub-Project 2 Parang-Balabagan coastal road is generally characterized by mono-specific Enhalus acoroides seagrass meadows with some patch of Thalassia hemprechii, Halodule sp. and Halophila ovalis. The reefs are narrow and rocky substrate which favourable for coral growth. Enhalus acoroides bed is usually observed in sheltered and permanently submerged in water. Other seagrass species such as Thalassia hemprechii and Halodule sp. were observed in transition between coral reefs and the E. acoroides seagrass bed. On the other hand, the seagrass ecosystem along Sub-Project 6 Tapian-Lebak coastal road is generally characterized by mono-specific Enhalus acoroides seagrass meadows with some patch of Thalassia hemprechii, *Halodule* sp. and *Halophila ovalis*. Only found two stations with seagrass bed in cove areas between the coral reefs and mangroves strands were found in these long stretches of coastal area. This may be because there are less available substrates for seagrass to grow.



Source: JICA Study Team

Figure 7.2.2-4 Map Showing the Marine Sampling Sites

Source: JICA Survey Team

Figure 7.2.2-5 A 0.5m x 0.5m stainless steel quadrat (0.25 m2) placed every 10 m interval used in the seagrass/seaweed assessment in Sub-Project 2 (left) and Sub-Project 6 (right)

The survey results indicate that fish sizes in Sub-Project 6 were larger and high in number relative to majority of the reefs in the country. The status shows that the reefs are not yet as exploited because of the presence of larger fishes in the survey. Moreover, the reefs are pristine with fair to good coral cover.Among the damselfish in the area include Pomacentridae (i.e., *Pomacentrus brachialis, Chromis ternatensis, Dascyllus reticulatus,Pomacentrus moluccensis*&*Chromis margaritifer)*. Also abundant fishes are Caesionidae (i.e., *Pterocaesio pisang* and *Caesio teres*). Based on the national standard, reef health status of Sub-Project 2 fish is categorized as poor in terms of species richness and abundance but high in terms of biomass. Fish abundance is mostly from family Caesionidae and Scaridae, Labridae/Wrasse and Pomacentridae/damselfish.

Source: JICA Survey Team

Figure 7.2.2-6 School of Fishes in Parang-Balabagan Road (Sub-Project 2)

Source: JICA Survey Team

Figure 7.2.2-7 School of Fishes in Tapian-Lebak Coastal (Sub-Project 6)

7.2.3 Ambient Air Quality

Air Samples were collected at the sampling within the study area. Total Suspended Particulates, Particulate Matter at 10 micron, Sulfur Dioxide and Nitrogen Dioxide were measured. Results of air quality for all parameters measured are compared with National Ambient Air Quality Guideline Values (NAAQGV) of Republic Act 8749 or known as Philippine Clean Air Act. All parameters tested are within the allowable limits. **Table 7.2.3-1** show the ambient air quality results and

Figure 7.2.3-1 shows the sampling points of air and water while **Figure 7.2.3-2** shows the photo of air sampling in Sub-Project 1.

Table 7.2.3-1 Ambient Air Quality Results Summary

No	Item	Baseline Survey (Standard Value)							Quantitative Forecast Analysis ※ (Standard Value)			
		Sub-Project	St.	Location	TSP (230 µg/Ncm)	PM_{10} (150 µg/Ncm)	NO_2 (150 µg/Ncm)	SO_2 (180 µg/Ncm)	TSP (230 µg/Ncm)	PM_{10} (150 µg/Ncm)	NO_2 (150 µg/Ncm)	SO_2 (180 µg/Ncm)
1	Air Pollution (Air quality)	1	1	Datu Malambut Limoken Memorial High School,Barira	20.0	3.9	2.9	1.9	-	4.0	2.9	1.9
			2	Bugasan Sur,Matanog,	14.5	1.7	6.7	1.0	-	1.7	6.7	1.0
		2	1	Salaman,Kapatagan	18.1	4.6	1.7	1.0	-	4.7	1.8	1.0
			2	Poblacion,Balabaga,	19.4	4.2	2.5	1.4	-	4.2	2.6	1.4
		5	1	NIA Cpd Satan,Shariff Aguak	22.7	4.3	1.3	2.4	Since traffic demand forecasting is not carried out, prediction is not carried out either.			
			2	llang-llang, Salumping,Esperanza, SK	18.6	2.2	5.0	4.3				
		6	1	Brgy. Tubuan	31.2	4.2	2.3	2.5	-	4.2	2.4	2.5
			2	Brgy. Kinimi	37.3	4.7	2.7	2.6	-	4.7	2.5	2.6
			3	Basketball court at Purok Apos,Brgy.Taguisa	29.6	5.5	2.5	2.6	-	5.5	2.5	2.6
		7	1	Brgy. Bubong, Saguiaran, Lanao del Sur	15.7	11.7	3.9	ND	-	11.8	4.0	0.0006
		8	1	Dulangan I,Brgy. Nituan,Parang	25.5	6.4	2.7	1.2	-	6.4	2.7	1.2
			2	Near Reservoir Area, Brgy. Making, Parang	22.7	4.6	3.6	1.4	-	4.6	3.8	1.4
		9	1	Brgy. Orandang, Parang	30.9	5.9	3.0	1.4	-	6.0	3.1	1.4
			2	Brgy. North Manuangan, Pigcawayan,	36.7	2.1	5.7	1.6	-	2.1	5.8	1.6

Note：Environment Impact Assessment Technique for Road Project (Edition of FY 2012)/ National Institute for Land and Infrastructure Management(No.714)/Public Works Research Insititute(No.4254)

ND ： Not Detected

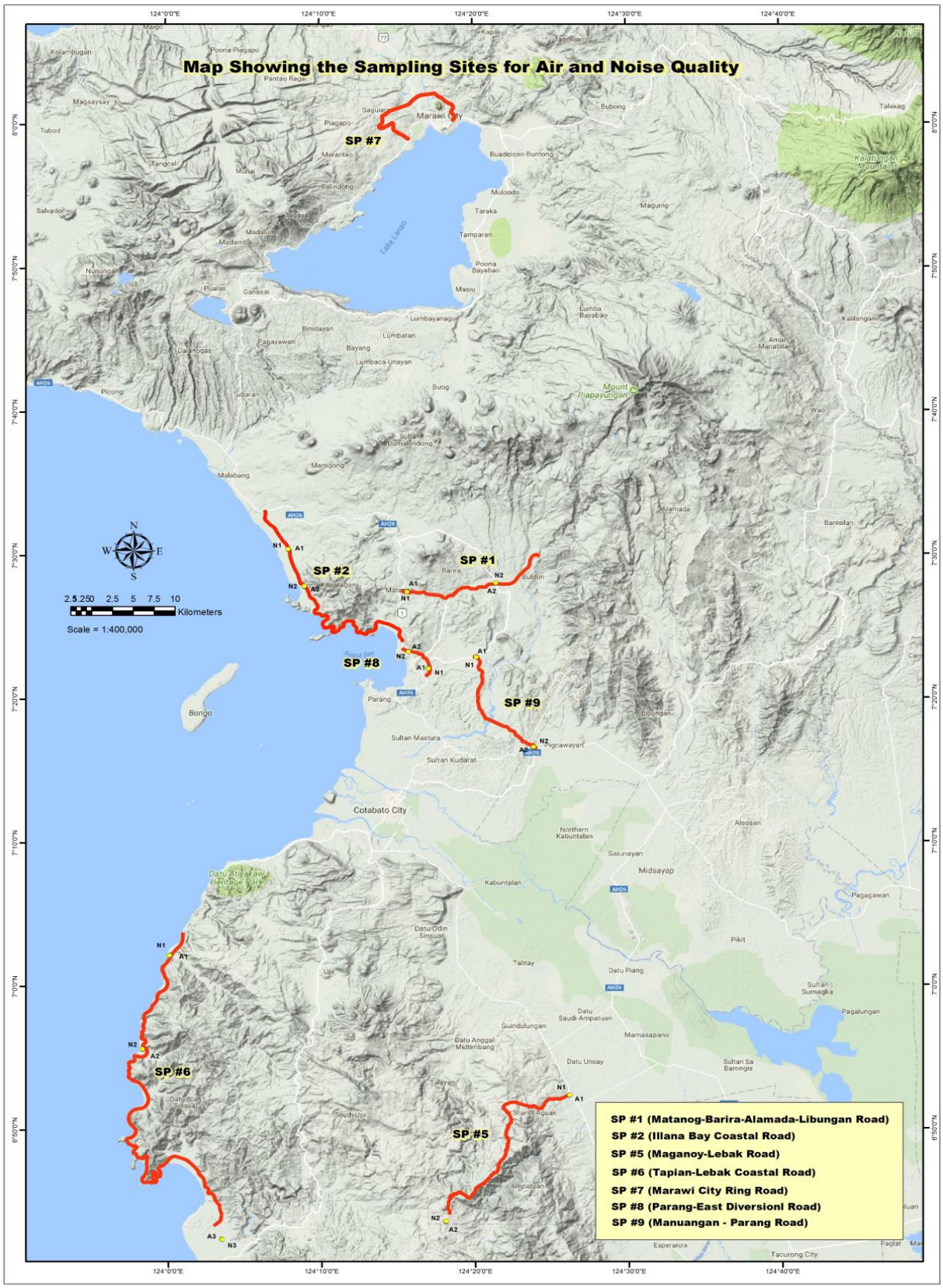
－ ：Since there is no forecasting method of TSP, it is not calculated.

Source: JICA Survey Team

Table 7.2.3-2 Standard values of air quality in Philippines

Item	TSP	PM_{10}	NO_2	SO_2
Philippine Standard Values	230ug/Ncm	150ug/Ncm	150 ug/Ncm (0.08ppm)	180 ug/Ncm (0.07ppm)
Japanese Standard Values	(SPM) 0.2 mg/m3 (200 ug/Ncm)	(SPM) 0.2 mg/m3 (200 ug/Ncm)	0.04-0.06ppm	0.1ppm

Note: DENR National Ambient Air Quality Standards for Source Specific Air Pollutants based on 60 minutes averaging time



Source: JICA Study Team

Figure 7.2.3-1 Map Showing the Air and Noise Quality Sampling Sites

Source: JICA Survey Team

Figure 7.2.3-2 Photos of Air Sampling at Brgy. Bugasan Sur, Matanog, Maguindanao

7.2.4 Noise Quality

Ambient noise levels are within DENR's limits, except for a slight noise level exceedance observed in some areas during night time, and this is generally typical among rural areas. Major sources of maximum noise levels came from vehicles plying in the streets, and during night time nocturnal animals, birds and insects like crickets. **Figure 7.2.4-1** shows the noise sampling photo in Sub-Project 8.

Source: JICA Survey Team

Figure 7.2.4-1 Photos of Noise Sampling Near Reservoir Area Brgy. Making, Parang, Maguindanao

Table 7.2.4-1 Ambient Noise Levels Results Summary

No	Item	Baseline Survey (Standard Value)							Quantitative Forecast Analysis (Standard Value)				
					L_{Aeq} (dB)				L_{Aeq} (dB)				
		SP	St	Location	Morning Time (ClassAA:45) (ClassA:50)	Day Time (ClassAA:50) (ClassA:55)	Evening Time (ClassAA:45) (ClassA:50)	Night Time (ClassAA:40) (ClassA:45)	Morning Time (ClassAA:45) (ClassA:50) <ClassA2:60dB>	Day Time (ClassAA:50) (ClassA:55) <ClassA2:60dB>	Evening Time (ClassAA:45) (ClassA:50) <ClassA2:60dB>	Night Time (ClassAA:40) (ClassA:45) <ClassA2:55dB>	Remark (Philippine standard) <Japan standard>
5	Noise and vibration (Noise)	1	1	Back of Datu Malambut Limoken Memorial HS,	50	48	50	49	52	52	51	50	ClassA
			2	Brgy. Bugasan Sur, Matanog	49	50	50	49	49	50	50	49	ClassA
		2	1	Brgy. Salaman, Kapatagan	51	51	49	49	55	56	52	50	ClassA
			2	Brgy. Poblacion, Balabagan	52	52	51	47	55	56	53	49	ClassA
		5	1	NIA Compound, Satan, Shariff Aguak,	50	49	50	49	Since traffic demand forecasting is not carried out, prediction is not carried out either				ClassAA
			2	Sitio Ilang-Ilang, Brgy. Salumping, Esperanza,	49	48	51	49					ClassA
		6	1	Tubuan, DBS	53	51	47	48	55	54	53	51	ClassA
			2	Brgy. Kinimi, DBS,	51	48	47	46	52	50	50	47	ClassA
			3	Basketball Court, Purok Apos, Taguisa,	50	48	51	50	50	48	51	50	ClassA
		7	1	Brgy. Bubong, Sag	53	53	53	51	54	55	54	52	ClassA
		8	1	Purok Dulangan I, Brgy. Nituan, Parang,	51	50	48	49	54	54	49	50	ClassA
			2	Near Reservoir Area, Brgy. Making, Parang	48	48	48	48	53	53	49	49	ClassA
		9	1	Brgy. Orandang, Parang,	51	50	51	49	52	52	52	50	ClassA
			2	Brgy. North Manuangan, Pigcawayan,	53	52	52	48	54	53	53	49	ClassA

Note：Environment Impact Assessment Technique for Road Project (Edition of FY 2012)/ National Institute for Land and Infrastructure Management(No.714)/Public Works Research Insititute(No.4254) in JAPAN
Source: JICA Study Team

Table 7.2.4-2 Standard Value of Noise Level in Philippines

Class		Morning Time 05:00-09:00 (dB(A))	Day Time 9:00-18:00 (dB(A))	Evening Time 18:00-22:00 (dB(A))	Night Time 22:00-5:00 (dB(A))
Philippines Standard	Class AA	45	50	45	40
	Class A (General)	50	55	50	45
	Class A (facing 4 lanes road area)	50	60	50	45
	Class B (Commercial area)	60	65	60	55
	Class C	65	70	65	60
Japanese Standard	Class AA	(6:00-22:00) 50	(6:00-22:00) 50	(6:00-22:00) 50	(22:00-6:00) 40
	Class A	55	55	55	45
	Class A2	60	60	60	55
	Class B	55	55	55	45
	Class B2	65	65	65	60
	Class C	60	60	60	55
	Class C2	65	65	65	60
	Class D	70	70	70	65

Note1: Definition of Class on Philippines Standards (Agreement between DPWH, EMB and MMT as indicated in Appendix 2-20 of the RPM for DAO 2003-30)
"AA" categorized areas (a section or contiguous area which requires quietness, such as an area within 100 m from school sites, nursery schools, hospitals, places of worships, and special homes for the aged)
"A" categorized areas (general residential areas)
"A" categorized areas (directly facing/fronting a 4 lanes road in residential area):
"B" categorized areas (general commercial areas)
"C" categorized areas (light industrial areas)
Note2: Definition of Class on Japanese Standards (Ministry of Environment in Japan)
"AA" categorized areas (sensitive area required to be calm such as hospital and social welfare facilities)
"A" categorized areas (general residential areas)
"A2" categorized areas (directly facing/fronting more than 2 lanes road in "A" area):
"B" categorized areas (mainly residential areas)
"B2" categorized areas (directly facing/fronting more than 2 lanes road in "B" area)
"C" categorized areas (mixed area with residential, commercial and industrial areas)
"C2" categorized areas (directly facing/fronting more than 2 lanes road in "C" area)
"D" categorized areas (directly facing/fronting trunk road)

7.3 Legislation and Institution for Environmental and Social Considerations

7.3.1 Environmental Considerations

(1) Legislation for Environmental Considerations

Major laws regarding the environment in the Philippines are shown in **Table 7.3.1-1**.

These environmental-related laws are composed under the Presidential Decree (PD) No.1151 as an environmental policy and PD No. 1152 as an environmental regulation in relation to the national policy and regulation.

Table 7.3.1-1 Major Environmental Laws in the Philippines

Title	Contents
Presidential Decree (PD)No.1151	Environmental policy
Presidential Code (PD)No. 1152	Environmental regulation

Source: JICA Study Team

Major environmental laws are set out for natural resources, protection of wildlife and bio-diversity, forest resources, mining, coastal and marine, ambient air, water quality, waste and disposal, land use and resettlement, conservation of historical and cultural assets, environmental assessment, and national integrated protected area system. The Government of the Philippines (GoP) has been ratified international treaties, agreements, and protocols in relation to environmental and social considerations which are listed in **Table 7.3.1-2**.

Table 7.3.1-2 Philippine Environmental Agreements to the International Treaty

Title	Year
Washington Treaty Convention on the international trade in endangered species of wild flora and fauna	(1981)
International tropical timber agreement	(1983)
United Nations convention on the law of the sea	(1984)
World heritage convention concerning the protection of the world cultural and natural heritage	(1985)
Montreal Protocol on substances that deplete the Ozone layer	(1991)
Vienna convention for the protection of the ozone layer	(1991)
Convention on biological diversity	(1993)
Basel convention on the control of trans-boundary movement of hazardous wastes and their disposal	(1993)
Ramsar convention on wetlands of international importance, especially as waterfowl habitat	(1994)
Framework convention on climate change	(1994)
Kyoto protocol	(1998)
Cartagena protocol on bio-safety to the convention on biological diversity	(2000)
Stockholm convention on persistent organic pollutants	(2001)

Source: JICA Study Team

(2) Roles of the Relevant Agencies

The Sub-Projects are required of EIA and required to secure ECC. Review and supervision of Philippine Environmental Impact Assessment System (PEISS) will be conducted by the Department of Environment and Natural Resources - Autonomous Region on Muslim Mindanao (DENR-ARMM). DENR EMB Region 12 will participate and part in the EIA Review Committee (EIARC), since portion of alignment traverses the region. DENR-ARMM will provide the Environmental Compliance Certificates (ECCs) since most of the Sub-Projects are covered under ARMM.

Table 7.3.1-3 Roles of the relevant agencies of EIA

Relevant Agency		Roles
Department of Public Works and Highways (DPWH) <The project Proponent>		To proceed with the project of EIA procedure as the project proponent Detailed roles are show below: Holding of a meeting for Information, Education and Communication (IEC) Holding a meeting for Public Scoping Preparation & submission of Public Scoping Report, Draft EIS, EIS Summary for the Public (ESP) and Revised EIS (to be submitted to EMB after the public hearing) Payment of EIA review support fund Making the necessary logistical arrangements for public consultation Submission of Final EIS/IEE
Department of Environment and Natural Resources (DENR)	ARMM	Responding to the application from the proponents, management of EIA review committee (EIARC) and the Secretary of DENR-ARMM will issue the environmental compliance certificates (ECCs) for the Sub-Projects Detailed roles are shown below: Facilitating of EIA Review Committee (EIARC) (scoping stage and substantive review stage) Scoping Procedural screening of EIS Conduct of public consultation Preparation of decision document Approval of ECCs from EMB Director / DENR Secretary Making the necessary arrangements for EIARC site validation and public consultation
	Region 12	Supporting of EIA process in the project area: Participation of public scoping facilitated by proponent of the project Participation of EIA Review Committee (EIARC) (scoping stage and substantive review stage)

Source: JICA Study Team

7.3.2 Gap Analysis between Philippines and JICA's Guideline for EIA

Based on the principles for "EIA Reports for Category A Projects" requested by JICA Guideline, gaps between the Guideline and the legislation in Philippines reviewed in **Table 7.3.2-1**. Basically, the Philippines legislation deems to meet the policy of JICA's Guideline, thus Philippines EIA process is applicable on this project.

Table 7.3.2-1 Gap analysis between the Philippines and the JICA's Guideline for EIA

JICA Guideline (Appendix 2. EIA Reports for Category A Projects)	Legislation of Philippine (DENR Administrative Order No. 30 Series of 2003 (DAO 03-30))	Gaps	Policy to fill up gaps in this Study
When assessment procedures already exist in host countries, and projects are subject to such procedures, project proponents etc. must officially finish those procedures and obtain the approval of the government of the host country.	The project is required to prepare the EIA and obtain the environmental compliance certificates (ECCs) in accordance with Philippine laws	- (no difference)	Not required
EIA reports (which may be referred to differently in different systems) must be written in the official language or in a language widely used in the country in which the project is to be implemented. When explaining projects to local residents, written materials must be provided in a language and form understandable to them.	The order stipulates that EIA shall be written in the local dialect or mixed with the popularly known language of the host communities. In this case, English is recognized as a popularly known language in the project area.	-	Not required
EIA reports are required to be made available to the local residents of the country in which the project is to be implemented. The EIA reports are required to be available at all times for perusal by project stakeholders such as local residents and copying must be permitted.	The Proponent is required to give copies of the full EIA Report to the EMB Regional office host municipalities; copies of Executive Summary to the host barangays	-	Not required
In preparing EIA reports, consultations with stakeholders, such as local residents, must take place	The prescript public consultation is held with project affected persons and other relevant agencies at scoping stage and	-	Not required

after sufficient information has been disclosed. Records of such consultations must be prepared.	draft EIA stage respectively after sufficient announcement of the meeting(s). Project outline is explained sufficiently prior to public consultation at scoping stage.		
Consultations with relevant stakeholders, such as local residents, should take place if necessary throughout the preparation and implementation stages of a project. Holding consultations is highly desirable, especially when the items to be considered in the EIA are being selected, and when the draft report is being prepared.	The prescript public consultation is held with project affected persons and other relevant agencies at scoping stage and draft EIA stage respectively after sufficient announcement of the meeting(s).	-	Not required

Source: JICA Study Team

7.3.3 Resettlement Consideration

(1) Right of Way Acquisition

Right of Way (ROW) acquisition is one of the serious problems which significantly delayed the implementation of infrastructure projects. ROW acquisition requires numerous research works, documentations and constant dialogue with the affected people. It should be understood that ROW acquisition requires time, thus it should be started as early as possible with enough staff, logistic support, and timely disbursement of budget.

To address this issue, Republic Act (RA) No. 10752 - "An Act to Facilitating the Acquisition of Right-of-Way, Site or Location for National Government Infrastructure Projects," or "Right-of-Way Act," – was approved on 07 March 2016, and became effective on 03 April 2016. RA 10752 repealed the previous ROW Act (RA 8974). RA 10752 aims to fast track and simplify negotiated sale as the preferred mode of ROW acquisition by making the price offer and terms of negotiation more attractive and just for the owners than the current rules. It enables Implementing Agencies (IAs) to quickly adopt a market-based price without fear of audit disallowance, while ensuring that the rights of property owners and project-affected persons (PAPs) are duly protected.

In order to achieve a more effective and expeditious implementation of the projects, the DPWH ROW Acquisition Manual (DRAM), dated 12 September 2017 is officially released for implementation starting November 15, 2017. This is to provide a clear, uniform, and user-friendly guide on the rules and procedures for the efficient acquisition by the DPWH of right-of-way (ROW) for its infrastructure projects, in accordance with the provisions of Republic Act No. 10752 (ROW Act) and its Implementing Rules and Regulations. This Order supersedes the Infrastructure ROW Procedural Manual, dated 01 April 2003.

The DRAM covers the entire ROW acquisition process – including (a) Project Feasibility Study with Environmental Impact Assessment and preparation of Preliminary ROW Action Plan (RAP) with property appraisal, (b) inclusion of the Project in the Medium-Term Infrastructure Program, (d) provision of appropriations in the General Appropriations Act (GAA), (e) Fund Release, (g) Detailed Engineering Design (DED) including Parcellary Surveys and preparation of Final RAP, (h) RAP Validation, (i) Actual ROW Acquisition through Donation, Negotiation, Expropriation, and Other Modes, (j) Payments, (k) Transfer of Title to the Republic, (l) Clearance of ROW, and (m) Management of ROW. The DRAM is expected to enhance the quality of DPWH ROW acquisition by showing a clear step-by-step procedure, which is quicker, consistent across all DPWH offices, more transparent, and with greater accountability. In turn, this will result in faster and more economical provision of infrastructure works and services needed to accelerate socio-economic development.[1]

[1] http://www.dpwh.gov.ph/dpwh/sites/default/files/issuances/DO_124_s2017_1.pdf

(2) Modes of Right of Way Acquisition

Modes of ROW Acquisition are fully discussed in the DPWH Right of Way (ROW) Acquisition Manual (DRAM), dated 12 September 2017.

Table 7.3.3-1 Mode of Right of Way Acquisition

Mode of ROW Acquisition	Objectives
Acquisition through Donation	To acquire ROW by requesting the property owners to donate the land needed for public use
Acquisition through Deed of Exchange	To acquire land by exchanging the property needed for ROW with an old abandoned road or government land near the project
Acquisition of Lands through Quit Claim (under CA 141)	To acquire ROW of lands granted through CA 141 using Quit Claim
Acquisition by Easement of ROW	To acquire ROW through easement of ROW
Acquisition through Negotiated Sale	To acquire ROW through negotiated sale.
Acquisition through Expropriation	To acquire ROW by means of expropriation proceedings.
Special Cases	
To acquire mortgaged properties for ROW	Acquisition of Mortgaged Properties
Acquisition by Road Conversion	To acquire ROW by conversion of a Provincial/City/Municipal/Barangay Road into a National Road
Acquisition of Untitled Lands	To acquire untitled lands for ROW
Acquisition where the Landowner is Deceased	To acquire untitled lands for ROW wherein the landowner is deceased
Acquisition of ROW where the Landowner is a Corporation	To acquire untitled lands for ROW where the landowner is a corporation
Acquisition of ROW where the Property is under Guardianship or Administratorship	To acquire untitled lands for ROW where the property is under guardianship/ administratorship
Acquisition of ROW where the Vendor is represented by an Attorney-in-Fact	To acquire untitled lands for ROW where the vendor is represented by an Attorney-in-Fact Acquisition of Lands where there are No Claimants
Acquisition of ROW where the land is untitled and there are no claimants	To acquire untitled lands for ROW when there are no claimants
Acquisition of Structures and Improvements of Owners With No Legal Rights to the Land	To acquire structures/improvements of owners/informal settlers who have no legal rights to the land.
Acquisition of Subsurface Properties	To acquire ROW of subsurface properties
Acquisition for PPP Projects	To acquire ROW for Projects under PPP Schemes
Acquisition for Design-and-Build Projects	To acquire ROW for Projects under Design-and-Build Schemes

Source: DPWH DRAM 2017

7.3.4 Resettlement Policy

The development projects undertaken by the Department of Public Works and Highways (DPWH-ARMM) must serve the public well, and in the design and implementation of such projects, all efforts shall be executed to help ensure that Project-affected Persons (PAPs) are not worse off. In addition, the Project shall provide an opportunity for the local populace to derive benefits from the Project.

This portion shall provide a tool, which will also help ensure that all PAPs along the road project, regardless of their number, receive the appropriate assistance in a fast and timely manner. For achieving the goal, the Project will follow the principles in accordance with those in LARRIPP, which has been based on the World Bank Policy OP/BP 4.12.

(1) The Government of the Republic of Philippines is bound to follow the Project Resettlement Policy (the Project Policy) for the road Project specifically which is intended to comply with the JICA Guidelines.

(2) Where there are gaps between the Republic of Philippines legal framework for resettlement and JICA's Policy on Involuntary Resettlement, practicable mutually agreeable approaches will be designed consistent with Government practices and JICA's Policy.

(3) Land acquisition and involuntary resettlement will be avoided where feasible, or minimized, by identifying possible alternative project designs that have the least adverse impact on the communities in the project area.

(4) Where displacement of households is unavoidable, all PAPs (including communities) losing assets, livelihoods or resources will be fully compensated and assisted so that they can improve, or at least restore, their former economic and social conditions.

(5) Compensation and rehabilitation support will be provided to any PAPs, that is, any person or household or business which on account of project implementation would have his, her or their standard of living adversely affected;

- Right, title or interest in any house, interest in, or right to use, any land (including premises, agricultural and grazing land, commercial properties, tenancy, or right in annual or perennial crops and trees or any other fixed or moveable assets, acquired or possessed, temporarily or permanently;
- Income earning opportunities, business, occupation, work or place of residence or habitat adversely affected temporarily or permanently; or
- Social and cultural activities and relationships affected or any other losses that may be identified during the process of resettlement planning.

(6) All affected people will be eligible for compensation and rehabilitation assistance, irrespective of tenure status, social or economic standing and any such factors that may discriminate against achievement of the objectives outlined above.

(7) Lack of legal rights to the assets lost or adversely affected tenure status and social or economic status will not bar the PAPs from entitlements to such compensation and rehabilitation measures or resettlement objectives.

(8) All PAPs residing, working, doing business and/or cultivating land within the project impacted areas as of the date of the latest census and inventory of lost assets (IOL), are entitled to compensation for their lost assets (land and/or non-land assets), at replacement cost, if available and restoration of incomes and businesses, and will be provided with rehabilitation measures sufficient to assist them to improve or at least maintain their pre-project living standards, income-earning capacity and production levels.

(9) PAPs that lose only part of their physical assets will not be left with a portion that will be inadequate to sustain their current standard of living. The minimum size of remaining land and structures will be agreed during the resettlement planning process.

(10) People temporarily affected are to be considered PAPs and resettlement plans address the issue of temporary acquisition.

(11) Where a host community is affected by the development of a resettlement site in that community, the host community shall be involved in any resettlement planning and decision-making. All attempts shall be made to minimize the adverse impacts of resettlement upon host communities.

(12) The resettlement plans will be designed in accordance with Land Acquisition, Resettlement, Rehabilitation and Indigenous Peoples' Policy (LARRIPP) of DPWH, 2007 and JICA's Policy on Involuntary Resettlement.

(13) The Resettlement Plan will be translated into local languages and disclosed for the reference

of PAPs as well as other interested groups.

(14) Payment for land and/or non-land assets will be based on the principle of replacement cost.

(15) Compensation for PAPs dependent on agricultural activities will be land-based wherever possible.

(16) Resettlement assistance will be provided not only for immediate loss, but also for a transition period needed to restore livelihood and standards of living of PAPs. Such support could take the form of short-term jobs, subsistence support, salary maintenance, or similar arrangements.

(17) The resettlement plan must consider the needs of those most vulnerable to the adverse impacts of resettlement (including the poor, those without legal title to land, ethnic minorities, women, children, elderly and disabled) and ensure they are considered in resettlement planning and mitigation measures identified. Assistance should be provided to help them improve their socio-economic status.

(18) PAPs will be involved in the process of developing and implementing resettlement plans.

(19) PAPs and their communities will be consulted about the project, the rights and options available to them, and proposed mitigation measures for adverse effects, and to the extent possible be involved in the decisions that are made concerning their resettlement.

(20) Adequate budgetary support will be fully committed and made available to cover the costs of land acquisition (including compensation and income restoration measures) within the agreed implementation period.

(21) Displacement does not occur before provision of compensation and of other assistance required for relocation.

(22) Sufficient civic infrastructure must be provided in resettlement site prior to relocation.

(23) Acquisition of assets, payment of compensation, and the resettlement and start of the livelihood rehabilitation activities of PAPs, will be completed prior to any construction activities, except when a court of law orders so in expropriation cases

(24) Livelihood restoration measures must also be in placed but not necessarily completed prior to construction activities, as these may be ongoing activities.

(25) Organization and administrative arrangements for the effective preparation and implementation of the resettlement plan will be identified and in place prior to the commencement of the process; this will include the provision of adequate human resources for supervision, consultation, and monitoring of land acquisition and rehabilitation activities.

(26) Appropriate reporting (including auditing and redress functions), monitoring and evaluation mechanisms, will be identified and set in place as part of the resettlement management system.

(27) An external monitoring group will be hired by the project and will evaluate the resettlement process and final outcome. Such groups may include qualified consultants, NGOs, research institutions or universities.

(28) Monitoring reports shall be forwarded directly to the JICA.

7.3.5 Legal Framework for RAP

Legal framework pertaining to involuntary resettlement consists of the key legal and administrative instruments, currently in force in the Philippines, which govern involuntary resettlement and key aspects of WB/JICA's Policy. Laws that address eminent domain, compensation, responsible parties, and public information, consultation and grievance procedures are included.

Table 7.3.5-1 Legal Framework for Resettlement

Title	Year
DPWH Right of Way Acquisition Manual (DRAM)	2017
RA 10752"An Act to Facilitating the Acquisition of Right-of-Way, Site or Location for National Government Infrastructure Projects,"	2016
IRR of RA 10752	2016
Commonwealth Act (CA) No. 141, "Public Land Act"	1936
RA 6957, as amended by RA 7718, "Build-Operate-and-Transfer Law," and its IRR	1994
RA 9184, "Government Procurement Reform Act," and its IRR	2017
RA 7279, "Urban Development and Housing Act of 1992," and its IRR.	1992
RA 7160, "Local Government Code of 1991"	1991
RA 8371, "Indigenous People's Act of 1997"	1997
PD 1586, "Philippine Environmental Impact System"	1978
DO 147, "Authority for DPWH Regional Directors and District Engineers to Hire Private Surveying Firms"	2001
DO187, "Strict Compliance to Inclusion of Preparation of Parcellary Plans and Cost Estimates for ROW Acquisition in Detailed Engineering of Infrastructure Projects"	2002
o DO 327, "Guidelines for Land Acquisition and Resettlement Action Plans (LAPRAPs) for Infrastructure Projects"	2003
DPWH D.O. No. 5 (series of 2003) "Creation of the Infrastructure Right of Way and Resettlement Project Management Office (IROW-PMO) and the Implementation of the Improved IROW Process	2003
DPWH LARRIPP or Land Acquisition, Resettlement, Rehabilitation and Indigenous People's Policy, revised March 2007	2007
DO 34, "Simplified Guidelines for the Validation and Evaluation of Infrastructure Right-of-Way Claims"	2007
DO 133, "Return/Transfer of Functions Relative to Acquisition of Right-of-Way to the Legal Service"	2014
DO 151, "Prescribing the Use of DPWH Procurement Manual, dated June 2016"	2016
DO 203, "Creation of Unified Project Management Office Right-of-Way (UPMO-ROW) Task Force"	2016
DO 65, Delegation of Authority to PPPS Director and Regional Directors for ROW Transactions and Deployment of ROW Task Forces	2017
DOE-DPWH Joint Circular, Relocation of Electric Cooperative Lines	
Indigenous Peoples' Rights Act (IPRA)	1997
Executive Order No.113 (E.O. 113)	1995
Section 23, Presidential Decree No. 17, revised Philippine Highway Act	1972
E.O. 1035	1985
R.A. 7160 The Philippines Constitution	1991
R.A. 9710 and Implementing Rules and Regulations (series of 2010) known as the "Magna Carta of Women"	2010
The Harmonized Gender and Development Guidelines (2007) DPWH and World Bank publication, "A Toolkit on Making Road Infrastructures and Related Facilities Gender Responsive"	2007

7.3.6 Gap between JICA Guidelines and Project Legal Framework / Practices

Table below shows the gap between JICA Guidelines and the existing laws and regulations adopted by the project. In the last column, the resettlement policy and the practices under the project are described.

Since the Republic Act 8974 stipulates mainly the procedures of the land acquisition, there are gaps between JICA Guidelines and RA 8974. However, most of such gaps were filled in by the Executive Order (EO) No. 15, Series of 2013, which was issued by the Governor of PGBh on 6th June 2013. The EO No 15 established the units and communities responsible for requirements by JICA Guidelines, including resettlement, livelihood assistance, consultations and grievance

redress. Even the requirements by JICA Guidelines were not stipulated in EO No 15, the actual practice is in accordance with JICA guidelines, such as avoidance of additional land acquisition by changing the road design, and prioritizing the assistance for the vulnerable PAFs.

On the other hand, a gap remains with regards to compensation payment between the JICA guidelines and practice under the project. The prevailing market price varies depending on the locations.

Table 7.3.6-1 Gaps between JICA Guidelines and Project Legal Framework/ Practice

JICA Guidelines (A)		Laws and Regulations adopted by the Project (B)	Gaps Between (A) and (B)	Resettlement Policy / Practice under the Project
1	Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives		NA	The final alignment of the project was adjusted to avoid heritage area.
2	When population displacement is unavoidable, effective measures to minimize the impact and to compensate for losses should be taken		NA	The final alignment of the project was adjusted land acquisition and resettlement.
3	People who must be resettled involuntary and people whose means of livelihood will be hinder or lost must be sufficient compensated and supported, so that they can improve or at least restore their standard of living, income opportunities and production levels to pre-project levels	EO No 15 stipulate the Resettlement Unit and Livelihood and their responsibilities	No significant gap	- Livelihood assistance and employment matching will be conducted. - Resettlement site with low-cost housing will be developed.
4	Compensation must be based on the full replacement cost as much as possible	RA 8974 stipulates the steps to determine land compensation, starting from donation, then zonal value. If not agreed by PAPs, market values shall be paid through negotiations.	Zonal value for the land may not meet the full replacement cost.	- Prevailing market value varied depending on the locations. - Offered options of cash compensation or barter of land.
5	Compensation and other assistance must be provided prior to displacement	EO No 15 stipulates the compensation payment and other assistance. Compensation schedule will be dependent with the implementing agency (DPWH).	No significant gaps were identified, as Implementing Rules and Regulations of R.A. No. 10752 shows PAPs are paid before relocation. Unless ROW is purchased, the construction is not started by DPWH D.O. No. 5.	Follow Implementing Rules and Regulations of R.A. No. 10752, JICA GL and DPWH D.O. No. 5,
7	In preparation a resettlement action plan, consultations must be held with the affected people and their communities based on sufficient	EO No 15 established the Community Relation & IES Unit and mandates the Unit to conduct adequate consultations.	No significant gaps	Series of consultations and information dissemination are being conducted.

JICA Guidelines (A)		Laws and Regulations adopted by the Project (B)	Gaps Between (A) and (B)	Resettlement Policy / Practice under the Project
	information made available to them in advance			
8	When consultations are held, explanation must be given in a form, manner, and language that are understandable to the affected people.	EO No 15 established the Community Relation & IES Unit and mandates the Unit to conduct adequate consultations.	No significant gaps	Consultations were conducted in Maranao (local) and Tagalog dialect.
9	Affected people are to be identified and recorded as early as possible in order to establish their eligibility through an initial baseline survey (including census that serves as an eligibility cut off dates, asses inventory and socio economic survey), preferably at the project identification stage, to prevent a subsequent influx of encroachers of others who wish to take advantage of such benefits	EO No 15 established the Land Acquisition Unit, and mandates the unit to conduct inventory and tagging of structures to discourage the influx of unqualified dwellers	No significant gaps	- The cut off dates was set on the completion of the census in ROW. Any improvements after the date have not been compensated. - Tagging of existing houses in the ROW was conducted, which is the basis for the eligibility for current resettlement assistance.
10	Provide support for the transition period (between displacement and livelihood restoration)	EO No 15 established the livelihood Unit and Estate Management Unit. The latter is mandated to manage the resettlement site.	No significant gaps	- Livelihood assistance and employment matching will be conducted. - The above assistance will ensure the payment of monthly amortization at the resettlement site
11	Particular attention must be paid to the needs of the vulnerable groups among those displaces, especially those below the poverty line, landless, elderly, women and children, ethnic minorities and etc	EO No 15 established the livelihood Unit and Estate Management Unit. The latter is mandated to manage the resettlement site.	NA	- Physically vulnerable persons who need assistance during relocation should be identified. - Livelihood assistance will be prioritize these PAFs or PAPs.

Source: JICA Guidelines for Environmental and Social Considerations (2010), World Bank Operational Policy 4.12 (2001), Land Acquisition, Department of Public Works and Highways Resettlement, Rehabilitation and Indigenous Peoples' Policy (2007), Philippines

7.3.7 Necessity of Land Acquisition and Resettlement

1) Objectives

The objectives of this Resettlement Action Plan (RAP) for the Sub-Project 1 are to ensure that no affected persons shall be worsened off as a result of the project implementation and that:

i. Adverse social and physical impacts are avoided, minimized, and mitigated;

ii. Stakeholders, and more importantly the Project-Affected Persons (PAPs), will benefit from the Project;

iii. PAPs are provided with sufficient compensation for lost assets and assistance with livelihood programs which will help them improve or at least restore their pre-project standard of living; and

iv. Resettlement activities are implemented with appropriate disclosure of information, consultation and the informed participation of those affected.

All the above objectives will be done in accordance with the appropriate and applicable Philippine laws, policies and/or guidelines with consideration of policies and guidelines of the International Financing Institutions, particularly of World Bank and JICA's Guidelines for Environmental and Social Considerations.

2) Methodology

During the conduct of RAP for the project, series of activities were undertaken which involves the following:

a) Meeting with Local Officials before conducting the survey

i. The team arranged a meeting with the LGU Officials, particularly the City/Municipal Mayor, Assessor, and Barangay Chairpersons to be traversed, before conducting the survey.

ii. Prepared and provided invitation letters signed by the project proponent.

iii. During the meetings/consultations, the team explained the purpose of the survey, the activities that will be undertaken, and the data requirements. The Survey Team emphasized to the Barangay Chairpersons that cooperation of the possible PAPs is necessary to expedite the process and help attain higher accuracy in the preparation of RAP.

iv. Cut Off dates were scheduled as follows:

Sub-Project No. 1	December 12, 2017 to December 19, 2017
Sub-Project No. 2	Parang (Nov. 28, 2017 to Dec. 5, 2017), Matanog (Dec 9, 2017 to Dec. 11, 2017), Kapatagan (Dec. 12, 2017 to Dec. 16, 2017) and Balabagan (Dec. 18, 2017 to Dec 19, 2017).
Sub-Project No. 6	December 12, 2017 to December 19, 2017
Sub-Project No. 7	January 28, 2018 to January 29, 2018
Sub-Project No. 8	December 12, 2017 to December 19, 2017
Sub-Project No. 9	November 28, 2017 to December 8, 2017

b) Data Gathering

i. Based on the proposed alignment of the Project, the team conducted an inventory of possible PAPs and all assets within the 30 meters width ROW using a handheld GPS with photo capacity.

The inventory includes:

a. Number and names of barangays to be traversed/affected.

b. Number of structures that will probably be affected

c. Type of land use (agricultural, residential, commercial, etc.)

d. Most common type of structures (concrete, wood, light materials)

e. Type of plantations/orchards (mango, banana, etc.)

Table 7.3.7-1 Method of Data Collection

No.	Type of Work	Method
1	Identification of affected houses	• By field reconnaissance
2	Identification of land lots affected	• Collection of cadastral map was not successful. It was not provided by the DENR due to the on-going updating of cadastral map • Land lot was identified by interviewing barangays captains and barangay residents
3	Identification of trees, crops, and others	• By field reconnaissance
4	Identification of improvement	• By field reconnaissance
5	Status of land ownership	• By interviewing Municipal Assessors Office
6	Land values	• Data collected from Municipal Assessor's Office • Evaluated by Independent Property Assessor

Source: JICA Study Team

ii. Validation undertaken at DENR-ARMM to obtain the cadastral map and at the Registry of Deeds for title numbers. However, cadastral map and title numbers were not provided due to ongoing finalization of the said data.

iii. The team proceeds to Assessors Offices of covered Municipalities to validated data through Tax Mapping Index and list of land ownership.

iv. Those potential PAPs without titles and tax declarations were validated through actual interviews.

v. For the classified agricultural lands, the team coordinated Network of Protected Agricultural Areas (NPAAs) to obtained plans on agricultural lands; however, they only provided boundary maps.

vi. The team also gathered the latest applicable established market values of the Department of Agriculture (DA), Philippine Coconut Authority (PCA), Department of Environment and Natural Resources (DENR), Department of Finance (DOF), or Local Government Unit (LGU), and Government Financial Institutions (GFI) for cost estimations.

c) Profiling

i. Due to security issues on affected areas and in availability of some PAPs during the visits/ inventory, socioeconomic profiling of PAPs were conducted on the following dates:

Sub-Project No. 1	March 21, 2018
Sub-Project No. 2	March 21, 2018
Sub-Project No. 6	March 21, 2018
Sub-Project No. 7	March 22, 24-25, 2018
Sub-Project No. 8	March 21, 2018
Sub-Project No. 9	February 21, 2018

ii. During the profiling, socio-economic data of the possible PAPs were gathered including their perception towards the project. Possible affected properties, lands, crops, structures and other improvements and preference for compensation, relocations sites and rehabilitation assistance were gathered were also discussed. Queries of the PAPs were also addressed by the team. Right after the interview a photograph of the household and owner was also taken.

Table 7.3.7-2 Summary of Methodology

Main activity	Purpose	Done through	Responsible Person	Materials used
Public Consultations	To inform and generate awareness and understanding, encourage participation of the Project affected persons to participate in the decision-making	1st round of Public Consultation Barangay Meetings	Persons and assets within the scope of thirty (30) meters width ROW	Information materials
Inventory of Losses (IOL)	Identification of persons and assets that can be affected in the implementation of the project	Geo-tagging Ground Reconnaissance	Persons and assets within the scope of thirty (30) meters width ROW	Handheld GPS with photo capacity Digital camera, appraisal forms
Socio-economic Survey	Profiling of the Socio-economic status of the possible project affected persons	House to house interview		Survey form
Structures Value Assessment	Determination of affected structure value	Actual structure valuation conducted by an engineer	Structures within the scope of thirty (30) meters width ROW	Current prices of the construction materials
Trees and Crops value assessment	Determination of the value of the affected trees and crops	Actual reconnaissance survey	Trees and crops within the scope of thirty (30) meters width ROW	Current market value of the trees and crops with reference from the Department of Agriculture

Source: JICA Study Team

3) Right-of-Way Limits

The implementation of the project is expected to cause physical and economic displacement within the 30m (15 meters from each side of the center line) width Road Right-of-Way (RROW), which is in accordance with the updated DPWH Design Guidelines, Criteria and Standards (DGCS, 2015 Edition). The project could potentially cause various impacts, ranging from the Involuntary Impact of the Project, Permanent loss of land along the 30m RROW, Permanent damages to structures, crops and trees; Temporary loss or disruption of land use and from work sites.

4) Cadastral Maps

The team requested copy of the cadastral map at the DENR ARMM. However, cadastral map was not obtained due to ongoing finalization (digitizing) of the said data. Instead, barangay boundary map was provided.

In the absence of cadastral map, the team proceeded to Assessors Offices of the covered Municipalities to validate data through Tax Mapping Index and list of land ownership. Those PAPs without titles and tax declarations were validated through actual interviews.

7.4 Stakeholders Meeting (Public Consultation)

A total of ninety-seven (97) stakeholders meetings were held for Sub-Project Nos. 1, 2, 5, 6, 7, 8, and 9 for the municipal and barangay levels. The first stakeholders meetings at municipal level are prescript Information Education Communication meetings (IEC meeting) based on the Philippine EIA guidelines held in the municipalities covered by the Sub-Projects attended by the affected stakeholders, barangay and municipal officials, and concerned LGU offices such as Assessors, MPDC. The second stakeholders meetings at municipal level presented the results of the baseline surveys. Barangay scoping discussed the project background and objectives, and the positive and negative impact of the proposed Sub-Projects. These two municipal level stakeholders meeting and barangay scoping were attended by a total of 4,190 participants composed of 2,900 males and 1,290 females.

Table 7.3.7-1 List of Municipality and No. of Participants Attended in Municipal Level Stakeholders Meeting

Sub-Project	Municipality	Date	1st		Date	2nd	
			Male	Female		Male	Female
Sub-Project 1	Matanog	Dec. 8, 2017	104	8	Mar. 1, 2018	25	16
	Barira	Dec. 8, 2017	71	12	Feb. 27, 2018	58	24
	Buldon	Dec. 12, 2017	54	16	Mar. 1, 2018	31	17
Sub-Project 2	Parang	Dec. 7, 2017	66	8	Feb. 27, 2018	45	13
	Matanog	Dec. 8, 2017	104	8	Mar. 1, 2018	25	16
	Kapatagan	Dec. 11, 2017	64	17	Feb. 28, 2018	58	32
	Balabagan	Dec. 11, 2017	37	23	Feb. 27, 2018	48	38
Sub-Project 5	Datu Unsay	Dec. 21, 2017	47	14	-	-	-
	Datu Hofer	Dec. 21, 2017	55	12	-	-	-
Sub-Project 6	Lebak, Sultan Kudarat	Dec. 9, 2017	122	30	Feb. 26, 2018	45	12
	Datu Blah Sinsuat	Dec. 14, 2017	31	6	Mar. 3, 2018	70	36
Sub-Project 7	Marawi	Jan. 15, 2018	53	19	Mar. 8, 2018	29	20
	Marantao	Jan. 17, 2018	57	31	Mar. 7, 2018	56	11
	Piagapo	Jan. 16, 2018	40	21	Mar. 8, 2018	39	24
	Saguiaran	Jan. 15, 2018	60	25	Mar. 7, 2018	56	30
Sub-Project 8	Parang	Dec. 7, 2017	66	8	Feb. 27, 2018	45	13
Sub-Project 9	Parang	Dec. 7, 2017	66	8	Feb. 27, 2018	45	13
	Sultan Mastura	Dec. 12, 2017	33	8	Mar. 1, 2018	18	5
	Sultan Kudarat	Dec. 12, 2017	23	14	Mar. 1, 2018	33	9
	Pigcawayan	Dec. 13, 2017	18	12	Mar. 2, 2018	23	18
Total			**1,171**	**300**		**749**	**347**

Source: JICA Study Team

The major opinions and requests of the participants include rerouting of the proposed Sub-Project if natural heritage and Muslim cemetery are present in the alignment, work labor from the community, landowner without proof of ownership, the process of compensation of the affected landowners, and determination of amount of the affected land and properties. All questions, comments and suggestions were answered by DPWH ARMM, JICA Cotabato, RAP, and EIA Study team.

The second stakeholders meetings were held in 63 barangays within the direct affected community in **Table 7.3.7-2**. These meetings were attended by one thousand three hundred eighty-five (1,385) participants, composed of 624 males and 761 female which discussed on the project background and objectives, and the positive and negative impacts of the proposed Sub-Projects to the people, health, habitat, and among others. The major considerations/opinions of the participants were the local workers from the affected community, proof of ownership, livelihood projects, process of land acquisitions, compensations, and the affected Muslim cemetery. The queries and comments on the barangay scoping checklist were responded by the Study team. It is worthy to note that the attendees were dominated by woman, maybe because the male are working and the females are available to attend the meeting. This shows that females in the area are involved on the decision making in the family.

Overall, the proposed Sub-Projects are socially acceptable based on the responses and feedbacks of the stakeholders. They are willing to be compensated and suggested to implement the project early from schedule to address the current problems on transportations for emergencies, and to improve their way of live and the community.

Table 7.3.7-2 List of Barangays and Number of Participant in Barangay Level Stakeholders Meeting

Barangay	Date	Participants		Barangay	Date	Participants	
		Male	Female			Male	Female
Sub-Project 1				Sub-Project 7			
Bugasan Sur	Jan. 8, 2018	17	6	Kilala	Mar. 5&8, 2018	20	34
Liong	Jan. 10, 2018	19	6	Dulay West	Mar. 5&8, 2018	5	17
Bualan	Jan. 10, 2018	16	2	Papandayan Caniogan	Mar. 5&8, 2018	3	8
Rumindas	Jan. 10, 2018	21	4	Guimba (Lilod Proper)	Mar. 5&8, 2018	38	40
Minabay	Jan. 10, 2018	13	3	Pantaon	Mar. 5&8, 2018	13	2
Cabayuan	Jan. 10, 2018	8	1	Rorogagus East	Mar. 5&8, 2018	27	18
Sub-Project 2				Boganga	Mar. 5&8, 2018	7	28
Macasandag	Jan. 11, 2018	7	3	Palao (Ranaranao)	Jan. 17, 2018	12	14
Sapad	Jan. 8, 2018	22	3	Matampay	Jan. 17, 2018	8	26
Kidama	Jan. 8, 2018	21	4	Bacong	Jan. 17, 2018	15	5
Salaman	Jan. 11, 2018	30	4	Daanaingud	Jan. 17, 2018	38	33
Matimos	Jan. 11, 2018	6	6	Rantian	Jan. 16, 2018	16	7
Bakikis	Jan. 9, 2018	19	5	Banga	Jan. 16, 2018	2	17
Lusain	Jan. 11, 2018	14	4	Paling	Jan. 16, 2018	3	19
Banago	Jan. 8, 2018	5	1	Bobo	Jan. 16, 2018	9	15
Narra	Jan. 8, 2018	15	3	Mipaga	Jan. 18, 2018	12	13
Lorenzo	Jan. 8, 2018	10	2	Bubong	Jan. 18, 2018	8	7
Molimoc	Jan. 9, 2018	5	6	Pagalamatan	Jan. 18, 2018	13	15
Barorao	Jan. 9, 2018	14	15	Lumbaca Toros	Jan. 18, 2018	4	9
Batuan	Jan. 9, 2018	14	4	Bagoa ingud	Jan. 18, 2018	6	13
Budas	Jan. 9, 2018	14	7	Alinun	Jan. 18, 2018	4	12
Sub-Project 6				Linao	Jan. 18, 2018	9	9
Taguisa	Feb. 16, 2018	4	17	Lombayanague	Jan. 18, 2018	11	12
Datu Karon	Feb. 16, 2018	12	8	Sub-Project 8			
Kalamongog	Feb. 16, 2018	19	7	Nituan	Jan. 11, 2018	12	2
Tran	Feb. 17, 2018	20	4	Gumagadong Calawag	Jan. 12, 2018	5	11
Laguitan	Feb. 12, 2018	11	9	Making	Jan. 11, 2018	14	8
Sinipak	Feb. 12, 2018	16	12	Manion	Jan. 11, 2018	15	0
Meti	Feb. 13, 2018	24	9	Sub-Project 9			
Sedem	Feb. 12, 2018	16	15	Gadungan	Jan. 12, 2018	15	4
Lapaken	Feb. 13, 2018	19	4	Orandang	Jan. 12, 2018	9	3
Resa	Feb. 14, 2018	15	6	Cabuan	Jan. 12, 2018	20	2
Kinimi	Feb. 13, 2018	28	13	Bungabong	Jan. 12, 2018	18	5
Tambak	Feb. 14, 2018	11	10	Nekitan	Jan. 13, 2018	14	4
Nalkan	Feb. 15, 2018	19	5	Olas	Jan. 13, 2018	15	3
Tubuan	Feb. 15, 2018	15	11	Matengen	Jan. 13, 2018	16	4
Penansaran	Feb. 15, 2018	20	3	North Manuangan	Jan. 13, 2018	5	2
Total						**980**	**643**

Source: JICA Study Team

Table 7.3.7-3 Number of Participants and PAPs in Stakeholders Meeting

Sub-Project No.	1st Municipal Level Stakeholders Meeting			2nd Municipal Level Stakeholders Meeting			Barangay Level Stakeholders Meeting		
	No. of Participants	No. of PAPs		No. of Participants	No. of PAPs		No. of Participants	No. of PAPs	
		with affected structures	with affected land lot		with affected structures	with affected land lot		with affected structures	with affected land lot
Sub-Project 1	265	6	29	171	3	69	116	0	6
Sub-Project 2	327	0	19	275	2	51	263	4	22
Sub-Project 6	189	1	3	163	5	67	382	7	17
Sub-Project 7	306	1	13	265	7	40	656	1	2
Sub-Project 8	74	1	2	58	8	18	67	0	0
Sub-Project 9	182	1	0	164	2	27	139	5	2
Total							**4,062**	**54**	**387**

Source: JICA Study Team

Source: JICA Study Team

Figure 7.3.7-1 Group picture with Matanog's LGU Officials, Brgy. Officials and Study Team in Sub-Project 1

Source: JICA Study Team

Figure 7.3.7-2 Approved signed with LGU Officials of Balabagan, Barangay Officials, PAPs, and Study Team in Sub-Project 2

Source: JICA Study Team

Figure 7.3.7-3 Approved sign by LGUs, PAPs, and Study Team Municipality of Datu Blah Sinsuat in Sub-Project 6

Source: JICA Study Team

Figure 7.3.7-4 Group pictures of LGUs, PAPs, and Study Team City of Marawi in Sub-Project 7

Source: JICA Study Team

Figure 7.3.7-5 Group pictures of LGUs, PAPs, and Study Team Municipality of Parang in Sub-Project 8

7.5 Institutional Arrangement for EMP Implementation

Environmental management and monitoring organization is shown in **Figure 7.5-1**which shows concerned agencies by construction stage and their functions.

All planned mitigation measures are carried out by the contractor and reported to the self-monitoring team and multi partite monitoring team (MMT). The monitoring results are reviewed and conducted corrective and preventive action, if necessary. The organization which conducts monitoring and environmental management and responsibility is shown in **Table 7.5-1**. This shall be updated upon finalization of the Detailed Engineering Design (DED) for the Project

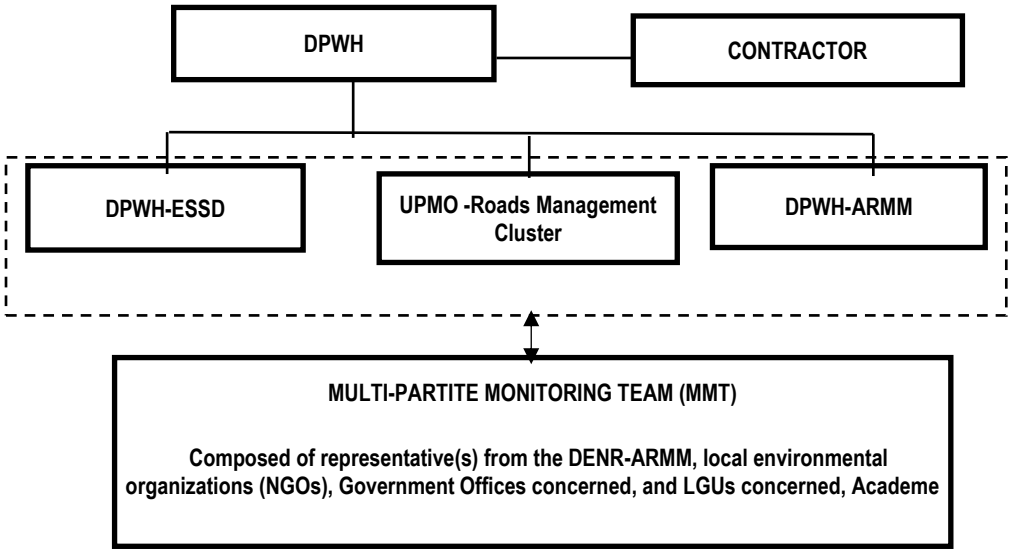


Figure 7.5-1 Simplified Institutional Plan for Implementing the EMP

Table 7.5-1 Environmental Management and Monitoring Implementation Organization

Stage	Name of Organization	Role and Responsibility
Pre-Construction and Construction Phases	DPWH-Environment and Social Safeguards Division (ESSD)	• Assist the UPMO Road Management Cluster and the Contractor in the setting up of the Multi-Partite Monitoring Team (MMT); • Overseeing the implementation of the EMP by the Contractor/s; • Overseeing the updating of the Resettlement Action Plan (RAP) after the DED; • Assisting in the conduct of IEC Meetings as enumerated in the IEC Framework of this EIS; • Monitoring actual payments of compensation to affected landowners, structure owners, and crops/trees owners; • In coordination with the DPWH-ARMM prepare periodic supervision and monitoring reports on RAP implementation; and • Other necessary roles upon finalization of the RAP during the DED stage
	The Construction Supervision Consultant	• Inspection of mitigation measures and environmental monitoring conducted by the contractor based on the approved EIS • Report the monitoring result to DPWH-ARMM and donor (JICA) on monthly report
	DPWH UPMO -Road Cluster Management	• Ensure that compliance to all conditions stipulated in the ECC are included as provisions in the Bid Documents to be issued to prospective Contractors; • Ensure that all engineering interventions in the approved EMP, RAP, and ECC issued are included in the Terms of Reference (TOR) of the Detailed Engineering Design; • Execution of MOA with DENR-ARMM regarding formation and operationalization of the Multi-Partite Monitoring Team (MMT) for implementing the EMoP; and • Other necessary roles upon finalization of the RAP during the DED stage
	Multi-Partite Monitoring Team (MMT) shall be composed of representatives of DPWH-ARMM, DENR-ARMM, LGUs, NGOs, academia, representative of affected persons and organizations and associations.	• Validate project compliance with the conditions stipulated in the ECC and the EMP; • Validate DPWH's conduct of self-monitoring; • Receive complaints, gather relevant information to facilitate determination of validity of complaints or concerns about the project and timely transmit to the Proponent and EMB recommended measures to address the complaint; • Prepare, integrate and disseminate simplified validation reports to community stakeholders; and • Make regular and timely submission of MMT Reports based on the EMB-prescribed format

Stage	Name of Organization	Role and Responsibility
		• Observe/participate as applicable during conduct of monitoring activities; • Coordinate with the Pollution Control Officer (PCO) of Contractors assigned to the Project, to ensure that conditions stipulated in the ECCs are properly complied with, including the gathering of baseline data on air and water quality, and subsequent monitoring of such; • Notify DPWH ESSD about any act or activity by the Contractors that are deemed as violations to the stipulations in the ECCs and amendments issued, and recommend immediate courses of action to avoid or mitigate any violation to said stipulations; and • Compile monitoring data gathered by the Contractors and supervise preparation of semi-annual monitoring reports to be submitted to the DENR-ARMM
Pre-Construction and Construction Phases	POs and NGOs	• Actively participate in ALL activities of the MMT; • Receive complaints from Barangay Homeowners' Associations, women's organizations, and other concerned sectors; • Gather relevant information to facilitate determination of validity of complaints or concerns about the project; • Promptly transmit to the MMT recommended measures to address the complaint; and • Prepare, integrate and disseminate simplified validation reports and feedback to community stakeholders
	The Contractor	• Ensuring that all engineering interventions in the approved EMP, RAP, and ECC issued are included in the Terms of Reference (TOR) of the Detailed Engineering Design; • Implementation of mitigation measures and monitoring based on the approved EMP on EIS and RAP
Operation	DPWH-ARMM and DENR-ARMM	• DPWH-ARMM shall conduct monitoring on the approved EMP on EIA and RAP, and report to DENR-ARMM and LGUs • The result of monitoring shall be disclosed at DPWH-ARMM and LGUs • Regular inspection and maintenance of the Sub-Projects • The Planned monitoring is carried out for two (2) years after construction of the Sub-Projects

Source: JICA Study Team

7.6 Institutional Arrangement for RAP

7.6.1 DPWH National and DPWH ARMM

Due to the nature of the ARMM which enjoys autonomy, there is a need to observe the legal process when the National Government is implementing project in the region. Based on the discussions with both sides (DPWH National and ARMM Government), the proposed procedure is illustrated in **Figure 7.6.1-1**.

Based on the said figure, identified projects by the DPWH National inside the ARMM will be submitted to the ARMM Government thru DPWH-ARMM for inclusion in the list of projects to be consolidated by the RPDO (Regional Planning Development Office). These lists are then discussed and approve by the REDPB (Regional Economic and Development Planning Board) and endorse to the RLA (Regional Legislative Assembly). The RLA then enact a law (Regional Assembly Public Works Act) containing the projects approved by the REDPB. Once the RAPWA is ready (where the target projects of DPWH-National are included), the ARMM Government through the DPWH-ARMM will request the DWPH-National to implement the projects identified by the DPWH-National. The reasons for such request may include (i) lack of experience of DPWH-ARMM to handle such huge project, (ii) technical difficulty among other reasons.

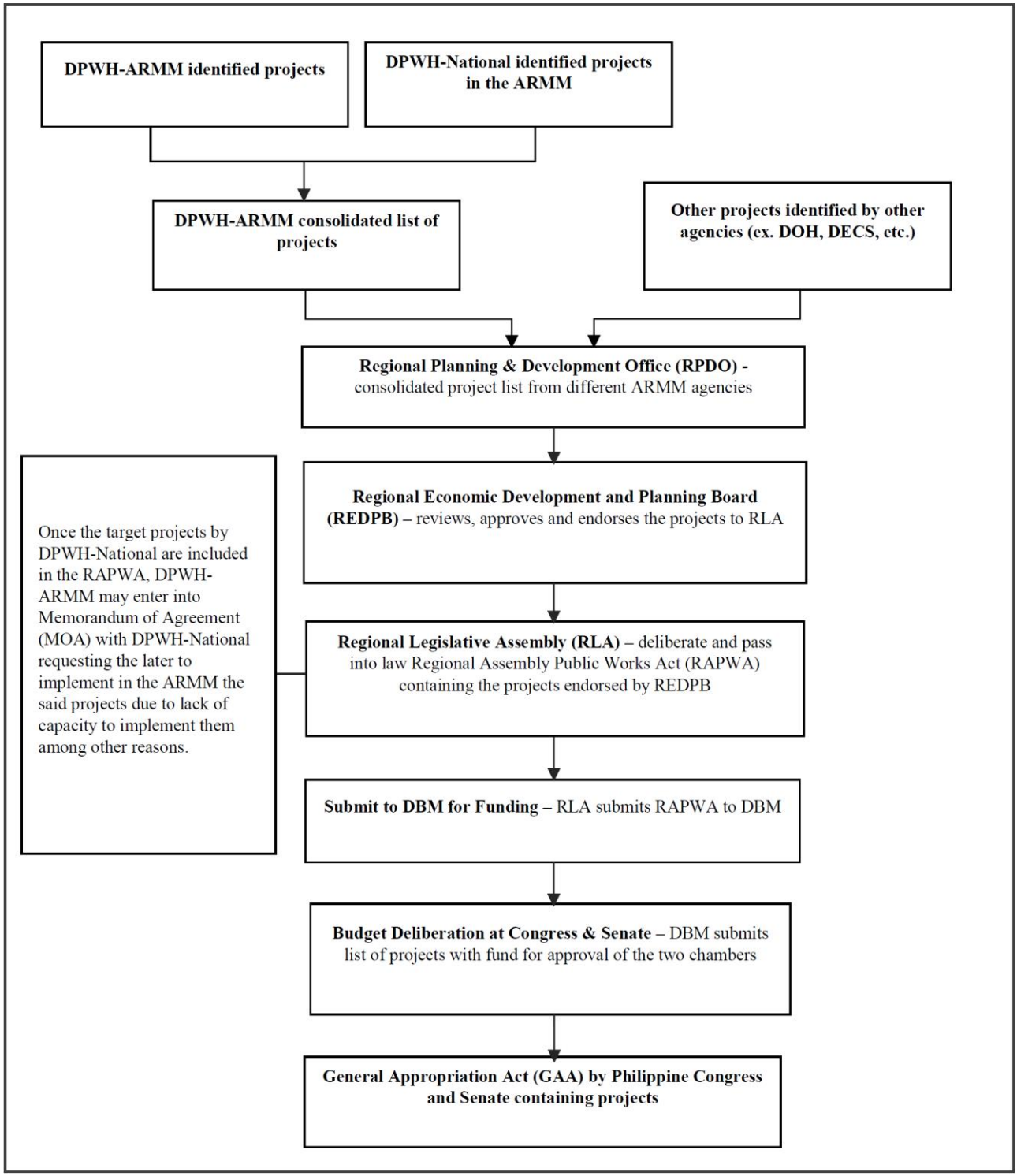


Figure 7.6.1-1 Proposed collaboration procedure between DPWH-ARMM and DPWH-National between DPWH-ARMM and DPWH-National

1) Current DPWH Capacities on Social Safeguards

Effective resettlement is influenced by on the capacity and commitment of the agencies responsible for resettlement planning and management. In the past few years, DPWH has improved its management processes; however, the capacity across all levels must be further strengthened. JICA will continue to assess the suitable institutional capacity of DPWH, including NCIP at the National, Regional and Local levels and provide technical assistance to address the issue of institutional development and capacity building by financing the conduct of IR/IP management training seminars and workshops.

2) National Level

DPWH. The Department of Public Works and Highways (DPWH) will be the Executing Agency (EA) for the Project. The overall direction and leadership for implementing the RIPP will be implemented by the Secretary, supported by the Undersecretary of UPMO Operations and other members of the Executive Committee (EXECOM) of the DPWH which composed of the Undersecretaries and Assistant Secretaries of the Department.

Unified Project Management Office-ROW Task Force, DPWH. The UPMO shall be responsible for implementing and evaluating the Project, including land acquisition and other resettlement related activities. It will guarantee that funds for the timely implementation of RIPP are available and that all costs are properly accounted for.

The Roads Management Cluster II, Multilateral, Unified Project Management Office, DPWH as the overall project management unit shall manage and supervise the implementation of the RIPP. RIPP implementation shall be in harmony with the RIPF which complements all GOP laws and the JICA SPS (2009), covering eligibility, compensation, entitlement and relocation, measures that ensure proper coordination and meaningful participation with stakeholders and PAPs. Resettlement activities and land acquisition will be carried out in close partnership with the DPWH Planning Service through its Environmental and Social Services Division (ESSD), Regional Office (RO), District Engineering Office (DEO), Local Government Units (LGUs), National Commission on Indigenous Peoples (NCIP), Resettlement Implementation Committee (RIC) and all other pertinent agencies and instrumentalities of the government to fully address the impacts of involuntary resettlement.

Environmental and Social Services Division, DPWH the ESSD shall provide technical guidance and support in the implementation and monitoring of the social safeguards document/plan. They are tasked to:

- carry out complete preparation and planning of the RIPP;
- submit social safeguards document/plan budget plans (to include compensation, relocation costs, operations) for approval and allocation of needed resources by the DPWH central office;
- in accordance with the Department's resettlement policies, guide the District Engineering Offices and the Regional Offices in their tasks, such as the authentication of PAPs, final inventory of affected assets, consultation, and information dissemination;
- revise or complement the RIPP in case problems or potential problems are identified during the internal and/or external monitoring of its implementation;

- in collaboration with its counterpart in the Region, work closely with the DPWH ROW on the processing of compensation entitlements of PAPs;
- in collaboration with UPMO, monitor the development of compensation payment to PAPs and other resettlement-related activities stated in the RIPP; and;
- In collaboration with its regional counterpart, make quarterly monitoring reports on social safeguards document/plan implementation for submission to the UPMO and JICA.
- For uploading the RAP the DEO with assistance of the RIC shall conduct record of loss and socio-economic surveys validation for submission the UPMO and JICA.
- Provide RIPP orientation to DPWH RO and DEO Team and RIC to strengthen the social, legal, and technical capabilities of these resettlement implementing entities.
- Assist the RIC in community awareness raising undertakings for the RIPP implementation.

3) Site Level

District Engineering Office, DPWH. The DEO will perform as Technical Coordinator and will (i) oversee the staking-out and verification of affected properties; (ii) review, and if found correct, prepares and approves disbursement vouchers/payments; (iii) cause the quick delivery of payments to the affected persons with the assistance of RIC (iv) submit reports on disbursements and payments to PAPs to the RO and the UPMO; and (v) submit monthly progress reports to ESSD, the ROs and the UPMO. The DEO will chair the RIC and will actively participate in its functions.

Regional Office, DPWH. The RO will act as the liaison between ESSD and the DEO and will make sure that the RIPP is implemented as planned. Specific activities of the RO are: (i) monitor the RIPP implementation and fund disbursement; (ii) submit the monthly progress reports to ESSD; (iii) monitor payments to PAPs; (iv) monitor assistance provided to the poor and vulnerable households and (v) address complaints filed by the PAPs for speedy resolution.

4) Interagency Coordination

Resettlement Implementation Committee (RIC). Its members shall be composed of representatives from the RO and DEO, the City/Municipal, the NCIP provincial and/or regional office, affected barangays, and PAPs with separate representation for IP/ICC communities affected by the project. Selection of these ICC/IP representatives shall follow the procedures of the NCIP. Its functions are:

i. Assist the DPWH staff involved in resettlement activities in (a) validating the list of PAPs; (b) validating the assets of the PAPs that will be affected by the project (using a prepared compensation form); and (c) monitoring and implementing the RIPP;

ii. Assist the DPWH and NCIP staff in recognizing who among the PAPs are IPs or belong to ICCs.

iii. Assist the DPWH and staff involved in the RIPP activities in the public information campaign, public participation and consultation.

iv. Assist DPWH in the disbursement of compensation to PAPs;

v. Receive complaints and grievances from PAPs and other stakeholders and act accordingly;

vi. Keep a record of all public meetings, complaints, and actions taken to address complaints and grievances; and

vii. In coordination with concerned government authorities, assist in the enforcement of laws/ordinances regarding intrusion into the project site or RROW.

The **Municipal Resettlement Implementation Committee** (RIC) shall be formed through a Memorandum of Understanding (MOU) between DPWH, the concerned local government unit, with the National Commission on Indigenous Peoples (NCIP) Provincial or Regional Office.

5) National Commission on Indigenous Peoples (NCIP)

The NCIP is the principal government agency through which ICCs/lPs can seek government assistance. The IPRA bestows upon the NCIP the power to issue certificate of ancestral land/domain title (CALT/CADT) (IPRA, Section 44e). It has the power to issue appropriate certification as a pre-condition to the grant of permit, lease, grant or any other similar authority for the disposition, utilization, management, and appropriation by any private individual, corporate entity or any government agency, corporation or subdivision thereof on any part or portion of the ancestral domain taking into consideration the consensus approval of the ICCs/lPs concerned.

NCIP AO No. 3 S. 2012 bestows upon the NCIP Regional Office the responsibility to receive applications for the issuance of Certification Precondition. It is responsible for the conduct of the Field Based Investigation (FBI) and overseeing the process for obtaining the Free and Prior, Informed Consent (FPIC) from the affected IPs/lCCs. The NCIP also authenticates expressions of voluntary initiation or solicitation for certain projects made by IP communities.

Local Government unit. Provide LGU legal instruments (e.g., Executive Orders, Municipal Resolutions, Memorandum Orders, etc.) that are essential for the implementation of the RIPP. In particular, LGUs shall (i) provide the necessary land for relocation purposes, (ii) cooperate with UPMO to form and mobilize RIC to direct and oversee implementation, and monitor RIPP implementation; and (iii) address issues, grievances and complaints as specified in the GRM section of this document.

National Housing Authority. Per RA 7279, the local government unit, in partnership with the National Housing Authority (NHA), shall provide relocation or resettlement sites with basic services and facilities and access to employment and livelihood opportunities appropriate to meet the basic needs of the affected families. NHA is tasked with the development of shelters/housing for relocation.

6) Capacity Building

To fully implement the RAP, the ESSD, RO and DEO units of DPWH will require capacitating on RIPF as well as the overall JICA SPS (2009). Trainings will be conducted before the social safeguards planning. Specific topics recommended for the training are:

i. Strengthen knowledge and awareness of DPWH vital units on provisions in the RIPF including JICA SPS (2009) on involuntary resettlement and indigenous peoples.

ii. Where there are IPs, an orientation on the cultural issues and sensitivities of the particular group will have to be conducted;

iii. Requirements, guidelines and procedures for social safeguards planning;

iv. Update, revision, as well as understanding use of the Inventory of Loss/ Detailed Measurement Survey instruments.

v. Conduct of meaningful consultations.

vi. Orientation and finalization of comprehensive plans for livelihood restoration, plan for compensation disbursement and its required document, and required document for grievance handling.

vii. Monitoring of resettlement, formulation of IP development plan and reporting.

DPWH as the primary executing agency shall retain sufficient staff with relevant qualifications and experience to be able to adequately implement the RAP.

(1) DPWH Unified Project Management Office (DPWH UPMO) ROW Task Force

The UPMO-ROW Task Force (URTF) and its TWG was created through the issuance by the DPWH Secretary the D.O No. 203 series of 2016. This Order is in line with the Department's decentralization efforts to streamline procedures for a more effective and expeditious implementation of urgent national roads, bridges and various flood control projects being implemented by the Unified Project Management Offices which are hampered by the delay in the ROW acquisition. The URTF shall perform the following responsibilities:

1. Organize a ROW Team for each UPMO Cluster that will handle the ROW acquisition of its projects, to be headed by the Project Managers assigned to the project.
2. Monitor the ROW acquisition status and recommend appropriate actions on projects with problematic ROW.
3. Execute and recommend appropriate resolutions pertaining to payment of ROW affected by various UPMO projects which are beyond the authority of the Project Directors.
4. Review the validation of supporting documents undertaken by its TWG and recommend payments after evaluation as to propriety of the claims.

(2) URTF Technical Working Group

The TWG shall exercise the following functions:

1. Ensure that all relevant papers and documents in support of the ROW claim are carefully screened and verified as to their authenticity and genuineness in order to forestall fraud, pursuant to the provisions of the Simplified Guidelines for Validation and Evaluation of ROW Claims.
2. Ensure that the computation of land valuations and disturbance compensation (structures and other improvements) are based on the RA 10752 and its IRR and other applicable laws, policies and department orders.

Under DO 203, the processing and payment of valid ROW claims for UPMO projects shall be governed by the following guidelines:

1. Processing of claims shall only be made upon the approval of the URTF/ROW Team Resolution.
2. Payment for lots and improvements (structures and trees) should be effected in accordance with the provisions of RA 10752 and IRR and other governing laws, policies and DOs.
3. Payments of ROW claims shall be made by the concerned DEOs. DPWH ROW Acquisition Manual

The UPMO concerned shall submit to the URTF the inventory and status of ROW claims every month. The URTF Chairperson shall submit the overall accomplishments of the Task Force to the Secretary, through the Undersecretary for UPMO Operations, every quarter. The UPMO concerned shall safe-keep ROW documents within its jurisdiction and prepare a continuing inventory of lots acquired for ROW for submission to the URTF and the Records Management Division of the Human Resource and Administrative Service in the CO.

(3) Public-Private Partnership Service (PPPS)

The DPWH Secretary has issued Department Order (DO) No. 65, series of 2017 to streamline the operations of the DPWH, and decentralize and rationalize ROW operations for a more effective and expeditious implementation of infrastructure projects.

The Public-Private Partnership (PPP) and Toll Regulatory Board (TRB) projects, shall be lodged with the PPP Service (PPPS) Director who will serve as the approving authority for all ROW functions and transactions for regional projects, that are neither PPP, TRB, nor Unified Project Management Office (UPMO) projects, regardless of amount.

(4) DPWH Legal Service (LS)

The Legal Service (LS) is directed to perform the following support functions in the pursuit of the objectives of ROW Task Forces:

1. ROWA activities described in Appendix "A" of DO 65 and in the DRAM, especially those provisions which concern the designation and delegation of new signing/ approving authorities.
2. Pre-validation, validation, or re-validation of ROW transactions, as necessary.
3. Technical assistance.
4. Logistics and ground works.
5. Advisory functions.
6. Inter-agency consultation, coordination, and collaboration.
7. Other activities necessary to ROW acquisition and enforcement.

(5) ROW Task Force

The ROW Task Force can either for PPP and TRB Projects or for Regional Projects. In PPP and TRB Projects wherein the PPPS Director is authorized to constitute a ROW Task Force, to be headed by him, for each PPP/ TRB project, or portion thereof, the ROW acquisition of which is being implemented by the DPWH. For the Regional Projects headed by the Regional Director concerned, prior notification of and clearance from the Undersecretary for Legal Affairs and Priority Projects.

Every ROW Task Force shall take all steps necessary for the timely completion of all ROW functions, including the following:

1. Exercising all pertinent tasks and functions associated with ROWA.
2. Engaging in inter-agency coordination and consultation.
3. Recommending, to the appropriate authority, appropriate measures to address ROW problems which lie outside the authority of any member of the ROW Task Force.
4. Advising and recommending to the Undersecretary for Planning and PPP, budgetary matters for purposes of submitting accurate, complete, and informed budget request to the Department of Budget and Management, and for other budgetary planning objectives.

(6) DPWH-ARMM/Regional Office

The DPWH -ARMM for all Sub-Projects and the Regional Director 12 for concerned road alignment in Sub-Project 6, however, may delegate to the District Engineer concerned the approval of Disbursement Vouchers and Checks for payments of ROW claims and transactions, particularly where the District Engineering Office (DEO) is the Implementing Office and the ROW funds are released to and administered by the DEO.

(7) DPWH ESSD

As further specified in the D.O. 65 Series of 2017, the ESSD shall have the following functions:

1. Assist in the preparation, review, update and approval of RAP and its budget plan;
2. Assist the DPWH- UPMO in facilitating consultation meetings and information dissemination to PAPs and other relevant stakeholders throughout the RAP Process;
3. Provide training on RAP;
4. Assist the DEOs and MRICs in the validation of PAPs and entitlements; and
5. Track and monitor the implementation of the RAP, in accordance with the RAP Monitoring and Tracking Manual

It is taken into consideration that some of the tasks which are not under the mandate of DPWH will still be indefinite. Among those areas include: (1) acquisition of land for relocation sites; (2) cutting and transport of coconut trees; and (3) community organizing among affected, and host communities in preparation for integration (i.e., if renters of land opt to be relocated).

7.7 Cost Estimates, Compensation and Entitlements

7.7.1 Cost Estimates and Compensation

The cost estimates provided in this report is based on the provisions of DPWH-LARIPP, 3rd Edition Manual, 2017 and Pursuant to RA 10752 which states that DPWH will deal to the property owner concerned, as compensation price, the sum of: (I) the current market value of land (ii) the replacement cost of structures and improvements and (iii) the current market value of crops and trees. Replacement Cost refers to the cost necessary to replace the affected structure or improvement with a related asset based on current market price. The Detailed Unit Price Analysis obtained from the DPWH which price

are certified by the Municipal Engineers Office was used to derive the current price of materials in coming up with Bill of Materials for both residential and other structures.

To determine the suitable price offer for the acquisition of ROW through negotiated sale, DPWH will employ the services of a government financial institution (GFI) with adequate experience in property appraisal or an independent property appraiser (IPA) accredited by: (1) the Bangko Sentral ng Pilipinas (BSP) or (2) a professional association of appraisers recognized by BSP.

1) Preliminary ROW Cost Estimates for Land

The current fair market values from the BIR Zonal Computation and an independent property appraiser (IPA) were compared to determine the Estimated ROW Cost of Land. To compute for the total ROW Cost of Land, the highest market value (which in this case was seen to be the current value by the independent property appraiser) was then multiplied by the total affected land area.

2) Preliminary ROW Replacement Cost Estimates for Structures and Improvements

Compensation for structure at replacement cost, defined as cost required replacing the affected structure or improvement with a similar asset based on current market. The following applies in compensation for other improvements on the affected land:

i. Cash compensation at replacement cost for the affected structures owned by the government or non-government agencies or the community.

ii. Cash compensation to include the cost of reconnecting damaged facilities, such as water, power and telephone lines.

The replacement cost of the affected structures, in this case were referred to the affected houses. The computation of individual dwellings was based on the current unit price of materials and estimated for each reconstruction of building according to type of the building part and kind of materials used.

3) Preliminary Cost Estimates for Crops and Trees

The following applies in compensation for affected crops, fruit trees, and perennials:

i. Cash compensation for perennials at current market value;

ii. PAPs will be given enough time to harvest crops on the subject land;

iii. Compensation for damaged crops (i.e palay and corn) at existing market value at the time of taking (compensation will be based on the cost of production per hectare pro-rata to the affected area); and

iv. Cash compensation for fruit trees will be based on current market value.

The current market values provided by the Department of Agriculture (DA) for crops and perennials, and Department of Environment and Natural Resources (DENR) for the trees were used in the valuation of the trees and crops of affected areas. The computation for the total cost will be computed using the following: ***yield x area x unit price.*** There was a separate detailed computation for the values of trees.

4) Preliminary Estimates of Other Entitlements of Project affected persons.

Pursuant on the provisions cited above, the following are mandated:

Disturbance Compensation - For agricultural land severely affected, the lessees are eligible to disturbance compensation equivalent to five times the average of the gross harvest for the past 3 years but not less than PhP15, 000.

Income Loss. For loss of business/income, the **AF** will be eligible to an income rehabilitation assistance not to exceed **PhP 15,000** for severely affected structures, or to be based on the latest copy of the AFs Tax record for the period corresponding to the stoppage of business activities.

Inconvenience Allowance in the amount of **PhP 10,000.00** shall be provided to AFs with severely affected structures, which require relocation and new construction.

Rehabilitation assistance (skills training and other development activities) equivalent to PhP15, 000 per family per municipality will be provided in partnership with other government agencies, if the present means of livelihood is no longer viable and the AF will have to engage in a new income activity.

Rental Subsidy. Will be provided to AFs without sufficient additional land to allow the reconstruction of their lost house under the following circumstances:

- The concerned properties are for residential use only and are considered as severely affected.
- The concerned AFs were physically residing in the affected structure and land at the time of the cut-off date.
- The amount to be given will be equivalent to the prevailing average monthly rental for a similar structure of equal type and dimension to the house lost.
- The amount will be given for the period between the delivery of house compensation and the delivery of land compensation.

Transportation allowance or assistance. If relocating, AFs are to be provided free transportation. Also, informal settlers in urban centers who choose to go back to their place of origin in the province or be shifted to government relocation sites will be provided free transportation.

The estimate values for the other entitlements were not determined in this report since there is a need to conduct a Parcellary Survey which will happen during the second phase of the project implementation which will be conducted by the Department of Public Works and Highways.

7.7.2 Mitigating Measures and Entitlement Matrix

1) Mitigating Measures

It is anchored in the following provisions of the law the mitigating measures that may be applied during the acquisition of land and implementation of resettlement action plan to achieve the optimum goals of this project. It is provided in the Philippine Constitution and its existing laws and JICA Resettlement

Guidelines the manner, by which these goals can be achieved: The following policy frameworks are reviewed as the basis for this project implementation.

Table 7.7.2-1 Matrix of Laws and Guidelines as basis for Mitigating Measures to be Undertaken

JICA / World Bank Guidelines	Laws of the Philippines
1. Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives.	No person shall be deprived of life, liberty, or property without due process of law, nor shall any person be denied the equal protection of the laws (Constitution of the Republic of the Philippines, Article III, and Section 1) and Acquisition, Resettlement, Rehabilitation and Indigenous Peoples' Policy, 2007 (LARRIPP, 2007)
2. When population displacement is unavoidable, effective measures to minimize impact and to compensate for losses should be taken.	Private property shall not be taken for public use without just compensation. (1987 Constitution of the Republic of the Philippines, Article II. Section 9) LARRIPP
3. People who must be resettled involuntarily and people whose means of livelihood will be hindered or lost must be sufficiently compensated and supported, so that they can improve or at least restore their standard of living, income opportunities and production levels to pre-project levels.	Monetary compensation is provided for the PAPs who have legal rights to land and structures (RA10752). For informal settlers, relocation site and socialized housing program is developed by the National Housing Authority (NHA) and LGUs (RA 7279). LARRIPP, 2007
4. Compensation must be based on the full replacement cost as much as possible.	Republic Act 10752, Section 4 clearly states that the modes of acquiring real property are through: a) donation, b) negotiated sale, c) And expropriation. Property valuation is market-based and undertaken using Government Financial Institutions (GFIs) or Independent Property Appraisers which help promotes unbiased property valuation. The assumption by the IA of the capital gains tax also provides supplementary incentive to the lot owners to negotiate with government, (DPWH, Dept. Order, No. 124, series of 2017)
5. Compensation and other kinds of assistance must be provided prior to displacement.	DO No. 5 (2003): unless ROW is purchased project notice of award to contractor cannot be issued, i.e. all kind of com pensation is paid before project is launched
6. For projects that entail large-scale involuntary resettlement, resettlement action plans must be prepared and made available to the public.	The LARRIP, 2017 spells out the legal framework and donors' policies governing instances when infrastructure projects implemented by the DPWH cause the involuntary taking of land, structures, crops, and other assets resulting in some cases in the displacement and resettlement of affected persons. It enumerates the entitlements and benefits that Project Affected Families (PPAPs) or Persons (PPAPs) should rightfully receive under the law based on the Project's adverse impacts on their assets, livelihood, and lives.
7. In preparing a resettlement action plan, consultations must be held with the affected people and their communities based on sufficient information made available to them in advance.	DPWH, LARIPP, 2017 Policy Framework Operations Manual incorporates the procedures that the National Commission on Indigenous Peoples (NCIP) has issued concerning the formulation of the Ancestral Domains Sustainable Development and Protection Plan (ADSDPP) and obtaining the Free and Prior, Informed Consent (FPIC) of Indigenous Peoples (FPIC). It also relates the requirements demanded by the NCIP with the requirements of multilateral lending agencies.
8. When consultations are held, explanations must be given in a form, manner, and language that are understandable to the affected people.	DENR Administrative Order No. 96-37 (To Further Strengthen the Implementation of the Environmental Impact Statement System), requires under Section 2 that "All information about the proposed project or undertaking shall be presented by the proponent to the public in a language and manner that are easily understood. LARRIPP, 2007

JICA / World Bank Guidelines	Laws of the Philippines
9. Appropriate participation of affected people must be promoted in planning, implementation, and monitoring of resettlement action plans.	RA 7279 Sec. 23 requires LGUs in coordination with Presidential Commission for the Urban Poor (PCUP) and concerned government agencies, to enable program beneficiaries "to be heard and to participate in the Decision-making process over matters involving the protection and promotion of their legitimate collective interests which shall include appropriate documentation and feedback mechanisms.", LARRIPP, 2007
10. Appropriate and accessible grievance mechanisms must be established for the affected people and their communities (WB OP 4.12 Para. 6).	LARRIPP, 2017 adopted the same procedure which states that: Grievances related to any aspect of the project or sub-project will be handled through negotiations and are aimed at achieving consensus following the procedures outlined below: a) The grievance shall be filed by the PAP with the Resettlement Implementation Committee (RIC) who will act within 15 days upon receipt thereof, except complaints and grievances that specifically pertain to the valuation of affected assets, since such will be decided upon by the proper courts. b) If no understanding or amicable solution can be reached, or if the PAP does not receive a response from the RIC within 15 days of registry of the complaint, he/she can appeal to the concerned Regional Office, which should act on the complaint/grievance within 15 days from the day of its filing; c) It the PAP is not satisfied with the decision of the Regional Office, he/she, as a last resort, can submit the complaint to any court of law.
11. Affected people are to be identified and recorded as early as possible in order to establish their eligibility through an initial baseline survey (including population census that serves as an eligibility cut-off date, asset inventory, and socioeconomic survey), preferably at the project identification stage, to prevent a subsequent influx of encroachers of others who wish to take advance of such benefits (WB OP 4.12 Para. 6).	There is a recognized provision under RA 7279 and its IRR where LGUs must conduct inventory of their ISFs. The conduct of survey and tagging are reputable practice by the Urban Poor Affair Office (UPAO). LARRIP, 2007 states the cut-off date as the date of commencement of the census. Resettlement project conducted by LGUs nationwide notifies to public the last day of the census work, and use the date as the cut-off date, so that no eligible PPAPs are left uncounted.
12. Eligibility of benefits include, the PPAPs who have formal legal rights to land (including customary and traditional land rights recognized under law), the PPAPs who don't have formal legal rights to land at the time of census but have a claim to such land or assets and the PPAPs who have no recognizable legal right to the land they are occupying (WB OP 4.12 Para. 6).	Professional Squatters (as defined by Republic Act 7279) applies to persons who have previously been awarded home lots or housing units by the government but who sold, leased or transferred the same to settle illegally in the same place or in another urban area, and non-bonafide occupants and intruders of lands reserved for socialized housing. Squatting Syndicates (as defined by Republic Act 7279) refers to groups of persons who are engaged in the business of squatter housing for profit or gain. Those persons are ineligible for structure compensation, relocation, and rehabilitation/ inconvenience/income-loss assistance in case their structures are to be demolished in resettlement project according to Republic Act 7279. This definition disregards individuals or groups who simply rent land and housing from professional squatters or squatting syndicates.
13. Preference should be given to land-based resettlement strategies for displaced persons whose livelihoods are land-based (WB OP 4.12 Para. 6).	A property needed for exchange with other government property near the project site (RA 8974 IRR Section 6). If reasonable, land for land will be provided in terms of anew parcel of land of Equivalent productivity, at a location acceptable to PPAPs. (LARRIP, 2007)
14. Provide support for the transition period (between displacement and livelihood restoration) (WB OP 4.12 Para. 6).	* Income Loss. For loss of business/income, the PAP will be entitled to an income rehabilitation assistance to be based on the latest copy of the PPAPs' Tax record for 3 months, or not to exceed P 15,000 for severely affected structures. *Inconvenience Allowance The amount of P10,000 shall be given to

JICA / World Bank Guidelines	Laws of the Philippines
	PPAPs with severely affected structures, which need relocation and new construction. *Rehabilitation assistance Skills training and other development activities equivalent to P 15,000 per family will be provided in partnership with other government agencies, if the present means of livelihood is no longer viable and the PAP will have to engage in a new income activity. *Transportation Allowance or assistance. If relocating, PPAPs to be provided free transportation. Also, informal settlers in urban centers who choose to go back to their place of origin in the province or be shifted to government relocation sites will be provided free transportation. (LARRIP (April, 2007, p. 18, 19)
15. Particular attention must be paid to the needs of the vulnerable groups among those displaced, especially those below the poverty line, landless, elderly, women and children, ethnic minorities etc. (WB OP 4.12 Para. 6).	RA 8972 provides assistances and privileges to solo parents and their children (solo parents include unmarried mother/ father, widow/widower, abandoned/separated). Under this law, they are given allocation in housing projects with liberal payment terms (Sec. 10), medical assistance (Sec. 11) and educational scholarship benefits (Sec. 9). RA 7279, for informal settlers below the poverty line and landless, requires preparation of relocation sites. Additional related laws of the Philippines address needs of vulnerable groups: a) RA 8425 (Social Reform and Poverty Alleviation Program Act) b) RA 9710 (Magna Carat of Women) c) RA 8371 (Indigenous Peoples Rights Act) d) RA 7277 (Magna Carta for Disabled Persons)

Source: JICA Study Team

Compensation and assistance are aimed to improve or at least restore the livelihoods of all displaced persons in real terms relative to pre-project levels and to enhance the standards of living of the displaced poor and other vulnerable groups. DPWH will deal to the property owner concerned, as compensation price (DPWH, Dept. Order No. 124, 2017), the sum of:

i. the current market value of land

ii. the replacement cost of structures and improvements and

iii. the current market value of crops and trees.

Replacement Cost — refers to the cost necessary to substitute the affected structure or improvement with a similar asset based on current market price.

Compensation and assistance are designed to improve or at least restore the livelihoods of all displaced persons in real terms relative to pre-project levels and to improve the standards of living of the displaced poor and other vulnerable groups.

2) Entitlement Matrix

Compensation and assistance are designed to improve or at least restore the livelihoods of all displace persons in real terms relative to pre-project level and to improve the standards of living of the displace poor and other vulnerable groups.

Table 7.7.2-2 Compensation and Entitlement Matrix

Type of Loss	Application	Entitled Person	Compensation/ Entitlements	Responsible Organization
A) Lands (Classified as Agricultural, Residential, Commercial, Institutional)	More than 20%of the total landholding lessor where less than 20% lost but the remaining land holding become economically unviable.	PAP with Transfer Certificate of Title or tax declaration (Tax declaration legalized to full title)	• Cash compensation for loss of land at 100% replacement cost at the informed request of PPAPs. • If feasible, land for land will be provided in terms of a new parcel of land of equivalent productivity, at a location acceptable to PPAPs, • Holders of free or homesteads patens and Holders of Certificates of Land Ownership (CLOA) under CA 141. Public Lands act will be compensated on land improvements only. • Public Lands Act will be granted under Comprehensive Agrarian Reform Act shall be compensated for the land at Zonal value. • If granted under Voluntary Offer to sell by the Landowner. CLOA issued under CA 141 shall be subject to the provisions of Section 112 of Public Lands Act shall receive compensation for damaged crops at market value at the time of taking. • Rehabilitation assistance in the form of skills training equivalent to the amount of P15,000.00, per family, if the present means of livelihood is no longer viable and the PAP will have to engage in a new income activity.	• UPMO-RMC II - Multi-lateral (DPWH)
		PAP without TCT	• Cash compensation for damaged crops at market value at the time of taking. • Agricultural lessors are entitled to disturbance compensation equivalent to five times the average of the gross harvest for the past 3 years but not less than PhP 15,000.	• UPMO-RMC II - Multi-lateral (DPWH)
	Less than 20% of the total land holding or where less 20% lost or where the remaining land holding still viable for use	PAP with TCT or lost tax declaration or declarations that are legalizable to full title	• Tax Cash compensation for loss of land at 100% replacement cost at the informed request of PAPs. • Holders of free or homesteads or patents and CLOAs under CA 141 Public Lands Act will be compensated on land improvements only. • Holders of Certificates of Land Ownership Award (CLOA) granted under the Comprehensive Agrarian Reform Act shall be compensated for the land at Zonal value. • If granted under Voluntary Offer to sell by the Landowner. CLOA issued under CA 141 shall be subject to the provisions of Section 112 of the Public Land Act. • Cash compensation for damaged crops at market value at the time of taking.	• UPMO-RMC II - Multi-lateral (DPWH)
		PAP without TCT	• Cash compensation for damaged crops at market value at the time of taking. • Agricultural lessors are entitled to disturbance compensation equivalent to five times the average of the gross harvest for the past 3 years but not less than PhP 15,000. (Computation Pro-rata)	• UPMO-RMC II - Multi-lateral (DPWH)
B) Structures (Classified as Agricultural, Residential,	More than 20%of the total land holding lost or where less than 20% lost but the	PAP with Transfer Certificate of Title or tax declaration (Tax declaration legalized to full title)	• PAP will be entitled to cash compensation for loss of entire structure at 100% of replacement cost. • Rental subsidy for the time between the submission of complete documents and the release of payment on land.	• UPMO-RMC II - Multi-lateral (DPWH)

Type of Loss	Application	Entitled Person	Compensation/ Entitlements	Responsible Organization
Commercial, Institutional)	Remaining structures no longer function as intended or no longer viable for continued use.	PAP without Transfer Certificate of Title	• PAP will be entitled to cash compensation for loss of entire structure at 100% of replacement cost. • Rental subsidy for the time between the submission of complete documents and the release of payment on land.	• UPMO-RMC II - Multi-lateral (DPWH)
	Less than 20% of the total landholding or where less 20% lost or where the remaining structure can still function and is viable for continued use.	PAP with Transfer Certificate of Title or lost tax declaration or declarations that are legalizable to full title	• Compensation for affected portion of the structure.	• UPMO-RMC II - Multi-lateral (DPWH)
		PAP without TCT	• Compensation for affected portion of the structure.	• UPMO-RMC II - Multi-lateral (DPWH)
C) Improvement	**Severely or marginally affected**	PAP with or without Transfer Certificate of Title, tax declaration, etc.	• Cash compensation for the affected improvements at replacement costs	• UPMO-RMC II - Multi-lateral (DPWH)
D) Crops, Trees, Perennials	**Severely or marginally affected**		• Cash compensation for the affected crops, trees, perennials at current market value as prescribed by DENR and LGUs.	• UPMO-RMC II - Multi-lateral (DPWH)
E) Commercial and Including Commercial Establishment	**Severely affected** 10% or more of the total landholding/productive asset lost or where less than 10% lost but the remaining land holding become economically unworkable	Land owner, Agricultural tenants/settlers/lessees with title, tax declaration and other proof of ownership or in compliance with RA 10752	• Rehabilitation assistance (skills training and other development activities) the same to P15, 000 per family will be provided in coordination with other government agencies, if the present means of livelihood is no longer viable and the PAP will have to engage in a new income activity. Department Order (DO) No.5, s. of 2003	• UPMO-RMC II - Multi-lateral (DPWH) • TESDA, CDA • DSWD • DOLE • DTI • NGO • LGU
F) Agricultural land	**Severely affected** Loss 20% and above of the total area of the land holding or where less than 20% loss but the remaining become economically unworkable	Agricultural Lessee	• Disturbance Compensation the same to five (5) times the average gross harvest for the past three (3) years but not less than 15,000.00. Department Order (DO) No.5, s. of 2003	• UPMO-RMC II - Multi-lateral (DPWH)
		Agricultural tenants and settlers	• Financial assistance the same to the average gross harvest for the last three (3) years and not less than P15,000 per hectare (EO 1035), Department Order (DO) No.5, s. of 2003	• UPMO-RMC II - Multi-lateral (DPWH)
G) Commercial/ Business Structure	**Severely affected** Loss 20% and above of the total area of the commercial structure or where less than 20% loss but the remaining Become economically Unworkable	PPAPs with latest copy of PAPs tax record for the period corresponding to the stoppage of business activities	• Income rehabilitation assistance not to exceed ₱15,000.00. Department Order (DO) No.5, s. of 2003	• UPMO-RMC II - Multi-lateral (DPWH)
H) Sever loss of residential structure	**Severely affected** Loss 20% and above of the total area of the main structure or where less than 20% loss but the remaining become economically unworkable	PPAPs that needs relocation and new construction	• Inconvenience Allowance in the amount of ₱10,000.00 Department Order (DO) No.5, s. of 200	• UPMO-RMC II - Multi-lateral (DPWH)
			Transportation Allowance or Assistance. • If relocating, free transportation will be provided to PAPs to include informal settlers in urban centres who choose to go back to their places of origin in the provinces or be shifted to government relocation sites. Department Order (DO) No.5, s. of 2003	• UPMO-RMC II - Multi-lateral (DPWH)

Type of Loss	Application	Entitled Person	Compensation/ Entitlements	Responsible Organization
			• For relocation (in coordination with the LGUs and NHA) or should relocation not be possible within the said period financial assistance in the amount the same to the prevailing minimum daily wage multiplied by six (6) months shall be extended to the affected families by LGUs concerned (RA 7279) • PAPs will be provided with relocation options suitable to their preference. Alternatives are a) Self relocation, b) On-site relocation, and c) Relocation to project-sponsored resettlement sites in cooperation with key actors – local governments and other entities as mandated by law.	• LGUs • NHA

Source: Department Order (DO) No.5, s. of 2003 R.A 7279 Executive Order No. 1035

7.8 Grievance Redress Mechanism

Simple query or inquiry, any controversy, issue or conflict that arose resulting from the interpretation and implementation of the Preparatory Survey for Road Network Development Project in Conflict-Affected Areas in Mindanao was referred to as grievance. This would range from issues on compensation for the lot and structure owners and eligibility criteria as well as on the issues of relocation sites and the quality of services extended by proper authorities and agencies in those sites. These grievances were seen to potentially induce unnecessary delays, local resistance and political tensions in executing the project. To appropriately address the grievances from the PAPs, a systematic Grievance Redress Mechanism (GRM) must be established to respond to potential valid concerns of the PAPs. This method will resolve the grievances of PAPs for the satisfactory implementation of the Preparatory Survey for Road Network Development Project in Conflict-Affected Areas in Mindanao.

There will be four (4) levels of grievance redress available to all PAPs and other stakeholders that can be done in the implementation of the project. Simple query or inquiry, any controversy, issue or conflict that arose resulting from the interpretation and implementation of the Preparatory Survey for Road Network Development Project in Conflict-Affected Areas in Mindanao was referred to as grievance. This would range from issues on compensation for the lot and structure owners and eligibility criteria as well as on the issues of relocation sites and the quality of services extended by proper authorities and agencies in those sites. These grievances were seen to potentially induce unnecessary delays, local resistance and political tensions in executing the project. To appropriately address the grievances from the Project affected persons, a systematic Grievance Redress Mechanism (GRM) must be established to respond to potential valid concerns of the Project affected persons. This method will resolve the grievances of Project affected persons for the satisfactory implementation of the Preparatory Survey for Road Network Development Project in Conflict-Affected Areas in Mindanao.

Level I – Municipal Level – There will be committee composed of AP representatives, representatives of affected Barangays and LGU stakeholders that will be set up and shall meet whenever a complaint is lodged. The committee will be chaired by the respective Municipal Mayor. However, in case the Municipal Mayor is an AP, there will be a deputy chair which will represent in his behalf. In this level, the grievance shall be filed by the AP (or the Punong Barangay) with the chairperson of the municipal grievance level committee. A record of the grievance will be provided to the MRIC within a working

day of receipt by the municipal level Grievance Committee chairperson. A decision should be made within 15 calendar days after receipt of the complaint. The AP or stakeholder will be informed in writing of the decision within two working days.

Level II – DPWH Regional Office – If the PAP is not satisfied with the decision of the Municipal Level, he can appeal before the DPWH Regional Office. The complaint will be acted upon and be decided within 10 calendar day from the date of receipt. A resolution will be officially sent in writing to the AP within five working days from the date in which the decision was made.

Level III – Project Level – The Project Level, represented by the DPWH Project Management Office and the DPWH ESSD, is the next level of committee that can cater any grievance complaint whose decision after the Level II is still not satisfactory to the AP. The complaint shall be acted upon and decided within 15 calendar days and the decision shall be communicated in writing within seven working days.

Level IV – Legal Procedures – Grievance complaints will be taken to the appropriate court of the Republic of the Philippines if the Project Level decision is unsatisfactory.

Other Grievances concerning officials conducting the resettlement process will be settled in accordance to the provisions of the DPWH Infrastructure Right-of-Way (IROW) Procedural Manual, to wit:

i. For complaints concerning local government executives, it shall be filed with the Department of Interior and Local Government.

ii. For complaints against subordinate officials shall be filed with the Office of the Local Chief Executive concerned.

iii. Complaints against officials of other national agencies may be filed with the Office of the President, or the Office of the Ombudsman.

iv. Aggrieved parties may also direct their complaints to and/or seek the assistance of the Commission on Human Rights or the Presidential Commission for the Urban Poor.

In addition to the project's GRM, JICA's accountability mechanism also applies to the project. The accountability mechanism provides opportunities for people that are adversely affected by JICA projects to express their grievances, seek solutions, and report alleged violations of JICA's operational policies and procedures, including safeguard policies. JICA's accountability mechanism comprises of (i) consultation led by JICA's special project facilitator to assist people adversely affected by JICA projects in finding solutions to their concerns and (ii) providing a process through which those affected by projects can file requests for compliance review by JICA's Compliance Review Panel.

7.8.1 GRM Procedures

All grievances received from the PAPs, both in writing and written when received verbally will be properly documented. It will be processed and handled appropriately, free of monetary charge until it arrived at a consensus resolution. The following general procedure in addressing grievances will be employed in the project:

1. A PAP with a grievance can submit a grievance report to the respective IGEC. It can be submitted in various forms: written, oral, by telephone, by email or text messages provided that the identity of the owner of the complaint is fully disclosed. Provision of multiple means of communication ensured a wider accessibility of the GRM to the PAP.
2. The IGEC will then verify the validity of the complaint, whether it is project related or not. For valid complaints, it will then be processed and submitted to the LIARAC for decision and action.
3. LIARAC will act and decide on the complaint within 15 days from the receipt of the complaint and then inform the IGEC regarding the decision. The IGEC will then inform the PAP about the decision of the LIARAC.
4. For non-valid complaint, the IGEC will extend services to the PAP by assisting them to the concerned agency that can act on the complaint.
5. The PAP has an option of forwarding the complaint to the DPWH UPMO if he is not satisfied with the decision of the LIARAC or his complaint had not been acted upon within the prescribed 15 days period and had not received any response from the IGEC. Moreover, complaints not fully resolved by the LIARAC within the prescribed period can also be forwarded to the DPWH UPMO.
6. The DPWH UPMO will review and decide on the complaint within 15 working days,and then forward the decision to the IGEC who will then inform the PAP on the decision.
7. If the PAP is not satisfied with the decision of the DPWH UPMO in the complaint submitted to them or there had been no response received, the PAP can file a legal complaint in any appropriate Court of Law.
8. Judicial procedures for the trial of the case will be followed once the complaint is already filed in the Court of Law. It is no longer covered in the jurisdiction and control of the Grievance Redress Mechanism and it is up to the Court to decide on the case.

7.9 Monitoring and Evaluation

7.9.1 Supervision and Internal Monitoring

The Environmental and Social Services Office (ESSO) under D.O. 58 of the DPWH shall conduct the supervision and in-house monitoring of implementation of the RAPs and will be alternately called the Internal Monitoring Agent (IMA).

The tasks of the Internal Monitoring Agent are to:

a. Regularly supervise and monitor the implementation of the RAPs in coordination with the concerned District Engineering Office (DEO), Regional Office (RO), and the Resettlement Implementation Committee (RIC). The findings will be documented in the quarterly report to be submitted to the PMO, which in turn will submit the report to the Bank;
b. Verify that the re-inventory baseline information of all PAFs has been carried out and that the valuation of assets lost or damaged, the provision of compensation and other entitlements, and relocation, if any, has been carried out in accordance with the LARRIPP and the respective RAP Report;
c. Ensure that the RAP and the MOA are implemented as designed and planned;

d. Verify that funds for implementing the RAPs, MOA are provided by the PMO in a timely manner and in amounts sufficient for the purpose;
e. Record all grievances and their resolution and ensure that complaints are dealt with promptly.

7.9.2 External Monitoring and Evaluation

An External Monitoring Agent (EMA) will be commissioned by the DPWH-PMO to undertake independent external monitoring and evaluation. The EMA for the Project will be either a qualified individual or a consultancy firm with qualified and experienced staff. The Terms of Reference of the engagement of the EMA shall be prepared by the DPWH and shall be acceptable to the Bank prior to the engagement. The tasks of the EMA are the following:

a. Verify results of internal monitoring;
b. Verify and assess the results of the information campaign for PAFs rights and entitlements;
c. Verify that the compensation process has been carried out with the procedures communicated with the PAFs and affected IPs during the consultations;
d. Assess whether resettlement, MOA; specifically, whether livelihoods and living standards have been restored or enhanced;
e. Assess efficiency, effectiveness, impact and sustainability of resettlement and MOA implementation, drawing lessons as a guide to future resettlement policy making and planning;
f. Ascertain whether the resettlement, MOA entitlements were appropriate to meet the objectives, and whether the objectives were suited to PAF; Suggest modification in the implementation procedures of the RAPs, MOA, if necessary, to achieve the principles and objectives of the Resettlement Policy;
g. Review on how compensation rates were evaluated; and
h. Review of the handling of compliance and grievances cases.

7.9.3 Stages and Frequency of Monitoring

The stages and monitoring frequency of the contract packages by the IMA and EMA as follows:

Compliance Monitoring.

1. This is the first activity that both IMA and EMA shall undertake to determine whether or not the RAPs and MOA were carried out as planned and according to this policy. The EMA will submit an Inception Report and Compliance Monitoring Report one month after receipt of Notice to Proceed for the engagement. The engagement of the EMA shall be scheduled to meet the Policy's requirement of concluding RAP, MOA, and implementation activities at least one (1) month prior to the start of civil works.
2. Semi-Annual Monitoring - The EMA will be required to conduct a monthly monitoring of RAP, MOA.
3. Final Evaluation-Final evaluation of the implementation of the LARRIPP will be conducted three months after the completion of payments of compensation to PAPs. For the MOA, the EMA will coordinate with the affected community on the dates of the final evaluation.
4. Post- Evaluation-This activity will be undertaken a year after the completion of the project, to determine whether the social and economic conditions of the PAFs after the implementation of the project have improved.

7.9.4 Schedule of Implementation of Raps And Monitoring

The PMO in coordination with the ESSO shall establish a schedule for the implementation of RAPs and PAPs and the required monitoring taking into account the project's implementing schedule. It is expected that one month prior to the start of the civil works, all RAP activities have been determined by the IMA and EMA as having been concluded. For MOA, all activities that relates to land acquisition, resettlement, including compensation, should also have been completed one month before the start of civil works. For activities other than those that execute Chapter III of this LARRIPP but are nonetheless covered by the MOA and the PAPs, their completion is not a pre-requisite for the start of the civil works component.

7.9.5 Reporting

The EMA is accountable to the PMO and reports to the ESSO. The PMO submits copy of EMA's and IMA's Reports.

7.9.6 Monitoring Indicators

Table 5.6-1 and **Table 5.6-2** presents the Internal and External Monitoring Indicators (based on Chapter 8, LARRIPP, 2007)

Table 7.9.6-1 Suggested Internal Monitoring Indicators

Monitoring Indicators	Basis for Indicators
1. Budget and timeframe	a) Have all land acquisition and resettlement staff been appointed and mobilized for the field and office work on schedule? b) Have capacity building and training activities been completed on schedule? c) Are resettlement implementation activities being achieved against the agreed implementation plan? d) Are PAP and MOA activities being implemented and targets achieved against the agreed time frame? e) Are funds for resettlement being allocated to resettlement agencies on time? f) Are funds for the implementation of the PAPs and MOA allocated to the proper agencies on time? g) Have resettlement offices received the scheduled funds? h) Have agencies responsible for the implementation of the PAPs and MOA received the scheduled funds? i) Have funds been disbursed according to the RAP? j) Have funds been disbursed according to the PAPs and MOA? k) Has the social preparation phase taken place as scheduled? l) Has all land been acquired and occupied in time for project implementation?
2. Delivery of Compensation and Entitlements	a) Have all AFs received entitlements according to numbers and categories of loss set out in the entitlement matrix? b) Have PAFs received payments for affected structures and lands on time? c) Have PAFs losing from temporary land borrow been compensated? d) Have all received the agreed transport costs, relocation costs, income substitution support and any resettlement allowances, according to schedule?

Monitoring Indicators	Basis for Indicators
	e) Have all replacement land plots or contracts been provided? Was the land developed as specified? Are measures in train to provide land titles to PAFs? f) How many PAFs opted to donate their land to the government? g) How many PAFs did not receive payment because their title is covered by the provisions of Sec. 112 of CA 141? h) How many PAFs opted to donate their lands to the government? i) How many landholdings were subjected to quit claim? Easement? j) How many PAFs accepted the first offer at zonal valuation? k) How many PAFs rejected the first offer and accepted the second offer? l) How many PAFs resorted to expropriation? m) How many PAF households have received land titles? n) How many PAFs have received housing as per relocation options in the RPAP? o) Does house quality meet the standards agreed? p) Have relocation sites been selected and developed as per agreed standards? q) Are the PAFs occupying the new houses? r) Are assistance measures being implemented as planned for host communities? s) Is restoration proceeding for social infrastructure and services? t) Are the PAFs able to access schools, health services, cultural sites and activities at the level of accessibility prior to resettlement? u) Are income and livelihood restoration activities being implemented as set out in income restoration Plan? For example utilizing replacement land, commencement of production, numbers of PAFs trained and provided with jobs, micro-credit disbursed, number of income generating activities assisted? v) Have affected businesses received entitlements including transfer and payments for net losses resulting from lost business and stoppage of production?
3. Public Participation and Consultation	a) Have consultations taken place as scheduled including meetings, groups, and community activities? Have appropriate resettlement leaflets been prepared and distributed? b) How many PAFs know their entitlements? How many know if they have been received? c) Have any PAFs used the grievance redress procedures? What were the outcomes? d) Have conflicts been resolved? e) Was the social preparation phase implemented? f) Was the conduct of these consultations inter-generationally exclusive, gender fair, free from external coercion and manipulation, done in a manner appropriate to the language and customs of the affected community and with proper disclosure?
4. Benefit Monitoring	a) What changes have occurred in patterns of occupation, production and resources use compared to the pre-project situation? b) What changes have occurred in income and expenditure patterns compared to pre-project situation? What have been the changes in cost of living compared to pre-project situation? Have PAFs' incomes kept pace with these changes? c) What changes have taken place in key social and cultural parameters relating to living standards? d) What changes have occurred for vulnerable groups? e) Are women reaping the same benefits as men? f) Are negative impacts proportionally shared by men and women?

Source: JICA Study Team

Table 7.9.6-2 External Monitoring Indicators

Monitoring Indicators	Basis for Indicators
1. Basic information on AP/IP households	a) Location b) Composition and structures, ages, education and skill levels c) Gender of household head d) Ethnic affiliation e) Access to health, education, utilities and other social services f) Housing type g) Land use and other resource ownership patterns h) Occupation and employment patterns i) Income sources and levels j) Agricultural production data (for rural households) k) Participation in neighborhood or community groups l) Access to cultural sites and events m) Value of all assets forming entitlements and resettlement entitlements
2. Restoration of livings standards	a) Were house compensation payments made free of depreciation, fees or transfer costs to the PAPs? b) Have PAPs adopted the housing choices developed? c) Have perceptions of "community" been established? d) Have PAPs achieved replacement of key social cultural elements?
3. Restoration of Livelihoods	a) Were compensation payments free of deduction for devaluation, fees or transfer costs to the PAPs? b) Were compensation payments adequate to replace lost assets? c) Was sufficient replacement land available of appropriate standard? d) Did transfer and relocation payments cover these costs? e) Did income substitution allow for re-establishment of enterprises and production? f) Have enterprises affected received adequate assistance to re-establish themselves? g) Have vulnerable groups have been provided income-earning opportunities? Are these effective and sustainable? h) Do jobs provided re-establish pre-project income levels and living standards?
4. Levels of AP Satisfaction	a) How much do PAPs know about resettlement procedures and entitlements? b) Do PAPs know their entitlements? c) Do they know if these have been met? d) How do PAPs measure the extent to which their own living standards and livelihood been restored? e) How much do PAPs know about grievance procedures and conflict resolution procedures? How satisfied are those who have used said mechanisms?
5. Effectiveness of Resettlement Planning	a) Were the PAPs and their assets correctly enumerated? b) Were any land speculators assisted? c) Was the time frame and budget enough to meet objectives? d) Were entitlements too generous? e) Were vulnerable groups identified and assisted? f) How did resettlement implementers deal with unforeseen difficulties?
6. Other impacts	a) Were there unintended environmental impacts? b) Were there unintended impacts on employment or incomes?

Source: JICA Study Team

7.9.7 Reporting and Disclosure

For internal monitoring, DPWH will generate the data for a comprehensive and consolidated semi-annual monitoring report (SMR) to be submitted to JICA. Semi-annual monitoring reports are subject to evaluation by JICA and posted on the JICA and project websites for disclosure purposes.

DPWH through its implementing units shall reveal results of monitoring relevant to the sites specifically to the affected communities/persons in summary form, to wit: status of the RIPP including its updated versions, information on benefits sharing, and corrective action plans, if necessary. Community disclosures will be in the language generally understood by the Affected households/IPs and posted at a location generally agreed with Affected households/IPs and village leaders.

7.10 Environmental Impact Assessment (EIA)

7.10.1 Summary of Environmental Impact Assessment (EIA) for Sub-Project 1

(1) Description of the Project Components

The Project Components are described in **Chapter 13**.

(2) Baseline of the Environmental and Social Condition

Baseline of the Environmental and Social Condition is described in **Chapter 13** and **Section 7.2**.

(3) Laws, Regulations, and Organizations related to Environmental and Social Considerations for EIA

Laws, Regulations, and Organizations related to Environmental and Social Considerations for EIA are described in **Section 7.1** and **Section 7.3.1**.

(4) Analysis of Alternative Alignments

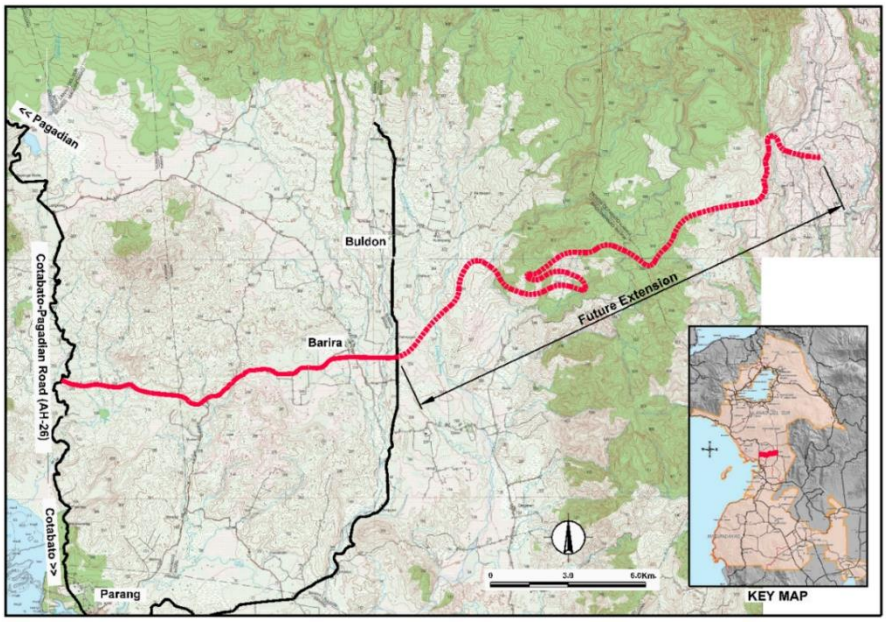
The comparative analysis of alternatives was described in **Chapter 12** and **Chapter 14**. The summary is shown below.

1) Alignment Selection Criteria

The criteria for alignment selection are as follows;

- Length, Construction Cost, Construction period (road length, no of bridges and culverts, etc.)
- Economic Impact (population along the alignment, agricultural land areas to be served, etc.)
- Environmental Impact (high-filling section length, high-cutting section length, no. of buildings to be affected)
- Technical feature (total no. of curves no. of curves < 300m, length of vertical grade >= 5%)

Figure 7.10.1-1 shows the recommended alignment for the road.



Source: JICA Study team

Figure 7.10.1-1 Recommended Alignment

2) Zero option

The zero option (with / without sub-project) of this project is shown in **Chapter 11** and **Chapter 22**.

(5) Scoping and Survey item for Environmental and Social Considerations Survey

Scope of the EIA study for the project is discussed in this section. The environmental scoping is conducted based on an environmental reconnaissance by the JICA Survey Team.

The result of scoping is indicated on the Leopold scoping matrix as shown in **Table 7.10.1-1** and reason for scoping tables as shown in **Table 7.10.1-2**.

The scoping matrix below shows the impact factors, impacted item and impact degree based on JICA's guidelines and Philippine items. According to the scoping matrix, majority of the items or seventeen (17) items are rated as "B-" (Some impact is expected) due to huge earth work volume and significant social impacts, No.14 (The poor) is rated as "B+/-" (Some impact is expected), four (4) items are rated as "C" (unknown impact is expected) and eight (8) are rated as "D" (Few impacts are expected).

Table 7.10.1-1 Draft Scoping Matrix Based on JICA's Guidelines and Philippines Items

	No	Affected Activities / Impact Items (JICA)	(Philippines)	Overall Rating	Pre/ During Construction Phase: Land acquisition and Loss of properties	Change of Land use plan, Control of various activities by regulations for the construction	Reclamation of Wetland, etc.	Deforestation	Alteration to ground by cut land, filling, drilling,	Operation of Construction Equipment and Vehicles	Construction of Roads, tollgates, parking lots, Access roads for bridges and other related facilities	Traffic Restriction in construction area	Influx of construction workers, construction of base camp	Operation Phase: Increase of Through Traffic	Appearance/ Occupancy of Roads and related building structures including tunnel and	Increasing influx of settlers
Pollution	1	Air Pollution	Air quality & noise	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	D
	2	Water pollution	Water quality	**B-**	D	D	D	D	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	3	Waste	Abandonment	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	4	Soil contamination	Soil quality/fertility	**B-**	D	**B-**	**B-**	D	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	5	Noise and Vibration	Noise	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	D
	6	Ground Subsidence	Subsidence/ collapse	D	D	D	D	D	D	D	D	D	D	D	D	D
	7	Odor		D	D	D	D	D	D	D	D	D	D	D	D	D
	8	Sediment quality	Soil quality	**B-**	D	D	D	D	**B-**	D	**B-**	D	D	D	D	D
Natural Environment	9	Protected Area	Environmentally Critical Areas (ECAs)	D	D	D	D	D	D	D	D	D	D	D	D	D
	10	Ecosystem	Terrestrial Biology Freshwater or marine ecology	**B-**	**B-**	**B-**	D	**B-**	**B-**	C	**B-**	D	**B-**	D	**B-**	**B-**
	11	Hydrology	Hydrology and oceanography	**B-**	D	D	**B-**	D	**B-**	D	D	D	D	D	**B-**	D

	No	Impact Items (JICA)	(Philippines)	Overall Rating	Pre/ During Construction Phase: Land acquisition and Loss of properties	Change of Land use plan, Control of various activities by regulations for the construction	Reclamation of Wetland, etc.	Deforestation	Alteration to ground by cut land, filling, drilling,	Operation of Construction Equipment and Vehicles	Construction of Roads, tollgates, parking lots, Access roads for bridges and other related facilities	Traffic Restriction in construction area	Influx of construction workers, construction of base camp	Operation Phase: Increase of Through Traffic	Appearance/ Occupancy of Roads and related building structures including tunnel and	Increasing influx of settlers
	12	Topography and geology	Geography, topography and landslides	**B-**	D	D	**B-**	D	**B-**	D	D	D	D	D	D	D
Social Environment	13	Involuntary resettlement	People	**B-**	**B-**	D	D	D	D	D	**B-**	D	D	D	D	D
	14	The poor	People	**B+/-**	**B+/-**	D	D	D	D	D	**B+/-**	D	D	D	D	**C**
	15	Indigenous and ethnic people	Indigenous people (IPs)	D	D	D	D	D	D	D	D	D	D	D	D	D
	16	Local economy such as employment and livelihood	People	**B-**	D	D	D	D	D	D	**B-**	D	**B-**	D	D	**C**
	17	Land use and utilization of local resources	Land use and classification	**B-**	D	**B-**	D	D	D	D	D	D	**B-**	D	D	**B-**
	18	Waste Usage	Hydrology / Hydrogeology/ Water quality	**B-**	D	D	D	D	D	D	D	D	**B-**	D	D	D
	19	Existing social infrastructures and services	People	**B-**	**B-**	D	D	D	D	D	**B-**	D	D	D	D	**B-**
	20	Social institutions such as social infrastructure and local decision making institutions		D	D	D	D	D	D	D	D	D	D	D	D	D
	21	Misdistribution of benefit and damage		D	D	D	D	D	D	D	D	D	D	D	D	D
	22	Local conflict of interests	People	**C**	D	**C**	D	D	D	D	D	D	D	D	D	D
	23	Cultural Heritage	People	**C**	**C**	D	D	D	D	D	**C**	D	D	D	D	D
	24	Landscape		D	D	D	D	D	D	D	D	D	D	D	D	D
	25	Gender		D	D	D	D	D	D	D	D	D	D	D	D	D
	26	Right of Children		D	D	D	D	D	D	D	D	D	D	D	D	D
	27	Infectious diseases such as HIV/AIDS	People	**C**	D	D	D	D	D	D	D	D	**C**	D	D	D
	28	Labor environment (including work safety)		**B-**	D	D	D	D	D	D	**B-**	D	**B-**	D	D	D
Others	29	Accidents	Traffic situation	**B-**	D	D	D	D	D	**B-**	D	**B-**	C	**B-**	D	D
	30	Cross Boundary impacts and climate change	Meteorology / Climatology	**C**	D	D	D	**C**	D	D	D	D	D	**C**	D	D

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

Table 7.10.1-2 Reasons for Draft Scoping

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
Pollution	1	Air pollution (Air quality & noise)	**B-**	**B-**	**Construction phase:** Temporary negative impacts are expected on air quality due to fugitive dust emissions from construction activities such as land clearing, grading, excavation, and the transport and movement of construction materials. **Operation phase:** Negative impacts on air quality are expected due to emission from vehicles passing on the new road.
	2	Water pollution (Water quality)	**B-**	D	**Construction phase:** Domestic wastewater will be generated from construction workers. Surface water will become turbid due to solids generated from earth works and drilling in the site. Oil and grease and petroleum hydrocarbons may pollute water that may come from vehicles and construction equipment. **Operation phase:** No serious impacts are expected.
	3	Waste (Abandonment)	**B-**	D	**Construction phase:** Construction waste such as waste soil and cutting trees are expected to be generated by deforestation, cutting, land clearing and drilling. Solid wastes from construction workers may be generated from construction base camp. Hazardous wastes such as busted lamps, used oil, used paints etc. maybe generated from construction site. **Operation phase:** No serious impacts are expected
	4	Soil contamination (soil quality)	**B-**	D	**Construction phase:** Removal of vegetation may affect the soil quality due to oil & grease and petroleum hydrocarbon contamination from construction equipment and vehicles. **Operation phase:** No serious impacts are expected.
	5	Noise (Noise)	**B-**	**B-**	**Construction phase:** Increased noise levels will be significant due to heavy construction vehicles moving to and from the site, drilling and excavation activities. **Operation phase:** Noise generation is expected by vehicles passing on the new road.
	6	Ground subsidence (Subsidence)	D	D	No impacts are expected. There will be no groundwater extraction during the construction and operation activities.
	7	Odor	D	D	Few impacts are expected. Obnoxious odor may come from vehicle exhaust, clearing & dredging of river banks.
	8	Sediment quality (Soil quality)	**B-**	D	**Construction phase:** Surface water runoff which may have caused the sediment transport is expected during construction activities due to earthworks, land clearing, excavation etc. **Operation phase:** Road operation which causes impacts on sediment quality is not expected.
Natural environment	9	Protected area (ECAs)	D	D	**Construction and operation phase:** No protected area such as designated conservation zone is observed in the project affected area.
	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	**B-**	**B-**	**Construction and Operation phase:** With the implementation of the project, during the construction phase, land clearing and topography alteration will require removal of existing vegetation cover within the road Right of way. Clearing of remaining vegetation will also possibly affect remaining wildlife and its habitats to give way for the construction of road project. Impacts of the project will be assessed based on the result of the terrestrial survey and to be able to come up with apt recommendations to mitigate such impacts. The result of the survey also serves as the basis for monitoring during the Operation phase.
	11	Hydrology (Hydrology and oceanography)	**B-**	**B-**	**Construction Phase:** Rating B- under Reclamation of Wetland, etc. - Extent of impact is unknown. The road alignment may not cross wetland and/or swamps. In case the final road alignment will traverse the wetlands, survey and analysis should be done to make sure that the road network will not hamper the natural flow of water prior to the road construction.

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
					Construction and Operation Phase Rating B- under Alteration to ground by cut land, land filling, drilling, tunnel, etc. - Some impact is expected. The proposed road will traverse through generally flat terrain and rolling grounds drainage impact is expected. This may change the drainage flow to other directions and may cause flooding in some areas. Flooding that is expected maybe due to rainwater flow restrictions and natural blocking of surface water runoff in the construction site.
	12	Topography and geology (Geography, topography and landslides)	**B-**	D	**Construction and Operation Phase**: Earthworks such as land filling and land cutting would affect the topographic condition along the proposed road alignment. Risk associated with landslides maybe expected in sections passing steep terrain. Slope protection measures could be necessary during the operation phase. No protected geological site is located in the project area.
Social Environment	13	Involuntary resettlement	**B-**	D	**Pre-Construction Phase:** Settlements and private lands will be acquired to give way for the road construction. This will cause involuntary resettlement (physical and economic) **Operation Phase:** No impact is expected since it was already settled during pre-construction period
	14	The poor	**B+/-**	**C**	**Construction Phase:** Some impacts (positive/negative) is expected considering the socio-economic condition of the community in the project area **Operation Phase:** Extent of impacts are still unknown but looks forward to easier access of the poor to public services
	15	Indigenous and ethnic people	D	D	**Construction and Operation Phase**: The existence of indigenous people has not been confirmed in project area. No impacts are expected.
	16	Local economy such as employment and livelihood	**B-**	**C**	**Pre-Construction phase:** Livelihood of residents and farmers may be affected by resettlement and acquisition of agricultural area **Operation Phase:** Few impacts are expected.
	17	Land use and utilization of local resources	**B-**	**B-**	**Pre-Construction phase:** Some agricultural areas will be affected by the project. **Operation Phase:** Roadside area may be developed as commercial or industrial area in non-designated land use area. Such unplanned development and influx of new settlers may give impact on land use and local resources.
	18	Waste Usage	**B-**	D	**Construction Phase:** Earth works such as cutting land and drilling of tunnel may give impact on drinking water resources such as springs and wells. **Operation phase:** No impact is expected.
	19	Existing social infrastructures and services	**B-**	**B-**	**Pre-construction and Construction Phase:** Relocation of religious facilities, school, cemetery and other public facilities need to be considered. **Operation Phase:** Existence of the road may disturb commuting/ going to school and hospital

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
	20	Social institutions such as social infrastructure and local decision making institutions	D	D	Impacts are not expected, since local decision making institute represented by local governments will continue after the road construction.
	21	Misdistribution of benefit and damage	D	D	Misdistribution of benefit and damage caused by the road constructions not expected.
	22	Local conflict of interests	**C**	D	**Construction Phase:** Local inhabitants and local authorities may request to ensure job opportunities as construction workers. **Operation phase:** No impact is expected.
	23	Cultural Heritage	**C**	D	**Pre-construction and Construction Phase:** Impact will be assessed based on confirmation of cultural heritages around the project site.
	24	Landscape	D	D	No impact is expected.
	25	Gender	D	D	Negative impact specified for women are not expected
	26	Right of Children	D	D	Negative impact specified for children are not expected
	27	Infectious diseases such as HIV/AIDS	**C**	D	**Construction Phase:** Infectious diseases such as STD are possible to be spread due to inflow of construction workers. Furthermore, alteration to ground by cut land and filling may provoke to provide habitats of mosquito that possibly transmits dengue fever **Operation phase:** Road operations which causes infectious diseases are not expected
	28	Labor environment (including work safety)	**B-**	D	**Construction Phase:** Construction work environment needs to be considered in accordance with relevant laws and regulations **Operation phase:** No impact is expected.
Others	29	Accidents (Traffic situation)	**B-**	**B-**	**Construction Phase:** Construction vehicles may use existing local road near residential areas, thus number of traffic accident. **Operation phase:** Quantitative analysis based on baseline survey
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	**C**	**C**	**Construction phase:** Deforestation for land clearance may give impact on cross boundary impacts and climate change. **Operation phase:** Greenhouse gas emissions from vehicles that pass by along the new roads maybe generated which will have an impact in the protection of ozone layer as a result of climate change.

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (serious impacts are not expected, but survey and analysis shall be done) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

Table 7.10.1-3 Baseline Survey and Forecast Analysis for Draft Scoping

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/ During Construction	Operation Phase		
Pollution	1	Air pollution (Air quality & noise)	**B-**	**B-**	-Site measurement (2 sites) TSP, PM_{10}, NO_2 and SO_2 -Secondary data collection, if any	**Construction Phase:** Qualitative analysis **Operation Phase:** - Quantitative analysis(PM_{10}, NO_2, and SO_2) (Puf model : calm wind model)
	2	Water pollution (Water quality)	**B-**	D	-Site measurement (2 sites: river water)	**Construction Phase:** Qualitative analysis

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/ During Construction	Operation Phase		
					DO, TSS, BOD, COD, pH, Total/Fecal Coliform, temperature -Secondary data collection, if any	
	3	Waste (Abandonment)	**B-**	D	Review of specification on design and construction plan	**During Construction Phase:** Quantitative analysis of volume of cutting trees by type and excavated or drilling soil and muck
	4	Soil contamination (soil quality)	**B-**	D	Review of specification on design and construction plan	**During Construction Phase:** Qualitative analysis
	5	Noise and vibration (Noise)	**B-**	**B-**	Noise -Site measurement (2 sites) $L_{Aeq,\ 10min}$ weekday (in accordance with DENR regulation) -Secondary data collection, if any	**During Construction Phase:** Qualitative analysis based on construction machines on standard formation **Operation Phase:** - Quantitative analysis(ASJ RTN-Model 2013)
	8	Sediment quality (Soil quality)	**B-**	D	Literature survey (land use history on affected land of the project)	**During Construction Phase:** Qualitative analysis base on the literature survey
Natural environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	B-	B-	Literature survey and site survey for fauna and flora. (Terrestrial: 4sites)	**During construction and operation phase:** Qualitative analysis base on the literature survey, site survey and construction plan & traffic volume in the future
	11	Hydrology (Hydrology and oceanography)	**B-**	**B-**	Literature survey and referring to hydrographic and geological survey result on feasibility study and designing	**During construction and operation phase:** Quantitative analysis on following items base on the hydrographic analysis for bridge and drainage designing. - Impact on hydrological situation on the rivers and streams - Impact on water vein underground - Impact on flooding situation
	12	Topography and geology (Geography, topography and landslides)	**B-**	D	Literature survey and topographic survey for designing	**During construction and operation phase:** Qualitative analysis base on the topographic analysis for designing
Social environment	13	Involuntary resettlement (People)	B-	D	Literature survey and a series of RAP surveys (Inventory of loss assets, census, social economic survey and replacement cost study)	**During construction phase:** Quantitative analysis based on RAP surveys
	14	The poor (People)	B+/B-	C	Literature survey and a series of RAP surveys	**During construction phase:** Quantitative analysis based on RAP surveys
	16	Local economy such as employment and livelihood (People)	**B-**	C	Literature survey and a series of RAP surveys	**During construction phase:** Qualitative analysis based on RAP surveys
	17	Land use and utilization of local resources (Land use and classification)	**B-**	**B-**	Literature survey and a series of RAP surveys	**During construction phase:** Quantitative analysis based on RAP surveys (area of land acquisition by land use)
	18	Water usage (Hydrology / Hydrogeology/Water quality)	**B-**	D	Literature survey, geological survey and water usage survey (identification of springs and wells around tunnel and cutting land areas based on the data from RAP survey)	**During construction phase:** Qualitative analysis base on the baseline survey for following items - Impact on springs and wells - Impact on watershed area

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/ During Construction	Operation Phase		
	19	Existing social infrastructures and services (People)	**B+**	**B-**	Literature survey and a series of RAP surveys	**During construction and operation phase:** Quantitative analysis based on RAP surveys
	22	Local conflict of interests (People)	C	D	Collection of information and opinions in stakeholder meeting(s)	**During construction:** Qualitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
	23	Cultural heritage (People)	C	D	Literature survey, a series of RAP surveys and collection of local information through stakeholder meeting(s)	**During construction:** Quantitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
	27	Infectious diseases such as HIV/AIDS (People)	C	D	Literature survey and collection of local information through stakeholder meeting(s)	**During construction phase:** Qualitative analysis based on baseline survey. Followings impacts are considered - Risks of HIV/AIDS - Risks of dengue fever - Other specific infection disease
	28	Labor environment (including work safety)	**B-**	D	Literature survey, a series of RAP surveys and collection of local information through stakeholder meeting(s)	**During construction:** Quantitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
Others	29	Accidents (Traffic situation)	**B-**	**B-**	Collection of traffic accident data from police station	**During construction and operation phase::** Quantitative analysis based on baseline survey
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	**C**	**C**	-Estimation of affected forest area and traffic conditions based on the project plan	**During construction and operation phase::** Quantitative analysis based on baseline survey

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

(6) Summary of Baseline Survey, Forecast and Impact Assessment

The summarized result of baseline survey and forecast of impacts are shown in **Table 7.10.1-4**. The baseline data and quantitative forecast is shown in **Table 7.10.1-5**. and survey points of air & noise and water quality is shown in **Figure 7.10.1-4** and survey points of air & noise and water quality is shown in **Table 7.10.1-6**.

In terms of pollution items such as air, water and noise, all the forecasted values are within the allowable limits, thus it is not likely provided serious impact in these items. However, construction waste soil from cutting land and drilling in the tunnel section shall be reused or disposed in appropriate designated disposal site.

With regard to IUCN List, although some species are identified through the baseline survey on flora and fauna, these species are distributed around the around the Sub-Project area. The estimated numbers of resettlers are 108, appropriate compensation and mitigation measures are necessary on the resettlement action plan.

Table 7.10.1-4 Result of baseline and Forecast on Main Items

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
Pollution	1	Air Pollution (Air Quality & Noise)	B-	B-	B-	B-	Result of (TSP, PM_{10}, SO_2, NO_2) at 2 stations are below the standard values (See **Table 7.10.1-6**)	Forecast value do not exceed standard values	Expected impacts by the project are not significant because all the forecasted values are within the standard values Quantitative Standards as shown in **Table 7.10.1-5**.
	2	Water pollution (water Quality)	B-	D	B-	D	Result of (pH, Temp, BOD, TSS, DO) are within the guidelines (See **Table 7.10.1-6**)	During construction activities may cause turbidity water and oil and grease contamination. Likewise, domestic waste may be discharge from the camp	Impacts may be minimized or mitigated by provision of erosion control measures such as settling traps, use of portable toilet, etc. Quantitative Standards as shown in **Table 7.10.1-5**.
	3	Waste	B-	D	B-	D	Not required	Clearing and deforestation activities are expected to generate construction waste such as soil, debris, cut trees Also, additional domestic waste may be generated from the construction camp.	Impacts can be mitigated by proper management and disposal of waste like practice ecological waste management, segregation at source, 3R, etc
	4	Soil Contamination (Soil Quality)	B-	D	B-	D	Not required	Soil maybe contaminated from the construction equipment and transportation.	Impacts can be mitigated by proper maintenance of equipment and transportation, proper containment and disposal of oil, etc.
	5	Noise	B-	B-	B-	B-	There are some measurement of noise that exceeded the standard particularly during the night due to presence of insects like crickets that make noise during the dark and usual in the rural areas. (See **Table 7.10.1-6**)	Forecast value exceed Philippines standard values (Class A (General)), but the value do not exceed Japanese standard values(Class B2). (See **Table 7.10.1-6**)	Impacts may be mitigated by avoidance and other measures such as no construction during the night or use of muffler or sound proof barrier. Quantitative Standards as shown in **Table 7.10.1-5**.

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
	6	Ground Subsidence	D	D	D	D	The Project Area is dominated by volcanic plain or volcanic piedmont deposits, chiefly pyroclastics and/or volcanic debris usually found at the foot of volcanoes. Plateau basalt in Pagadian and Lanao regions, and non-active cones (generally pyroxene andesite) are also present. The most recent deposit is the Quaternary Alluvium composed of alluvium, fluviatile, lacustrine and beach deposits, raised coral reefs, and beachrock. Thick, extensive, transgressive mixed shelf marine deposits, largely wackes, shales and reef limestone are also present.	Not required	Not required
	7	Odor	D	D	D	D	Not required	Few impacts are expected. Obnoxious odor may come from vehicle exhaust, clearing & dredging of river banks.	Qualitative measurements based on sensitivity of receptors against unobjectionable odor
	8	Sediment Quality	B-	D	B-	D	Not required	During construction sediment will most likely erode into the water particularly during heavy rains	Impacts may be mitigated through erosion /sedimentation control measures, or stoppage of soil clearing during heavy rains, use of silt trap
Natural Environment	9	Protected Area	D	D	D	D	Not required	Not required	No protected area is observed in the area.
	10	Ecosystem (Terrestrial Flora and Fauna)	B-	C	B-	C	Diversity composition of the study area is very low having a total of 46 species accounted dominated by trees. Recorded species are common and naturally growing in the area. The result of assessment also reveals that there are no threatened species included in the IUCN categories. Faunal composition of the assessed alignment is dominated by avifauna species (24 avifauna and 4 herpeto-fauna). Most of the recorded species are common and locally sited in different ecosystems in the lowland areas including the agricultural areas, shrub lands, grass lands and settlements areas. These species also thrive even in highly disturb areas including cities. Only 1 species is	The project development will require removal of vegetation cover to give way for the construction of the proposed road project. Further loss of vegetation cover as a result of land clearing may encourage movement/migration of wildlife species in the area aggravated by the loss of habitat/abode and remaining sources of food for survival. Likewise, wildlife disturbance due to noise pollution brought about by the operation of heavy equipment's during construction will force some faunal species to migrate to	Prior to project implementation the proponent will coordinate to the DENR and Philippine Coconut Authority (PCA) to seek clearance for the identification of required documents for the issuance of needed tree and coconut cutting permits (PD 705). Moreover, to compensate the loss of habitats, the proponent will replace the number of trees removed/cut and plant them in nearby areas or in accordance with the advice of the DENR. Species that will be used for the reforestation must be indigenous trees and/or fruit bearing trees endemic in the place that can attract wildlife species. Planting of trees will help in sequestering carbon in the environment. As per DENR Memorandum Order no. 05 of 2012 mandated that "Uniform replacement ratio for cut or

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
							endemic in the study area. No threatened species are included in the IUCN conservation categories.	other or nearby areas/habitat where disturbance is less.	relocated trees" item 2.2 "For planted trees in private land and forest lands... tree replacement shall be 1:50 while naturally growing trees in the same area, including those affected by the project, shall be 1:100 ratio in support of the National Greening Program (NGP) and Climate Change Initiatives of the Government". Compensation for affected coconut palms shall be based on Section 5 of Republic Act No. 8048, an act providing for the regulation of the cutting of coconut palms. Replacement ratio of cut coconut palm shall be 1:1.
	11	Hydrology	B-	B-	D	D	The river systems that affect the proposed road alignment are the Nituan River and one of its tributary. During the conduct of field investigation, no ground water wells or springs were found that may be affected by the project and based on the data from the National Water Resources Board (NWRB) and from Local Water Utilities Administration (LWUA) .	Most likely not affected as no wells were found on the alignment	Not give serious impact on the ground water
	12	Topography and Geology	B-	B-	B-	B-	In general, Maguindanao for its part has 45% plain and 55% sloping areas. Its southwestern part consists of mountain cluster of the Binica and Blit Mountains. The biggest and longest river is the Rio Grande de Mindanao which flows through Liguasan Marsh before emptying into the Moro Gulf.	Slope failure, soil erosion, and rock fall may potentially occur along high cut slope sections by unstable soil layers of sand and gravel due to cut, weathering, erosion and water infiltration.	Impacts may be mitigated by slope protection

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
Social Environment	13	Involuntary resettlement (People)	B-	D	B-	D	Based on the RAP survey, there are 20 affected dwellings and 108 resettlers are identified.	Land acquisition may cause acquisition of agricultural land, crops and resettlement. Thus, RAP is prepared in accordance with JICA Guidelines and Philippine Laws.	Appropriate compensation and assistance in accordance with RAP is prepared to minimize adverse social impacts.
	14	The Poor (People)	B+	C	B+ /-	C	Based on the profiles of the respondents during perception survey, 36.77% of the households are earning below poverty line (PhP5,000 to PhP10,000/month). This composed of the total income of the households per month which only reflects that more than quarter of the respondents are living in poverty.	Land acquisition by the project gives some adverse impact to poor people under poverty line	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of livelihood/income to the poor may be consider.
	15	Indigenous and ethnic people (Indigenous People)	D	D	D	D	Not required	Not required	The existence of indigenous people has not been confirmed in project area. No impacts are expected.
	16	Local Economy such as employment and livelihood (People)	B-	D	B-	D	Based from the occupation or source of income of the respondents, most of them depend on farming 65.16% and laborers 60% in the project area. Farming is the most strategic form of work due to the proximity of these people to the community. Around 16.77% are employed while 18.71% are engaged in others occupation.	Land acquisition by the project gives some adverse impact to tenant farmers and employees of the shops.	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of livelihood/income to the poor may be consider
	17	Land Use and utilization of local resources (Land Use and classification)	B-	D	B-	D	The project alignment is passing through mainly agricultural area such as plantation and residential zone	.In terms of the Agricultural Land Zone (AG), impacts are considered as both positive and negative. Positive in the sense that the road can provide better and faster way, and as such more economical way of transporting products from these areas to trading centers and other distribution sites. Negative in the sense that there is an imminent danger of illegal conversion into other uses	Some impacts are expected; thus these impacts and risks are minimized by appropriate land management

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
	18	Water usage (hydrology/ hydrogeology/water quality)	B-	B-	B-	B-	Water supply is scarce in some portions of project affected areas. Water source comes from dugwells and springs which are used for domestic and drinking water. In Balabagan, there are water delivery trucks in some areas that supplies water which costs PhP 50 per drum.	Earthworks may cause turbidity of river water as being use for domestic.	Minimized by control measures like silt trap, sedimentation pond, etc.
	19	Existing Social infrastructures and services (People)	B-	D	B-	D	There is 1 cemetery identified in the proposed alignment	The project does not give any impact to social infrastructures. Thus it is not likely to give any serious impacts on this item	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts, if any impacts are expected in the detailed design
	20	Social institutions such as social infrastructure and local decision-making institutions	C	C	C	C	Impacts are not expected, since local decision-making institute represented by local governments will continue after the road construction.	Impacts not Expected	Not required
	21	Misdistribution of benefit and damage	D	D	D	D	Misdistribution of benefit and damage caused by the road constructions not expected.	Impacts not Expected	Not required
	22	Local Conflict of interest (People)	C	D	C	D	Most of the stakeholders requested to provide work opportunities as a construction worker during construction in the stakeholder meetings on scoping stage	The local conflicts regarding work opportunities between local communities may be raised in case of unfair employment.	This risk is minimized by mitigation measures such as provision of priority in hiring during construction period.
	23	Cultural Heritage (People)	C	D	C	D	No cultural heritage affected.	Impacts not Expected	Not required
	24	Landscape	D	D	D	D	Not required	Few impact is expected	Not required
	25	Gender	D	D	D	D	LGU has implemented GAD projects	Impacts on Gender are mostly positive since opportunity for livelihood is expected (small business to women, employment to men)	Prioritization in hiring during construction and assistance for livelihood development
	26	Right of Children	D	D	D	D	Not required	Few impact is expected	Not required
	27	Infectious diseases such as HIV/AIDS (People)	B-	D	B-	D	No infectious illness recorded in the project area. Project should not to create a habitat of mosquito that transmits dengue fever in incidental pond in the construction area without appropriate drainage.	Infectious diseases such as STD are possible to be spread due to inflow of construction workers. Furthermore, alteration to ground by cut land and filling may provoke to provide habitats	This risk is minimized by mitigation measures such as construction of sufficient drainage, management of construction yard and health check & education for workers.

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
								of mosquito that possibly transmits dengue fever	
	28	Labor environment (including Work safety)	B-	D	B-	D	Not required	There are risks for workers during construction, if the construction contractor does not comply with relevant labor laws and regulations.	These risks are avoided and minimized by complying with relevant laws and regulations by the contractor under observation of DPWH
Others	29	Accident (Traffic Situation)	B-	B-	B-	B-	No serious problem on traffic	Construction vehicles may use existing local road near residential areas, thus number of traffic accident may increase	Can be minimized by installing traffic sign boards, lighting in the night, trained personnel and use of PPEs.
	30	Cross boundary impacts and climate change (Meteorology /climatology)	D	D	D	D	Not required	During Construction, deforestation will incur. On loss of vegetation, the project development will require removal of vegetation cover to give way for the construction of road project. The removal of vegetation will also result in the reduction in the population of plant species growing within the project area. Future vegetation will face a great threat during the clearing activity. This activity will hinder the opportunity of these regenerants to grow and replace those mature vegetation in the area. During operations, generation of carbon monoxide and other gases will be generated from exhaust vehicles which will impact the ozone layer	On loss of vegetation: During site preparation, clearing of the road ROW will result to the removal of of an estimated tree above ground biomass (using large of trees with dbh of 10 cm and above, and pole size tress with $\geq$ 5 cm dbh to 9.5 cm) of 1.59×10^{-4} and 2.87×10^{-4}megaram per hectare, and with estimated Carbon stored value of 3.53×10^{-4} and 6.38×10^{-4} megagram per hectare, respectively. It was computed using the brown allometric equation.

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

Table 7.10.1-5 Summary of Baseline and Forecasted Value (Air, Noise, Water)

No.	Item			Baseline Value (Standard Value)					Quantitative Forecast Analysis (Standard Value)			
1	Air Pollution	St.	Location	TSP (230μg/Ncm)	PM_{10} (150μg/Ncm)	NO_2 (150μg/Ncm)	SO_2 (180μg/Ncm)		TSP (230μg/Ncm)	PM_{10} (150μg/Ncm)	NO_2 (150μg/Ncm)	SO_2 (180μg/Ncm)
		1	Back of Datu Malambut Limoken Memorial High School,Barira, Maguindanao	20.0	3.9	2.9	1.9		-	4.0	2.9	1.9
		2	Brgy. Poblacion, Balabagan	14.5	1.7	6.7	1.0		-	1.7	6.7	1.0
2	Water Pollution (Water Quality)	St	Location	pH (6.5-9)	Temp, ºC (25-31)	BOD (7)	TSS (80)	DO (5ppm min.)	Basically, waste water is not discharged during and after construction, thus quantitative forecast has not been conducted.			
		1	Ambal River	7.4	26.1	<1	10	7				
		2	Kumagui River	7.2	27.3	2	3	9				
5	Noise	St	Location	Morning (50)	Daytime (55)	Evening (50)	Night time (45)		Morning (50) <60>	Evening (55) <60>	Evening (50) <60>	Night Time (45) <55>
		1	Back of Datu Malambut Limoken Memorial High School,Barira, Maguindanao	50	48	50	**49**		**52**	52	**51**	**50**
		2	Brgy. Poblacion, Balabagan	49	50	50	**49**		49	50	50	**49**

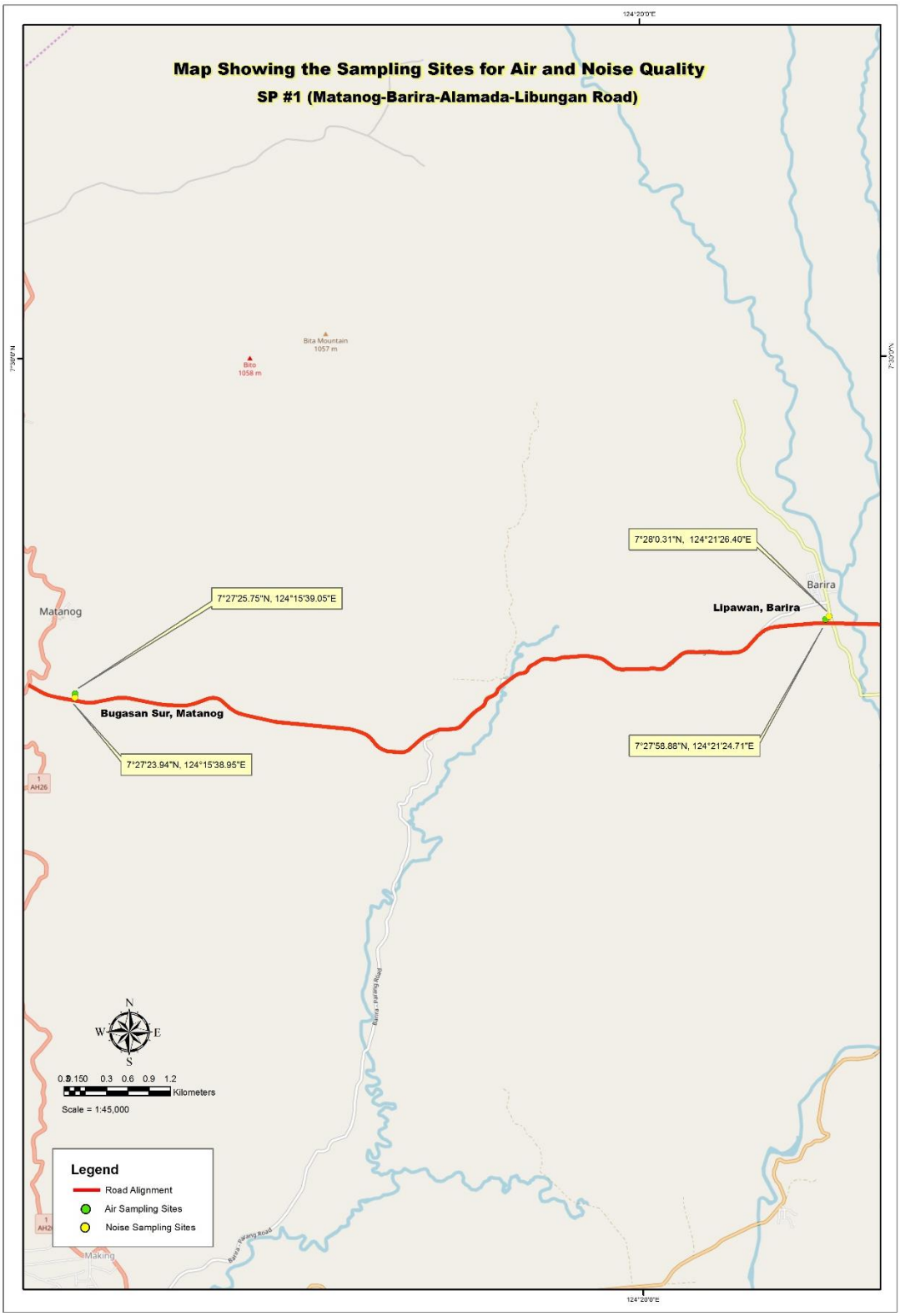
( ): Philippine Standard Values
< >: Japanese Standard Values
Source: JICA Study Team

Table 7.10.1-6 shows sampling stations for Noise, Air and Water Sampling Sites, Coordinates, Date and Time of Samplings and **Figure 7.10.1-2** and **Figure 7.10.1-3** show the sampling location for air, noise and water.

Table 7.10.1-6 Sampling points for Noise, Air and Water Quality

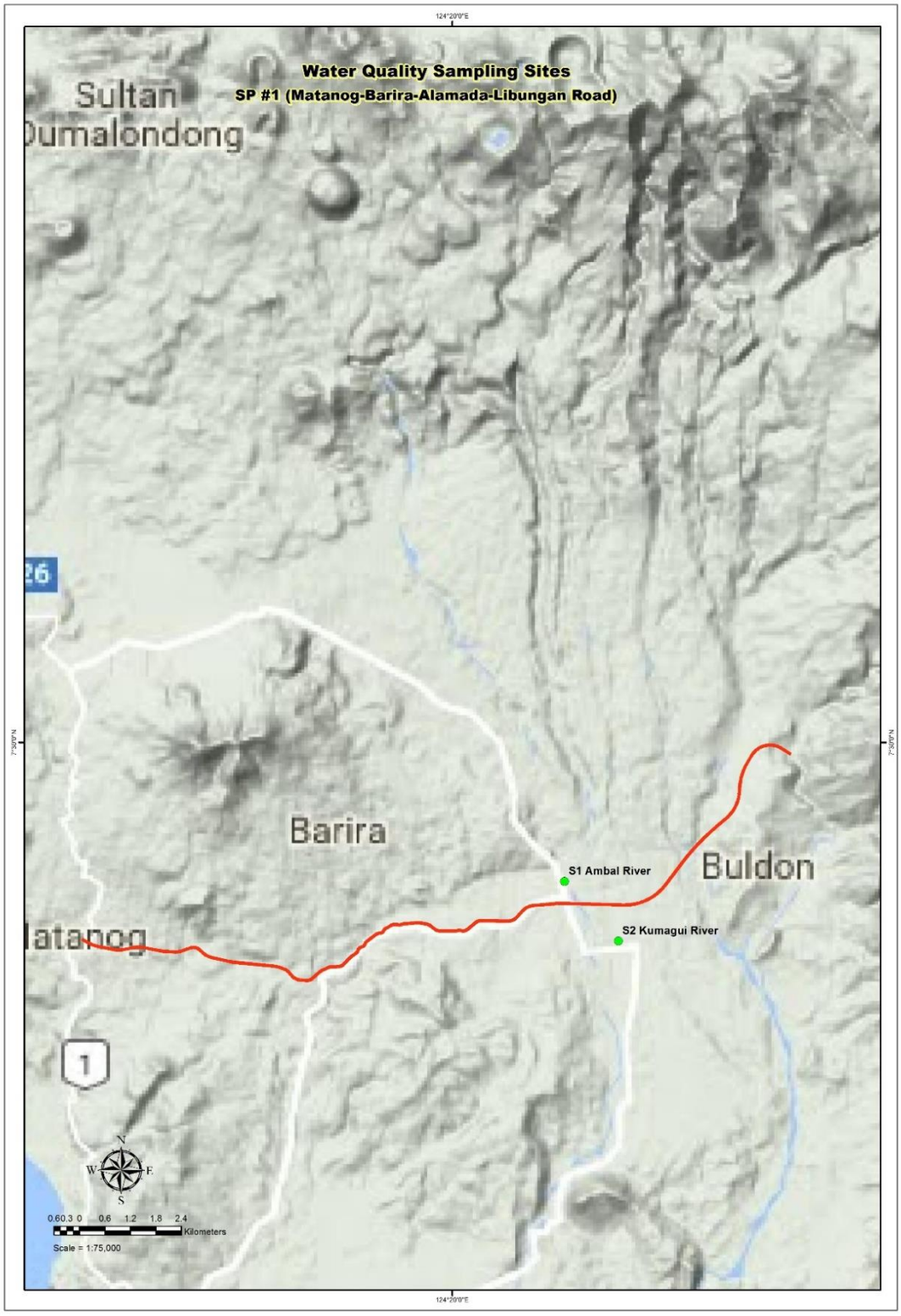
Station No.	Sampling Stations	Coordinates	Date and Time of Samplings
Noise			
N1	Back of Datu Malambut Limoken Memorial High School, Barira, Maguindanao	7°27'58.61" N 124° 21'26.02" E	December 9-10, 2017, 1420H
N2	Brgy. Bugasan Sur, Matanog, Maguindanao	7°27'51.5" N 124°15'35.02" E	December 15-16, 2017, 1000H
Air			
A1	Back of Datu Malambut Limoken Memorial High School, Barira, Maguindanao	7°27'58.61" N 124° 21'26.02" E	December 9-10, 2017, 1420H
A2	Brgy. Bugasan Sur, Matanog, Maguindanao	7°27'51.5" N 124°15'35.02" E	December 15-16, 2017, 1000H
Water			
W1	Ambal River	7°28'13.9" N 124° 21'25.6" E	November 15, 2017, 1430H
W2	Kumagui River	7°27'28.4" N 124° 22'06.7" E	December 5, 2017, 1125H

Source: JICA Study Team



Source: JICA Study Team

Figure 7.10.1-2 Sampling location map of air and noise covered by Matanog – Barira – Buldon – Alamada - Libungan Road



Source: JICA Study Team

Figure 7.10.1-3 Water Sampling Map covered by Matanog – Barira – Buldon – Alamada - Libungan Road

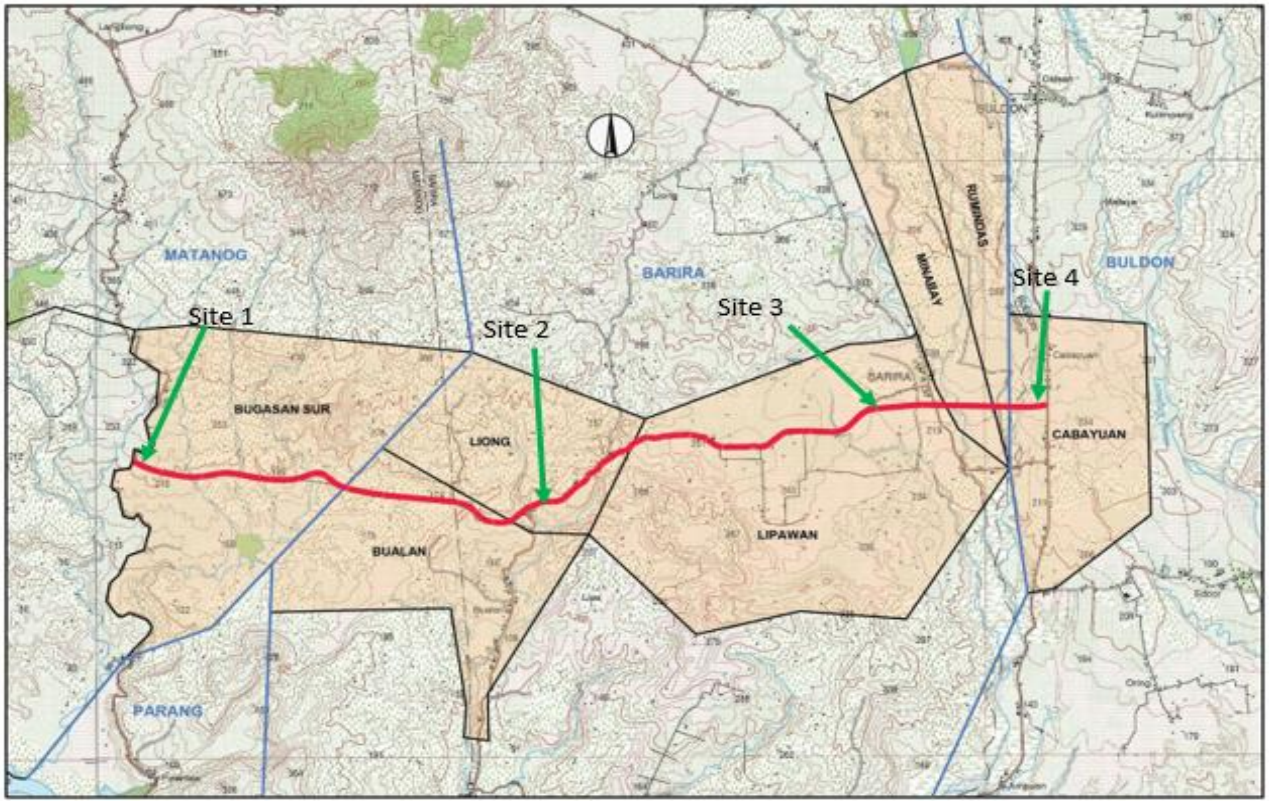
Survey on terrestrial flora and fauna was undertaken in 4 sampling sites within the proposed alignment in 7 covering barangays of Matanog,Barira and Buldon. Sampling for plant species composition and observation of prevailing fauna species within the proposed alignment was undertaken in the same selected locations. Barangays covered the sampling sites include Barangay Bugasan Sur, Liong,

Lipawan and Cabayuan, in the municipality of Matanog, Barira and Buldon. Geographic coordinates of observation sites are shown in the table below.

Table 7.10.1-7 Locations of observation sites for flora and fauna

Site	Municipality	Barangay	Geographic coordinates	
			Northing	Easting
1	Matanog	Bugasan Sur	7°27'29.37	124°15'18.24
2	Barira	Liong	7°27'8.43	124°18'25.50
3	Barira	Lipawan	7°27'54.88	124°20'58.80
4	Buldon	Cabayuan	7°27'56.75	124°22'19.30

Source: JICA Study Team



Source: JICA Study Team

Figure 7.10.1-4 Terrestrial flora and fauna observation sites

(7) Mitigation Measures and Environmental Management Plan

A proposed mitigation plans during and after construction are shown in **Table 7.10.1-8**. All mitigation measures are included in the submitted EIS Report by DPWH. All cost for mitigation measures will be finalized in detailed engineering design phase.

Table 7.10.1-8 Environmental Management Plan

Category	No.	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
Pollution	1	Air pollution (Air quality & noise)	(Dust) - Water sprinkling near residential area - 20 kph speed limit for construction machines at construction sites adjacent to settlement areas	(NO2, SO2 and TSP) - Setting up green buffer zone along the road (the zone and planting trees are carried out during construction)	Contractor	[During Const.] DPWH [Operation **Phase]** Matanog, Barira, Buldon
	2	Water pollution (Water quality)	[Turbid water and other items] - Discharge through sedimentation pond and silt fence -Installation of portable toilet for workers -Appropriate waste and construction machines management	Not required	Contractor	DPWH
	3	Waste (Abandonment)	[Construction waste (trees and waste soil)] - After considering the possibility of reuse, construction waste is disposed at designated disposal site Note) [Muck soil from tunnel section] -Reuse or disposed at designated disposal site after treatment [Garbage from base camp] - Garbage at workers camp and waste oil shall be brought to disposal site or facility [Night soil] -Temporary sanitation facility such as septic tank shall be introduced to the workers camp.	Not required	Contractor	DPWH
	4	Soil contamination (soil quality)	-Reuse or disposed at designated disposal site after treatment	Not required	Contractor	DPWH
	5	Noise and vibration (Noise)	[Construction noise] - Installing noise barrier and selecting low-noise equipment. - Avoiding works of heavy equipment during night time. -Informing the construction schedule to surrounding communities to obtain their consensus	[Traffic noise] - Establishment of green belt as buffer zone along the road - Secure sufficient distance from boundary of the road to residential area after construction of the road (secure noise decay distance) on land use plan along the road - Installation of noise barrier near sensitive facility, if required	Contractor	DPWH

Category	No.	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
	6	Sediment quality (Soil quality)	-Reuse or disposed at designated disposal site after treatment	Not required	Contractor	DPWH
Natural Environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	-Relocation & replanting trees along the road in ROW -Tree planting at sites designated by DENR -Create ecotone habitats in consideration of Amphibia and other fauna, if the existing habitats along the river are impacted by the project	Appropriate land use management not to develop natural area along the road	[Const.] Contractor [Operation] Matanog, Barira, Buldon	[Const.] DPWH [Operation] Matanog, Barira, Buldon
	11	Hydrology (Hydrology and oceanography)	- Designing of bridges with sufficient capacity - Installation of sufficient drainage facilities on bypass - Secure waterways in construction area	Not required	Contractor	DPWH
	12	Topography and geology (Geography, topography and landslides	- Installation of slope protection measures	Not required	Contractor	DPWH
Social Environment	13	Involuntary resettlement (People)	Appropriate compensation and social assistance in accordance with RAP	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	DPWH	Matanog, Barira, Buldon
	14	The poor (People)	Appropriate social assistance in accordance with RAP	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	DPWH	Matanog, Barira, Buldon
	15	Indigenous and ethnic people (Indigenous people)	Not required However, situation of minority religious group (s) such as Islamic group shall be monitored and adequate assistance and coordination shall be given, if necessary	Not required for designated Indegenous and Ethnic group specially if NCIP has been issued. However situation of minority Religious group such as Islamic group shall be monitored and adequate assistance and coordination shall be given, if necessary	–	–
	16	Local economy such as employment and livelihood	Appropriate compensation and social assistance in accordance with RAP	Not required	DPWH	Matanog, Barira, Buldon
	17	Land use and utilization of local resources (Land use and classification)	Appropriate land acquisition and compensation for agricultural area	Management of appropriate land use in accordance with approved detailed zoning map	[Const.] DPWH [Operation] Matanog, Barira, Buldon	Matanog, Barira, Buldon

Category	No.	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
	18	Water usage (Hydrology / Hydrogeology/ Water quality)	Installation of alternative water distribution system when unexpected situation such as reduction of spring water and water level of wells	Installation of alternative water distribution system when unexpected situation such as reduction of spring water and water level of wells	DPWH, Matanog, Barira, Buldon	Matanog, Barira, Buldon
	19	Existing social infrastructures and services	Appropriate compensation and/or relocation in accordance with RAP	Not Required	Contractor and DPWH	DPWH, Matanog, Barira, Buldon
	22	Local conflict of interests	Local workforce is prioritized for construction of the road	Not required	Contractor	DPWH
	23	Cultural heritage	No cultural heritage to be affected. Mitigation not required	Not required	-	-
	27	Infectious diseases such as dengue and HIV/AIDS	- Installation of sufficient drainage facilities not to provide habitat for vector mosquito - Provision of adequate temporary sanitation facilities - Enforcement of medical screening and periodical medical check-up - In order to prevent spread of infectious diseases such as HIV/AIDS, awareness of the labors is promoted	Not Required	Contractor,	DPWH,
	28	Labor environment (including work safety)	Complying with relevant laws and regulations by the contractor under observation of DPWH	Not required	Contractor,	DPWH
Others	29	Accidents (Traffic situation)	- Deploying flagman at the gate and crossing points of the construction vehicles - Installation of safety sign board - Installing fence around the construction site to keep out local people such as children - Installation of lightning in the night time - Installation of parking for idling construction machines - Safety training for the workers - Safety patrol at the construction site by supervisors	Not Required	Contractor	DPWH
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	Replanting endemic/ native trees and other agricultural trees such as coconuts	Not required	Contractor	DPWH

Source: JICA Study Team

(8) Environmental Monitoring Plan and Budget

A proposed monitoring plan during and after construction are shown in **Table 7.10.1-9** and **Table 7.10.1-10** respectively. All monitoring plans are included in the submitted EIA by DPWH to EMB. The monitoring in operation phase shall be carried out for two (2) years at least.

Proposed items to be monitored by JICA are shown in **Table 7.10.1-11**. Air, water quality, noise, ecosystem, resettlement and livelihood of relocated people shall be monitored during and after construction.

Table 7.10.1-9 Environmental Monitoring Plan (Pre and During Construction)

Cate-gory	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
Pollution	1	Air pollution (Air quality & noise)	TSP, SO_2, NO_2 and PM_{10}	1.TSP –Gravimetric 2.SO2 –Pararosaniline 3.NO2 – Griess Saltzman Reaction 4. PM_{10}–Direct Reading (Gas Analyzer)	2 sites (same locations of baseline survey) (see **Table 14.12.3-6** and **Figure 14.12.3-1**)	2 times	800,000	TSP 300μg/Ncm SO_2 340 μg/Ncm NO_2 260 μg/Ncm PM_{10} 150 μg/Ncm
	2	Water pollution (Water quality)	pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Methodologies are described in DAO 34-1990 and EMBDENR Manual for Ambient Water Quality Monitoring Volume I	2 sites (same locations of baseline survey) **Table 14.12.3-6** and **Figure 14.12.3-2**)	2 times	600,000	For Class "C" freshwater pH – 6.5 to 8.5 DO – 5.0 mg/L Oil & Grease – 2.0 mg/L BOD – 7.0 mg/L TSS – not more than 30 mg/L increase
	3	Waste (Abandonment	Volume of waste soil, cutting tree and domestic garbage	Record volume of generated waste	Cutting land section, tunnel section, cutting tree section and workers camp	4 times	200,000	Generated waste shall be reused or disposed at designated site.
	4	Noise and vibration (Noise	Ambient and road side noise (dB(A)LAeq)	L_{Aeq}, 10min during morning, daytime, evening and night time	2 sites (same locations of baseline survey) (see **Table 14.12.3-6** and **Figure 14.12.3-1**)	2 times	400,000	For "A" categorized areas (general area) Morning: 50 dB(A) Daytime: 60 dB(A) Evening: 50 dB(A) Night: 45 dB(A) For "B" categorized areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night: 55 dB (A)
Natural Environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology	Situation of Cutting tree area	Ocular inspection	Major bridge section (see **Table 14.12.3-7** and **Figure 14.12.3-3)**	4 times	200,000	Cutting tree area is limited on ROW
	11	Hydrology (Hydrology and oceanography)	Flooding situation	Flood level measurement during high precipitation periods Interview with local residents	Flood-prone areas, particularly near major river systems	4 times	200,000	Project activities and structures does not cause flooding
	12	Topography and geology (Geography, topography and landslides)	Stability of slope	Ocular inspection	High cut and high embankment section	4 times	200,000	Must be continuously undertaken until slopes are fairly stable and vegetation cover achieves high survival rate
Social	13	Involuntary resettlement (People)	Payment and implementation n of social assistance in accordance with RAP	Consultation Meeting and/or Survey with the project affected persons (PAPs)	Affected barangays	Monthly	500,000	Must be completed prior to construction stage

Cate-gory	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
	14	The poor (People)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	16	Local economy such as employment and livelihood	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	19	Existing social infrastructures and services	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	22	Local conflict of interests	Construction n worker's native barangay	Confirmation of workers list from contractor	All barangays on the affected route	4 times	500,000	Employment opportunity shall be provided fairly
	27	Infectious diseases such as HIV/AIDS	Number of infected patient	Confirmation of health check list from contractor	All construction workers	4 times	500,000	Infection disease rate shall be less than average rate
	28	Labor environment (including work safety)	Number of workers with required instrument such as helmet	Count numbers of workers with instrument	All construction workers (weekly meeting place)	4 times	500,000	All workers shall have designated device such as helmet

Table 7.10.1-10 Environmental Monitoring Plan (Operation Phase)

Cate-gory	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
Pollution	1	Air pollution (Air quality & noise	TSP, SO_2, NO_2 and PM_{10}	1.TSP –Gravimetric 2.SO2 –Pararosaniline 3. NO2 – Griess Saltzman Reaction 4. PM_{10}–Direct Reading (Gas Analyzer)	2 sites (same locations of baseline survey)	1 times	400,000	TSP 300µg/Ncm SO2 340 µg/Ncm NO2 260 µg/Ncm PM_{10} 150 µg/Ncm
	2	Water pollution (Water quality)	pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Methodologies are described in DAO 34-1990 and EMBDENR Manual for Ambient Water Quality Monitoring Volume I	2 sites (same locations of baseline survey)	1 times	600,000	For Class "C" freshwater pH – 6.5 to 8.5 DO – 5.0 mg/L Oil & Grease – 2.0 mg/L BOD – 7.0 mg/L TSS – not more than 30 mg/L increase

Cate-gory	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
	4	Noise and vibration (Noise)	Ambient and road side noise (dB(A)L_{Aeq})	L_{Aeq}, 10min during morning, daytime, evening and night tim	2 sites (same locations of baseline survey)	1 times	200,000	For "A" categorized areas (general area) Morning: 45 dB(A) Daytime: 50 dB(A) Evening: 45 dB(A) Night : 40 dB(A) For "B" categorized Areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)
Natural Environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology	Situation of Cutting tree area	Ocular inspection	Major bridge section	1 times	100,000	Cutting tree area is limited on ROW
	11	Hydrology (Hydrology and oceanography)	Flooding situation	Flood level measurement during high precipitation periods Interview with local residents	Flood-prone areas, particularly near major river systems	1 times	100,000	Project activities and structures does not cause flooding
	12	Topography and geology (Geography, topography and landslides)	Stability of slope	Ocular inspection	High cut and high embankment section	4 times	200,000	Must be continuously undertaken until slopes are fairly stable and vegetation cover achieves high survival rate
Social Environment	13	Involuntary resettlement (People)	Payment and implementation of social assistance in accordance with RAP	Consultation meeting and/or Survey with the project affected persons (PAPs)	Affected barangays	Monthly	500,000	Must be completed prior to construction stage
	14	The poor (People)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	16	Local economy such as employment and livelihood	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	19	Existing social infrastructures and services	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	22	Local conflict of interests	Construction worker's native barangay	Confirmation of workers list from contractor	All barangays on the affected route	Quarterly	500,000	Employment opportunity shall be provided fairly
	27	Infectious diseases such as HIV/AIDS	Number of infected patient	Confirmation of health check list from contractor	All construction workers	Quarterly	500,000	Infection disease rate shall be less than average rate
	28	Labor environment (including work safety)	Number of workers with required instrument such as helmet	Count numbers of workers with instrument	All construction workers (weekly meeting place)	4 times	500,000	All workers shall have designated device such as helmet

Table 7.10.1-11 Environmental Monitoring Form (JICA Form)

-If environmental reviews indicate the need of monitoring by JICA, JICA undertakes monitoring for necessary items that are decided by environmental reviews. JICA undertakes monitoring based on regular reports including measured data submitted by the project proponent. When necessary, the project proponent should refer to the following monitoring form for submitting reports.

-When monitoring plans including monitoring items, frequencies and methods are decided, project phase or project life cycle (such as construction phase and operation phase) should be considered

1. Relevant Permission and Public Consultation

Monitoring Item	Monitoring Results during Report Period
Confirmation of relevant written permissions and minutes of meetings for held consultations and meetings	

2. Mitigation Measures/Monitoring

- Air Quality（Traffic /Ambient Air Quality

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
TSP	µg/Ncm	17.3	20	230µg/Ncm	0.2 mg/m3	-Same points as baseline survey (see **Table 7.10.1-6**) -Two (2) time a year during construction -Once a year during operation -TSP = Gravimetric - SO_2 =Pararosaniline - NO_2 = Griess Saltzman Reaction - PM_{10} = Gravimetric (Gas Analyzer)
NO_2	µg/Ncm	4.8	6.7	150ug/Ncm	0.04-0.06 ppm	
SO_2	Mg/Ncm	1.5	1.9	180ug/Ncm	0.1 ppm	
PM_{10}	ppm	2.8	3.9	150ug/Ncm	-	

- Water Quality（Physico-chemical Analyses of Surface Water）

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
pH	-	7.3	7.4	6.5-9	6.5-8.5	-Upstream and downstream portion -Same points as baseline survey (see **Table 7.10.1-6**) -Two (2) time a year during construction -Once a year during operation -grab sampling
DO	mg/L	8	9	5ppm min.	5 ppm	
TSS	mg/L	6.5	10	80	25	
BOD	mg/L	1.5	2	7	3	
Turbidity	NTU	0.7	1.3	-		
Temperature	°C	26.7	27.3	25-31		

-Noise/Vibration

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
Noise level	dB(A)	Morning 50dB Daytime 49dB Evening 50dB Night time 49dB	Morning 50dB Daytime 50dB Evening 51dB Night time 50dB	For "A" categorized areas (general / residential area) Morning: 45 dB(A) Daytime: 50 dB(A) Evening: 45 dB(A) Night : 40 dB(A) For "B" categorized Areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)	Daytime: (6:00-22:00) 50dB(AA) 55 dB(A) 55 dB(B) 60 dB(C) Evening Time: (22:00-6:00) 40 dB(AA) 45 dB(A) 45 dB(B) 55 dB(C)	- Same points as baseline survey (see **Table 7.10.1-6**) - 2 times a year during construction - Once a year during operation - Digital sound level meter

- Odor

Monitoring Item	Monitoring Results during Report Period
Not required	

3. Natural Environment

- Ecosystem

Monitoring Item	Monitoring Results during Report Period
Situation of cutting tree area (during construction) Situation of replanting area along the road (operation phase)	

4. Social Environment

- Resettlement (During and after Construction)

Monitoring Item	Monitoring Results during Report Period
Number of PAPs including IPs to be resettled/ relocated/ provided livelihood assistance where required. (during Construction)	
Inventory and valuation of PAPS affected assets (during Construction)	
Notice period given to PAPs before shifting them from their original locations within the ROW (Pre and during construction)	
Number of grievances recorded and redressed (Pre and during Construction)	
Conflicts between religions (Pre, during and after construction)	

- Living / Livelihood

Monitoring Item	Monitoring Results during Report Period
Pre-and post-resettlement incomes and livelihood of PAPs especially for poor people (during and after construction)	

(9) Institutional Arrangement for EMP Implementation

Institutional Arrangement for EMP Implementation is described in **Section 7.5**.

(10) Stakeholders Meeting for EIA

A total of 12 stakeholders' meetings were held for Sub-Project 1, two (2) stakeholders' meetings were held at municipal level and one (1) was held at barangay level for barangay scoping**.** The first stakeholders' meetings at municipal level are prescript Information Education Communication meetings (IEC meeting) based on the Philippine EIA guidelines held in the municipalities of Matanog, Barira and Buldon attended by the affected stakeholders, barangay and municipal officials, and concerned LGU offices such as Assessors, MPDC. The second stakeholders' meetings at municipal level presented the results of the baseline surveys. These meetings were attended by a total of 436 participants composed of 343 males and 93 females.

The major questions of the participants brought out during the 1st and 2nd public consultations are enumerated below. All questions, comments and suggestions were answered by DPWH ARMM, JICA Cotabato, RAP, and EIA Study team, and it seemed that all questioners understood and agreed all answers as shown in **Table 7.10.1-12**.

a. Buldon Municipality suggested/proposed that the road alignment will traverse from Matanog-Barira-Kabayuan up to Rumidas-Binabay-Kalaan- Manabay-Karim-Pantawan;
b. Final alignment of the proposed road;
c. Proposed realignment of the proposed road near the community (farm to market road);
d. The proposed road will overlap the existing road;
e. What will happen to houses and lands to the affected;
f. What will happen to the landowner without land titles and proof of ownership;
g. Who will compensate the affected land, crops, and other structures;
h. What will happen to the families if all of their properties will be affected;
i. Necessary documents for claims and compensations;
j. Who will determine the price of the affected; and
k. Proper knowledge on the process of compensations and needed documents.

During the public consultations, the women's emphasized the importance of proper compensation for the affected landowners, work force from the community, and livelihood programs.

As said earlier, the 2nd stakeholders meeting/public consultations is to present and validate the results of environmental impact assessment. Most of the opinions of the PAPs are the compensation prior the implementation of Sub-Project 1.

Overall, the proposed Sub-Project1 is socially acceptable based on the responses and feedbacks of the stakeholders. They are willing to be compensated, improved the condition of the community, and suggested to implement the project early from schedule. This Sub-Project1 project will improve the community, particularly in education and transportation of their products.

Table 7.10.1-12 Contents of Stakeholder Meeting Municipal Level

Date (venues)	Objectives of the meeting	Major Agenda	Participants	No. of Participants		
				Location	Male	Female
1st Public Consultations Dec. 8 and 12, 2017 1. Matanog Municipal, Multipurpose Hall 2. Conference Room, Barira, Maguindanao 3. Barangay Hall of Minabay, Buldon Municipality	Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	1. Inform and generate awareness and understanding of the concerned public about the project; 2. Provide the stakeholders and avenue to ventilate salient issues and concerns regarding the project; 3. Give an opportunity to the stakeholders to have an open discussion with the Preparers, Proponents and LGU about the project; 4. Educate the stakeholders of their rights and privileges; and 5. Enable the stakeholders to effectively participate and make informed and guided decisions.	Municipal Officials, Project-Affected Persons (PAPs) and Barangay Officials, RAP, DPWH ARMM and JICA Study Team	Matanog Barira Buldon	104 71 54	8 12 16
2nd Public Consultations February 27, March 1 and March 2, 2018 1. Conference Room, Matanog 2. Barira Municipal Conference Rm 3. Barangay Hall of Calaan, Buldon	Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	To present and validate the results of environmental impact assessment	Municipal Officials, Project-Affected Persons (PAPs) and Barangay Officials, and JICA Study Team	Matanog Barira Buldon	25 58 31	16 24 17

Table 7.10.1-13 Major Opinions in Stakeholder Meetings Municipal Level

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
1st Public Consultations Dec. 8 and 12, 2017 Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	1. Introduce the project and discuss the project objectives and the benefits that can be derived. 2. EIA and RAP Process 3. Tentative Schedules 4. Solicit queries, comments, concerns and suggestions on the project	Land	Properties (trees/crops)	1. (Buldon) We suggested/proposed that the road alignment will traverse from Matanog-Barira-Kabayuan up to Rumidas-Binabay-Kalaan- Manabay-Karim-Pantawan. Because in Karim, we have a recognized tourist spot called Binaan falls and Cacao Plantation (2,000-4,000 plants) which is funded by Japan Investors, ICNET. The ideal alignment is from Pantawan going to Alamada-Libungan. We should focus and address on the barangay areas without road. (Buldon) Based on my understanding, the road alignment is from Barangay Cabayuan going up to Barangay Manibay to Alamada. My suggestion is that the best alignment should traverse via barangay Karim since the funded Cacao plantation project by ICNET is within the barangay. (Buldon) For the community, those without title will be negotiated and compensated considering the law. We are also requesting to the community to pay your taxes so that you cannot encounter problem during the negotiations and compensation.	1. Suggestions will be noted and included in the report.
		Socio/ The People	Infrastructure (Alignment)	2. (Barira) What is the final alignment of the proposed road project?	2. For now, we are in the feasibility study or pilot stage. There are three alternative routes as options for the best alignment. We will finalize the alignment for the good of the people in your community during the detailed design.
				3. (Barira) What happen to the existing road, we observed that there are overlapping roads from the existing road to proposed road alignments?	3. There is a possibility to improve the existing road.
				4. (Barira) Is the alignment of the road from Matanog- Barira-Alamada-Libunga will have possible changes or be realigned?	4. The Bangsamoro development is one of the references for this project. We are having a survey and study in every conflict-affected area in barangays to know if they are favor or not. If the majority of the people in the affected areas are not favor for the proposed alignment, we will report it in the proponent in Manila for possibility to change the alignment. For example in Bualan, if the project is not favorable with the people in the area, then we will find a new route or alignment.
				5. (Matanog) What is the route or alignment of the project road?	5. There are proposed alternatives and after the study, we will determine the best alignment favorable to the people.

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
				6. (Matanog) We suggest/recommend that the best route is from Sitio 41, Sapad to Lagaan to Tubaran to Cabugao going to Kidama	6. We will see the possibility of your request/recommendations. May I suggest that the Barangay need to submit a resolution to the Municipality of Matanog thru Mayor to endorse the resolution to DPWH for inclusion of the suggested route to their future project.
				7. (Matanog) Is it the final alignment or can we realign the road?	7. No, the design is not final. We will wait the final results of the study and we will finalize the design of the proposed design of road.
			Properties	8. (Matanog) What happen to the houses and lands to be affected by the project?	8. DPWH will pay the acquisition of all affected structures after the conduct of RAP. Make sure that all affected people have documents like land title and tax declaration.
				9. (Matanog) Who will determine the amount of the affected houses?	9. As part of the process of RAP, we will submit the results of inventory to DPWH. DPWH will decide the right cost or amount based on their guidelines. We will provide a copy of the results of the study per Barangay level for their information and confirmation.
				10. (Matanog) What kind of documents are we needed to be compensated? Our experienced from previous project with DPWH, they did not pay our affected constituents. Also, can you consider the amount provided by the owners?	10. Certificate of land title or tax declaration certified by LGU. For the cost, DPWH will negotiate to the land owner based on their guidelines, structures for compensation, and by what is the present cost of the said land considering the gathered data from assessor's office, local construction suppliers. Also, we will coordinate to the municipal assessor's office.
				11. (Matanog) What happen to the households who don't have land title? The land came from our ancestors.	11. Without land title, no compensation from DPWH. The DPWH is in charge to pay for the affected land owner's. Must secure all documents needed so that all affected landowner's can be compensated.
2nd Public Consultations February 27, March 1 and March 2, 2018 Information Education and Communication (IEC) in accordance	To present and validate the results of environmental impact assessment	Socio/The People	Properties	1. (Barira) What will happen to the people without land title? Will they be paid?	1. RAP team will present the details on compensation. You need to have legal documents to be compensated Vice Mayor said that if they don't have title, you should go to assessors to talk about it.
				2. (Barira) We hope that the project will soon be implemented. As of this time, 99% is our support but if project will be implemented in a long time its possible that our support will change. We are tired of attending meetings	2. There are processes we need to follow. We also hope that this project will be implemented soon
				3. (Barira) Others are anxious that they will not be paid.	3. They will be compensated provided that they have legal documents The mayor said that if you will not be paid, he will pay them. He said that he is sure that JICA and DPWH will not allow this to happen.

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
with Philippines EIA Guidelines				4. (Matanog) The surveyor did not informed some of the people or families regarding that their properties that may be affected	4. The team will coordinate to RAP team for proper coordination and information dissemination to the affected families. The RAP team will present the detail and results of their assessment.
			The Poor	5. (Barira) The poor should not be taken advantage and will consider only those who are rich. The benefit of the project should consider all the people in the community regardless they are poor or rich.	5. The project will surely benefit the poor
			Infrastructure (Alignment)	6. (Matanog) Requested to realign the road from Villa Rosario to Sitio Campo Dos, Bugasan Sur this will be connected to the Municipality of Barira.	6. The team stated that their concerns and requests were noted and informed them that this will be recommended to the proponent.
				7. (Matanog) Mayor Guro reiterated to the team that his request for realignment was already raised during steering committee meeting with proponent in metro manila. If the rerouting will not be followed, there will be more affected and he cannot commit to negotiate with the proponent in terms of land acquisition. Only 10 meters are allowed by the people but more than that, he is not sure.	7. The realignment will be discussed with the proponent and JICA Study Team. This will be noted for consideration.
				8. (Buldon) They are requesting for realignment so that those affected will not complain or disagree. We cannot commit that all affected households/families will cooperate.	8. The team explained to the participants that the study is almost done (99%). Their request is no assurance that realignment will be approved. Mayor said that the LGU will be the one or take charge to talked with the affected households/families so the project will not be delayed. Mayor said that he don't want to be the cause of delay for the implementation of the project.
				9. (Buldon) requested for the realignment to avoid people to be affected. He doesn't want to have conflict with the people regarding the project.	9. Mayor replied that he will talk to t those in favor about the project and its benefits to them. He assured that his constituents will support the project because he knows that the project is a good opportunity for development

1) Barangay Scoping

The barangay scoping meetings were held in 6 barangays within the direct affected community as shown in **Table 7.10.1-14**. These meetings discussed the project background and objectives, and the positive and negative impacts of the proposed project to the people, health, habitat, and among others. The major opinions of the participants are the process of land acquisitions and compensations as shown in **Table 7.10.1-15**. The queries and comments on the barangay scoping checklist was responded by the Study team.

Table 7.10.1-14 Contents of Stakeholder Meeting on Scoping Stage Barangay Level

Date (venues)	Objectives of the meeting	Major Agenda	Participants	No. of Participants		
				Barangay	Male	Female
Feb 8 to 10, 2018 Barangay Hall	Barangay Scoping in accordance with Philippines EIA Guidelines	1. Inform and generate awareness and understanding of the concerned public about the project; 2. To gather and address the queries and concerns and provide responses and clarifications to queries on the proposed project; and 3. To identify the foreseeable positive and negative effect of the Project based on the barangay scoping matrix.	Barangay Officials, Project-Affected Persons (PAPs), RAP, and JICA Study Team	Matanog		
				Bugasan Sur	17	6
				Barira		
				Liong	19	6
				Bualan	16	2
				Buldon		
				Rumidas	21	4
				Minabay	13	3
				Cabayuan	8	1

Source: JICA Study Team

Table 7.10.1-15 Major Opinions in Stakeholder Meetings on Scoping Barangay Level

Date and Objectives; Agenda	Item on EIA		Major Opinion	Answers (RAP, and JICA Survey Team's answers has been accepted and understood basically)
Jan. 8 and 10, 2018 Barangay Scoping in accordance with Philippines EIA Guidelines	Land	Properties (Crops/ Trees)	1. (Brgy. Bugasan Sur, Matanog and Brgy. Liong, Barira) Is the root crops like cassava included for compensation?	1. Yes, it will be compensated as long as included in the inventory or during cut offs conducted by RAP team. DPWH will pay based on their guidelines.
	Socio/The People	Infrastructures (Realignment/Farm to Market Road/Facilities)	2. (Bugasan Sur) Requesting for a possible realignment of the road from Sitio Mangran I to Sitio Tambak, Sitio Mariga to Sitio South, and to Sitio Pindolunan to Bualan, Barira.	2. This will be noted for considerations of JICA/DPWH.
			3. (Brgy. Liong, Barira) Requested rubber hose for water supply of the community during and after the construction.	3. It is not part of the project but will be noted for considerations. The barangay officials can submit a resolution to Municipal Officials for endorsement to DPWH.
			4. (Brgy. Lipawan, Barira) They requested a farm to market road, so they may have easier access in terms of transporting their harvested product.	4. It is not part of the project but will be noted for considerations. The barangay officials can submit a resolution to Municipal Officials for endorsement to DPWH.
			5. (Brgy. Minabay, Buldon) Barangay officials requested the following needs of the community, if can be considered: • Farm to Market Road, from Sitio Kotawato Cadayunan to Sitio Sarip and from Sitio Kotawato to Tambak/ Kanenggongan; • Water system in Sitio Mapantao and Cadayunan; • School facility in Sitio Tambak; • Additional classrooms in Minabay Elementary School; and Solar Drier in Sitio Kotawato.	5. These are not part of the project but will be noted for considerations for another project to be proposed by JICA
			6. (Brgy. Lipawan, Barira) Requested to realign the route of the road that traversed to Sitio Malanga to Sitio , Carwisan to Sitio Babasan and Sitio Tugar to Sitio Lum-bak to Crossing.	6. This will be noted for considerations of JICA/DPWH
			7. (Brgy. Rumidas, Buldon) Can we request a realignment to avoid the cemetery?	7. This will be noted for considerations and validated during the inventory of RAP Team.
	Socio/The People	Properties	8. (Brgy. Rumidas, Buldon) What happen to the houses, trees and lands to be affected by the project?	8. This will be compensated as long as included in the inventory or during cut offs. DPWH will pay the affected structures and other properties after the conduct of RAP. Make sure that all affected people have legal documents like Certificate of land title or tax declaration.
			9. (Brgy. Bualan, Barira and Brgy. Cabayuan, Buldon) Barangay officials clarify that compensation of private properties within the alignment of the road should be prior to the construction.	9. This will be noted. Private property owners are advised to prepare proof of ownership such as titles, certifications or declarations for them to be compensated.
		Livelihood	10. (Brgy. Bualan, Barira and Brgy. Cabayuan, Buldon) Barangay officials appeal to prioritize their constituents in hiring constructions workers.	10. This will be recommended to the proponent considering that they are qualified for the job. ※To be referred to the below implementing rules and regulations for hiring of construction workers ; Department Order 130(series of 2016), the Guidelines for the Implementation of the Provisions of Republic Act No.6685, Republic Act 9710 and Magna Carta for Women (MCW)

Source: JICA Study Team

7.10.2 Summary of Environmental Impact Assessment (EIA) for Sub-Project 2

(1) Description of the Project Components

The Project Components are described in **Chapter 13**.

(2) Baseline of the Environmental and Social Condition

Baseline of the Environmental and Social Condition is described in **Chapter 13** and **Section 7.2**.

(3) Laws, Regulations, and Organizations related to Environmental and Social Considerations for EIA

Laws, Regulations, and Organizations related to Environmental and Social Considerations for EIA are described in **Section 7.1** and **Section 7.3.1**.

(4) Analysis of Alternative Alignments

The comparative analysis of alternatives was described in **Chapter 12** and **Chapter 14**. The summary is shown below.

1) Alignment Selection Criteria

The criteria for alignment selection are as follows;

- Length, Construction Cost, Construction period (road length, no of bridges and culverts, etc.)
- Economic Impact (population along the alignment, agricultural land areas to be served, etc.)
- Environmental Impact (high-filling section length, high-cutting section length, no. of buildings to be affected)
- Technical feature (total no. of curves no. of curves < 300m, length of vertical grade >= 5%)

Figure 7.10.2-1 shows the recommended alignment for the road.

Source: JICA Study team

Figure 7.10.2-1 Recommended Alignment

2) Zero option

The zero option (with / without Sub-Project) of this project is shown in **Chapter 11** and **Chapter 22**.

(5) Scoping and Survey item for Environmental and Social Considerations Survey

Scope of the EIA study for the project is discussed in this section. The environmental scoping is conducted based on an environmental reconnaissance by the JICA Survey Team.

The result of scoping is indicated on the Leopold scoping matrix as shown in **Table 7.10.2-1** and reason for scoping tables as shown in **Table 7.10.2-2**.

The scoping matrix below shows the impact factors, impacted item and impact degree based on JICA's guidelines and Philippine items. According to the scoping matrix, majority of the items or seventeen (17) items are rated as "B-" (Some impact is expected) due to huge earth work volume and significant

social impacts, No.14 (The poor) is rated as "B+/-" (Some impact is expected), four (4) items are rated as "C" (unknown impact is expected) and eight (8) are rated as "D" (Few impacts are expected).

Table 7.10.2-1 Draft Scoping Matrix Based on JICA's Guidelines and Philippines Items

	No	Affected Activities / Impact Items (JICA)	(Philippines)	Overall Rating	Pre/ During Construction Phase: Land acquisition and Loss of properties	Change of Land use plan, Control of various activities by regulations for the construction	Reclamation of Wetland, etc.	Deforestation	Alteration to ground by cut land, filling, drilling, tunnel, etc.	Operation of Construction Equipment and Vehicles	Construction of Roads, tollgates, parking lots, Access roads for bridges and other related facilities	Traffic Restriction in construction area	Influx of construction workers, construction of base camp	Operation Phase: Increase of Through Traffic	Appearance/ Occupancy of Roads and related building structures including tunnel and embankment	Increasing influx of settlers
Pollution	1	Air Pollution	Air quality & noise	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	D
	2	Water pollution	Water quality	**B-**	D	D	D	D	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	3	Waste	Abandonment	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	4	Soil contamination	Soil quality/fertility	**B-**	D	**B-**	**B-**	D	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	5	Noise and Vibration	Noise	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	D
	6	Ground Subsidence	Subsidence/ collapse	D	D	D	D	D	D	D	D	D	D	D	D	D
	7	Odor		D	D	D	D	D	D	D	D	D	D	D	D	D
	8	Sediment quality	Soil quality	**B-**	D	D	D	D	**B-**	D	**B-**	D	D	D	D	D
Natural Environment	9	Protected Area	Environmentally Critical Areas (ECAs)	D	D	D	D	D	D	D	D	D	D	D	D	D
	10	Ecosystem	Terrestrial Biology Freshwater or marine ecology	**B-**	**B-**	**B-**	D	**B-**	**B-**	C	**B-**	D	**B-**	D	**B-**	**B-**
	11	Hydrology	Hydrology and oceanography	**B-**	D	D	**B-**	D	**B-**	D	D	D	D	D	**B-**	D
	12	Topography and geology	Geography, topography and landslides	**B-**	D	D	**B-**	D	**B-**	D	D	D	D	D	D	D
Social Environment	13	Involuntary resettlement	People	**B-**	**B-**	D	D	D	D	D	**B-**	D	D	D	D	D
	14	The poor	People	**B+/-**	**B+/-**	D	D	D	D	D	**B+/-**	D	D	D	D	**C**
	15	Indigenous and ethnic people	Indigenous people (IPs)	D	D	D	D	D	D	D	D	D	D	D	D	D
	16	Local economy such as employment and livelihood	People	**B-**	D	D	D	D	D	D	**B-**	D	**B-**	D	D	**C**
	17	Land use and utilization of local resources	Land use and classification	**B-**	D	**B-**	D	D	D	D	D	D	**B-**	D	D	**B-**
	18	Waste Usage	Hydrology / Hydrogeology/ Water quality	**B-**	D	D	D	D	D	D	D	D	**B-**	D	D	D

	No	Impact Items (JICA)	(Philippines)	Overall Rating	Pre/ During Construction Phase: Land acquisition and Loss of properties	Change of Land use plan, Control of various activities by regulations for the construction	Reclamation of Wetland, etc.	Deforestation	Alteration to ground by cut land, filling, drilling, tunnel, etc.	Operation of Construction Equipment and Vehicles	Construction of Roads, tollgates, parking lots, Access roads for bridges and other related facilities	Traffic Restriction in construction area	Influx of construction workers, construction of base camp	Operation Phase: Increase of Through Traffic	Appearance/ Occupancy of Roads and related building structures including tunnel and embankment	Increasing influx of settlers
	19	Existing social infrastructures and services	People	**B-**	**B-**	D	D	D	D	D	**B-**	D	D	D	D	**B-**
	20	Social institutions such as social infrastructure and local decision making institutions		D	D	D	D	D	D	D	D	D	D	D	D	D
	21	Misdistribution of benefit and damage		D	D	D	D	D	D	D	D	D	D	D	D	D
	22	Local conflict of interests	People	**C**	D	**C**	D	D	D	D	D	D	D	D	D	D
	23	Cultural Heritage	People	**C**	**C**	D	D	D	D	D	**C**	D	D	D	D	D
	24	Landscape		D	D	D	D	D	D	D	D	D	D	D	D	D
	25	Gender		D	D	D	D	D	D	D	D	D	D	D	D	D
	26	Right of Children		D	D	D	D	D	D	D	D	D	D	D	D	D
	27	Infectious diseases such as HIV/AIDS	People	**C**	D	D	D	D	D	D	D	D	**C**	D	D	D
	28	Labor environment (including work safety)		**B-**	D	D	D	D	D	D	**B-**	D	**B-**	D	D	D
Others	29	Accidents	Traffic situation	**B-**	D	D	D	D	D	**B-**	D	**B-**	C	**B-**	D	D
Others	30	Cross Boundary impacts and climate change	Meteorology / Climatology	**C**	D	D	D	**C**	D	D	D	D	D	**C**	D	D

Note: Rating:

A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.

Source: JICA Study Team

Table 7.10.2-2 Reasons for Draft Scoping

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
Pollution	1	Air pollution (Air quality & noise)	**B-**	**B-**	**Construction phase:** Temporary negative impacts are expected on air quality due to fugitive dust emissions from construction activities such as land clearing, grading, excavation, and the transport and movement of construction materials. **Operation phase:** Negative impacts on air quality are expected due to emission from vehicles passing on the new road.
	2	Water pollution (Water quality)	**B-**	D	**Construction phase:** Domestic wastewater will be generated from construction workers. Surface water will become turbid due to solids generated from earth works and drilling in the site. Oil and grease and petroleum hydrocarbons may pollute water that may come from vehicles and construction equipment. **Operation phase:** No serious impacts are expected.
	3	Waste (Abandonment)	**B-**	D	**Construction phase:** Construction waste such as waste soil and cutting trees are expected to be generated by deforestation, cutting, land clearing and drilling. Solid wastes from construction workers may be generated from construction base camp. Hazardous wastes such as busted lamps, used oil, used paints etc. maybe generated from construction site. **Operation phase:** No serious impacts are expected
	4	Soil contamination (soil quality)	**B-**	D	**Construction phase:** Removal of vegetation may affect the soil quality due to oil & grease and petroleum hydrocarbon contamination from construction equipment and vehicles. **Operation phase:** No serious impacts are expected.
	5	Noise (Noise)	**B-**	**B-**	**Construction phase:** Increased noise levels will be significant due to heavy construction vehicles moving to and from the site, drilling and excavation activities. **Operation phase:** Noise generation is expected by vehicles passing on the new road.
	6	Ground subsidence (Subsidence)	D	D	No impacts are expected. There will be no groundwater extraction during the construction and operation activities.
	7	Odor	D	D	Few impacts are expected. Obnoxious odor may come from vehicle exhaust, clearing & dredging of river banks.
	8	Sediment quality (Soil quality)	**B-**	D	**Construction phase:** Surface water runoff which may have caused the sediment transport is expected during construction activities due to earthworks, land clearing, excavation etc. **Operation phase:** Road operation which causes impacts on sediment quality is not expected.
Natural environment	9	Protected area (ECAs)	D	D	**Construction and operation phase:** No protected area such as designated conservation zone is observed in the project affected area.
	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	**B-**	**B-**	**Construction and Operation phase:** With the implementation of the project, during the construction phase, land clearing and topography alteration will require removal of existing vegetation cover within the road Right of way. Clearing of remaining vegetation will also possibly affect remaining wildlife and its habitats to give way for the construction of road project. Impacts of the project will be assessed based on the result of the terrestrial survey and to be able to come up with apt recommendations to mitigate such impacts. The result of the survey also serves as the basis for monitoring during the Operation phase.
	11	Hydrology (Hydrology and oceanography)	**B-**	**B-**	**Construction Phase:** Rating B- under Reclamation of Wetland, etc. - Extent of impact is unknown. The road alignment may not cross wetland and/or swamps. In case the final road alignment will traverse the wetlands, survey and analysis should be done to make sure that the road network will not hamper the natural flow of water prior to the road construction. **Construction and Operation Phase** Rating B- under Alteration to ground by cut land, land filling, drilling, tunnel, etc. - Some impact is expected. The proposed road will traverse through generally flat terrain and rolling grounds drainage impact is expected. This may change the drainage flow to other directions and may cause flooding in some areas. Flooding that is expected maybe due to rainwater flow restrictions and natural blocking of surface water runoff in the construction site.

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
	12	Topography and geology (Geography, topography and landslides)	**B-**	D	**Construction and Operation Phase**: Earthworks such as land filling and land cutting would affect the topographic condition along the proposed road alignment. Risk associated with landslides maybe expected in sections passing steep terrain. Slope protection measures could be necessary during the operation phase. No protected geological site is located in the project area.
Social Environment	13	Involuntary resettlement	**B-**	D	**Pre-Construction Phase:** Settlements and private lands will be acquired to give way for the road construction. This will cause involuntary resettlement (physical and economic) **Operation Phase:** No impact is expected since it was already settled during pre-construction period
	14	The poor	**B+/-**	**C**	**Construction Phase:** Some impacts (positive/negative) is expected considering the socio-economic condition of the community in the project area **Operation Phase:** Extent of impacts are still unknown but looks forward to easier access of the poor to public services
	15	Indigenous and ethnic people	D	D	**Construction and Operation Phase**: The existence of indigenous people has not been confirmed in project area. No impacts are expected.
	16	Local economy such as employment and livelihood	**B-**	**C**	**Pre-Construction phase:** Livelihood of residents and farmers may be affected by resettlement and acquisition of agricultural area **Operation Phase:** Few impacts are expected.
	17	Land use and utilization of local resources	**B-**	**B-**	**Pre-Construction phase:** Some agricultural areas will be affected by the project. **Operation Phase:** Roadside area may be developed as commercial or industrial area in non-designated land use area. Such unplanned development and influx of new settlers may give impact on land use and local resources.
	18	Waste Usage	**B-**	D	**Construction Phase:** Earth works such as cutting land and drilling of tunnel may give impact on drinking water resources such as springs and wells. **Operation phase:** No impact is expected.
	19	Existing social infrastructures and services	**B-**	**B-**	**Pre-construction and Construction Phase:** Relocation of religious facilities, school, cemetery and other public facilities need to be considered. **Operation Phase:** Existence of the road may disturb commuting/ going to school and hospital
	20	Social institutions such as social infrastructure and local decision making institutions	D	D	Impacts are not expected, since local decision making institute represented by local governments will continue after the road construction.
	21	Misdistribution of benefit and damage	D	D	Misdistribution of benefit and damage caused by the road constructions not expected.
	22	Local conflict of interests	**C**	D	**Construction Phase:** Local inhabitants and local authorities may request to ensure job opportunities as construction workers. **Operation phase:** No impact is expected.
	23	Cultural Heritage	**C**	D	**Pre-construction and Construction Phase:** Impact will be assessed based on confirmation of cultural heritages around the project site.
	24	Landscape	D	D	No impact is expected.

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
	25	Gender	D	D	Negative impact specified for women are not expected
	26	Right of Children	D	D	Negative impact specified for children are not expected
	27	Infectious diseases such as HIV/AIDS	**C**	D	**Construction Phase:** Infectious diseases such as STD are possible to be spread due to inflow of construction workers. Furthermore, alteration to ground by cut land and filling may provoke to provide habitats of mosquito that possibly transmits dengue fever **Operation phase:** Road operations which causes infectious diseases are not expected
	28	Labor environment (including work safety)	**B-**	D	**Construction Phase:** Construction work environment needs to be considered in accordance with relevant laws and regulations **Operation phase:** No impact is expected.
Others	29	Accidents (Traffic situation)	**B-**	**B-**	**Construction Phase:** Construction vehicles may use existing local road near residential areas, thus number of traffic accident. **Operation phase:** Quantitative analysis based on baseline survey
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	**C**	**C**	**Construction phase:** Deforestation for land clearance may give impact on cross boundary impacts and climate change. **Operation phase:** Greenhouse gas emissions from vehicles that pass by along the new roads maybe generated which will have an impact in the protection of ozone layer as a result of climate change.

Note: Rating
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

Table 7.10.2-3 Baseline Survey and Forecast Analysis for Draft Scoping

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/ During Construction	Operation Phase		
Pollution	1	Air pollution (Air quality & noise)	**B-**	**B-**	-Site measurement (2 sites) TSP,PM_{10}, NO_2 and SO_2 -Secondary data collection, if any	**Construction Phase:** Qualitative analysis **Operation Phase:** - Quantitative analysis(PM_{10}, NO_2, and SO_2) (Puf model : calm wind model)
	2	Water pollution (Water quality)	**B-**	D	-Site measurement (2 sites: river water) DO, TSS, BOD, COD, pH, Total/Fecal Coliform, temperature -Secondary data collection, if any	**Construction Phase:** Qualitative analysis
	3	Waste (Abandonment)	**B-**	D	Review of specification on design and construction plan	**During Construction Phase:** Quantitative analysis of volume of cutting trees by type and excavated or drilling soil and muck
	4	Soil contamination (soil quality)	**B-**	D	Review of specification on design and construction plan	**During Construction Phase:** Qualitative analysis
	5	Noise and vibration (Noise)	**B-**	**B-**	Noise -Site measurement (2 sites) $L_{Aeq,\ 10min}$ weekday	**During Construction Phase:** Qualitative analysis based on construction machines on standard formation

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/ During Construction	Operation Phase		
					(in accordance with DENR regulation) -Secondary data collection, if any	**Operation Phase:** - Quantitative analysis(ASJ RTN-Model 2013)
	8	Sediment quality (Soil quality)	**B-**	D	Literature survey (land use history on affected land of the project)	**During Construction Phase:** Qualitative analysis base on the literature survey
Natural environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	B-	B-	Literature survey and site survey for fauna and flora. (Terrestrial: 9sites) (Marine: 4sites)	**During construction and operation phase:** Qualitative analysis base on the literature survey, site survey and construction plan & traffic volume in the future
	11	Hydrology (Hydrology and oceanography)	**B-**	**B-**	Literature survey and referring to hydrographic and geological survey result on feasibility study and designing	**During construction and operation phase:** Quantitative analysis on following items base on the hydrographic analysis for bridge and drainage designing. -Impact on hydrological situation on the rivers and streams -Impact on water vein underground -Impact on flooding situation
	12	Topography and geology (Geography, topography and landslides)	**B-**	D	Literature survey and topographic survey for designing	**During construction and operation phase:** Qualitative analysis base on the topographic analysis for designing
Social environment	13	Involuntary resettlement (People)	B-	D	Literature survey and a series of RAP surveys (Inventory of loss assets, census, social economic survey and replacement cost study)	**During construction phase:** Quantitative analysis based on RAP surveys
	14	The poor (People)	B+/B-	C	Literature survey and a series of RAP surveys	**During construction phase:** Quantitative analysis based on RAP surveys
	16	Local economy such as employment and livelihood (People)	**B-**	C	Literature survey and a series of RAP surveys	**During construction phase:** Qualitative analysis based on RAP surveys
	17	Land use and utilization of local resources (Land use and classification)	**B-**	**B-**	Literature survey and a series of RAP surveys	**During construction phase:** Quantitative analysis based on RAP surveys (area of land acquisition by land use)
	18	Water usage (Hydrology / Hydrogeology/Water quality)	**B-**	D	Literature survey, geological survey and water usage survey (identification of springs and wells around tunnel and cutting land areas based on the data from RAP survey)	**During construction phase:** Qualitative analysis base on the baseline survey for following items - Impact on springs and wells - Impact on watershed area
	19	Existing social infrastructures and services (People)	**B+**	**B-**	Literature survey and a series of RAP surveys	**During construction and operation phase:** Quantitative analysis based on RAP surveys
	22	Local conflict of interests (People)	C	D	Collection of information and opinions in stakeholder meeting(s)	**During construction:** Qualitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
	23	Cultural heritage (People)	C	D	Literature survey, a series of RAP surveys and collection of local information through stakeholder meeting(s)	**During construction:** Quantitative analysis based on RAP surveys and opinions through stakeholder meeting(s)

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/ During Construction	Operation Phase		
	27	Infectious diseases such as HIV/AIDS (People)	C	D	Literature survey and collection of local information through stakeholder meeting(s)	**During construction phase:** Qualitative analysis based on baseline survey. Followings impacts are considered - Risks of HIV/AIDS - Risks of dengue fever - Other specific infection disease
	28	Labor environment (including work safety)	**B-**	D	Literature survey, a series of RAP surveys and collection of local information through stakeholder meeting(s)	**During construction:** Quantitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
Others	29	Accidents (Traffic situation)	**B-**	**B-**	Collection of traffic accident data from police station	**During construction and operation phase::** Quantitative analysis based on baseline survey
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	**C**	**C**	-Estimation of affected forest area and traffic conditions based on the project plan	**During construction and operation phase::** Quantitative analysis based on baseline survey

Note: Rating
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

(6) Summary of Baseline Survey, Forecast and Impact Assessment

The summarized result of baseline survey and forecast of impacts are shown in **Table 7.10.2-4**. The baseline data and quantitative forecast is shown in **Table 7.10.2-5** and survey points of air & noise and water quality is shown in **Figure 7.10.2-5** and survey points of air & noise and water quality is shown in **Table 7.10.2-6**.

In terms of pollution items such as air, water and noise, all the forecasted values are within the allowable limits, thus it is not likely provided serious impact in these items. However, construction waste soil from cutting land and drilling in the tunnel section shall be reused or disposed in appropriate designated disposal site.

With regard to IUCN List, although some species are identified through the baseline survey on flora and fauna, these species are distributed around the around the Sub-Project area. The estimated numbers of resettlers are 36, appropriate compensation and mitigation measures are necessary on the resettlement action plan.

Table 7.10.2-4 Result of baseline and Forecast on Main Items

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
Pollution	1	Air Pollution (Air Quality & Noise)	B-	B-	B-	B-	Result of (TSP, PM_{10}, SO_2, NO_2) at 2 stations are below the standard values (See **Table 7.10.2-6**)	Forecast value do not exceed standard values	Expected impacts by the project are not significant because all the forecasted values are within the standard values Quantitative Standards as shown in **Table 7.10.2-5**.
	2	Water pollution (water Quality)	B-	D	B-	D	Result of (pH, Temp, BOD, TSS, DO) are within the guidelines (See **Table 7.10.2-6**)	During construction activities may cause turbidity water and oil and grease contamination. Likewise, domestic waste may be discharge from the camp	Impacts may be minimized or mitigated by provision of erosion control measures such as settling traps, use of portable toilet, etc. Quantitative Standards as shown in **Table 7.10.2-5**.
	3	Waste	B-	D	B-	D	Not required	Clearing and deforestation activities are expected to generate construction waste such as soil, debris, cut trees Also, additional domestic waste may be generated from the construction camp.	Impacts can be mitigated by proper management and disposal of waste like practice ecological waste management, segregation at source, 3R, etc
	4	Soil Contamination (Soil Quality)	B-	D	B-	D	Not required	Soil maybe contaminated from the construction equipment and transportation.	Impacts can be mitigated by proper maintenance of equipment and transportation, proper containment and disposal of oil, etc.
	5	Noise	B-	B-	B-	B-	There are some measurement of noise that exceeded the standard particularly during the night due to presence of insects like crickets that make noise during the dark and usual in the rural areas. (See **Table 7.10.2-6**)	Forecast value exceed philippines standard values(Class A (General)), but the value do not exceed Japanese standard values(Class B2). (See **Table 7.10.2-6**)	Impacts may be mitigated by avoidance and other measures such as no construction during the night or use of muffler or sound proof barrier. Quantitative Standards as shown in **Table 7.10.2-5**.
	6	Ground Subsidence	D	D	D	D	The Project Area is dominated by volcanic plain or volcanic piedmont deposits, chiefly pyroclastics and/or volcanic debris usually found at the foot of volcanoes. Plateau basalt in Pagadian and Lanao regions, and non-active cones (generally pyroxene andesite) are also present.	Not required	Not required
	7	Odor	D	D	D	D	Not required	Few impacts are expected. Obnoxious odor may come from vehicle exhaust, clearing & dredging of river banks.	Qualitative measurements based on sensitivity of receptors against unobjectionable odor

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
	8	Sediment Quality	B-	D	B-	D	Not required	During construction sediment will most likely erode into the water particularly during heavy rains	Impacts may be mitigated through erosion /sedimentation control measures, or stoppage of soil clearing during heavy rains, use of silt trap
Natural Environment	9	Protected Area	D	D	D	D	Not required	Not required	No protected area is observed in the area.
	10	Ecosystem (Terrestrial Flora and Fauna)	B-	C	B-	C	Floristic composition of the assessed alignment is vegetated with common and naturally growing species in the area. There are only 88 plant species were recorded dominated by trees. The result also showed that only 1 species is identified as critically endangered under the IUCN conservation categories. Faunal composition of the area is very low comprised of 36 species dominated by avifauna. Most of the species recorded are common and highly adaptive in wide a range of habitats and ecosystems including agricultural areas, shrub lands, grassland, within settlements areas and sometimes cited in highly urbanized areas and cities. Six (6) species are endemic in the study area dominated by Aves. Only one (1) species is near threatened in the category of the IUCN.	The project development will require removal of vegetation cover to give way for the construction of the proposed road project. Further loss of vegetation cover as a result of land clearing may encourage movement/migration of wildlife species in the area aggravated by the loss of habitat/abode and remaining sources of food for survival. Likewise, wildlife disturbance due to noise pollution brought about by the operation of heavy equipment's during construction will force some faunal species to migrate to other or nearby areas/habitat where disturbance is less.	Prior to project implementation the proponent will coordinate to the DENR and Philippine Coconut Authority (PCA) to seek clearance for the identification of required documents for the issuance of needed tree and coconut cutting permits (PD 705). Moreover, to compensate the loss of habitats, the proponent will replace the number of trees removed/cut and plant them in nearby areas or in accordance with the advice of the DENR. Species that will be used for the reforestation must be indigenous trees and/or fruit bearing trees endemic in the place that can attract wildlife species. Planting of trees will help in sequestering carbon in the environment. As per DENR Memorandum Order no. 05 of 2012 mandated that "Uniform replacement ratio for cut or relocated trees" item 2.2 "For planted trees in private land and forest lands... tree replacement shall be 1:50 while naturally growing trees in the same area, including those affected by the project, shall be 1:100 ratio in support of the National Greening Program (NGP) and Climate Change Initiatives of the Government". Compensation for affected coconut palms shall be based on Section 5 of Republic Act No. 8048, an act providing for the regulation of the cutting of coconut palms. Replacement ratio of cut coconut palm shall be 1:1.

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
	11	Hydrology (Hydrology and oceanography)	B-	B-	C	C	The river systems that affect the proposed road alignment are the Tigatan, Matimus, Salanga, Abunabun and Muda Rivers and Diarong Creek. During the conduct of field investigation, no ground water wells or springs were found that may be affected by the project but based on the data from the National Water Resources Board (NWRB), two springs are within the vicinity of the road alignment namely; Macasandag Spring and Libuan Spring. These springs are used for municipal and irrigation purposes respectively. In general, the proposed alignment has a low susceptibility to flooding.	Earthworks may cause turbidity of river water and as to the springs reported on the alignment will most likely affected	Impacts may be mitigated by sediment and silt traps .Appropriate assistance for other source of water
	12	Topography and Geology (Geography, topography and landslides)	B-	B-	B-	B-	Characterized by low elevations at the upper half that form the transition area between the coastal plain and hilly areas. The lower half of the road alignment is generally steep due to the presence of Mt. Abunabun.	• The proximity of active faults exposes the project to moderate to strong ground shaking. • Some sections may be prone to liquefaction due to presence of loose/unconsolidated sediments with shallow water table. • Some sections passing through steep to very steep, hilly to mountainous terrain may be susceptible to slope failure, soil erosion, and rock fall. • The coastal barangays are prone to tsunami. Localized flooding may occur due to overflowing of water from rivers and other bodies of water.	• Conduct Probabilistic Seismic Hazard Assessment (PSHA). • Appropriate geotechnical investigation to evaluate potential liquefiable soil layers. • Impacts may be mitigated by slope protection. • Coordinate with PHIVOLCS regarding tsunami alerts. Impact may be mitigated by construction of physical structures, flood modeling, and early warning systems.
Social Environment	13	Involuntary resettlement (People)	B-	D	B-	D	Based on the RAP survey, 8 affected dwellings and 36 resettlers are identified.	Land acquisition may cause acquisition of agricultural land, crops and resettlement. Thus, RAP is prepared in accordance with JICA Guidelines and Philippine Laws.	Appropriate compensation and assistance in accordance with RAP is prepared to minimize adverse social impacts.

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
	14	The Poor (People)	B+	C	B+ /-	C	Based on the profiles of the respondents during perception survey, 40.73% of the households are earning below poverty line (PhP5,000 to PhP10,000/month).	Land acquisition by the project gives some adverse impact to poor people under poverty line	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of livelihood/income to the poor may be consider.
	15	Indigenous and ethnic people (Indigenous People)	D	D	D	D	Not required	Not required	The existence of indigenous people has not been confirmed in project area. No impacts are expected.
	16	Local Economy such as employment and livelihood (People)	B-	D	B-	D	Based on the occupation or source of income of the respondents, most of them depend on farming 68.87% and laborers 50.33% in the project area. Farming is the most strategic form of work due to the proximity of these people to the community. Around 20.53% are engaged in fishing, 16.56% are employed while 15.23% are engaged in others occupation.	Land acquisition by the project gives some adverse impact to tenant farmers and employees of the shops.	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of livelihood/income to the poor may be consider
	17	Land Use and utilization of local resources (Land Use and classification)	B-	D	B-	D	The project alignment is passing through mainly agricultural area such as plantation and residential zone	In terms of the Agricultural Land Zone (AG), impacts are considered as both positive and negative. Positive in the sense that the road can provide better and faster way, and as such more economical way of transporting products from these areas to trading centers and other distribution sites. Negative in the sense that there is an imminent danger of illegal conversion into other uses	Some impacts are expected; thus these impacts and risks are minimized by appropriate land management
	18	Water usage (hydrology/ hydrogeology/water quality)	B-	B-	B-	B-	Water supply is scarce in some portions of project affected areas. Water source comes from dugwells and springs which are used for domestic and drinking water. In Balabagan, there are water delivery trucks in some areas that supplies water which costs PhP 50 per drum.	Earthworks may cause turbidity of river water as being use for domestic.	Minimized by control measures like silt trap, sedimentation pond, etc.

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
	19	Existing Social infrastructures and services (People)	B-	D	B-	D	There are 25 electric post, 1 water sytem and 3 cemetery identified in the proposed alignment	The project does not give any impact to social infrastructures. Thus it is not likely to give any serious impacts on this item	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts, if any impacts are expected in the detailed design
	20	Social institutions such as social infrastructure and local decision-making institutions	C	C	C	C	Impacts are not expected, since local decision-making institute represented by local governments will continue after the road construction.	Impacts not Expected	Not required
	21	Misdistribution of benefit and damage	D	D	D	D	Misdistribution of benefit and damage caused by the road constructions not expected.	Impacts not Expected	Not required
	22	Local Conflict of interest (People)	C	D	C	D	Most of the stakeholders requested to provide work opportunities as a construction worker during construction in the stakeholder meetings on scoping stage	The local conflicts regarding work opportunities between local communities may be raised in case of unfair employment.	This risk is minimized by mitigation measures such as provision of priority in hiring during construction period.
	23	Cultural Heritage (People)	C	D	C	D	No cultural heritage affected.	Impacts not Expected	Not required
	24	Landscape	D	D	D	D	Not required	Few impact is expected	Not required
	25	Gender	D	D	D	D	LGU has implemented GAD projects	Impacts on Gender are mostly positive since opportunity for livelihood is expected (small business to women, employment to men)	Prioritization in hiring during construction and assistance for livelihood development
	26	Right of Children	D	D	D	D	Not required	Few impact is expected	Not required
	27	Infectious diseases such as HIV/AIDS (People)	B-	D	B-	D	No infectious illness recorded in the project area. Project should not to create a habitat of mosquito that transmits dengue fever in incidental pond in the construction area without appropriate drainage.	Infectious diseases such as STD are possible to be spread due to inflow of construction workers. Furthermore, alteration to ground by cut land and filling may provoke to provide habitats of mosquito that possibly transmits dengue fever	This risk is minimized by mitigation measures such as construction of sufficient drainage, management of construction yard and health check & education for workers.
	28	Labor environment (including Work safety)	B-	D	B-	D	Not required	There are risks for workers during construction, if the construction contractor does not comply with relevant labor laws and regulations.	These risks are avoided and minimized by complying with relevant laws and regulations by the contractor under observation of DPWH

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
Others	29	Accident (Traffic Situation)	B-	B-	B-	B-	No serious problem on traffic	Construction vehicles may use existing local road near residential areas, thus number of traffic accident may increase	These risks are avoided and minimized by installation of traffic signage such as sign board, reflector/lighting in the night, safety personnel and parking for construction machines
	30	Cross boundary impacts and climate change (Meteorology /climatology)	D	D	D	D	Not required	During Construction, deforestation will incur. On loss of vegetation, the project development will require removal of vegetation cover to give way for the construction of road project. The removal of vegetation will also result in the reduction in the population of plant species growing within the project area. Future vegetation will face a great threat during the clearing activity. This activity will hinder the opportunity of these regenerants to grow and replace those mature vegetation in the area. During operations, generation of carbon monoxide and other gases will be generated from exhaust vehicles which will impact the ozone layer	On loss of vegetation: During site preparation, clearing of the road ROW will result to the removal of of an estimated tree above ground biomass (using large of trees with dbh of 10 cm and above, and pole size tress with $\geq$ 5 cm dbh to 9.5 cm) of 1.59×10^{-4} and 2.87×10^{-4}megaram per hectare, and with estimated Carbon stored value of 3.53×10^{-4} and 6.38×10^{-4} megagram per hectare, respectively. It was computed using the brown allometric equation.

Note: Rating

A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.

Source: JICA Study Team

Table 7.10.2-5 Summary of Baseline and Forecasted Value (Air, Noise, Water)

No.	Item			Baseline Value (Standard Value)					Quantitative Forecast Analysis (Standard Value)			
1	Air Pollution	St.	Location	TSP (230μg/Ncm)	PM_{10} (150μg/Ncm)	NO_2 (150μg/Ncm)	SO_2 (180μg/Ncm)		TSP (230μg/Ncm)	PM_{10} (150μg/Ncm)	NO_2 (150μg/Ncm)	SO_2 (180μg/Ncm)
		1	Brgy. Salaman, Kapatagan	18.1	4.6	1.7	1.0		-	4.7	1.8	1.0
		2	Brgy. Poblacion, Balabagan	19.4	4.5	2.5	1.4		-	4.2	2.6	1.4
2	Water Pollution (Water Quality)	St	Location	pH (6.5-9)	Temp, ºC (25-31)	BOD (7)	TSS (80)	DO (5ppm min.)	Basically, waste water is not discharged during and after construction, thus quantitative forecast has not been conducted.			
		1	Budas River	7.5	29.0	2	23	8				
		2	Matimos River	7.6	26.6	<1	12	8				
5	Noise	St	Location	Morning (50)	Daytime (55)	Evening (50)	Night time (45)		Morning (50) <65>	Evening (55) <65>	Evening (50) <65>	Night Time (45) <60>
		1	Brgy Salaman, Kapatagan	**51**	52	**52**	**49**		**55**	**56**	**52**	**50**
		2	Brgy. Poblacion, Balabagan	**52**	53	**52**	**46**		**55**	**56**	**53**	**49**

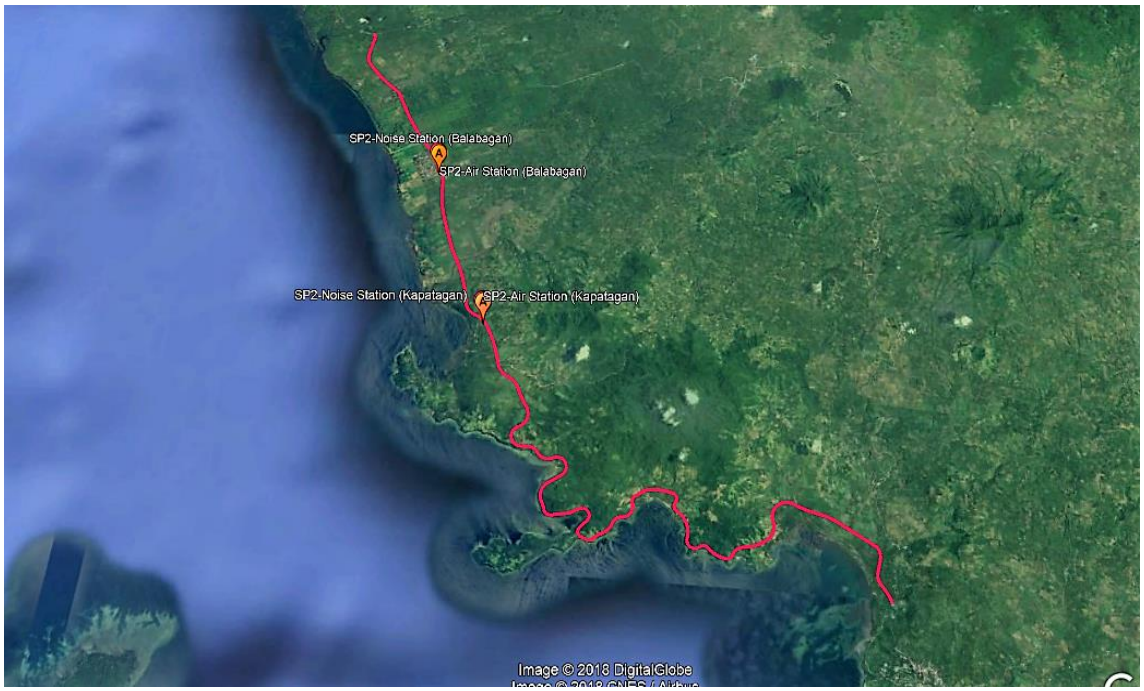
( ): Philippine Standard Values
< >: Japanese Standard Values
Source: JICA Study Team

Table 7.10.2-6 shows sampling stations for Noise, Air and Water Sampling Sites, Coordinates, Date and Time of Samplings and **Figure 7.10.2-2** and **Figure 7.10.2-3**shows the sampling location for air, noise and water.

Table 7.10.2-6 Sampling points for Noise, Air and Water Quality

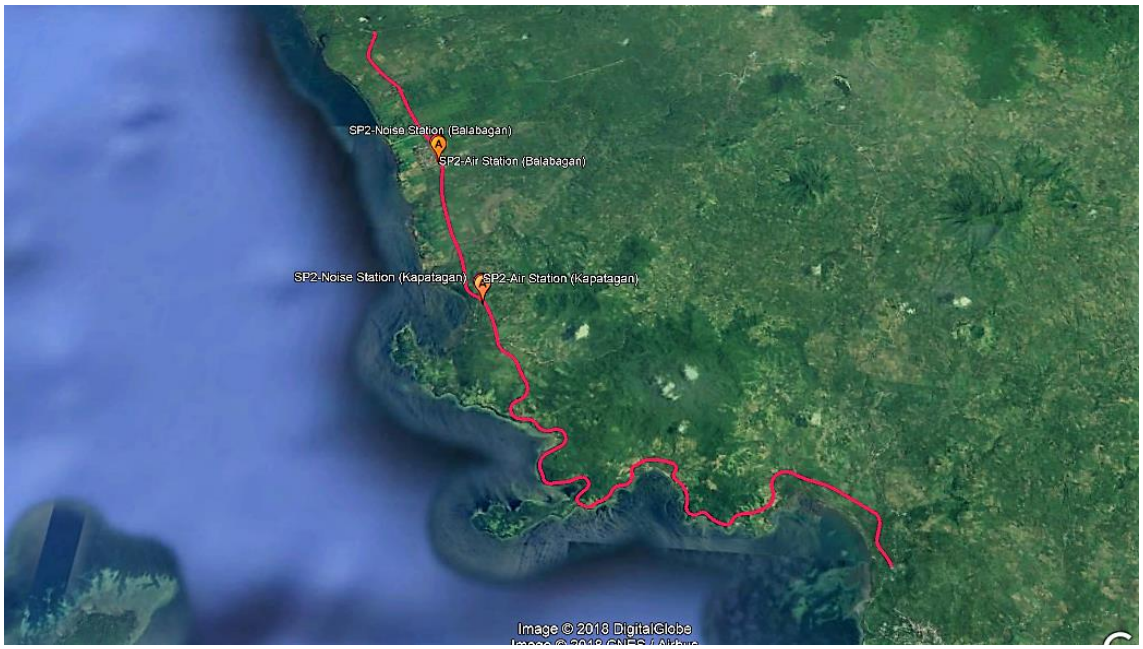
Station No.	Sampling Stations	Coordinates	Date and Time of Samplings
Noise			
N1	Brgy. Salaman, Kapatagan	7°27'49.02"N 124° 8'57.31"E	December 12-13, 2017, 1050H
N2	Brgy. Narra, Balabagan	7°30'24.36"N 124° 7'54.19"E	December 13-14, 2017, 1225H
Air			
A1	Brgy. Salaman, Kapatagan	7°27'47.60"N 124° 8'58.43"E	December 12-13, 2017, 1050H
A2	Brgy. Poblacion, Balabagan	7° 30’ 22.02” N 124° 7’ 55.77” E	December 13-14, 2017, 1225H
Water			
W1	Budas River	7°28’49.1” N 124° 08’ 25.2” E	November 16, 2017, 1120H
W2	Matimos-Minoan River	7°27’9.8” N 124° 09’ 26.9” E	November 16, 2017, 1337H

Source: JICA Study Team



Source: JICA Study Team

Figure 7.10.2-2 Sampling location map of air and noise covered by Parang - Balabagan Road



Source: JICA Study Team

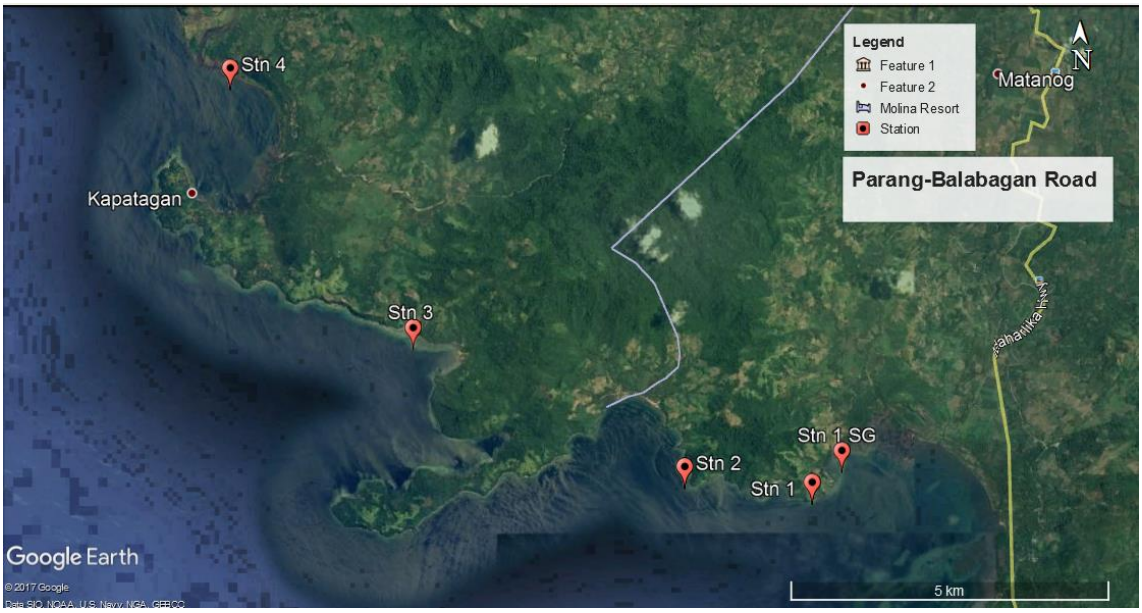
Figure 7.10.2-3 Water Sampling Map covered by Parang - Balabagan Road

The coordinates and sampling location maps for marine ecology are shown in **Table 7.10.2-7** and **Figure 7.10.2-4** respectively.

Table 7.10.2-7 Sampling Stations for Marine Ecology

Station No.	Location	Sampling Depth, (m)	Coordinates	Description
1	Brgy. Sapad, Matanog, Maguindanao	3	07° 24' 18.4" N 124° 13' 25.2"E	Conducted Fish Visual Census and Coral Assessment (Line Intercept Technique). Underwater photo documentation. Collected Phytoplankton, Zooplankton and Macroinvertebrates.
	Brgy. Sapad, Matanog, Maguindanao	3	07° 24' 34.8" N 124° 13' 40.9"E	Seagrass Station. With Patches of mangroves
2	Brgy. Kidama, Matanog, Maguindanao	3	07° 24' 26.5" N 124° 12' 18.5"E	No seagrass, Conducted Fish Visual Census and Coral Assessment (Line Intercept Technique). Underwater photo documentation. Collected Phytoplankton, Zooplankton and Macroinvertebrates
3	Brgy. Lusain, Kapatagan, Lanao del Sur	7	07° 25' 38.6" N 124° 09' 56.0"E	Dive site of the municipality of Kapatagan. No seagrass in this station. Conducted Fish Visual Census and Coral Assessment (Line Intercept Technique). Underwater photo documentation. Collected Phytoplankton, Zooplankton and Macroinvertebrates. Additional marine ecology station
4	Brgy. Bakikis, Kapatagan, Lanao del Sur	4	07° 27' 54.1" N 124° 08' 19.5"E	Near Buddha River, black sand, No corals, reef fish and seagrass station. Underwater photo documentation. Collected Phytoplankton, Zooplankton and Macroinvertebrates

Source: JICA Study Team



Source: JICA Study Team

Figure 7.10.2-4 Location of Marine Ecology Sampling Stations, Parang-Balabagan Road Project

Survey on terrestrial flora and fauna was undertaken in 9 sampling sites within the proposed alignment in 14 covering barangays of Parang, Kapatagan and Balabagan. Sampling for plant species composition and observation of prevailing fauna species within the proposed alignment was undertaken in the same selected locations. Barangays covered the sampling sites include Makasandag, Matimos, Salaman, Bakikis, Batuan, Narra, Lorenzo and Barorao, in the municipality of Parang, Kapatagan and Balabagan.

Geographic coordinates of observation sites are shown in the table below,

Table 7.10.2-8 Locations of sampling sites for flora and fauna

Municipality	Site	Barangay	Geographic coordinates	
			Northing	Easting
Parang	1	Makasandag	7°24' 2.66"	124°15'19.29"
	2	Makasandag	7°24'59.87"	124°14'44.90"
Kapatagan	3	Matimos	7°26'25.97"	124° 9'49.60"
	4	Salaman	7°27'24.72"	124° 9'12.55"
	5	Bakikis	7°28'41.44"	124° 8'29.82"
Balabagan	6	Batuan	7°29'28.79"	124° 8' 9.46"
	7	Narra	7°30'29.72"	124° 7'54.43"
	8	Lorenzo	7°31'25.99"	124° 7'16.12"
	9	Barorao	7°32'51.70"	124° 6'25.91"

Source: JICA Study Team

Source: JICA Study Team

Figure 7.10.2-5 Terrestrial flora and fauna sampling sites

(7) Mitigation Measures and Environmental Management Plan

A proposed mitigation plans during and after construction are shown in **Table 7.10.2-9**. All mitigation measures are included in the submitted EIS Report by DPWH. All cost for mitigation measures will be finalized in detailed engineering design phase.

Table 7.10.2-9 Environmental Management Plan

Category	No.	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
Pollution	1	Air pollution (Air quality & noise)	(Dust) - Water sprinkling near residential area - 20 kph speed limit for construction machines at construction sites adjacent to settlement areas	(NO_2, SO_2 and TSP) - Setting up green buffer zone along the road (the zone and planting trees are carried out during construction)	Contractor	[During Const.] DPWH [Operation **Phase]** Parang, Matanog, Balabagan, Kapatagan
	2	Water pollution (Water quality)	[Turbid water and other items] - Discharge through sedimentation pond and silt fence -Installation of portable toilet for workers - Appropriate waste and construction machines management	Not required	Contractor	DPWH
	3	Waste (Abandonment)	[Construction waste (trees and waste soil)] - After considering the possibility of reuse, construction waste is disposed at designated disposal site Note) [Muck soil from tunnel section] -Reuse or disposed at designated disposal site after treatment [Garbage from base camp] - Garbage at workers camp and waste oil shall be brought to disposal site or facility [Night soil] -Temporary sanitation facility such as septic tank shall be introduced to the workers camp.	Not required	Contractor	DPWH
	4	Soil contamination (soil quality)	-Reuse or disposed at designated disposal site after treatment	Not required	Contractor	DPWH
	5	Noise and vibration (Noise)	[Construction noise] - Installing noise barrier and selecting low-noise equipment.	[Traffic noise] - Establishment of green belt as buffer zone along the road	Contractor	DPWH

Category	No.	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
			- Avoiding works of heavy equipment during night time. -Informing the construction schedule to surrounding communities to obtain their consensus	- Secure sufficient distance from boundary of the road to residential area after construction of the road (secure noise decay distance) on land use plan along the road - Installation of noise barrier near sensitive facility, if required		
	6	Sediment quality (Soil quality)	-Reuse or disposed at designated disposal site after treatment	Not required	Contractor	DPWH
Natural Environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	-Relocation & replanting trees along the road in ROW -Tree planting at sites designated by DENR -Create ecotone habitats in consideration of Amphibia and other fauna, if the existing habitats along the river are impacted by the project	Appropriate land use management not to develop natural area along the road	[Const.] Contractor [Operation] Parang, Matanog, Balabagan, Kapatagan	[Const.] DPWH [Operation] Parang, Matanog, Balabagan, Kapatagan
	11	Hydrology (Hydrology and oceanography)	- Designing of bridges with sufficient capacity - Installation of sufficient drainage facilities on bypass - Secure waterways in construction area	Not required	Contractor	DPWH
	12	Topography and geology (Geography, topography and landslides	- Installation of slope protection measures	Not required	Contractor	DPWH
Social Environment	13	Involuntary resettlement (People)	Appropriate compensation and social assistance in accordance with RAP	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	DPWH	Parang, Matanog, Balabagan, Kapatagan

Category	No.	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
	14	The poor (People)	Appropriate social assistance in accordance with RAP	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	DPWH	Parang, Matanog, Balabagan, Kapatagan
	15	Indigenous and ethnic people (Indigenous people)	Not required However, situation of minority religious group (s) such as Islamic group shall be monitored and adequate assistance and coordination shall be given, if necessary	Not required for designated Indigenous and Ethnic group specially if NCIP has been issued. However situation of minority Religious group such as Islamic group shall be monitored and adequate assistance and coordination shall be given, if necessary	DPWH	Parang, Matanog, Balabagan, Kapatagan
	16	Local economy such as employment and livelihood	Appropriate compensation and social assistance in accordance with RAP	Not required	DPWH	Parang, Matanog, Balabagan, Kapatagan
	17	Land use and utilization of local resources (Land use and classification)	Appropriate land acquisition and compensation for agricultural area	Management of appropriate land use in accordance with approved detailed zoning map	[Const.] DPWH [Operation] Parang, Matanog, Balabagan, Kapatagan	Parang, Matanog, Balabagan, Kapatagan
	18	Water usage (Hydrology / Hydrogeology/ Water quality)	Installation of alternative water distribution system when unexpected situation such as reduction of spring water and water level of wells	Installation of alternative water distribution system when unexpected situation such as reduction of spring water and water level of wells	DPWH, Parang, Matanog, Balabagan, Kapatagan	Parang, Matanog, Balabagan, Kapatagan
	19	Existing social infrastructures and services	Appropriate compensation and/or relocation in accordance with RAP	Not Required	Contractor and DPWH	DPWH, Parang, Matanog, Balabagan, Kapatagan
	22	Local conflict of interests	Local workforce is prioritized for construction of the road	Not required	Contractor	DPWH
	23	Cultural heritage	No cultural heritage to be affected. Mitigation not required	Not required	-	-

Category	No.	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
	27	Infectious diseases such as dengue and HIV/AIDS	- Installation of sufficient drainage facilities not to provide habitat for vector mosquito - Provision of adequate temporary sanitation facilities - Enforcement of medical screening and periodical medical check-up - In order to prevent spread of infectious diseases such as HIV/AIDS, awareness of the labors is promoted	Not Required	Contractor,	DPWH,
	28	Labor environment (including work safety)	Complying with relevant laws and regulations by the contractor under observation of DPWH	Not required	Contractor,	DPWH
Others	29	Accidents (Traffic situation)	- Deploying flagman at the gate and crossing points of the construction vehicles - Installation of safety sign board - Installing fence around the construction site to keep out local people such as children - Installation of lightning in the night time - Installation of parking for idling construction machines - Safety training for the workers - Safety patrol at the construction site by supervisors	Not Required	Contractor	DPWH
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	Replanting endemic/ native trees and other agricultural trees such as coconuts	Not required	Contractor	DPWH

Source: JICA Study Team

(8) Environmental Monitoring Plan and Budget

A proposed monitoring plan during and after construction are shown in **Table 7.10.2-10** and **Table 7.10.2-11** respectively**.** All monitoring plans are included in the submitted EIA by DPWH to EMB. The monitoring in operation phase shall be carried out for two (2) years at least.

Proposed items to be monitored by JICA are shown in **Table 7.10.2-12**. Air, water quality, noise, ecosystem, resettlement and livelihood of relocated people shall be monitored during and after construction.

Table 7.10.2-10 Environmental Monitoring Plan (Pre and During Construction)

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
Pollution	1	Air pollution (Air quality & noise)	TSP, SO_2, NO_2 and PM_{10}	1.TSP –Gravimetric 2.SO2 –Pararosaniline 3.NO2 – Griess Saltzman Reaction 4. PM_{10}–Direct Reading (Gas Analyzer)	2 sites (same locations of baseline survey) (see **Table 7.10.2-6** and **Figure 7.10.2-2**)	2 times	800,000	TSP 300µg/Ncm SO_2 340 µg/Ncm NO_2 260 µg/Ncm PM_{10} 150 µg/Ncm
	2	Water pollution (Water quality)	pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Methodologies are described in DAO 34-1990 and EMBDENR Manual for Ambient Water Quality Monitoring Volume I	2 sites (same locations of baseline survey) **Table 7.10.2-6** and **Figure 7.10.2-3**)	2 times	600,000	For Class "C" freshwater pH – 6.5 to 8.5 DO – 5.0 mg/L Oil & Grease – 2.0 mg/L BOD – 7.0 mg/L TSS – not more than 30 mg/L increase
	3	Waste (Abandonment	Volume of waste soil, cutting tree and domestic garbage	Record volume of generated waste	Cutting land section, tunnel section, cutting tree section and workers camp	4 times	200,000	Generated waste shall be reused or disposed at designated site.
	4	Noise and vibration (Noise	Ambient and road side noise (dB(A)LAeq)	L_{Aeq}, 10min during morning, daytime, evening and night time	2 sites (same locations of baseline survey) (see **Table 7.10.2-6** and **Figure 7.10.2-2**)	2 times	400,000	For "A" categorized areas (general area) Morning: 50 dB(A) Daytime: 60 dB(A) Evening: 50 dB(A) Night: 45 dB(A) For "B" categorized areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night: 55 dB (A)
Natural Environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology	Situation of Cutting tree area	Ocular inspection	Major bridge section (see **Table 7.10.2-7** and **Figure 7.10.2-4**)	4 times	200,000	Cutting tree area is limited on ROW
	11	Hydrology (Hydrology and oceanography)	Flooding situation	Flood level measurement during high precipitation periods Interview with local residents	Flood-prone areas, particularly near major river systems	4 times	200,000	Project activities and structures does not cause flooding
	12	Topography and geology (Geography, topography and landslides)	Stability of slope	Ocular inspection	High cut and high embankment section	4 times	200,000	Must be continuously undertaken until slopes are fairly stable and vegetation cover achieves high survival rate

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
Social Environment	13	Involuntary resettlement (People)	Payment and implementation n of social assistance in accordance with RAP	Consultation Meeting and/or Survey with the project affected persons (PAPs)	Affected barangays	Monthly	500,000	Must be completed prior to construction stage
	14	The poor (People)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	15	Indigenous and ethnic people (Indigenous people)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	16	Local economy such as employment and livelihood	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	19	Existing social infrastructures and services	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	22	Local conflict of interests	Construction n worker's native barangay	Confirmation of workers list from contractor	All barangays on the affected route	4 times	500,000	Employment opportunity shall be provided fairly
	27	Infectious diseases such as HIV/AIDS	Number of infected patient	Confirmation of health check list from contractor	All construction workers	4 times	500,000	Infection disease rate shall be less than average rate
	28	Labor environment (including work safety)	Number of workers with required instrument such as helmet	Count numbers of workers with instrument	All construction workers (weekly meeting place)	4 times	500,000	All workers shall have designated device such as helmet

Source: JICA Study Team

Table 7.10.2-11 Environmental Monitoring Plan (Operation Phase)

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
Pollution	1	Air pollution (Air quality & noise	TSP, SO_2, NO_2 and PM_{10}	1.TSP –Gravimetric 2.SO2 –Pararosaniline 3. NO2 – Griess Saltzman Reaction 4. PM_{10}–Direct Reading (Gas Analyzer)	2 sites (same locations of baseline survey)	1 times	400,000	TSP 300μg/Ncm SO2 340 μg/Ncm NO2 260 μg/Ncm PM_{10} 150 μg/Ncm
	2	Water pollution (Water quality)	pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Methodologies are described in DAO 34-1990 and EMBDENR Manual for Ambient Water Quality Monitoring Volume I	2 sites (same locations of baseline survey)	1 times	600,000	For Class “C” freshwater pH – 6.5 to 8.5 DO – 5.0 mg/L Oil & Grease – 2.0 mg/L BOD – 7.0 mg/L TSS – not more than 30 mg/L increase
	4	Noise and vibration (Noise)	Ambient and road side noise (dB(A)L_{Aeq})	L_{Aeq}, 10min during morning, daytime, evening and night tim	2 sites (same locations of baseline survey)	1 times	200,000	For “A” categorized areas (general area) Morning: 45 dB(A) Daytime: 50 dB(A) Evening: 45 dB(A) Night : 40 dB(A) For “B” categorized Areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)
Natural Environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology	Situation of Cutting tree area	Ocular inspection	Major bridge section	1 times	100,000	Cutting tree area is limited on ROW
	11	Hydrology (Hydrology and oceanography)	Flooding situation	Flood level measurement during high precipitation periods Interview with local residents	Flood-prone areas, particularly near major river systems	1 times	100,000	Project activities and structures does not cause flooding
	12	Topography and geology (Geography, topography and landslides)	Stability of slope	Ocular inspection	High cut and high embankment section	4 times	200,000	Must be continuously undertaken until slopes are fairly stable and vegetation cover achieves high survival rate
Social Environment	13	Involuntary resettlement (People)	Payment and implementation of social assistance in accordance with RAP	Consultation meeting and/or Survey with the project affected persons (PAPs)	Affected barangays	Monthly	500,000	Must be completed prior to construction stage
	14	The poor (People)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	15	Indigenous and ethnic people (Indigenous people)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	16	Local economy such as employment and livelihood	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
	19	Existing social infrastructures and services	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	22	Local conflict of interests	Construction worker's native barangay	Confirmation of workers list from contractor	All barangays on the affected route	Quarterly	500,000	Employment opportunity shall be provided fairly
	27	Infectious diseases such as HIV/AIDS	Number of infected patient	Confirmation of health check list from contractor	All construction workers	Quarterly	500,000	Infection disease rate shall be less than average rate
	28	Labor environment (including work safety)	Number of workers with required instrument such as helmet	Count numbers of workers with instrument	All construction workers (weekly meeting place)	4 times	500,000	All workers shall have designated device such as helmet

Source: JICA Study Team

Table 7.10.2-12 Environmental Monitoring Form (JICA Form)

-If environmental reviews indicate the need of monitoring by JICA, JICA undertakes monitoring for necessary items that are decided by environmental reviews. JICA undertakes monitoring based on regular reports including measured data submitted by the project proponent. When necessary, the project proponent should refer to the following monitoring form for submitting reports.

-When monitoring plans including monitoring items, frequencies and methods are decided, project phase or project life cycle (such as construction phase and operation phase) should be considered

1. Relevant Permission and Public Consultation

Monitoring Item	Monitoring Results during Report Period
Confirmation of relevant written permissions and minutes of meetings for held consultations and meetings	

2. Mitigation Measures/Monitoring

- Air Quality（Traffic /Ambient Air Quality

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
TSP	µg/Ncm	18.8	19.4	230µg/Ncm	0.2 mg/m3	-Same points as baseline survey (see **Table 7.10.2-6** -Two (2) time a year during construction -Once a year during operation -TSP = Gravimetric - SO_2 =Pararosaniline - NO_2 = Griess Saltzman Reaction - PM_{10} = Gravimetric (Gas Analyzer)
NO_2	µg/Ncm	2.1	2.5	150ug/Ncm	0.04-0.06 ppm	
SO_2	Mg/Ncm	1.2	1.4	180ug/Ncm	0.1 ppm	
PM_{10}	ppm	4.4	4.6	150ug/Ncm	-	

- Water Quality（Physico-chemical Analyses of Surface Water）

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
pH	-	7.6	7.6	6.5-9	6.5-8.5	-Upstream and downstream portion -Same points as baseline survey (see **Table 7.10.2-6** -Two (2) time a year during construction -Once a year during operation -grab sampling
DO	mg/L	8	8	5ppm min.	5 ppm	
TSS	mg/L	18	23	80	25	
BOD	mg/L	1.5	2	7	3	
Turbidity	NTU	0.6	0.9	-	-	
Temperature	℃	27.8	29.0	25-31		

-Noise/Vibration

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
Noise level	dB(A)	Morning 52dB Daytime 52dB Evening 50dB Night time 48dB	Morning 52dB Daytime 53dB Evening 53dB Night time 50dB	For "A" categorized areas (general / residential area) Morning: 45 dB(A) Daytime: 50 dB(A) Evening: 45 dB(A) Night : 40 dB(A) For "B" categorized Areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)	Daytime: (6:00-22:00) 50dB(AA) 55 dB(A) 55 dB(B) 60 dB(C) Evening Time: (22:00-6:00) 40 dB(AA) 45 dB(A) 45 dB(B) 55 dB(C)	- Same points as baseline survey (see **Table 7.10.2-6)** - 2 times a year during construction - Once a year during operation - Digital sound level meter

- Odor

Monitoring Item	Monitoring Results during Report Period
Not required	

3. Natural Environment

- Ecosystem

Monitoring Item	Monitoring Results during Report Period
Situation of cutting tree area (during construction) Situation of replanting area along the road (operation phase)	

4. Social Environment

- Resettlement (During and after Construction)

Monitoring Item	Monitoring Results during Report Period
Number of PAPs including IPs to be resettled/ relocated/ provided livelihood assistance where required. (during Construction)	
Inventory and valuation of PAPS affected assets (during Construction)	
Notice period given to PAPs before shifting them from their original locations within the ROW (Pre and during construction)	
Number of grievances recorded and redressed (Pre and during Construction)	
Conflicts between religions (Pre, during and after construction)	

- Living / Livelihood

Monitoring Item	Monitoring Results during Report Period
Pre-and post-resettlement incomes and livelihood of PAPs especially for poor people (during and after construction)	

(9) Institutional Arrangement for EMP Implementation

Institutional Arrangement for EMP Implementation is described in **Section 7.5**.

(10) Stakeholders Meeting for EIA

A total of 22 stakeholders' meetings were held for Sub-Project 2, two (2) stakeholders' meetings were held at municipal level and one (1) was held at barangay level for barangay scoping**.** The first stakeholders' meetings at municipal level are prescript Information Education Communication meetings (IEC meeting) based on the Philippine EIA guidelines held in the municipalities of Parang, Matanog, Kapatagan and Balabagan attended by the affected stakeholders, barangay and municipal officials, and concerned LGU offices such as Assessors, MPDC. The second stakeholders' meetingsat municipal level presented the results of the baseline surveys. These meetings were attended by a total of 596 participants composed of 441 males and 155 females.

The major questions of the participants brought out during the 1st and 2nd public consultations are enumerated below. All questions, comments and suggestions were answered by DPWH ARMM, JICA Cotabato, RAP, and EIA Study team, and it seemed that all questioners understood and agreed all answers as shown in **Table 7.10.2-14**.

1st Public Consultation:

a. What will happen to the landowner without land titles and proof of ownership;
b. What will happen to the land under the military reservations;
c. Realignment to avoid the Muslim cemetery, less affected community, and near the proper barangay (farm to market road) ;
d. Exact alignment of the road that will also benefits the PWD;
e. Who will compensate the affected land, crops, and other structures;
f. What will happen to the families if all of their properties will be affected;
g. Tress and fruit bearings are included in the compensations;
h. Necessary documents for claims and compensations;
i. Who will determine the price of the affected;
j. No compensation received for the affected landowner from the past projects of DPWH;
k. Avoid the proposed expansion of Air Strip in Balabagan Municipality; and
l. Proper knowledge on the process of compensations and needed documents;

2nd Public Consultation

a. What will happen to the new existing road?
b. Mayor hope that the proponent will consider the prevailing price because the assessed value is very low
c. How many meters will be occupied of the said road project?
d. When will we can submit the need requirements documents for the compensation?
e. Negative effects to the students on noise and air during construction
f. How about occurrence of flood
g. They hope that they will be compensated first before constructing the road
h. Priority to hire locals
i. Request for Realignment (Matanog)

During the 1st public consultations, the women's emphasized the importance of proper compensation for the affected landowners, work force from the community, livelihood programs, and business opportunities. While in 2nd Public Consultation, some express their support while others are still requesting for realignment of the road. This should be decided by JICA/DPWH and be discussed with the LGUs during the Steering Committee Meeting.

Table 7.10.2-13 Contents of Stakeholder Meetings Municipal Level

Date (venues)	Objectives of the meeting	Major Agenda	Participants	No. of Participants		
				Location	Male	Female
1st Public Consultations Dec. 7 and 11-12, 2017 1. Municipal Conference Room, Parang Municipality 2. Matanog Municipal, Multipurpose Hall 3. Balabagan Municipal Hall Executive Bldg. 4. Barira Municipal Conference Rm	Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	1. Inform and generate awareness and understanding of the concerned public about the project; 2. Provide the stakeholders and avenue to ventilate salient issues and concerns regarding the project; 3. Give an opportunity to the stakeholders to have an open discussion with the Preparers, Proponents and LGU about the project; 4. Educate the stakeholders of their rights and privileges; and 5. Enable the stakeholders to effectively participate and make informed and guided decisions.	Municipal Officials, Project-Affected Persons (PAPs) and Barangay Officials, RAP, DPWH ARMM and JICA Study Team	Parang Matanog Kapatagan Balabagan	66 104 64 37	8 8 17 23
2nd Public Consultations Feb 27, Feb 28 and Mar 1, 2018 1. Conference Room, Parang, Maguindanao 2. Conference Room, Matanog 3. Barangay Bakikis Covered Court, Kapatagan, LDS 4. Conference Room, Balabagan, LDS	Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	To present and validate the results of environmental impact assessment	Municipal Officials, Project-Affected Persons (PAPs) and Barangay Officials, and JICA Study Team	Parang Matanog Kapatagan Balabagan	45 25 58 48	13 16 32 38

Source: JICA Study Team

Table 7.10.2-14 Major Opinions in Stakeholder Meetings Municipal Level

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
1st Public Consultations Dec. 7 and 11- 12, 2017 Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	1. Introduce the project and discuss the project objectives and the benefits that can be derived. 2. EIA and RAP Process 3. Tentative Schedules 4. Solicit queries, comments, concerns and suggestions on the project	Land	Properties	1. (Parang) Are the trees also included in the compensation? Is the fruit-bearing trees included to be paid or compensated?	1. Yes, they will be compensated as long as included in the inventory or during cut offs. All trees that will be affected with the project will be paid or compensated especially the fruit-bearing trees. DPWH will pay the trees based on their guidelines. It depends on the size, and height of the trees.
			Land Class	2. (Parang) What will happen to the land under military reservation?	2. The alignment of the project is not yet final. We will provide a copy of the results of the inventory per Barangay level for their information and confirmation.
		Socio/ The People	I Infrastructure Alignment/Project Details)	3. (Parang) Is there any way to realign the road to another area?	3. For now this is a proposed or under the feasibility study stage. There are proposed alternatives and best alignment. This consultation meeting is part of the study to discuss or confirm you if you are in favor on the proposed project. We need this road for easier access and to avoid traffic.
				4. (Parang) Can we request that the alignment avoid the cemetery of Muslim?	4. We will always considered and respect the heritage area for the benefit of the culture of the affected community. We need your cooperation during the survey in your community. Please provide us the right information so that we will not encounter any problem during the project implementation.
				5. (Parang) Affected people/areas are requesting for the possibility to move the alignment to avoid them or move to an area where there will be less affected.	5. We will request to the proponent to provide the affected community the final road alignment.
				6. (Parang) Where is the exact alignment of the project?	6. There are alternative options for the road alignment. The presented alignment is the feasible and will be finalized after the RAP inventory.
				7. (Matanog) We suggest/recommend that the best route is from Sitio 41, Sapad to Lagaan to Tubaran to Cabugao going to Kidama	7. We will see the possibility of your request/recommendations. May I suggest that the Barangay need to submit a resolution to the Municipality of Matanog thru Mayor to endorse the resolution to DPWH for inclusion of the suggested route to their future project.
				8. (Matanog) Is it the final alignment or can we realign the road?	8. No, the design is not final. We will wait the final results of the study and we will finalize the design of the proposed design of road.

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
				9. (Matanog) What is the route or alignment of the project road?	9. There are proposed alternatives and after the study, we will determine the best alignment favorable to the people.
				10. (Kapatagan) Currently, there is an ongoing road construction in our barangay that was implemented by Mayor, this proposed road alignment is continue with the ongoing construction?	10. This ongoing road construction implemented by DPWH ARMM was discussed during the first steering meeting in Manila. This proposed national road project is different location and far from the ongoing road construction.
				11. (Balabagan) Eng'r. Ogka Sapiano, Sr. proposed to reroute the road alignment (sta. 4+400 to 4+900) and move up to give way on the future expansion of the Air Strip. This proposed Air Strip expansion (refer google map vacant lot) is within the property of Lobregat Family. Eng'r. Sapiano said that the affected barangay in Balbalan Municipality are Narra, going to Batuan and Budas (creek). If the project will be implemented, the travel time will be less than 30 mins from barangay Poblacion going to Parang Municipality. While travel time from Balabagan to Parang will be shorten about 1 hour, and Matimos to Parang will be less than 30 mins. The product from barangay to the market will be transported easily. Everything that will be affected by the project will be included in the study such as impacts and compensations.	11. The resolution will be helpful and provide advance information to JICA and DPWH on the plan of the municipality especially the Air Strip area.
		Socio/ The People	Vulnerable People	12. (Parang) What is the design of the road? Is it accessible to all, with signage and PWD friendly?	12. The road will follow the design road guidelines of DPWH. It includes the signage and pedestrians especially for schools. We will always considered the needs of our PWD but there always a limitations.

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
		Socio/ The People	Properties	13. (Matanog) Who will determine the amount of the affected houses?	13. As part of the process of RAP, we will submit the results of inventory to DPWH. DPWH will decide the right cost or amount based on their guidelines. We will provide a copy of the results of the study per Barangay level for their information and confirmation.
				14. (Parang) What are the needed documents for claims?	14. You need to secure certificate of land title or tax declaration.
				15. (Parang) Who will pay for all the structures like houses that will be affected by the project?	15. DPWH will be the implementing agency and will pay the acquisition of all affected land, structures after the inventory of RAP team.
				16. (Parang) What will happen to our families if almost all of the land area will be acquired? How can the project help us if we lose our property and livelihood?	16. DPWH along with the LGU will negotiate and help those who will be affected.
				17. (Parang) What will happen to land owners without land title?	17. Based on the discussion with JICA during our meeting in Manila last November 2017, DPWH will compensate the affected land owner. In absence of land/lot title and other supporting documents will not be compensated from DPWH. Land owners should secure proper documents. We strictly follow the guidelines of DPWH.
				18. (Matanog) What happen to the houses and lands to be affected by the project?	18. DPWH will pay the acquisition of all affected structures after the conduct of RAP. Make sure that all affected people have a documents like land title and tax declaration.
				19. (Matanog) What happen to the households who don't have land title? The land came from our ancestors.	19. Without land title, no compensation from DPWH. The DPWH is in charge to pay for the affected land owner's. Must secure all documents needed so that all affected landowner's can be compensated.
				20. (Matanog) What kind of documents are we needed to be compensated? Our experienced from previous project with DPWH, they did not pay our affected constituent. Also, can you consider the amount provided by the owners?	20. Certificate of land title or tax declaration certified by LGU. For the cost, DPWH will negotiate to the land owner based on their guidelines, structures for compensation, and by what is the present cost of the said land considering the gathered data from assessor's office, local construction suppliers. Also, we will coordinate to the municipal assessor's office.
				21. (Balabagan) What will happen to the affected barangay, does this will cause trouble?	21. That is why we are gathered here because JICA avoided ROW problem. Your cooperation will be helpful because this might not be implemented if there will be a resistance. The affected property or trees will not be taken by the government for free. There will be a negotiations and process on the compensations. This is the main objective of the consultation.

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
				Possible affected stakeholders might get angry because of the damage property?	We need to cooperate because if we encounter resistance/oppositions, possible that this project might be delayed and Balabagan Municipality will be left on the development.
				22. (Balabagan) How to compensate those affected without land titles?	22. DPWH National will review the submitted RAP results. They will prepare a compensation plan on how to compensate those without land titles. But if the owner can provide a tax declaration, this will be considered and basis for the computations. Like the military reservation in Parang Municipality, there is no land title but the affected properties, trees and displacement of habitat will be included in the computations. All of this issue will be considered. We also have "agreed value", PAPs will be consulted if they agreed on the presented prices. The methodology, procedure and basis on the computations, and results will be presented during the barangay public consultations.
				23. (Balabagan) Mayor Edna Ogka-Benito suggested to the Municipal Assessors office to assess and update the price of lands, trees and etc. to have a reasonable value for the benefits of the PAPs. Mayor advised the participants to apply for a land title to avoid any problem.	23. Noted.
				24. (Kapatagan) What will happen to our grandchildren, if our lot will be affected by the road alignment?	24. All affected lot will be compensated. The assessor's office will also help and assist the affected to prepare the needed documents if you have no title. This will be considered as public land.
				25. (Kapatagan) What will happen to our property without land titles?	25. This will be part of the study. All of this will be compensated especially those affected with titles and tax declaration. For affected without land titles, we will compensate the cost of the properties affected. The government thru DPWH will be fare for those affected with and without land titles. We will include this in our study and the estimated cost of the affected properties

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
					All the collected data and estimated cost will be submitted to JICA and DPWH. DPWH is the implemented agency that will determine the true value of properties among others. Also, DPWH will prepare the compensation plan for the estimated cost.
				26. (Kapatagan) What will happen if one affected barangay will disapproved on the proposed project?	26. All of the barangay and LGUs we have visited are very supportive on the project. In Barira Municipality, some of the barangays that are not affected on the road alignment suggested to be part of the alignment or reroute the alignment on their barangay because they want a development. The DPWH said mentioned during one of the public consultation that if the proposed national road will be constructed, the interior road going to the barangays are planned to be connected to this.
2nd Public Consultations February 27, February 28 and March 1, 2018 Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	To present and validate the results of environmental impact assessment	Socio/The People	Properties	1. (Parang) Can we get those trees that will be cut?	1. This depends to DENR. They have processes regarding tree cutting.
				2. (Kapatagan) What will happen to the trees that may be affected by the road project?	2. It will be compensated based on the results of the RAP assessment and considering the laws and policies adopted by DPWH
				3. (Kapatagan) How about those land with many owners	3. Those who is in the title of land will be compensated
				4. (Balabagan) What will happen to the new existing road?	4. The team explained that the proponent will check if the existing road is for improvement or for replacement.
				5. (Balabagan) How many meters will be occupied of the said road project?	5. Team responded that only 30 meters will be occupied.
				6. (Kapatagan) What is the final size that may be affected by the road project? If 60 meters will be taken, they will lose all their lands.	6. The team responded that the final size or right of way is 30 meters not 60 meters. Yes, bridge is also included in the project.
				7. (Balabagan) What is the basis of compensation? Mayor hope that the proponent will consider the prevailing price because the assessed value is very low.	7. The RAP team will explain the details with regards on the pricing or compensation
				8. (Kapatagan) We also hope that we will be compensated first before constructing the road.	8. RAP will be implemented once the project is finalized. This is before the project implementation
				9. (Balabagan) When will we can submit the need requirements documents for the compensation?	9. RAP team will explain the process for compensation. They will conduct separate scoping
				10.(Kapatagan) My house, land and trees will be affected. How will my family live? Who will pay and compensate us?	10. You will be compensated considering that you have legal documents that you owned the land, house a d trees subject for assessment of DPWH

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
				11.(Kapatagan) Will they pay us per sq.m?	11. Yes, the RAP team will present the detail information on compensation
				12.(Matanog) The surveyor did not informed some of the people or families regarding that their properties that may be affected	12. The team will coordinate to RAP team for proper coordination and information dissemination to the affected families. The RAP team will present the detail and results of their assessment.
				13.(Matanog) Mayor Guro reiterated to the team that his request for realignment was already raised during steering committee meeting with proponent in metro manila. If the rerouting will not be followed, there will be more affected and he cannot commit to negotiate with the proponent in terms of land acquisition. Only 10 meters are allowed by the people but more than that, he is not sure.	13. The realignment will be discussed with the proponent and JICA Study Team. This will be noted for consideration.
			Livelihood	14. (Kapatagan) We hope that we will be hired as security during construction	14. This will be recommended to the proponent considering that you are qualified to the job
		Water	Flooding	15.(Kapatagan) There are houses along the river which are within the alignment of the proposed road. How about occurrence of floods?	15. There are studies to avoid flooding in the area. This will be considered in the detailed engineering.
		Air	Noise Pollution	16.(Kapatagan) Are there negative effects to the students on noise and air during construction?	16. The team explained that there will be negative effect but will be mitigated through measures identified in the study. The constructor should follow the said measures to minimize impact on noise and air. Also, the residents can monitor if the contractor will not follow the environmental management plan.

Source: JICA Study Team

1) Barangay Scoping

The barangay scoping meetings were held in 14 barangays within the direct affected community as shown in **Table 7.10.2-15**. These meetings discussed the project background and objectives, and the positive and negative impacts of the proposed project to the people, health, habitat, and among others. The major opinions of the participants are the process of land acquisitions and compensations as shown in **Table 7.10.2-16**. The queries and comments on the barangay scoping checklist was responded by the Study team.

Table 7.10.2-15 Contents of Stakeholder Meeting on Scoping Stage Barangay Level

Date (venues)	Objectives of the meeting	Major Agenda	Participants	No. of Participants		
				Barangay	Male	Female
Feb 8 to 10, 2018 Barangay Hall	Barangay Scoping in accordance with Philippines EIA Guidelines	1. Inform and generate awareness and understanding of the concerned public about the project; 2. To gather and address the queries and concerns and provide responses and clarifications to queries on the proposed project; and 3. To identify the foreseeable positive and negative effect of the Project based on the barangay scoping matrix.	Barangay Officials, Project-Affected Persons (PAPs), RAP, and JICA Study Team	Parang		
				Macasandag	7	3
				Matanog		
				Sapad	22	3
				Kidama	21	4
				Kapatagan		
				Salaman	30	4
				Matimos	6	6
				Bakikis	18	5
				Lusain	14	4
				Balabagan		
				Banago	5	1
				Narra	15	3
				Lorenzo	10	2
				Molimoc	5	6
				Barorao	14	15
				Batuan	14	4
				Budas	14	7

Source: JICA Study Team

Table 7.10.2-16 Major Opinions in Stakeholder Meetings on Scoping Barangay Level

Date and Objectives; Agenda	Item on EIA		Major Opinion	Answers (RAP, and JICA Survey Team's answers has been accepted and understood basically)
Jan. 8 and 9, 2018 Barangay Scoping in accordance with Philippines EIA Guidelines Agenda: Introduce the project and discuss the project objectives and the positive and negative impacts of the project.	Land	Properties (Crops/Trees)	1. (Brgy. Lorenzo, Balabagan) Suggested that DPWH should closely coordinated and consulted the barangay and affected landowners before project implementation.	1. Yes, this will be noted for considerations of JICA/DPWH.
			2. (Brgy. Kidama, Matanog) What happen to the trees and lands that will be affected by the project?	2. They will be compensated as long as included in the inventory or during cut offs. DPWH will compensate the affected structures and other properties. Make sure that all affected people have legal documents like Certificate of land title, tax declaration, etc.
			3. (Brgy. Banago, Balabagan) Barangay Chairman recommends that affected properties must settled before the implementation. He is willing to intervene for any settlement.	3. The team noted the recommendations of the barangay chairman.
			4. (Brgy. Barorao, Balabagan) Farming is the main livelihood of the people in the barangay. They are seriously concerned of farm lots that will be traversing by the proposed road where their crops are planted like coconut, lansones, cassava, mango, marang, and others. Aside from these plantations, 15 households are affected by the crossing of the road.	4. Owners will be informed that properties affected by the road project are subject to a negotiation/settlement and will be compensation. They are advised to prepare proof of ownership such as certificate of land titles or tax declaration and have them presented to the RAP Team and DPWH during the survey/validation.
			5. (Brgy. Batuan, Balabagan) Who will pay for all the land/lots, structures like houses that will be affected by the project?	5. DPWH will pay the acquisition of all affected land/lots, structures based on the result of the inventory of RAP.
			6. (Brgy. Batuan, Balabagan) There is an affected private land along the alignment. The compensation should be settle before project implementation.	6. The RAP team will present the final list of the affected land, trees and structures to the affected community based on their conducted inventory. The listed affected people will be consulted for disclosure.
	The People	Infrastructure	7. (Brgy. Macasandag, Parang) Based on the survey conducted by the other team, the start of the road alignment is near a water reservoir. There is also huge fishponds area to be traversed, a Muslim cemetery and creeks.	7. This will be considered in the study. Also, RAP Team already take note of this heritage since they already conducted the survey.
			8. (Brgy. Lusain, Kapatagan) Brgy. Captain stated that the proposed alignment will traversed a cemetery of the Muslim.	8. This will be considered in the design of the project for considerations of realignment
			9. (Brgy. Lusain, Kapatagan and Brgy. Salaman, Kapatagan) What are the needed documents to claim the compensation and what if the land owner has no documents?	9. The land/lot owners need to present the supporting documents such as title, certification or declaration as proof of ownership if not, they can't claim the said compensation
			10. (Brgy. Matimos, Kapatagan) What happen to the households who don't have land title?	10. DPWH is the implementing agency of the project. Secure all documents needed such as tax declaration with the help of barangay officials and LGUs so that all affected can be compensated.

Date and Objectives; Agenda	Item on EIA		Major Opinion	Answers (RAP, and JICA Survey Team's answers has been accepted and understood basically)
			11. (Brgy. Sapad, Matanog) Requesting for farm to market road to be connected. on the proposed road.	11. The barangay officials can submit a resolution to Municipal Officials for endorsement to DPWH for considerations to their future project.
		Livelihood	12. (Brgy. Kidama, Matanog) Requested the proponent/JICA to provide livelihood program or support especially for the affected households.	12. This will be recommended to the proponent for the possibility to provide livelihood program for the affected households/families.
			13. (Brgy. Sapad, Matanog and Brgy. Budas Balabagan) Is it possible that the people in our community can work or be hired during the construction/ implementation of the project? This project is very helpful to the community if they will be hired during the implementation of the said project.	13. This local hire is priority to the project thru DPWH with the support of the LGU officials.
			14. (Brgy. Macasandag, Parang) The officials are appealing to be prioritized in labor and work when construction started.	14. This will be recommended to the proponent considering that they are qualified for the job.
		Peace and Order	15. (Brgy. Sapad, Matanog) To some residents, the proposed road project will serve as an access for the terrorist.	15. Security will be tightened when project will be implemented. The government will not allow this terrorism to happen.
		Utilities	16. (Brgy. Sapad, Matanog) When will the final alignment be presented to the barangay?	16. RAP team will present to the affected community, the final alignment and will provide the list of affected households for the compensation. We suggested that you must secure necessary documents needed for the compensation ahead of time such as certificate of land title or tax declaration.
			17. (Brgy. Narra, Balabagan) Residents are requesting for water system to be implemented in their barangay because they have been deprived from a water resources. They are buying water from private owner.	17. This is not part of the project, but the barangay officials can request through writing a resolution and submit it to the Municipal Office.
			18. (Brgy. Bakikis, Kapatagan) Requested JICA and DPWH to rehabilitated the potable water source. (Brgy. Bakikis, Kapatagan and Brgy Budas Balabagan) Provide livelihood program or support for the affected community.	18. This is not part of the project but will be noted for considerations.
		Utilities	19. (Brgy. Molimoc, Balabagan) Suggested to have a water system for their constituents.	19. This is not part of the project but be included as your concerns for considerations of JICA/DPWH
			20. (Brgy. Salaman, Kapatagan) Requested JICA and DPWH to add pipes in the reservoir of their water sources of the community.	20. This is not part of the project but be included as your concerns for considerations of JICA/DPWH

Date and Objectives; Agenda	Item on EIA		Major Opinion	Answers (RAP, and JICA Survey Team's answers has been accepted and understood basically)
			21. (Brgy. Narra, Balabagan) The residents are also requesting for electricity because it has been 4 years that the barangay/municipal has no electricity.	21. Team noted their requests and recommendations.
			22. (Brgy. Lusain, Kapatagan) Suggestions: ・The participants requested to fast track the implementation of the project. The project is very helpful for the people in the community in terms of transporting their products to other areas or barangays/municipality; and ・We want the project to be implemented as soon as possible. We need the development in our community since the barangay Lusain is one of the poorest barangay in the Municipality of Kapatagan.	22. Based on the timeline provided by JICA and DPWH, this will be implemented within President Duterte's Administration but depends on the outcome of the studies conducted.

Source: JICA Study Team

7.10.3 Summary of Environmental Impact Assessment (EIA) for Sub-Project 5

(1) Description of the Project Components

The Project Components are described in **Chapter 13**.

> Note that in the middle of the study, security condition had worsened which prevented the JICA Study Team to continue undertaking field works. Hence EIA study was not completed. Data provided here are the most collected by the Study Team.

(2) Baseline of the Environmental and Social Condition

Baseline of the Environmental and Social Condition is described in **Chapter 13** and **Section 7.2**.

(3) Laws, Regulations, and Organizations related to Environmental and Social Considerations for EIA

Laws, Regulations, and Organizations related to Environmental and Social Considerations for EIA are described in **Section 7.1** and **Section 7.3.1**.

(4) Analysis of Alternative Alignments

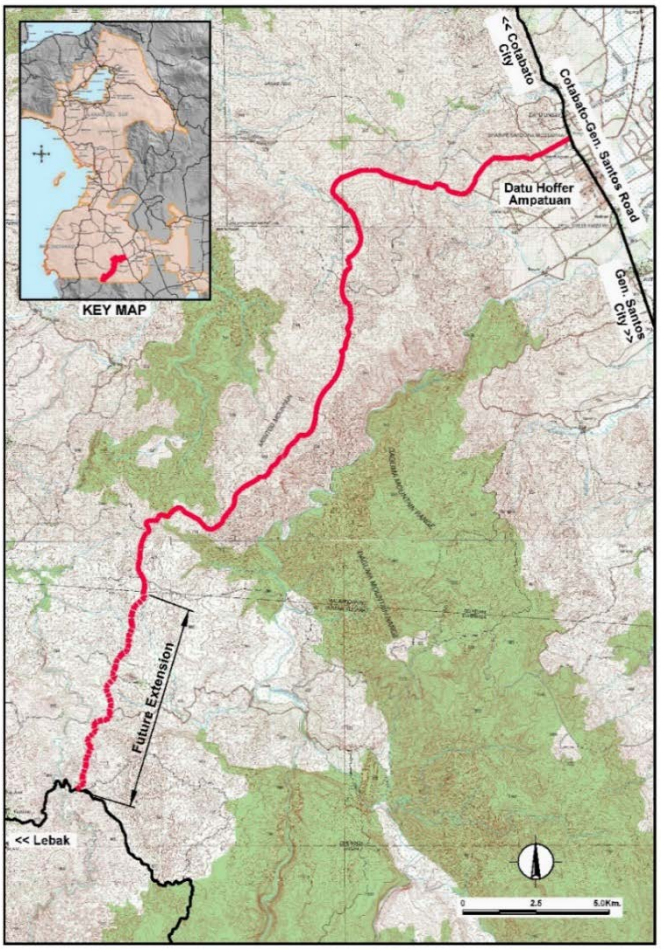
The comparative analysis of alternatives was described in **Chapter 12** and **Chapter 14**. The summary is shown below.

1) Alignment Selection Criteria

The criteria for alignment selection are as follows;

- Length, Construction Cost, Construction period (road length, no of bridges and culverts,etc.)
- Economic Impact (population along the alignment, agricultural land areas to be served, etc.)
- Environmental Impact (high-filling section length, high-cutting section length, no. of buildings to be affected)
- Technical feature (total no. of curves no. of curves < 300m, length of vertical grade >= 5%)

Figure 7.10.3-1 shows the recommended alignment for the road.



Source: JICA Study team

Figure 7.10.3-1 Recommended Alignment

2) Zero option

The zero option (with / without Sub-Project) of this project is shown in **Chapter 11** and **Chapter 22**.

(5) Scoping and Survey item for Environmental and Social Considerations Survey

Scope of the EIA study for the project is discussed in this section. The environmental scoping is conducted based on an environmental reconnaissance by the JICA Survey Team.

The result of scoping is indicated on the Leopold scoping matrix and reason tables as shown in **Table 7.10.3-1** and **Table 7.10.3-2**.

The scoping matrix below shows the impact factors, impacted item and impact degree based on JICA's guidelines and Philippine items. According to the scoping matrix, majority of the items or seventeen (17) items are rated as "B-" (Some impact is expected) due to huge earth work volume and significant social impacts, No.14 (The poor) is rated as "B+/-" (Some impact is expected), four (4) items are rated as "C" (unknown impact is expected) and eight (8) are rated as "D" (Few impacts are expected).

Table 7.10.3-1 Draft Scoping Matrix Based on JICA's Guidelines and Philippines Items

	No	Affected Activities / Impact Items (JICA)	(Philippines)	**Overall Rating**	Pre/ During Construction Phase: Land acquisition and Loss of properties	Change of Land use plan, Control of various activities by regulations for the construction	Reclamation of Wetland, etc.	Deforestation	Alteration to ground by cut land, filling, drilling, tunnel, etc.	Operation of Construction Equipment and Vehicles	Construction of Roads, tollgates, parking lots, Access roads for bridges and other related facilities	Traffic Restriction in construction area	Influx of construction workers, construction of base camp	Operation Phase: Increase of Through Traffic	Appearance/ Occupancy of Roads and related building structures including tunnel and embankment	Increasing influx of settlers
Pollution	1	Air Pollution	Air quality & noise	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	D
	2	Water pollution	Water quality	**B-**	D	D	D	D	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	3	Waste	Abandonment	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	4	Soil contamination	Soil quality/fertility	**B-**	D	**B-**	**B-**	D	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	5	Noise and Vibration	Noise	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	D
	6	Ground Subsidence	Subsidence/ collapse	D	D	D	D	D	D	D	D	D	D	D	D	D
	7	Odor		D	D	D	D	D	D	D	D	D	D	D	D	D
	8	Sediment quality	Soil quality	**B-**	D	D	D	D	**B-**	D	**B-**	D	D	D	D	D
Natural Environment	9	Protected Area	Environmentally Critical Areas (ECAs)	D	D	D	D	D	D	D	D	D	D	D	D	D
	10	Ecosystem	Terrestrial Biology Freshwater or marine ecology	**B-**	**B-**	**B-**	D	**B-**	**B-**	C	**B-**	D	**B-**	D	**B-**	**B-**
	11	Hydrology	Hydrology and oceanography	**B-**	D	D	**B-**	D	**B-**	D	D	D	D	D	**B-**	D
	12	Topography and geology	Geography, topography and landslides	**B-**	D	D	**B-**	D	**B-**	D	D	D	D	D	D	D
Social Environment	13	Involuntary resettlement	People	**B-**	**B-**	D	D	D	D	D	**B-**	D	D	D	D	D
	14	The poor	People	**B+/-**	**B+/-**	D	D	D	D	D	**B+/-**	D	D	D	D	**C**
	15	Indigenous and ethnic people	Indigenous people (IPs)	**B-**	**B-**	D	D	D	D	D	D	**B-**	**B-**	D	D	**B-**
	16	Local economy such as employment and livelihood	People	**B-**	D	D	D	D	D	D	**B-**	D	**B-**	D	D	**C**
	17	Land use and utilization of local resources	Land use and classification	**B-**	D	B-	D	D	D	D	D	D	**B-**	D	D	**B-**
	18	Waste Usage	Hydrology / Hydrogeology/ Water quality	**B-**	D	D	D	D	D	D	D	D	**B-**	D	D	D

	No	Impact Items (JICA)	(Philippines)	Overall Rating	Pre/ During Construction Phase: Land acquisition and Loss of properties	Change of Land use plan, Control of various activities by regulations for the construction	Reclamation of Wetland, etc.	Deforestation	Alteration to ground by cut land, filling, drilling, tunnel, etc.	Operation of Construction Equipment and Vehicles	Construction of Roads, tollgates, parking lots, Access roads for bridges and other related facilities	Traffic Restriction in construction area	Influx of construction workers, construction of base camp	Operation Phase: Increase of Through Traffic	Appearance/ Occupancy of Roads and related building structures including tunnel and embankment	Increasing influx of settlers
	19	Existing social infrastructures and services	People	**B-**	B-	D	D	D	D	D	**B-**	D	D	D	D	**B-**
	20	Social institutions such as social infrastructure and local decision making institutions		D	D	D	D	D	D	D	D	D	D	D	D	D
	21	Misdistribution of benefit and damage		D	D	D	D	D	D	D	D	D	D	D	D	D
	22	Local conflict of interests	People	**C**	D	**C**	D	D	D	D	D	D	D	D	D	D
	23	Cultural Heritage	People	**C**	**C**	D	D	D	D	D	**C**	D	D	D	D	D
	24	Landscape		D	D	D	D	D	D	D	D	D	D	D	D	D
	25	Gender		D	D	D	D	D	D	D	D	D	D	D	D	D
	26	Right of Children		D	D	D	D	D	D	D	D	D	D	D	D	D
	27	Infectious diseases such as HIV/AIDS	People	**C**	D	D	D	D	D	D	D	D	**C**	D	D	D
	28	Labor environment (including work safety)		**B-**	D	D	D	D	D	D	**B-**	D	**B-**	D	D	D
Others	29	Accidents	Traffic situation	**B-**	D	D	D	D	D	**B-**	D	**B-**	C	**B-**	D	D
Others	30	Cross Boundary impacts and climate change	Meteorology / Climatology	**C**	D	D	D	**C**	D	D	D	D	D	**C**	D	D

Note Rating:

A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.

Source: JICA Study Team

Table 7.10.3-2 Reasons for Draft Scoping

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
Pollution	1	Air pollution (Air quality & noise)	B-	B-	**Construction phase:** Temporary negative impacts are expected on air quality due to fugitive dust emissions from construction activities such as land clearing, grading, excavation, and the transport and movement of construction materials. **Operation phase:** Negative impacts on air quality are expected due to emission from vehicles passing on the new road.
	2	Water pollution (Water quality)	B-	D	**Construction phase:** Domestic wastewater will be generated from construction workers. Surface water will become turbid due to solids generated from earth works and drilling in the site. Oil and grease and petroleum hydrocarbons may pollute water that may come from vehicles and construction equipment. **Operation phase:** No serious impacts are expected.
	3	Waste (Abandonment)	B-	D	**Construction phase:** Construction waste such as waste soil and cutting trees are expected to be generated by deforestation, cutting, land clearing and drilling. Solid wastes from construction workers may be generated from construction base camp. Hazardous wastes such as busted lamps, used oil, used paints etc. maybe generated from construction site. **Operation phase:** No serious impacts are expected
	4	Soil contamination (soil quality)	B-	D	**Construction phase:** Removal of vegetation may affect the soil quality due to oil & grease and petroleum hydrocarbon contamination from construction equipment and vehicles. **Operation phase:** No serious impacts are expected.
	5	Noise (Noise)	B-	B-	**Construction phase:** Increased noise levels will be significant due to heavy construction vehicles moving to and from the site, drilling and excavation activities. **Operation phase:** Noise generation is expected by vehicles passing on the new road.
	6	Ground subsidence (Subsidence)	D	D	No impacts are expected. There will be no groundwater extraction during the construction and operation activities.
	7	Odor	D	D	Few impacts are expected. Obnoxious odor may come from vehicle exhaust, clearing & dredging of river banks.
	8	Sediment quality (Soil quality)	B-	D	**Construction phase:** Surface water runoff which may have caused the sediment transport is expected during construction activities due to earthworks, land clearing, excavation etc. **Operation phase:** Road operation which causes impacts on sediment quality is not expected.
Natural environment	9	Protected area (ECAs)	D	D	**Construction and operation phase:** No protected area such as designated conservation zone is observed in the project affected area.
	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	B-	B-	**Construction and Operation phase:** With the implementation of the project, during the construction phase, land clearing and topography alteration will require removal of existing vegetation cover within the road Right of way. Clearing of remaining vegetation will also possibly affect remaining wildlife and its habitats to give way for the construction of road project. Impacts of the project will be assessed based on the result of the terrestrial survey and to be able to come up with apt recommendations to mitigate such impacts. The result of the survey also serves as the basis for monitoring during the Operation phase.
	11	Hydrology (Hydrology and oceanography)	B-	B-	**Construction Phase:** Rating B- under Reclamation of Wetland, etc. - Extent of impact is unknown. The road alignment may not cross wetland and/or swamps. In case the final road

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
					alignment will traverse the wetlands, survey and analysis should be done to make sure that the road network will not hamper the natural flow of water prior to the road construction. **Construction and Operation Phase** Rating B- under Alteration to ground by cut land, land filling, drilling, tunnel, etc. - Some impact is expected. The proposed road will traverse through generally flat terrain and rolling grounds drainage impact is expected. This may change the drainage flow to other directions and may cause flooding in some areas. Flooding that is expected maybe due to rainwater flow restrictions and natural blocking of surface water runoff in the construction site.
	12	Topography and geology (Geography, topography and landslides)	**B-**	D	**Construction and Operation Phase**: Earthworks such as land filling and land cutting would affect the topographic condition along the proposed road alignment. Risk associated with landslides maybe expected in sections passing steep terrain. Slope protection measures could be necessary during the operation phase. No protected geological site is located in the project area.
Social Environment	13	Involuntary resettlement	**B-**	D	**Pre-Construction Phase:** Settlements and private lands will be acquired to give way for the road construction. This will cause involuntary resettlement (physical and economic) **Operation Phase:** No impact is expected since it was already settled during pre-construction period
	14	The poor	**B+/-**	**C**	**Construction Phase:** Some impacts (positive/negative) is expected considering the socio-economic condition of the community in the project area **Operation Phase:** Extent of impacts are still unknown but looks forward to easier access of the poor to public services
	15	Indigenous and ethnic people	**B-**	**B-**	**Pre-Construction phase:** Some impacts (positive/negative) is expected considering the socio-economic condition of the community in the project area **Operation Phase:** Some impacts (positive/negative) is expected.
	16	Local economy such as employment and livelihood	**B-**	**C**	**Pre-Construction phase:** Livelihood of residents and farmers may be affected by resettlement and acquisition of agricultural area **Operation Phase:** Few impacts are expected.
	17	Land use and utilization of local resources	**B-**	**B-**	**Pre-Construction phase:** Some agricultural areas will be affected by the project. **Operation Phase:** Roadside area may be developed as commercial or industrial area in non-designated land use area. Such unplanned development and influx of new settlers may give impact on land use and local resources.
	18	Waste Usage	**B-**	D	**Construction Phase:** Earth works such as cutting land and drilling of tunnel may give impact on drinking water resources such as springs and wells. **Operation phase:** No impact is expected.
	19	Existing social infrastructures and services	**B-**	**B-**	**Pre-construction and Construction Phase:** Relocation of religious facilities, school, cemetery and other public facilities need to be considered. **Operation Phase:** Existence of the road may disturb commuting/ going to school and hospital
	20	Social institutions such as social infrastructure and local decision-making institutions	D	D	Impacts are not expected, since local decision-making institute represented by local governments will continue after the road construction.
	21	Misdistribution of benefit and damage	D	D	Misdistribution of benefit and damage caused by the road constructions not expected.
	22	Local conflict of interests	**C**	D	**Construction Phase:** Local inhabitants and local authorities may request to ensure job opportunities as construction workers. **Operation phase:** No impact is expected.

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
	23	Cultural Heritage	**C**	D	**Pre-construction and Construction Phase:** Impact will be assessed based on confirmation of cultural heritages around the project site.
	24	Landscape	D	D	No impact is expected.
	25	Gender	D	D	Negative impact specified for women are not expected
	26	Right of Children	D	D	Negative impact specified for children are not expected
	27	Infectious diseases such as HIV/AIDS	**C**	D	**Construction Phase:** Infectious diseases such as STD are possible to be spread due to inflow of construction workers. Furthermore, alteration to ground by cut land and filling may provoke to provide habitats of mosquito that possibly transmits dengue fever **Operation phase:** Road operations which causes infectious diseases are not expected
	28	Labor environment (including work safety)	**B-**	D	**Construction Phase:** Construction work environment needs to be considered in accordance with relevant laws and regulations **Operation phase:** No impact is expected.
Others	29	Accidents (Traffic situation)	**B-**	**B-**	**Construction Phase:** Construction vehicles may use existing local road near residential areas, thus number of traffic accident. **Operation phase:** Quantitative analysis based on baseline survey
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	**C**	**C**	**Construction phase:** Deforestation for land clearance may give impact on cross boundary impacts and climate change. **Operation phase:** Greenhouse gas emissions from vehicles that pass by along the new roads maybe generated which will have an impact in the protection of ozone layer as a result of climate change.

Note: Rating
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

Table 7.10.3-3 Baseline Survey and Forecast Analysis for Draft Scoping

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/ During Construction	Operation Phase		
Pollution	1	Air pollution (Air quality & noise)	**B-**	**B-**	--Site measurement (2 sites) TSP, PM_{10}, NO_2 and SO_2 -Secondary data collection, if any	**Construction Phase:** Qualitative analysis **Operation Phase:** - Quantitative analysis (PM_{10}, NO_2, and SO_2) (Puf model : calm wind model)
	2	Water pollution (Water quality)	**B-**	D	-Site measurement (1 sites: river water) DO, TSS, BOD, COD, pH, Total/Fecal Coliform, temperature -Secondary data collection, if any	**Construction Phase:** Qualitative analysis
	3	Waste (Abandonment)	**B-**	D	Review of specification on design and construction plan	**During Construction Phase:** Quantitative analysis of volume of cutting trees by type and excavated or drilling soil and muck
	4	Soil contamination (soil quality)	**B-**	D	Review of specification on design and construction plan	**During Construction Phase:** Qualitative analysis

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/During Construction	Operation Phase		
	5	Noise and vibration (Noise)	**B-**	**B-**	Noise -Site measurement (2 sites) $L_{Aeq, 10min}$ weekday (in accordance with DENR regulation) -Secondary data collection, if any	**During Construction Phase:** Qualitative analysis based on construction machines on standard formation **Operation Phase:** - Quantitative analysis(ASJ RTN-Model 2013)
	8	Sediment quality (Soil quality)	**B-**	D	Literature survey (land use history on affected land of the project)	**During Construction Phase:** Qualitative analysis base on the literature survey
Natural environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	**B-**	**B-**	Literature survey and site survey for fauna and flora. (Terrestrial: 9sites)	**During construction and operation phase:** Qualitative analysis base on the literature survey, site survey and construction plan & traffic volume in the future
	11	Hydrology (Hydrology and oceanography)	**B-**	**B-**	Literature survey and referring to hydrographic and geological survey result on feasibility study and designing	**During construction and operation phase:** Quantitative analysis on following items base on the hydrographic analysis for bridge and drainage designing. • Impact on hydrological situation on the rivers and streams • Impact on water vein underground • Impact on flooding situation
	12	Topography and geology (Geography, topography and landslides)	**B-**	D	Literature survey and topographic survey for designing	**During construction and operation phase:** Qualitative analysis base on the topographic analysis for designing
Social environment	13	Involuntary resettlement (People)	**B+**	D	Literature survey and a series of RAP surveys (Inventory of loss assets, census, social economic survey and replacement cost study)	**During construction phase:** Quantitative analysis based on RAP surveys
	14	The poor (People)	**B+/-**	**C**	Literature survey and a series of RAP surveys	**During construction phase:** Quantitative analysis based on RAP surveys
	15	Indigenous and ethnic people (Indigenous people)	**B-**	**B-**	Literature survey and a series of RAP / IP surveys	**During construction phase:** Quantitative analysis based on RAP / IP surveys
	16	Local economy such as employment and livelihood (People)	**B-**	C	Literature survey and a series of RAP surveys	**During construction phase:** Qualitative analysis based on RAP surveys
	17	Land use and utilization of local resources (Land use and classification)	**B-**	**B-**	Literature survey and a series of RAP surveys	**During construction phase:** Quantitative analysis based on RAP surveys (area of land acquisition by land use)
	18	Water usage (Hydrology / Hydrogeology/Water quality)	**B-**	D	Literature survey, geological survey and water usage survey (identification of springs and wells around tunnel and cutting land areas based on the data from RAP survey)	**During construction phase:** Qualitative analysis base on the baseline survey for following items Impact on springs and wells Impact on watershed area

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/During Construction	Operation Phase		
	19	Existing social infrastructures and services (People)	**B+**	**B-**	Literature survey and a series of RAP surveys	**During construction and operation phase:** Quantitative analysis based on RAP surveys
	22	Local conflict of interests (People)	**C**	D	Collection of information and opinions in stakeholder meeting(s)	**During construction:** Qualitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
	23	Cultural heritage (People)	**C**	D	Literature survey, a series of RAP surveys and collection of local information through stakeholder meeting(s)	**During construction:** Quantitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
	27	Infectious diseases such as HIV/AIDS (People)	**C**	D	Literature survey and collection of local information through stakeholder meeting(s)	**During construction phase:** Qualitative analysis based on baseline survey. Followings impacts are considered Risks of HIV/AIDS Risks of dengue fever Other specific infection disease
	28	Labor environment (including work safety)	**B-**	D	Literature survey, a series of RAP surveys and collection of local information through stakeholder meeting(s)	**During construction:** Quantitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
Others	29	Accidents (Traffic situation)	**B-**	**B-**	Collection of traffic accident data from police station	**During construction and operation phase:** Quantitative analysis based on baseline survey
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	**C**	**C**	-Estimation of affected forest area and traffic conditions based on the project plan	**During construction and operation phase:** Quantitative analysis based on baseline survey

Note: Rating
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

(6) Summary of Baseline Survey, Forecast and Impact Assessment

The summarized result of baseline survey and forecast of impacts are shown in **Table 7.10.3-4**. The baseline data and quantitative forecast is shown in **Table 7.10.3-5** and survey points of air & noise and water quality is shown in **Table 7.10.3-6**.

In terms of pollution items such as air, water and noise, all the forecasted values are within the allowable limits, thus it is not likely provided serious impact in these items. However, construction waste soil from cutting land and drilling in the tunnel section shall be reused or disposed in appropriate designated disposal site.

With regard to IUCN List, although some species are identified through the baseline survey on flora and fauna, these species are distributed around the around the Sub-Project area.

Table 7.10.3-4 Result of baseline and Forecast on Main Items

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/	Ope	Pre/	Ope	Baseline	Forecast	Evaluation (Quantitative Standard)
Pollution	1	Air Pollution (Air Quality & Noise)	B-	B-	B-	B-	Result of (TSP, PM10, SO2, NO2) at 2 stations are below the standard values (See **Table 7.10.3-6**)	Forecast value do not exceed standard values	Expected impacts by the project are not significant because all the forecasted values are within the standard values Quantitative Standards as shown in **Table 7.10.3-5.**
	2	Water pollution (water Quality)	B-	D	B-	D	Result of (pH, Temp, BOD, TSS, DO) are within the guidelines (See **Table 7.10.3-6**)	During construction activities may cause turbidity water and oil and grease contamination. Likewise, domestic waste may be discharge from the camp	Impacts may be minimized or mitigated by provision of erosion control measures such as settling traps, use of portable toilet, etc. Quantitative Standards as shown in **Table 7.10.3-5.**
	3	Waste	B-	D	B-	D	Not required	Clearing and deforestation activities are expected to generate construction waste such as soil, debris, cut trees Also, additional domestic waste may be generated from the construction camp.	Impacts can be mitigated by proper management and disposal of waste like practice ecological waste management, segregation at source, 3R, etc.
	4	Soil Contamination (Soil Quality)	B-	D	B-	D	Not required	Soil maybe contaminated from the construction equipment and transportation.	Impacts can be mitigated by proper maintenance of equipment and transportation, proper containment and disposal of oil, etc.
	5	Noise	B-	B-	B-	B-	There are some measurement of noise that exceeded the standard particularly during the night due to presence of insects like crickets that make noise during the dark and usual in the rural areas. (See **Table 7.10.3-6**)	Forecast value exceed philippines standard values(Class A (General)), but the value do not exceed Japanese standard values(Class B2).	Impacts may be mitigated by avoidance and other measures such as no construction during the night or use of muffler or sound proof barrier. Quantitative Standards as shown in **Table 7.10.3-5.**
	6	Ground Subsidence	D	D	D	D	Not required	Not required	Not required
	7	Odor	D	D	D	D	Not required	Few impacts are expected. Obnoxious odor may come from vehicle exhaust, clearing & dredging of river banks.	Qualitative measurements based on sensitivity of receptors against unobjectionable odor
	8	Sediment Quality	B-	D	B-	D	Not required	During construction sediment will most likely erode into the water particularly during heavy rains	Impacts may be mitigated through erosion /sedimentation control measures, or stoppage of soil clearing during heavy rains, use of silt trap
Natural Environ	9	Protected Area	D	D	D	D	Not required	Not required	No protected area is observed in the area.
	10	Ecosystem (Terrestrial Flora and Fauna)	B-	C	B-	C	Not required	The project development will require removal of vegetation cover to give way	Prior to project implementation the proponent will coordinate to the DENR and Philippine Coconut Authority (PCA) to seek clearance for

								for the construction of the proposed road project. Further loss of vegetation cover as a result of land clearing may encourage movement/migration of wildlife species in the area aggravated by the loss of habitat/abode and remaining sources of food for survival. Likewise, wildlife disturbance due to noise pollution brought about by the operation of heavy equipment's during construction will force some faunal species to migrate to other or nearby areas/habitat where disturbance is less.	the identification of required documents for the issuance of needed tree and coconut cutting permits (PD 705). Moreover, to compensate the loss of habitats, the proponent will replace the number of trees removed/cut and plant them in nearby areas or in accordance with the advice of the DENR. Species that will be used for the reforestation must be indigenous trees and/or fruit bearing trees endemic in the place that can attract wildlife species. Planting of trees will help in sequestering carbon in the environment. As per **DENR Memorandum Order no. 05 of 2012** mandated that "Uniform replacement ratio for cut or relocated trees" item 2.2 "For planted trees in private land and forest lands... tree replacement shall be 1:50 while naturally growing trees in the same area, including those affected by the project, shall be 1:100 ratio in support of the National Greening Program (NGP) and Climate Change Initiatives of the Government". Compensation for affected coconut palms shall be based on Section 5 of Republic Act No. 8048, an act providing for the regulation of the cutting of coconut palms. Replacement ratio of cut coconut palm shall be 1:1.
	11	Hydrology	B-	B-	D	D	The river systems that affect the proposed road alignment are the Mata and Bagong creeks in Barangays Kubentong, Limpongo and Talibadok. During the conduct of field investigation, no ground water wells or springs were found that may be affected by the project and also based on the data from the National Water Resources Board (NWRB) and Local Water Utilities Administration (LWUA).	Most likely not affected as no wells were found on the alignment	Not give serious impact on the ground water
	12	Topography and Geology	B-	B-	B-	B-	The project straddles Montod Mountain giving rise to very steep terrain with elevation ranging from 500 to more than 700 masl.	The proximity of active faults to the proposed road alignments indicates that moderately strong to very strong ground shaking is expected to be experienced in Sub-Project 5. The Sub-Project 5 is prone to ground rupture. Covered barangays of municipalities covered by Sub-Project 5 are not	- Conduct Probabilistic Seismic Hazard Assessment (PSHA). - Appropriate geotechnical investigation to evaluate potential liquefiable soil layers. - Impacts may be mitigated by slope protection. - Coordinate with PHIVOLCS regarding tsunami alerts.

								susceptible to tsunami as they are located farther inland. Sub-Project 5 Maganoy-Lebak Road which is underlain by thick, extensive, transgressive mixed shelf marine deposits may be susceptible to liquefaction. Sub-Project 5 Maganoy-Lebak Road has low to moderate susceptibility to landslide.	Impact may be mitigated by construction of physical structures, flood modeling, and early warning systems.
Social Environment	13	Involuntary resettlement (People)	B-	D	B-	D	RAP survey has not been conducted.	Land acquisition may cause acquisition of agricultural land, crops and resettlement. Thus, RAP is prepared in accordance with JICA Guidelines and Philippine Laws.	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts.
	14	The Poor (People)	B+/-	C	B+/-	C	Based on the profiles of the respondents during perception survey, 95.45% have a total monthly income of PhP5,000-PhP10,000, 4.55% earned PhP11,000 to PhP15,000, This composed of the total income of the households per month which only reflects that only 5% of the respondents are living in poverty	Land acquisition by the project gives some adverse impact to poor people under poverty line	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of livelihood/income to the poor may be consider
	15	Indigenous and ethnic people (Indigenous People)	B-	B-	B-	B-	Based on the conducted IP survey by CFSI, there are identified indigenous cultural communities (ICC)/indigenous peoples (IP) living within the affected barangay in their native land but no ancestral domain title. These are the Teduray tribe. In terms of ethnicity based on the Municipal Profile of the affected municipalities, the project area is dominated with Maguindanao, Iranon, and Teduray tribe. There are also Hiligaynon, Cebuano, Ilocano, and indigenous people which are migrant in the municipalities such as Manobo and Lambangian however comprises only small portion of the project area.	Few impacts are expected on designated indigenous and ethnic group.	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of livelihood/income to the poor may be consider
	16	Local Economy such as employment and livelihood (People)	B-	D	B-	D	Based on the occupation or source of income of the respondents, most of them depend on farming 87.73%. Farming is the most strategic form of work due to the proximity of these people to the community. Around 9.09% are engaged in others occupation while 0.91% are employed. Households' employment	Land acquisition by the project gives some adverse impact to tenant farmers and employees of the shops.	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of livelihood/income to the poor may be consider

							profiles are not limited with one (1) work hence the frequency are more than the number of the respondents. This indicates that majority of the residents are depends their source income from farming due to lack of education attainment.		
	17	Land Use and utilization of local resources (Land Use and classification)	B-	D	B-	D	The project alignment is passing through mainly agricultural area such as plantation and residential zone	.In terms of the Agricultural Land Zone (AG), impacts are considered as both positive and negative. Positive in the sense that the road can provide better and faster way, and as such more economical way of transporting products from these areas to trading centers and other distribution sites. Negative in the sense that there is an imminent danger of illegal conversion into other uses	some impacts are expected; thus these impacts and risks are minimized by appropriate land management
	18	Water usage (hydrology/ hydrogeology/water quality)	B-	B-	B-	B-	Water supply is scarce in some portions of project affected areas. Water source comes from dugwells and springs which are used for domestic and drinking water. In Balabagan, there are water delivery trucks in some areas that supplies water which costs PhP 50 per drum.	Earthworks may cause turbidity of river water as being use for domestic.	Minimized by control measures like silt trap , sedimentation pond, etc Or appropriate assistance for tapping other source of water
	19	Existing Social infrastructures and services (People)	B-	D	B-	D	RAP survey has not been conducted.	The project does not give any impact to social infrastructures. Thus it is not likely to give any serious impacts on this item	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts, if any impacts are expected in the detailed design
	20	Social institutions such as social infrastructure and local decision-making institutions	C	C	C	C	Impacts are not expected, since local decision-making institute represented by local governments will continue after the road construction.	Impacts not Expected	Not required
	21	Misdistribution of benefit and damage	D	D	D	D	Misdistribution of benefit and damage caused by the road constructions not expected.	Impacts not Expected	Not required
	22	Local Conflict of interest (People)	C	D	C	D	Most of the stakeholders requested to provide work opportunities as a construction worker during construction in the stakeholder meetings on scoping stage	The local conflicts regarding work opportunities between local communities may be raised in case of unfair employment.	This risk is minimized by mitigation measures such as provision of priority in hiring during construction period.
	23	Cultural Heritage (People)	D	D	D	D	No cultural heritage affected.	Impacts not Expected	Not required
	24	Landscape	D	D	D	D	Not required	Few impact is expected	Not required

	25	Gender	D	D	D	D	LGU has implemented GAD projects	Impacts on Gender are mostly positive since opportunity for livelihood is expected (small business to women, employment to men)	Prioritization in hiring during construction and assistance for livelihood development
	26	Right of Children	D	D	D	D	Not required	Few impact is expected	Not required
	27	Infectious diseases such as HIV/AIDS (People)	B-	D	B-	D	No infectious illness recorded in the project area. Project should not to create a habitat of mosquito that transmits dengue fever in incidental pond in the construction area without appropriate drainage.	Infectious diseases such as STD are possible to be spread due to inflow of construction workers. Furthermore, alteration to ground by cut land and filling may provoke to provide habitats of mosquito that possibly transmits dengue fever	This risk is minimized by mitigation measures such as construction of sufficient drainage, management of construction yard and health check & education for workers.
	28	Labor environment (including Work safety)	B-	D	B-	D	Not required	There are risks for workers during construction, if the construction contractor does not comply with relevant labor laws and regulations.	These risks are avoided and minimized by complying with relevant laws and regulations by the contractor under observation of DPWH
Others	29	Accident (Traffic Situation)	B-	B-	B-	B-	No serious problem on traffic	Construction vehicles may use existing local road near residential areas, thus number of traffic accident may increase	Can be minimized by installing traffic sign boards, lighting in the night, trained personnel and use of PPEs.
	30	Cross boundary impacts and climate change (Meteorology /climatology)	D	D	D	D	Not required	During Construction, deforestation will incur. On loss of vegetation, the project development will require removal of vegetation cover to give way for the construction of road project. The removal of vegetation will also result in the reduction in the population of plant species growing within the project area. Future vegetation will face a great threat during the clearing activity. This activity will hinder the opportunity of these regenerants to grow and replace those mature vegetation in the area. During operations, generation of carbon monoxide and other gases will be generated from exhaust vehicles which will impact the ozone layer	On loss of vegetation: During site preparation, clearing of the road ROW will result to the removal of of an estimated tree above ground biomass (using large of trees with dbh of 10 cm and above, and pole size tress with $\geq$ 5 cm dbh to 9.5 cm) of 1.59×10^{-4} and 2.87×10^{-4} megagram per hectare, and with estimated Carbon stored value of 3.53×10^{-4} and 6.38×10^{-4} megagram per hectare, respectively. It was computed using the brown allometric equation.

Note) Rating:

A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.

Source: JICA Study Team

Table 7.10.3-5 Summary of Baseline and Forecasted Value (Air, Noise, Water)

No.	Item			Baseline Value (Standard Value)					Quantitative Forecast Analysis (Standard Value)			
1	Air Pollution	St.	Location	TSP (230μg /Ncm)	PM_{10} (150μg /Ncm)	NO_2 (150μg/Ncm)	SO_2 (180μg/Ncm)		TSP (230μg/Ncm)	PM_{10} (150μg /Ncm)	NO_2 (150μg /Ncm)	SO_2 (180 μg/Ncm)
		1	NIA Compound,Brgy. Satan,Shariff Aguak,Maguindanao	22.7	4.3	1.3	2.4		There is no demand forecast for traffic volume in Sub-Project5, thus pollution forecast is not implemented.			
		2	Sitio llang-llang,Brgy. Salumping,Esperanza,Sultan Kudarat	18.6	2.2	5.0	4.3					
2	Water Pollution (Water Quality)	St	Location	pH (6.5-9)	Temp, ºC (25-31)	BOD (7)	TSS (80)	DO (5ppm min.)	Basically, waste water is not discharged during and after construction, thus quantitative forecast has not been conducted.			
		1	Satan Creek	7.3	28.5	1	229	8				
5	Noise	St	Location	Morning (50)	Daytime (55)	Evening (50)	Night time (45)		Morning (50) <65>	Evening (55) <65>	Evening (50) <65>	Night Time (45) <60>
		1	NIA Compound,Brgy. Satan,Shariff Aguak,Maguindanao	**50**	49	**50**	**49**		There is no demand forecast for traffic volume in Sub-Project5, thus pollution forecast is not implemented.			
		2	Sitio llang-llang,Brgy. Salumping,Esperanza,Sultan Kudarat	49	48	**51**	**49**					

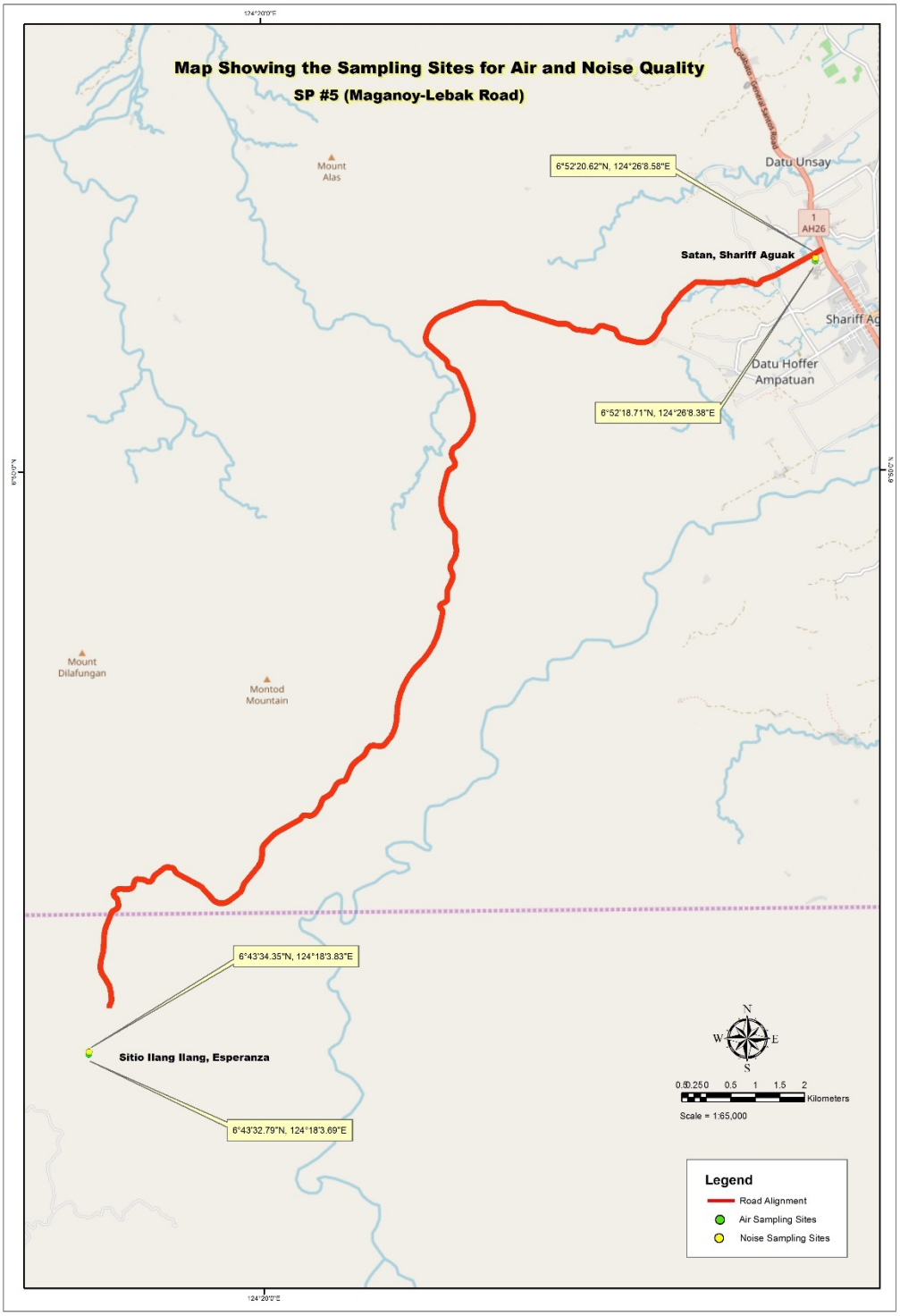
( ): Philippine Standard Values < >: Japanese Standard Values
Source: JICA Study Team

Table 7.10.3-6 shows sampling stations for Noise, Air and Water Sampling Sites, Coordinates, Date and Time of Samplings and **Figure 7.10.3-2** shows the sampling location for air and noise.

Table 7.10.3-6 Sampling points for Noise, Air and Water Quality

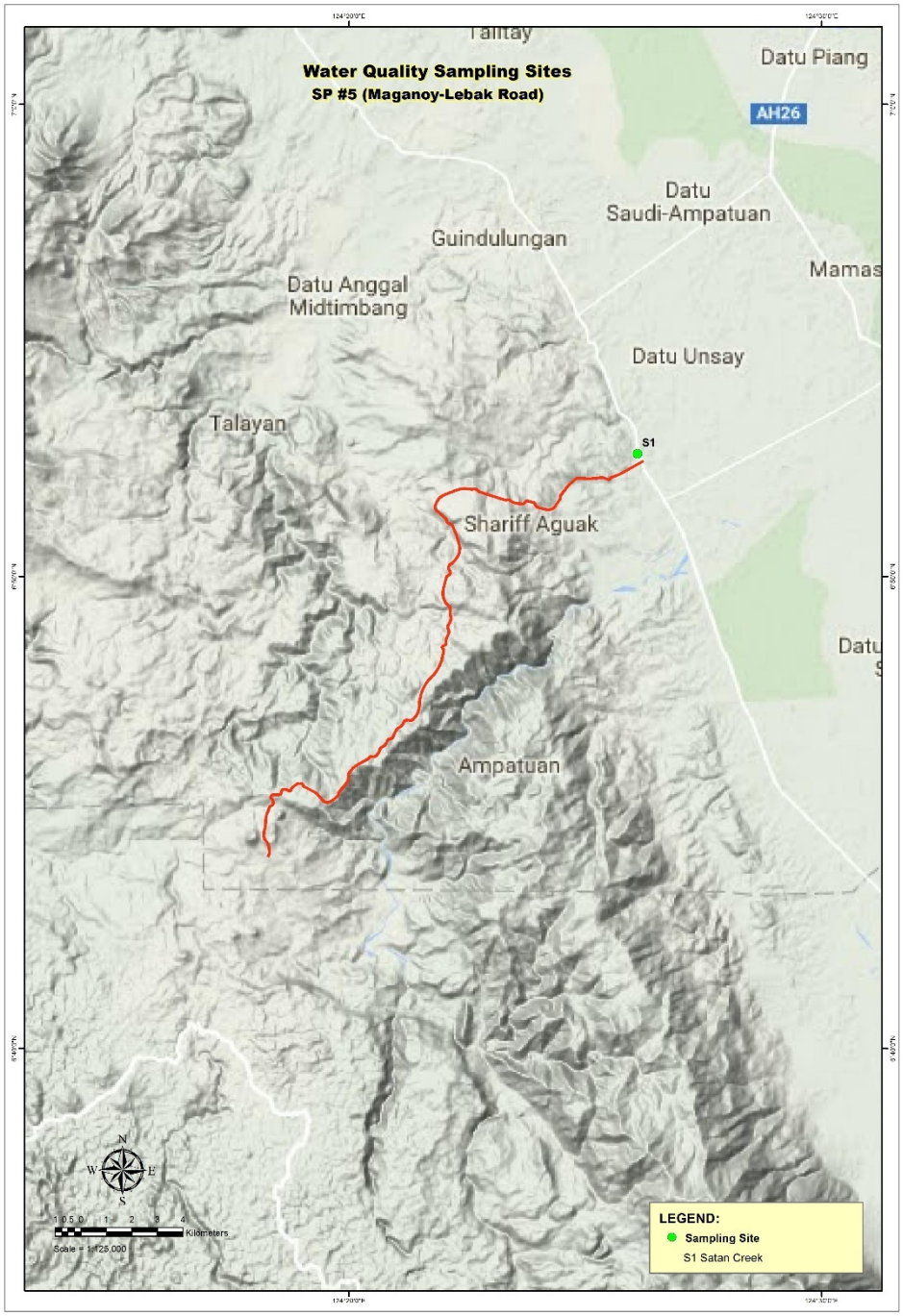
Station No.	Sampling Stations	Coordinates	Date and Time of Samplings
Noise			
N1	NIA Compound, Brgy. Satan, Shariff Aguak, Maguindanao	6°52'20.62"N 124°26'8.58"E	December 5-6, 2017
N2	Sitio Ilang-Ilang, Brgy. Salumping, Esperanza, Sultan Kudarat	6°43'33.71"N 124°18'3.54"E	December 19-20, 2017
Air			
A1	NIA Compound, Brgy. Satan, Shariff Aguak, Maguindanao	6°52'18.71"N 124°26'8.38"E	December 5-6, 2017`
A2	Sitio Ilang-Ilang, Brgy. Salumping, Esperanza, Sultan Kudarat	6°43'32.79"N 124°18'3.69"E	December 19-20, 2017
Water			
W1	Satan Creek, Brgy. Satan, Shariff Aguak	6°52'35.80"N 124°26'6.20"E	December 4, 2017

Source: JICA Study Team



Source: JICA Study Team

Figure 7.10.3-2 Sampling location map of air and noise covered by Lebak – Maganoy Road



Source: JICA Study Team

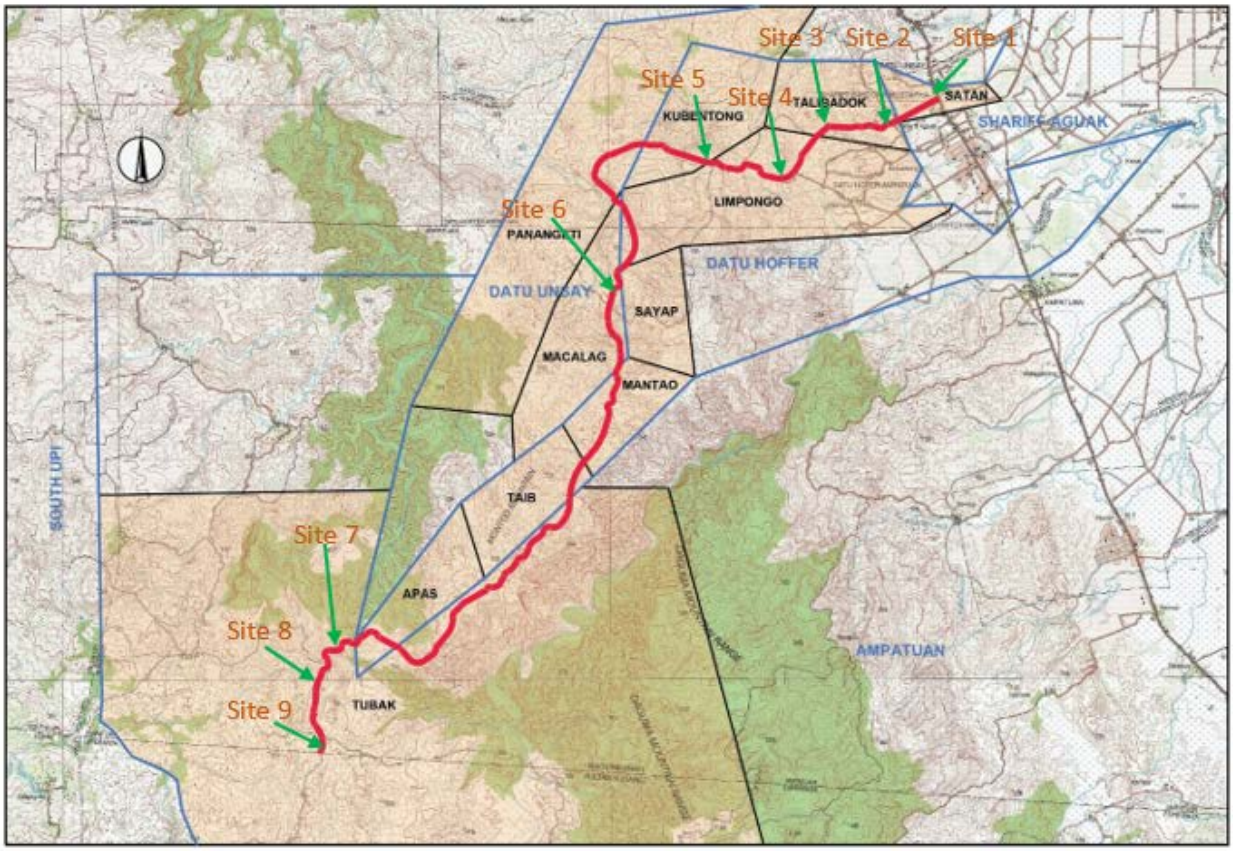
Figure 7.10.3-3 Water Sampling Map covered by Lebak-Maganoy Road

Survey on terrestrial flora and fauna was undertaken in 9 sampling sites within the proposed alignment covering 11 barangays in the municipalities of Shariff Aguak, Datu Hofer, Datu Unsay and Ampatuan. Geographic coordinates of observation sites are shown in **Table 7.10.3-7**.

Table 7.10.3-7 Locations of sampling sites for flora and fauna

Municipality	Site	Barangay	Geographic coordinates	
			Northing	Easting
Shariff Aguak	1	Satan	6°52'26.02	124°26'12.68
Datu Hoffer	2	Talibadok	6°52'4.23"	124°25'31.32"
Datu Hoffer	3	Talibadok	6°52'4.02"	124°24'47.80"
Datu Hoffer	4	Limpongo	. 6°51'25.26"	124°24'16.79"
Datu Hoffer	5	Limpongo	6°51'36.79"	124°23'19.70"
Datu Unsay	6	Macalag	6°49'58.12"	124°22'3.40"
Ampatuan	7	Tubak	6°45'22.95"	124°18'30.65"
Ampatuan	8	Tubak	6°44'49.49"	124°18'13.92"
Ampatuan	9	Tubak	6°44'5.56"	124°18'17.45"

Source: JICA Study Team



Source: JICA Study Team

Figure 7.10.3-4 Terrestrial flora and fauna sampling sites

(7) Mitigation Measures and Environmental Management Plan

A proposed mitigation plans during and after construction are shown in **Table 7.10.3-8**. All mitigation measures are included in the submitted EIS Report by DPWH. All cost for mitigation measures will be finalized in detailed engineering design phase.

Table 7.10.3-8 Environmental Management Plan

Category	No.	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
Pollution	1	Air pollution (Air quality & noise)	(Dust) Water sprinkling near residential area 20 kph speed limit for construction machines at construction sites adjacent to settlement areas	(NO_2, SO_2 and TSP) Setting up green buffer zone along the road (the zone and planting trees are carried out during construction)	Contractor	［During Const.］ DPWH [Operation Phase] Datu Unsay, Datu Hofer, Ampatutan, Shariff Aguak
	2	Water pollution (Water quality)	[Turbid water and other items] - Discharge through sedimentation pond and silt fence -Installation of portable toilet for workers - Appropriate waste and construction machines management	Not required	Contractor	DPWH
	3	Waste (Abandonment)	[Construction waste (trees and waste soil)] - After considering the possibility of reuse, construction waste is disposed at designated disposal site Note) [Muck soil from tunnel section] -Reuse or disposed at designated disposal site after treatment [Garbage from base camp] - Garbage at workers camp and waste oil shall be brought to disposal site or facility [Night soil] -Temporary sanitation facility such as septic tank shall be introduced to the workers camp.	Not required	Contractor	DPWH
	4	Soil contamination (soil quality)	-Reuse or disposed at designated disposal site after treatment	Not required	Contractor	DPWH
	5	Noise and vibration (Noise)	[Construction noise] - Installing noise barrier and selecting low-noise equipment. - Avoiding works of heavy equipment during night time. -Informing the construction schedule to surrounding communities to obtain their consensus	[Traffic noise] - Establishment of green belt as buffer zone along the road - Secure sufficient distance from boundary of the road to residential area after construction of the road (secure noise decay distance) on land use plan along the road - Installation of noise barrier near sensitive facility, if required	Contractor	DPWH
	6	Sediment quality (Soil quality)	-Reuse or disposed at designated disposal site after treatment	Not required	Contractor	DPWH
Natural Environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	- Relocation & replanting trees along the road in ROW -Tree planting of indigenous species at sites designated by DENR -Create ecotone habitats in consideration of Amphibia, if the existing habitats along the river are impacted by the project	- Appropriate land use management not to develop natural area along the road	[Const.] Contractor [Operation] Datu Unsay, Datu Hofer, Ampatutan, Shariff Aguak	[Const.] DPWH [Operation] Datu Unsay, Datu Hofer, Ampatutan, Shariff Aguak
	11	Hydrology (Hydrology and oceanography)	Designing of bridges with sufficient capacity Installation of sufficient drainage facilities on bypass	Not required	Contractor	DPWH

Category	No.	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
			Secure waterways in construction area			
	12	Topography and geology (Geography, topography and landslides	- Installation of slope protection measures	Not required	Contractor	DPWH
Social Environment	13	Involuntary resettlement (People)	Appropriate compensation and social assistance in accordance with RAP	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	DPWH	Datu Unsay, Datu Hofer, Ampatutan, Shariff Aguak
	14	The poor (People)	Appropriate social assistance in accordance with RAP	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	DPWH	Datu Unsay, Datu Hofer, Ampatutan, Shariff Aguak
	15	Indigenous and ethnic people (Indigenous people)	Appropriate compensation and/or relocation in accordance with RAP for affected IPs However situation of religious group(s) such as Islamic group shall be monitored and adequate assistance and coordination shall be given, if necessary.	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP (for affected IPs) However situation of minority religious group(s) such as Islamic group shall be monitored and adequate assistance and coordination shall be given, if necessary. **(See Chapter 17.4.2 for the Indigenous People (IP) Plan)**	DPWH	Datu Unsay, Datu Hofer, Ampatutan, Shariff Aguak
	16	Local economy such as employment and livelihood	Appropriate compensation and social assistance in accordance with RAP	Not required	DPWH	Datu Unsay, Datu Hofer, Ampatutan, Shariff Aguak
	17	Land use and utilization of local resources (Land use and classification)	Appropriate land acquisition and compensation for agricultural area	Management of appropriate land use in accordance with approved detailed zoning map	[Const.] DPWH [Operation] Datu Unsay, Datu Hofer, Ampatutan, Shariff Aguak	Datu Unsay, Datu Hofer, Ampatutan, Shariff Aguak
	18	Water usage (Hydrology / Hydrogeology/ Water quality)	Installation of alternative water distribution system when unexpected situation such as reduction of spring water and water level of wells	Installation of alternative water distribution system when unexpected situation such as reduction of spring water and water level of well	DPWH, Datu Unsay, Datu Hofer, Ampatutan, Shariff Aguak	Datu Unsay, Datu Hofer, Ampatutan, Shariff Aguak
	19	Existing social infrastructures and services	Appropriate compensation and/or relocation in accordance with RAP	Not Required	Contractor and DPWH	Datu Unsay, Datu Hofer, Ampatutan, Shariff Aguak
	22	Local conflict of interests	Local workforce is prioritized for construction of the road	Not required	Contractor	DPWH

Category	No.	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
	23	Cultural heritage	No cultural heritage to be affected. Mitigation not required	Not required	–	–
	27	Infectious diseases such as dengue and HIV/AIDS	- Installation of sufficient drainage facilities not to provide habitat for vector mosquito - Provision of adequate temporary sanitation facilities - Enforcement of medical screening and periodical medical check-up - In order to prevent spread of infectious diseases such as HIV/AIDS, awareness of the labors is promoted	Not Required	Contractor	DPWH
	28	Labor environment (including work safety)	Complying with relevant laws and regulations by the contractor under observation of DPWH	Not required	Contractor	DPWH
Others	29	Accidents (Traffic situation)	Deploying flagman at the gate and crossing points of the construction vehicles Installation of safety sign board Installing fence around the construction site to keep out local people such as children Installation of lightning in the night time Installation of parking for idling construction machines Safety training for the workers Safety patrol at the construction site by supervisors	Not Required	Contractor	DPWH
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	Replanting natural native trees and other agricultural trees such as coconuts	Not required	Contractor	DPWH

Source: JICA Study Team

(1) Environmental Monitoring Plan and Budget

A proposed monitoring plan during and after construction are shown in **Table 7.10.3-9** and **Table 7.10.3-10**. All monitoring plans are included submitted EIA by DPWH to EMB. The monitoring in operation phase shall be carried out for two (2) years at least.

Proposed items to be monitored by JICA are shown in **Table 7.10.3-11**. Air, water quality, noise, ecosystem, resettlement and livelihood of relocated people shall be monitored during and after construction.

Table 7.10.3-9 Environmental Monitoring Plan (Pre and During Construction)

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
Pollution	1	Air pollution (Air quality & noise	TSP, SO_2, NO_2 and PM_{10}	1. TSP –Gravimetric 2. SO_2 –Pararosaniline 3. NO_2 – Griess Saltzman Reaction 4. PM_{10} –Direct Reading (Gas Analyzer)	2 sites (same locations of baseline survey) (see **Table 7.10.3-6** and **Figure 7.10.3-2**)	2 times	800,000	TSP 300µg/Ncm SO_2 340 µg/Ncm NO_2 260 µg/Ncm PM_{10} 150 µg/Ncm
	2	Water pollution (Water quality)	pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Methodologies are described in DAO 34-1990 and EMBDENR Manual for Ambient Water Quality Monitoring Volume I	1 sites (same locations of baseline survey) **Table 7.10.3-6** and **Figure 7.10.3-3**)	2 times	600,000	For Class "C" freshwater pH – 6.5 to 8.5 DO – 5.0 mg/L Oil & Grease – 2.0 mg/L BOD – 7.0 mg/L TSS – not more than 30 mg/L increase
	3	Waste (Abandonment)	Volume of waste soil, cutting tree and domestic garbage	Record volume of generated waste	Cutting land section, tunnel section, cutting tree section and workers camp	4 times	200,000	Generated waste shall be reused or disposed at designated site.
	4	Noise and vibration (Noise	Ambient and road side noise (dB(A)L_{Aeq})	L_{Aeq}, 10min during morning, daytime, evening and night time	2 sites (same locations of baseline survey) (see **Table 7.10.3-6** and **Figure 7.10.3-2**)	2 times	400,000	For "A" categorized areas (general area) Morning: 50 dB(A) Daytime: 60 dB(A) Evening: 50 dB(A) Night : 45 dB(A) For "B" categorized areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A
	5	Ecosystem (Terrestrial Biology Freshwater or marine ecology	Situation of Cutting tree area	Ocular inspection	Major bridge section	4 times	200,000	Cutting tree area is limited on ROW
Natural Env't	11	Hydrology (Hydrology and oceanography)	Flooding situation	Flood level measurement during high precipitation periods Interview with local residents	Flood-prone areas, particularly near major river systems	4 times	200,000	Project activities and structures does not cause flooding
	12	Topography and geology (Geography, topography and landslides)	Stability of slope	Ocular inspection	High cut and high embankment section	4 times	200,000	Must be continuously undertaken until slopes are fairly stable and vegetation cover achieves high survival rate
Soc	13	Involuntary resettlement (People)	Payment and implementation n of	Consultation Meeting and/or Survey with the	Affected barangays	Monthly	500,000	Must be completed prior to construction stage

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
			social assistance in accordance with RAP	project affected persons (PAPs)				
	14	The poor (People)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	15	Indigenous and ethnic people (Indigenous people)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	16	Local economy such as employment and livelihood	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	19	Existing social infrastructures and services	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	22	Local conflict of interests	Construction n worker's native barangay	Confirmation of workers list from contractor	All barangays on the affected route	4 times	500,000	Employment opportunity shall be provided fairly
	27	Infectious diseases such as HIV/AIDS	Number of infected patient	Confirmation of health check list from contractor	All construction workers	4 times	500,000	Infection disease rate shall be less than average rate
	28	Labor environment (including work safety)	Number of workers with required instrument such as helmet	Count numbers of workers with instrument	All construction workers (weekly meeting place)	4 times	500,000	All workers shall have designated device such as helmet

Source: JICA Study Team

Table 7.10.3-10 Environmental Monitoring Plan (Operation Phase)

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
Pollution	1	Air pollution (Air quality & noise	TSP, SO_2, NO_2 and PM_{10}	1.TSP –Gravimetric 2.SO_2 –Pararosaniline 3. NO_2 – Griess Saltzman Reaction 4. PM_{10}–Direct Reading (Gas Analyzer)	2 sites (same locations of baseline survey)	1 times	400,000	TSP 300µg/Ncm SO_2 340 µg/Ncm NO_2 260 µg/Ncm PM_{10} 150 µg/Ncm
	2	Water pollution (Water quality)	pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Methodologies are described in DAO 34-1990 and EMBDENR Manual for Ambient Water Quality Monitoring Volume I	1 sites (same locations of baseline survey)	1 times	600,000	For Class "C" freshwater pH – 6.5 to 8.5 DO – 5.0 mg/L Oil & Grease – 2.0 mg/L BOD – 7.0 mg/L TSS – not more than 30 mg/L increase
	4	Noise and vibration (Noise	Ambient and road side noise (dB(A) L_{Aeq})	L_{Aeq}, 10min during morning, daytime, evening and night tim	2 sites (same locations of baseline survey)	1 times	200,000	For "A" categorized areas (general area) Morning: 45 dB(A) Daytime: 50 dB(A) Evening: 45 dB(A) Night : 40 dB(A) For "B"

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
								categorized Areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)
Natural Env't	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology	Situation of Cutting tree area	Ocular inspection	Major bridge section	1 times	100,000	Cutting tree area is limited on ROW
	11	Hydrology (Hydrology and oceanography)	Flooding situation	Flood level measurement during high precipitation periods Interview with local residents	Flood-prone areas, particularly near major river systems	1 times	100,000	Project activities and structures does not cause flooding
	12	Topography and geology (Geography, topography and landslides)	Stability of slope	Ocular inspection	High cut and high embankment section	4 times	200,000	Must be continuously undertaken until slopes are fairly stable and vegetation cover achieves high survival rate
Social Environment	13	Involuntary resettlement (People)	Payment and implementation n of social assistance in accordance with RAP	Consultation Meeting and/or Survey with the project affected persons (PAPs)	Affected barangays	Monthly	500,000	Must be completed prior to construction stage
	14	The poor (People)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	15	Indigenous and ethnic people (Indigenous people)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	16	Local economy such as employment and livelihood	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	19	Existing social infrastructures and services	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	22	Local conflict of interests	Construction worker's native barangay	Confirmation of workers list from contractor	All barangays on the affected route	Quarterly	500,000	Employment opportunity shall be provided fairly
	27	Infectious diseases such as HIV/AIDS	Number of infected patient	Confirmation of health check list from contractor	All construction workers	Quarterly	500,000	Infection disease rate shall be less than average rate

Source: JICA Study Team

Table 7.10.3-11 Environmental Monitoring Form (JICA Form)

-If environmental reviews indicate the need of monitoring by JICA, JICA undertakes monitoring for necessary items that are decided by environmental reviews. JICA undertakes monitoring based on regular reports including measured data submitted by the project proponent. When necessary, the project proponent should refer to the following monitoring form for submitting reports.
-When monitoring plans including monitoring items, frequencies and methods are decided, project phase or project life cycle (such as construction phase and operation phase) should be considered

1. Relevant Permission and Public Consultation

Monitoring Item	Monitoring Results during Report Period
Confirmation of relevant written permissions and minutes of meetings for held consultations and meetings	

2. Mitigation Measures/Monitoring

- Air Quality（Traffic /Ambient Air Quality

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
TSP	µg/Ncm	20.7	22.7	230µg/Ncm	0.2 mg/m3	-Same points as baseline survey (see **Table 7.10.3-6**) -Two (2) time a year during construction -Once a year during operation -TSP = Gravimetric - SO2 =Pararosaniline - NO2 = Griess Saltzman Reaction - CO =Direct Reading (Gas Analyzer)
NO2	µg/Ncm	3.2	5.0	150ug/Ncm	0.04-0.06 ppm	
SO2	Mg/Ncm	3.4	4.3	180ug/Ncm	0.1 ppm	
PM10	ppm	3.3	4.3	150ug/Ncm		

- Water Quality（Physico-chemical Analyses of Surface Water）

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
pH	-	7.3	7.3	6.5-9	6.5-8.5	-Upstream and downstream portion -Same points as baseline survey (see **Table 7.10.3-6**) -Two (2) time a year during construction -Once a year during operation -grab sampling
DO	mg/L	8.0	8.0	5ppm min.	5 ppm	
TSS	mg/L	229	229	80	25	
BOD	mg/L	1	1	7	3	
Temperature	℃	28.5	28.5	25-31		

-Noise/Vibration

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
Noise level	dB(A)	Morning 50 Daytime 49 Evening 51 Night time 49	Morning 50 Daytime 49 Evening 51 Night time 52	For "A" categorized areas (general / residential area) Morning: 45 dB(A) Daytime: 50 dB(A) Evening: 45 dB(A) Night : 40 dB(A) For "B" categorized Areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)	Daytime: (6:00-22:00) 50dB(AA) 55 dB(A) 55 dB(B) 60 dB(C) EveningTime: (22:00-6:00) 40 dB(AA) 45 dB(A) 45 dB(B) 55 dB(C)	- Same points as baseline survey (see **Table 7.10.3-6**) - 2 times a year during construction - Once a year during operation - Digital sound level meter

- Odor

Monitoring Item	Monitoring Results during Report Period
Not required	

3. Natural Environment

- Ecosystem

Monitoring Item	Monitoring Results during Report Period
Situation of cutting tree area (during construction) Situation of replanting area along the road (operation phase)	

4. Social Environment

- Resettlement (During and after Construction)

Monitoring Item	Monitoring Results during Report Period
Number of PAPs including IPs to be resettled/ relocated/ provided livelihood assistance where required. (during Construction)	
Inventory and valuation of PAPS affected assets (during Construction)	
Notice period given to PAPs before shifting them from their original locations within the ROW (Pre and during construction)	
Number of grievances recorded and redressed (Pre and during Construction)	
Conflicts between religions (Pre, during and after construction)	

- Living / Livelihood

Monitoring Item	Monitoring Results during Report Period
Pre-and post-resettlement incomes and livelihood of PAPs especially for poor people (during and after construction)	

(2) Institutional Arrangement for EMP Implementation

Institutional Arrangement for EMP Implementation is described in **Section 7.5**.

(3) Stakeholders Meeting for EIA

Before the stoppage of the project's baseline survey due to Peace and Order situation in Sub-Project 5, JICA study team was able to conduct two Municipal stakeholders' meetings in the municipalities of Datu Hoffer and Datu Unsay. The stakeholders' meetings are prescript Information Education Communication meetings (IEC meeting) based on the Philippine EIA guidelines attended by the affected stakeholders, barangay and municipal officials, and concerned LGU offices such as Assessors. These meetings were attended by a total of 126 participants composed of 102 males and 24 females.

The major questions of the participants brought out during the 1st public consultations are enumerated below. All questions, comments and suggestions were answered by DPWH ARMM, JICA Cotabato, RAP, and EIA Study team, and it seemed that all questioners understood and agreed all answers as shown in **Table 7.10.3-13**.

Major Concern:

a. In terms of road right of way, do you have payments for crop damage? How much per square meter;
b. Since we are formulating our CPD, can we request the data of the study team so we could use the information regarding the land, water and geology;
c. Is the project related to the on-going project covering the 15 municipalities;
d. We will face challenges but we should help each other so the realization of the project will become possible. This is our opportunity. Datu Hofer is assuring you full support to the project. The League of Barangay will also provide assistance.
e. In Limongon Datu Hofffer, what is the assurance that we will not be displaced on our ancestral land? We don't have legal documents;
f. In Macalag Datu Unsay, We have fears that our ancestral lands will be taken to us. If road is already constructed, others might claim it and worse they will get land titles. Because most of us are uneducated, we do not know what to do. Our lands are grabbed by Muslims and they left us nothing. We owned the land before Marshal law but after that some Muslim positioned in our land. We are afraid that they will get all our lands;
g. Are barangay Macalag and Panangget included in the claim;
h. In barangay Pangget, We wanted to have a road. We hope that those educated like you will know what our rights is;
i. We wanted to have road in barangay Macalag, most of us are uneducated, some doesn't understand much about the effects of this project;
j. Those that will be traversed by the road, where will they go; and
k. Barangay Chairman's committed to support and help the proponent, EIA and Rap team to complete the activities in the affected barangays of Sub-Project 5.

During the 1st public consultations, the women's emphasized the importance of proper compensation for the affected landowners and livelihood programs for extra income.

Overall, the proposed Sub-Project 5 is socially acceptable based on the responses and feedbacks of the stakeholders. They are desiring to have road for long time ago because majority of the people are uneducated and mentioned that the road will be a way that their community will be developed and improved their living. They are willing to negotiated and compensated and suggested to implement the project early from schedule.

Table 7.10.3-12 Contents of Stakeholder Meeting Municipal Level

Date (venues)	Objectives of the meeting	Major Agenda	Participants	No. of Participants		
				Location	Male	Female
Dec. 7, 2017 Datu Hoffer Municipal Hall	Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	Inform and generate awareness and understanding of the concerned public about the project; Provide the stakeholders and avenue to ventilate salient issues and concerns regarding the project; Give an opportunity to the stakeholders to have an open discussion with the Preparers, Proponents and LGU about the project; Educate the stakeholders of their rights and privileges; and Enable the stakeholders to effectively participate and make informed and guided decisions.	Municipal Officials, Project-Affected Persons (PAPs) and Barangay Officials, DPWH, RAP and JICA Study Team	Datu Hofer	55	14
Datu Unsay Municipal Hall				Datu Unsay	47	12

Source: JICA Study Team

Table 7.10.3-13 Major Opinions in Stakeholders' Meetings Municipal Level

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
Dec. 7, 2017 Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	Introduce the project and discuss the project objectives and the benefits that can be derived. EIA and RAP Process Tentative Schedules Solicit queries, comments, concerns and suggestions on the project	Land	Properties	(Haji Basit Gzangkala, Chairman Brgy. Labu-Labu II (League of Barangay)) In terms of road right of way, do you have payments for crop damage? How much per square meter?	We get the prices based in provincial estimates for crop damages. After we gather these information we will present it to you and then we will have agreed values which we will submit to JICA/DPWH
				(Khomenie Mantawel, MPDO) We are thankful to you even the project is not yet implemented. I just want to clarify who is our guest because we thought its JICA but the there is no JICA in the tarpaulin	We are all under JICA
				(Khomenie Mantawel, MPDO) Since we are formulating our CPD, can we request the data of the study team so we could use the information regarding the land, water and geology	You can send a letter requesting the data to the project manager/leader if JICA Study Team after all the study has been conducted because once we submit the data, it is already their copyright.
				(Haji Basit Gzangkala, Chairman Brgy. Labu-Labu II (League of Barangay) Is the project related to the on-going project covering the 15 municipalities?	The project for 15 municipalities is part of the ARMM-Humanitarian and Development Action Plan (ARMM-HDAP) project

Source: JICA Study Team

7.10.4 Summary of Environmental Impact Assessment (EIA) for Sub-Project 6

(1) Description of the Project Components

The Project Components are described in **Chapter 13**.

(2) Baseline of the Environmental and Social Condition

Baseline of the Environmental and Social Condition is described in **Chapter 13** and **Section 7.2**.

(3) Laws, Regulations, and Organizations related to Environmental and Social Considerations for EIA

Laws, Regulations, and Organizations related to Environmental and Social Considerations for EIA are described in **Section 7.1** and **Section 7.3.1**.

(4) Analysis of Alternative Alignments

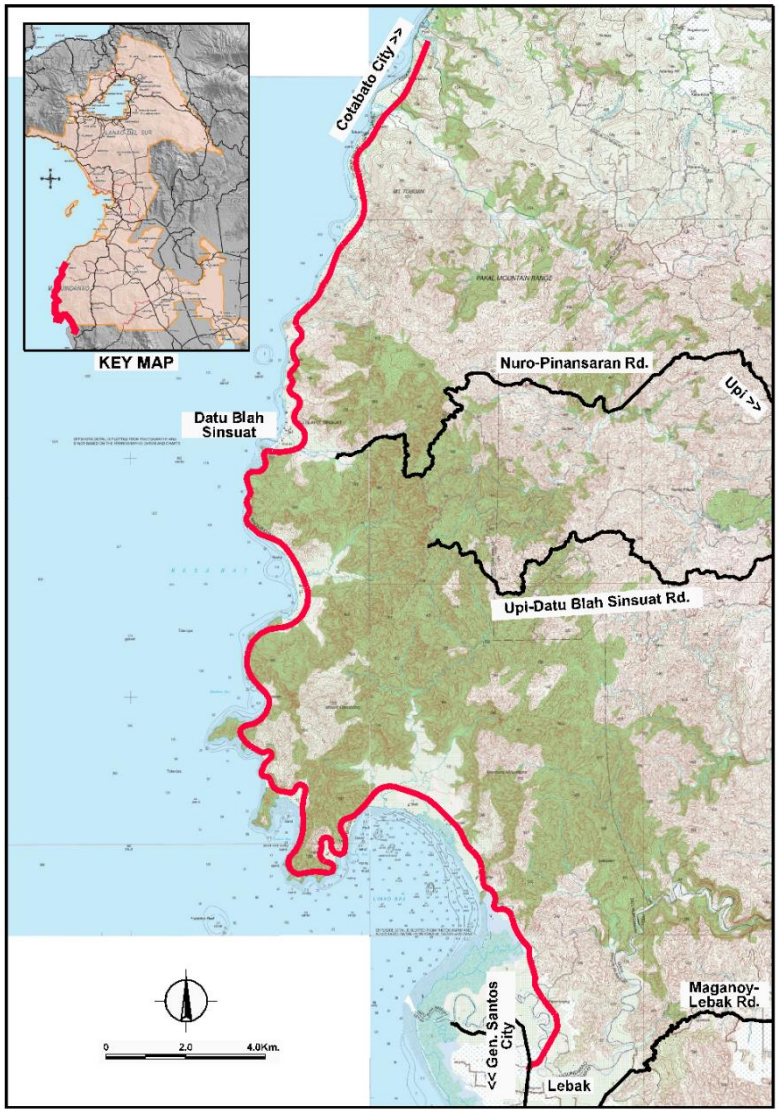
The comparative analysis of alternatives was described in **Chapter 14** and **Chapter 12**. The summary is shown below.

1) Alignment Selection Criteria

The criteria for alignment selection are as follows;

- Length, Construction Cost, Construction period (road length, no of bridges and culverts,etc.)
- Economic Impact (population along the alignment, agricultural land areas to be served, etc.)
- Environmental Impact (high-filling section length, high-cutting section length, no. of buildings to be affected)
- Technical feature (total no. of curves no. of curves < 300m, length of vertical grade >= 5%)

Figure 7.10.4-1 shows the recommended alignment for the road.



Source: JICA Study team

Figure 7.10.4-1 Recommended Alignment

2) Zero option

The zero option (with / without Sub-Project) of this project is shown in **Chapter 11** and **Chapter 22**.

(5) Scoping and Survey item for Environmental and Social Considerations Survey

Scope of the EIA study for the project is discussed in this section. The environmental scoping is conducted based on an environmental reconnaissance by the JICA Survey Team.

The result of scoping is indicated on the Leopold scoping matrix and reason tables as shown in **Table 7.10.4-1** and reason for scoping tables as shown in **Table 7.10.4-2**.

The scoping matrix below shows the impact factors, impacted item and impact degree based on JICA's guidelines and Philippine items. According to the scoping matrix, majority of the items or seventeen

(17) items are rated as "B-" (Some impact is expected) due to huge earth work volume and significant social impacts, No.14 (The poor) is rated as "B+/-" (Some impact is expected), four (4) items are rated as "C" (unknown impact is expected) and eight (8) are rated as "D" (Few impacts are expected).

Table 7.10.4-1 Draft Scoping Matrix Based on JICA's Guidelines and Philippines Items

	No	Affected Activities / Impact Items (JICA)	(Philippines)	Overall Rating	Pre/ During Construction Phase: Land acquisition and Loss of properties	Change of Land use plan, Control of various activities by regulations for the construction	Reclamation of Wetland, etc.	Deforestation	Alteration to ground by cut land, filling, drilling, tunnel, etc.	Operation of Construction Equipment and Vehicles	Construction of Roads, tollgates, parking lots, Access roads for bridges and other related facilities	Traffic Restriction in construction area	Influx of construction workers, construction of base camp	Operation Phase: Increase of Through Traffic	Appearance/ Occupancy of Roads and related building structures including tunnel and embankment	Increasing influx of settlers
Pollution	1	Air Pollution	Air quality & noise	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	D
	2	Water pollution	Water quality	**B-**	D	D	D	D	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	3	Waste	Abandonment	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	4	Soil contamination	Soil quality/fertility	**B-**	D	**B-**	**B-**	D	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	5	Noise and Vibration	Noise	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	D
	6	Ground Subsidence	Subsidence/ collapse	D	D	D	D	D	D	D	D	D	D	D	D	D
	7	Odor		D	D	D	D	D	D	D	D	D	D	D	D	D
	8	Sediment quality	Soil quality	**B-**	D	D	D	D	**B-**	D	**B-**	D	D	D	D	D
Natural Environment	9	Protected Area	Environmentally Critical Areas (ECAs)	D	D	D	D	D	D	D	D	D	D	D	D	D
	10	Ecosystem	Terrestrial Biology Freshwater or marine ecology	**B-**	**B-**	**B-**	D	**B-**	**B-**	C	**B-**	D	**B-**	D	**B-**	**B-**
	11	Hydrology	Hydrology and oceanography	**B-**	D	D	**B-**	D	**B-**	D	D	D	D	D	**B-**	D
	12	Topography and geology	Geography, topography and landslides	**B-**	D	D	**B-**	D	**B-**	D	D	D	D	D	D	D
Social Environment	13	Involuntary resettlement	People	**B-**	**B-**	D	D	D	D	D	**B-**	D	D	D	D	D
	14	The poor	People	**B+/-**	**B+/-**	D	D	D	D	D	**B+/-**	D	D	D	D	**C**
	15	Indigenous and ethnic people	Indigenous people (IPs)	**B-**	**B-**	D	D	D	D	D	D	**B-**	**B-**	D	D	**B-**
	16	Local economy such as employment and livelihood	People	**B-**	D	D	D	D	D	D	**B-**	D	**B-**	D	D	**C**
	17	Land use and utilization of local resources	Land use and classification	**B-**	D	**B-**	D	D	D	D	D	D	**B-**	D	D	**B-**
	18	Waste Usage	Hydrology / Hydrogeology/ Water quality	**B-**	D	D	D	D	D	D	D	D	**B-**	D	D	D
	19	Existing social infrastructures and services	People	**B-**	**B-**	D	D	D	D	D	**B-**	D	D	D	D	**B-**

	No	Affected Activities / Impact Items (JICA)	(Philippines)	Overall Rating	Pre/ During Construction Phase: Land acquisition and Loss of properties	Change of Land use plan, Control of various activities by regulations for the construction	Reclamation of Wetland, etc.	Deforestation	Alteration to ground by cut land, filling, drilling, tunnel, etc.	Operation of Construction Equipment and Vehicles	Construction of Roads, tollgates, parking lots, Access roads for bridges and other related facilities	Traffic Restriction in construction area	Influx of construction workers, construction of base camp	Operation Phase: Increase of Through Traffic	Appearance/ Occupancy of Roads and related building structures including tunnel and embankment	Increasing influx of settlers
	20	Social institutions such as social infrastructure and local decision making institutions		D	D	D	D	D	D	D	D	D	D	D	D	D
	21	Misdistribution of benefit and damage		D	D	D	D	D	D	D	D	D	D	D	D	D
	22	Local conflict of interests	People	C	D	C	D	D	D	D	D	D	D	D	D	D
	23	Cultural Heritage	People	C	C	D	D	D	D	D	C	D	D	D	D	D
	24	Landscape		D	D	D	D	D	D	D	D	D	D	D	D	D
	25	Gender		D	D	D	D	D	D	D	D	D	D	D	D	D
	26	Right of Children		D	D	D	D	D	D	D	D	D	D	D	D	D
	27	Infectious diseases such as HIV/AIDS	People	C	D	D	D	D	D	D	D	D	C	D	D	D
	28	Labor environment (including work safety)		B-	D	D	D	D	D	D	B-	D	B-	D	D	D
Others	29	Accidents	Traffic situation	B-	D	D	D	D	D	B-	D	B-	C	B-	D	D
	30	Cross Boundary impacts and climate change	Meteorology / Climatology	C	D	D	D	C	D	D	D	D	D	C	D	D

Note) Rating:

A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done)** D: Few impacts are expected. Detailed quantitative survey is not necessary.

Source: JICA Study Team

Table 7.10.4-2 Reasons for Draft Scoping

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating: Pre/ During Construction	Rating: Operation Phase	Reasons of the Rating
Pollution	1	Air pollution (Air quality & noise)	B-	B-	**Construction phase:** Temporary negative impacts are expected on air quality due to fugitive dust emissions from construction activities such as land clearing, grading, excavation, and the transport and movement of construction materials. **Operation phase:** Negative impacts on air quality are expected due to emission from vehicles passing on the new road.
	2	Water pollution (Water quality)	B-	D	**Construction phase:** Domestic wastewater will be generated from construction workers. Surface water will become turbid due to solids generated from earth works and drilling in the site. Oil and grease and petroleum hydrocarbons may pollute water that may come from vehicles and construction equipment. **Operation phase:** No serious impacts are expected.

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
	3	Waste (Abandonment)	**B-**	D	**Construction phase:** Construction waste such as waste soil and cutting trees are expected to be generated by deforestation, cutting, land clearing and drilling. Solid wastes from construction workers may be generated from construction base camp. Hazardous wastes such as busted lamps, used oil, used paints etc. maybe generated from construction site. **Operation phase:** No serious impacts are expected
	4	Soil contamination (soil quality)	**B-**	D	**Construction phase:** Removal of vegetation may affect the soil quality due to oil & grease and petroleum hydrocarbon contamination from construction equipment and vehicles. **Operation phase:** No serious impacts are expected.
	5	Noise (Noise)	**B-**	**B-**	**Construction phase:** Increased noise levels will be significant due to heavy construction vehicles moving to and from the site, drilling and excavation activities. **Operation phase:** Noise generation is expected by vehicles passing on the new road.
	6	Ground subsidence (Subsidence)	D	D	No impacts are expected. There will be no groundwater extraction during the construction and operation activities.
	7	Odor	D	D	Few impacts are expected. Obnoxious odor may come from vehicle exhaust, clearing & dredging of river banks.
	8	Sediment quality (Soil quality)	**B-**	D	**Construction phase:** Surface water runoff which may have caused the sediment transport is expected during construction activities due to earthworks, land clearing, excavation etc. **Operation phase:** Road operation which causes impacts on sediment quality is not expected.
Natural environment	9	Protected area (ECAs)	D	D	**Construction and operation phase:** No protected area such as designated conservation zone is observed in the project affected area.
	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	**B-**	**B-**	**Construction and Operation phase:** With the implementation of the project, during the construction phase, land clearing and topography alteration will require removal of existing vegetation cover within the road Right of way. Clearing of remaining vegetation will also possibly affect remaining wildlife and its habitats to give way for the construction of road project. Impacts of the project will be assessed based on the result of the terrestrial survey and to be able to come up with apt recommendations to mitigate such impacts. The result of the survey also serves as the basis for monitoring during the Operation phase.
	11	Hydrology (Hydrology and oceanography)	**B-**	**B-**	**Construction Phase:** Rating B- under Reclamation of Wetland, etc. - Extent of impact is unknown. The road alignment may not cross wetland and/or swamps. In case the final road alignment will traverse the wetlands, survey and analysis should be done to make sure that the road network will not hamper the natural flow of water prior to the road construction. **Construction and Operation Phase** Rating B- under Alteration to ground by cut land, land filling, drilling, tunnel, etc. - Some impact is expected. The proposed road will traverse through generally flat terrain and rolling grounds drainage impact is expected. This may change the drainage flow to other directions and may cause flooding in some areas. Flooding that is expected maybe due to rainwater flow restrictions and natural blocking of surface water runoff in the construction site.
	12	Topography and geology (Geography, topography and landslides)	**B-**	D	**Construction and Operation Phase**: Earthworks such as land filling and land cutting would affect the topographic condition along the proposed road alignment. Risk associated with landslides maybe expected in sections passing steep terrain. Slope protection measures could be necessary during the operation phase. No protected geological site is located in the project area.
Social Environment	13	Involuntary resettlement	**B-**	D	**Pre-Construction Phase:** Settlements and private lands will be acquired to give way for the road construction. This will cause involuntary resettlement (physical and economic) **Operation Phase:** No impact is expected since it was already settled during pre-construction period

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
	14	The poor	B+/-	C	**Construction Phase:**Some impacts (positive/negative) is expected considering the socio-economic condition of the community in the project area **Operation Phase:** Extent of impacts are still unknown but looks forward to easier access of the poor to public services
	15	Indigenous and ethnic people	B-	B-	**Pre-Construction phase:** Some impacts (positive/negative) is expected considering the socio-economic condition of the community in the project area **Operation Phase:** Some impacts (positive/negative) is expected.
	16	Local economy such as employment and livelihood	B-	C	**Pre-Construction phase:** Livelihood of residents and farmers may be affected by resettlement and acquisition of agricultural area **Operation Phase:** Few impacts are expected.
	17	Land use and utilization of local resources	B-	B-	**Pre-Construction phase:** Some agricultural areas will be affected by the project. **Operation Phase:** Roadside area may be developed as commercial or industrial area in non-designated land use area. Such unplanned development and influx of new settlers may give impact on land use and local resources.
	18	Waste Usage	B-	D	**Construction Phase:** Earth works such as cutting land and drilling of tunnel may give impact on drinking water resources such as springs and wells. **Operation phase:** No impact is expected.
	19	Existing social infrastructures and services	B-	B-	**Pre-construction and Construction Phase:** Relocation of religious facilities, school, cemetery and other public facilities need to be considered. **Operation Phase:** Existence of the road may disturb commuting/ going to school and hospital
	20	Social institutions such as social infrastructure and local decision-making institutions	D	D	Impacts are not expected, since local decision-making institute represented by local governments will continue after the road construction.
	21	Misdistribution of benefit and damage	D	D	Misdistribution of benefit and damage caused by the road constructions not expected.
	22	Local conflict of interests	C	D	**Construction Phase:** Local inhabitants and local authorities may request to ensure job opportunities as construction workers. **Operation phase:** No impact is expected.
	23	Cultural Heritage	C	D	**Pre-construction and Construction Phase:** Impact will be assessed based on confirmation of cultural heritages around the project site.
	24	Landscape	D	D	No impact is expected.
	25	Gender	D	D	Negative impact specified for women are not expected
	26	Right of Children	D	D	Negative impact specified for children are not expected
	27	Infectious diseases such as HIV/AIDS	C	D	**Construction Phase:** Infectious diseases such as STD are possible to be spread due to inflow of construction workers. Furthermore, alteration to ground by cut land and filling may provoke to provide habitats of mosquito that possibly transmits dengue fever **Operation phase:** Road operations which causes infectious diseases are not expected

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
	28	Labor environment (including work safety)	**B-**	D	**Construction Phase:** Construction work environment needs to be considered in accordance with relevant laws and regulations **Operation phase:** No impact is expected.
Others	29	Accidents (Traffic situation)	**B-**	**B-**	**Construction Phase:** Construction vehicles may use existing local road near residential areas, thus number of traffic accident. **Operation phase:** Quantitative analysis based on baseline survey
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	**C**	**C**	**Construction phase:** Deforestation for land clearance may give impact on cross boundary impacts and climate change. **Operation phase:** Greenhouse gas emissions from vehicles that pass by along the new roads maybe generated which will have an impact in the protection of ozone layer as a result of climate change.

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done)** D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

Table 7.10.4-3 Baseline Survey and Forecast Analysis for Draft Scoping

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/ During Construction	Operation Phase		
Pollution	1	Air pollution (Air quality & noise)	**B-**	**B-**	-Site measurement (6 sites) TSP, PM_{10}, NO_2 and SO_2 -Secondary data collection, if any	**Construction Phase:** Qualitative analysis **Operation Phase:** - Quantitative analysis (PM_{10}, NO_2, and SO_2) (Puf model : calm wind model)
	2	Water pollution (Water quality)	**B-**	D	-Site measurement (6 sites: river water) DO, TSS, BOD, COD, pH, Total/Fecal Coliform, temperature -Secondary data collection, if any	**ConstructionPhase:** Qualitative analysis
	3	Waste (Abandonment)	**B-**	D	Review of specification on design and construction plan	**During Construction Phase:** Quantitative analysis of volume of cutting trees by type and excavated or drilling soil and muck
	4	Soil contamination (soil quality)	**B-**	D	Review of specification on design and construction plan	**During Construction Phase:** Qualitative analysis
	5	Noise and vibration (Noise)	**B-**	**B-**	Noise -Site measurement (3 sites) $L_{Aeq,\ 10min}$ weekday (in accordance with DENR regulation) -Secondary data collection, if any	**During Construction Phase:** Qualitative analysis based on construction machines on standard formation **Operation Phase:** - Quantitative analysis(ASJ RTN-Model 2013)
	8	Sediment quality (Soil quality)	**B-**	D	Literature survey (land use history on affected land of the project)	**During Construction Phase:** Qualitative analysis base on the literature survey
Natural environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	B-	B-	Literature survey and site survey for fauna and flora. (Terrestrial: 12sites) (Marine: 6sites)	**During construction and operation phase:** Qualitative analysis base on the literature survey, site survey and construction plan & traffic volume in the future

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/ During Construction	Operation Phase		
	11	Hydrology (Hydrology and oceanography)	**B-**	**B-**	Literature survey and referring to hydrographic and geological survey result on feasibility study and designing	**During construction and operation phase:** Quantitative analysis on following items base on the hydrographic analysis for bridge and drainage designing. - Impact on hydrological situation on the rivers and streams - Impact on water vein underground - Impact on flooding situation
	12	Topography and geology (Geography, topography and landslides)	**B-**	D	Literature survey and topographic survey for designing	**During construction and operation phase:** Qualitative analysis base on the topographic analysis for designing
Social environment	13	Involuntary resettlement (People)	B-	D	Literature survey and a series of RAP surveys (Inventory of loss assets, census, social economic survey and replacement cost study)	**During construction phase:** Quantitative analysis based on RAP surveys
	14	The poor (People)	B+/B-	C	Literature survey and a series of RAP surveys	**During construction phase:** Quantitative analysis based on RAP surveys
	15	Indigenous and ethnic people (Indigenous people)	**B-**	**B-**	Literature survey and a series of RAP / IP surveys	**During construction phase:** Quantitative analysis based on RAP / IP surveys
	16	Local economy such as employment and livelihood (People)	**B-**	C	Literature survey and a series of RAP surveys	**During construction phase:** Qualitative analysis based on RAP surveys
	17	Land use and utilization of local resources (Land use and classification)	**B-**	**B-**	Literature survey and a series of RAP surveys	**During construction phase:** Quantitative analysis based on RAP surveys (area of land acquisition by land use)
	18	Water usage (Hydrology / Hydrogeology/Water quality)	**B-**	D	Literature survey, geological survey and water usage survey (identification of springs and wells around tunnel and cutting land areas based on the data from RAP survey)	**During construction phase:** Qualitative analysis base on the baseline survey for following items - Impact on springs and wells - Impact on watershed area
	19	Existing social infrastructures and services (People)	B+	**B-**	Literature survey and a series of RAP surveys	**During construction and operation phase:** Quantitative analysis based on RAP surveys
	22	Local conflict of interests (People)	C	D	Collection of information and opinions in stakeholder meeting(s)	**During construction:** Qualitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
	23	Cultural heritage (People)	C	D	Literature survey, a series of RAP surveys and collection of local information through stakeholder meeting(s)	**During construction:** Quantitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
	27	Infectious diseases such as HIV/AIDS (People)	C	D	Literature survey and collection of local information through stakeholder meeting(s)	**During construction phase:** Qualitative analysis based on baseline survey. Followings impacts are considered - Risks of HIV/AIDS - Risks of dengue fever - Other specific infection disease

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/ During Construction	Operation Phase		
	28	Labor environment (including work safety)	**B-**	D	Literature survey, a series of RAP surveys and collection of local information through stakeholder meeting(s)	**During construction:** Quantitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
Others	29	Accidents (Traffic situation)	**B-**	**B-**	Collection of traffic accident data from police station	**During construction and operation phase::** Quantitative analysis based on baseline survey
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	**C**	**C**	-Estimation of affected forest area and traffic conditions based on the project plan	**During construction and operation phase::** Quantitative analysis based on baseline survey

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and anZalysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

(6) Summary of Baseline Survey, Forecast and Impact Assessment

The summarized result of baseline survey and forecast of impacts are shown in **Table 7.10.4-4**. The baseline data and quantitative forecastis shown in **Table 7.10.4-5** and survey points of air & noise and water quality is shown in **Table 7.10.4-6**.

In terms of pollution items such as air, water and noise, all the forecasted values are within the allowable limits, thus it is not likely provided serious impact in these items. However, construction waste soil from cutting land and drilling in the tunnel section shall be reused or disposed in appropriate designated disposal site.

With regard to IUCN List, although some species are identified through the baseline survey on flora and fauna, these species are distributed around the around the Sub-Project area. The estimated numbers of resettlers are 119, of which 86 belong to Indigenous Peoples (IPs), although the numbers of PAPs are very minimal, appropriate mitigation measure are necessary on the resettlement action plan.

Table 7.10.4-4 Result of Baseline and Forecast on Main Items

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
Pollution	1	Air Pollution (Air Quality & Noise)	B-	B-	B-	B-	Result of (TSP, PM10, SO2, NO2) at 6 stations are below the standard values (See **Table 7.10.4-6**)	Forecast value do not exceed standard values	Expected impacts by the project are not significant because all the forecasted values are within the standard values Quantitative Standards as shown in **Table 7.10.4-5.**
	2	Water pollution (water Quality)	B-	D	B-	D	Result of (pH, Temp, BOD, TSS, DO) are within the guidelines (See **Table 7.10.4-6**)	During construction activities may cause turbidity water and oil and grease contamination. Likewise, domestic waste may be discharge from the camp	Impacts may be minimized or mitigated by provision of erosion control measures such as settling traps, use of portable toilet, etc. Quantitative Standards as shown in **Table 7.10.4-5.**
	3	Waste	B-	D	B-	D	Not required	Clearing and deforestation activities are expected to generate construction waste such as soil, debris, cut trees Also, additional domestic waste may be generated from the construction camp.	Impacts can be mitigated by proper management and disposal of waste like practice ecological waste management, segregation at source, 3R, etc
	4	Soil Contamination (Soil Quality)	B-	D	B-	D	Not required	Soil maybe contaminated from the construction equipment and transportation.	Impacts can be mitigated by proper maintenance of equipment and transportation, proper containment and disposal of oil, etc.
	5	Noise	B-	B-	B-	B-	There are some measurement of noise that exceeded the standard particularly during the night due to presence of insects like crickets that make noise during the dark and usual in the rural areas.(See **Table 7.10.4-6**)	Forecast value exceed philippines standard values(Class A (General)), but the value do not exceed Japanese standard values(Class B2). (See **Table 7.10.4-6**)	Impacts may be mitigated by avoidance and other measures such as no construction during the night or use of muffler or sound proof barrier. Quantitative Standards as shown in **Table 7.10.4-5.**
	6	Ground Subsidence	D	D	C	C	Ground rupture of the alignment directly straddle or located within a narrow zone of active fault traces. For ground shaking, the proximity of active faults to the proposed road alignments indicates that strong to very strong ground shaking is expected to be experienced in Sub-Project 6. At the Project Area, parts of road sections underlain by thick deposit of alluvial materials could be prone to liquefaction.	• The proximity of active faults exposes the project to strong to very strong ground shaking. • The project could be susceptible to ground rupture as it directly straddles or located within a narrow zone of active fault trace. • Some sections may be prone to liquefaction due to presence of loose/unconsolidated sediments with shallow water table.	• Conduct Probabilistic Seismic Hazard Assessment (PSHA). • Detailed assessment of the identified active fault intersecting the road alignment. • Appropriate geotechnical investigation to evaluate potential liquefiable soil layers.

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
							Sub-Project 6 Tapian-Lebak Coastal Road which is underlain by thick, extensive, transgressive mixed shelf marine deposits may be susceptible to liquefaction.		
	7	Odor	D	D	D	D	Not required	Few impacts are expected. Obnoxious odor may come from vehicle exhaust, clearing & dredging of river banks.	Qualitative measurements based on sensitivity of receptors against unobjectionable odor
	8	Sediment Quality	B-	D	B-	D	Not required	During construction sediment will most likely erode into the water particularly during heavy rains	Impacts may be mitigated through erosion /sedimentation control measures, or stoppage of soil clearing during heavy rains, use of silt trap
Na tur	9	Protected Area	D	D	D	D	Not required	Not required	No protected area is observed in the area.

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
	10	Ecosystem (Terrestrial Flora and Fauna)	B-	C	B-	C	Floristic composition of the alignment comprised of 97 species dominated by trees. Species recorded are common and naturally growing in the area. Result of the assessment shows that only 7 species are included in the IUCN lists as Critically endangered (2), Vulnerable (4) and of least concern (1) in categories. The faunal composition of the alignment is nominal dominated by avifauna species (44 avifauna and 8 herpeto-fauna). These species are common and locally sited in different ecosystems in the lowland areas including agricultural areas, shrubland, grassland and settlement areas. These species also thrive even in highly disturb areas including cities. *Twelve* (12) species are endemic in the study area dominated by Avifauna. Two (2) species are included in the IUCN as near threatened and vulnerable in the category listing.	The project development will require removal of vegetation cover to give way for the construction of the proposed road project. Further loss of vegetation cover as a result of land clearing may encourage movement/migration of wildlife species in the area aggravated by the loss of habitat/abode and remaining sources of food for survival. Likewise, wildlife disturbance due to noise pollution brought about by the operation of heavy equipment's during construction will force some faunal species to migrate to other or nearby areas/habitat where disturbance is less.	Prior to project implementation the proponent will coordinate to the DENR and Philippine Coconut Authority (PCA) to seek clearance for the identification of required documents for the issuance of needed tree and coconut cutting permits (PD 705). Moreover, to compensate the loss of habitats, the proponent will replace the number of trees removed/cut and plant them in nearby areas or in accordance with the advice of the DENR. Species that will be used for the reforestation must be indigenous trees and/or fruit bearing trees endemic in the place that can attract wildlife species. Planting of trees will help in sequestering carbon in the environment. As per **DENR Memorandum Order no. 05 of 2012** mandated that "Uniform replacement ratio for cut or relocated trees" item 2.2 "For planted trees in private land and forest lands... tree replacement shall be 1:50 while naturally growing trees in the same area, including those affected by the project, shall be 1:100 ratio in support of the National Greening Program (NGP) and Climate Change Initiatives of the Government". Compensation for affected coconut palms shall be based on Section 5 of Republic Act No. 8048, an act providing for the regulation of the cutting of coconut palms. Replacement ratio of cut coconut palm shall be 1:1.
	11	Hydrology	C	C	D	D	The river systems that affect the proposed road alignment are tributaries of the Tubuan River and some minor creeks**.** During the conduct of field investigation, no ground water wells or springs were found that may be affected by the project. Based on the data	Most likely not affected as no wells were found on the alignment	Not give serious impact on the ground water

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
							from the National Water Resources Board (NWRB), one spring in Barangay Laguitan is being harnessed as the source for irrigation This is being maintained by Laguitan Irrigators Association Incorporated.		
	12	Topography and Geology	B-	B-	B-	B-	The alignment generally follows the coastline bordering hilly to mountainous areas. Elevation along the upper half of the alignment is generally flat while the sections.	• The proximity of active faults exposes the project to strong to very strong ground shaking. • The project could be susceptible to ground rupture as it directly straddles or located within a narrow zone of active fault trace. • Some sections may be prone to liquefaction due to presence of loose/unconsolidated sediments with shallow water table. • The coastal barangays are prone to tsunami.	• Conduct Probabilistic Seismic Hazard Assessment (PSHA). • Detailed assessment of the identified active fault intersecting the road alignment. • Appropriate geotechnical investigation to evaluate potential liquefiable soil layers. • Coordinate with PHIVOLCS regarding tsunami alerts
Social Environment	13	Involuntary resettlement (People)	B-	D	B-	D	Based on the RAP survey, 22 affected dwellings and 119 resettlers are identified.	Land acquisition may cause acquisition of agricultural land, crops and resettlement. Thus, RAP is prepared in accordance with JICA Guidelines and Philippine Laws.	Appropriate compensation and assistance in accordance with RAP is prepared to minimize adverse social impacts.
	14	The Poor (People)	B+/-	C	B+/-	C	Based on the profiles of the respondents during perception survey, 68.75% of the households are earning below poverty line (PhP5,000 to PhP10,000/month). This composed of the total income of the households per month which only reflects that more than half of the respondents are living in poverty	Land acquisition by the project gives some adverse impact to poor people under poverty line	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of livelihood/income to the poor may be consider
	15	Indigenous and ethnic people (Indigenous People)	B-	B-	B-	B-	In terms of ethnicity, the project area is dominated with Iranun, Maguindanaon, Cebuano and Maranao. There are also indigenous people such as Manobo and	Few impacts are expected on designated indigenous and ethnic group. However, religious group(s) such as Iranun shall be monitored, and	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
							Tiduray however comprises only small portion of the project area and outside an Ancestral Domain Claim/Title.	then adequate assistance and coordination shall be given, if necessary.	livelihood/income to the poor may be consider
	16	Local Economy such as employment and livelihood (People)	B	C	B	D	Based on the occupation or source of income of the respondents, most of them depend on farming 65.38% and laborers 51.44% in the project area. Farming is the most strategic form of work due to the proximity of these people to the community. Around 15.87% are employed while 10.58% are engaged in others occupation.	Land acquisition by the project gives some adverse impact to tenant farmers and employees of the shops.	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of livelihood/income to the poor may be consider
	17	Land Use and utilization of local resources (Land Use and classification)	B-	D	B-	D	The project alignment is passing through mainly agricultural area such as plantation and residential zone	.In terms of the Agricultural Land Zone (AG), impacts are considered as both positive and negative. Positive in the sense that the road can provide better and faster way, and as such more economical way of transporting products from these areas to trading centers and other distribution sites. Negative in the sense that there is an imminent danger of illegal conversion into other uses	some impacts are expected; thus these impacts and risks are minimized by appropriate land management
	18	Water usage (hydrology/ hydrogeology/water quality)	B-	B-	B-	B-	Water supply is scarce in some portions of project affected areas. Water source comes from dugwells and springs which are used for domestic and drinking water. In Balabagan, there are water delivery trucks in some areas that supplies water which costs PhP 50 per drum.	Earthworks may cause turbidity of river water as being use for domestic.	Minimized by control measures like silt trap , sedimentation pond, etc Or appropriate assistance for tapping other source of water
	19	Existing Social infrastructures and services (People)	B-	D	B-	D	There is no social infrastructure and services affected	The project does not give any impact to social infrastructures. Thus it is not	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
								likely to give any serious impacts on this item	the adverse social impacts, if any impacts are expected in the detailed design
	20	Social institutions such as social infrastructure and local decision-making institutions	C	C	C	C	Impacts are not expected, since local decision-making institute represented by local governments will continue after the road construction.	Impacts not Expected	Not required
	21	Misdistribution of benefit and damage	D	D	D	D	Misdistribution of benefit and damage caused by the road constructions not expected.	Impacts not Expected	Not required
	22	Local Conflict of interest (People)	C	D	C	D	Most of the stakeholders requested to provide work opportunities as a construction worker during construction in the stakeholder meetings on scoping stage	The local conflicts regarding work opportunities between local communities may be raised in case of unfair employment.	This risk is minimized by mitigation measures such as provision of priority in hiring during construction period.
	23	Cultural Heritage (People)	D	D	D	D	No cultural heritage affected.	Few impacts	Not required
	24	Landscape	D	D	D	D	Not required	Few impact is expected	Not required
	25	Gender	D	D	D	D	LGU has implemented GAD projects	Impacts on Gender are mostly positive since opportunity for livelihood is expected (small business to women, employment to men)	Prioritization in hiring during construction and assistance for livelihood development
	26	Right of Children	D	D	D	D	Not required	Few impact is expected	Not required
	27	Infectious diseases such as HIV/AIDS (People)	B-	D	B-	D	No infectious illness recorded in the project area. Project should not to create a habitat of mosquito that transmits dengue fever in incidental pond in the construction area without appropriate drainage.	Infectious diseases such as STD are possible to be spread due to inflow of construction workers. Furthermore, alteration to ground by cut land and filling may provoke to provide habitats of mosquito that possibly transmits dengue fever	This risk is minimized by mitigation measures such as construction of sufficient drainage, management of construction yard and health check & education for workers.

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
	28	Labor environment (including Work safety)	B-	D	B-	D	Not required	There are risks for workers during construction, if the construction contractor does not comply with relevant labor laws and regulations.	These risks are avoided and minimized by complying with relevant laws and regulations by the contractor under observation of DPWH
Others	29	Accident (Traffic Situation)	B-	B-	B-	B-	No serious problem on traffic	Construction vehicles may use existing local road near residential areas, thus number of traffic accident may increase	Can be minimized by installing traffic sign boards, lighting in the night, trained personnel and use of PPEs.
	30	Cross boundary impacts and climate change (Meteorology /climatology)	D	D	D	D	Not required	During Construction, deforestation will incur. On loss of vegetation, the project development will require removal of vegetation cover to give way for the construction of road project. The removal of vegetation will also result in the reduction in the population of plant species growing within the project area. Future vegetation will face a great threat during the clearing activity. This activity will hinder the opportunity of these regenerants to grow and replace those mature vegetation in the area. During operations, generation of carbon monoxide and other gases will be generated from exhaust vehicles which will impact the ozone layer	On loss of vegetation: During site preparation, clearing of the road ROW will result to the removal of of an estimated tree above ground biomass (using large of trees with dbh of 10 cm and above, and pole size tress with $\geq$ 5 cm dbh to 9.5 cm) of 1.59×10^{-4} and 2.87×10^{-4}megaram per hectare, and with estimated Carbon stored value of 3.53×10^{-4} and 6.38×10^{-4} megagram per hectare, respectively. It was computed using the brown allometric equation.

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

Table 7.10.4-5 Summary of Baseline and Forecasted Value (Air, Noise, Water)

No.	Item			Baseline Value (Standard Value)					Quantitative Forecast Analysis (Standard Value)			
1	Air Pollution	St.	Location	TSP (230μg/Ncm)	PM_{10} (150μg/Ncm)	NO_2 (150μg/Ncm)	SO_2 (180μg/Ncm)		TSP (230μg/Ncm)	PM_{10} (150μg/Ncm)	NO_2 (150μg/Ncm)	SO_2 (180μg/Ncm)
		1	BrgyTubuan	31.3	4.2	2.3	2.5		-	4.2	2.4	2.5
		2	BrgyKinimi	37.3	4.7	2.7	2.6		-	4.7	2.7	2.6
		3	Basketball Court at Purok Apos, BrgyTaguisa	29.6	5.5	2.5	2.6		-	5.5	2.5	2.6
2	Water Pollution (Water Quality)	St	Location	pH (6.5-9)	Temp, ºC (25-31)	BOD (7)	TSS (80)	DO (5ppm min.)	Basically, waste water is not discharged during and after construction, thus quantitative forecast has not been conducted.			
		1	Sitio Calanda Creek	7.5	28.7	<2	4	7				
		2	Tubuan River	7.9	31.2	<1	7	8				
		3	Tambak River	7.6	30.5	3	5	8				
		4	KinimiRiver	6.7	29.8	1	3	7				
		5	Pagalungan River	6.9	28.3	1	17	7				
		6	Sitio Apus, BrgyTaguisa	7.7	29.0	2	195	9				
5	Noise	St	Location	Morning (50)	Daytime (55)	Evening (50)	Night time (45)		Morning (50) <65>	Evening (55) <65>	Evening (50) <65>	Night Time (45) <60>
		1	BrgyTubuan	53	52	54	49		55	54	53	51
		2	BrgyKinimi	51	48	47	46		52	50	50	47
		3	Basketball Court at Purok Apos, BrgyTaguisa	50	48	51	50		50	48	51	50

( ): Philippine Standard Values < >: Japanese standard Values
Source: JICA Study Team

Table 7.10.4-6 shows sampling stations for Noise, Air and Water Sampling Sites, Coordinates, Date and Time of Samplings and **Figure 7.10.4-2** shows the sampling location for air and noise.

Table 7.10.4-6 Sampling points for Noise, Air and Water Quality

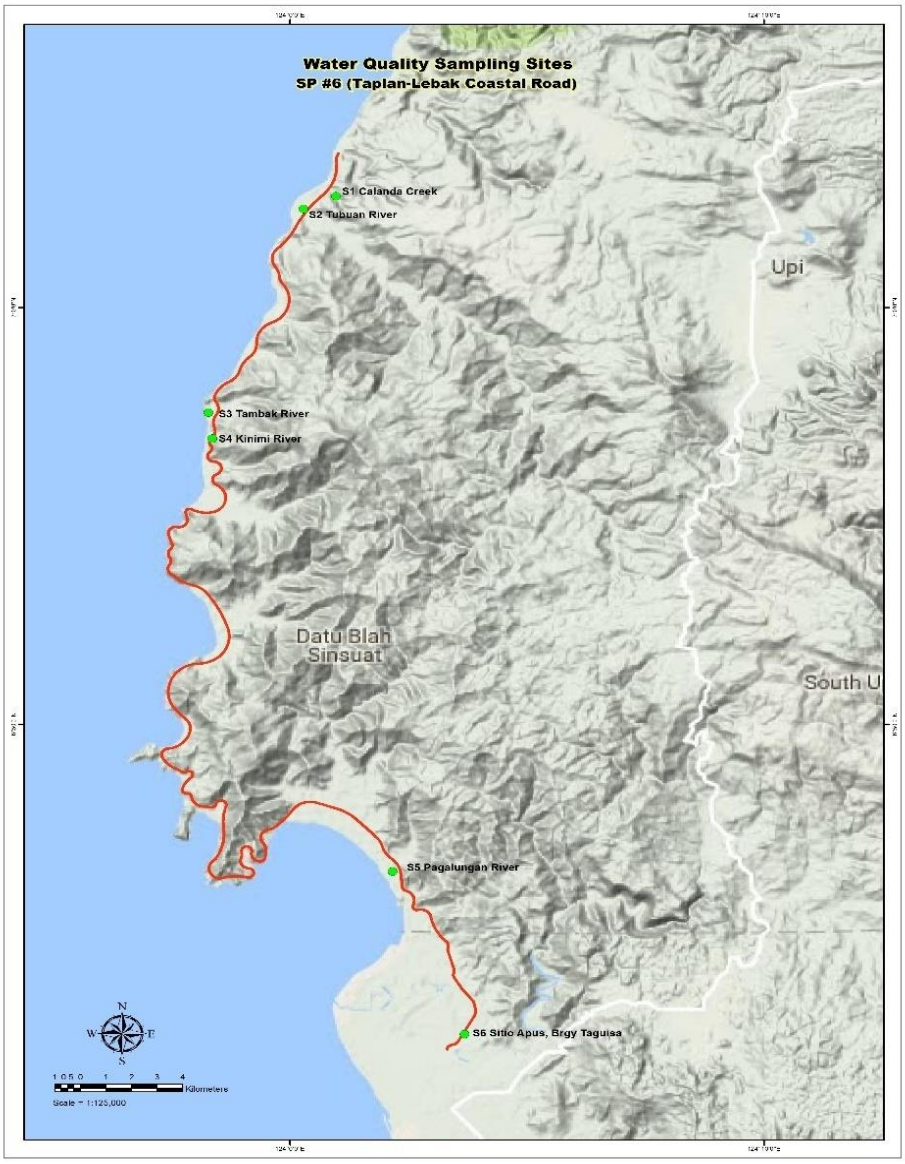
Station No.	Sampling Stations	Coordinates	Date and Time of Samplings
Noise			
N1	Brgy. Tubuan, DBS	7°02'7.52" N 124° 00'6.75" E	December 1-2, 2017, 0920H
N2	Brgy. Kinimi, DBS	6°55'36.31" N 123° 58'19.83" E	December 2-3, 2017, 1200H
N3	Basektball Court at Purok Apos, Brgy. Taguisa, Lebak	6°42'20.73" N 124° 03' 30.11" E	December 4-5, 2017, 1000H
Air			
A1	Brgy. Tubuan, DBS	7°02'8.75" N 124° 00' 9.3" E	December 1-2, 2017, 0920H
A2	Brgy. Kinimi, DBS	6°55'34.86" N 123° 58'20.38" E	December 2-3, 2017, 1200H
A3	Basektball Court at Purok Apos, Brgy. Taguisa, Lebak	6°42'21.43" N 124° 03' 27.78" E	December 4-5, 2017, 1000H
Water			
W1	Sitio Calanda Creek	7°02'40.3" N 124° 00' 58.2" E	December 1, 2017, 1435H
W2	Tubuan River	7°02'21.8" N 124° 00' 16.9" E	December 1, 2017, 1235H

W3	Tambak River	6°57’28.3” N 123° 58’ 16.5” E	December 1, 2017, 1045H
W4	Kinimi River	6°55’18.2” N 123° 58’21.4” E	December 1, 2017, 0930H
W5	Pagalungan River	6°46’27.4” N 124° 02’ 09.7” E	December 2, 2017, 1353H
W6	Tran River Sitio Apus, Brgy. Taguisa	6°42’33.3” N 124° 03’ 40.7” E	December 2, 2017, 1005H

Source: JICA Study Team

Source: JICA Study Team

Figure 7.10.4-2 Sampling location map of air and noise covered by Tapian-Lebak Coastal Road



Source: JICA Study Team

Figure 7.10.4-3 Water Sampling Map covered by Tapian-Lebak Coastal Road

The coordinates and sampling location maps for marine ecology are shown in **Table 7.10.4-7** and, **Figure 7.10.4-4** respectively.

Table 7.10.4-7 Sampling Stations for Marine Ecology

Station No.	Location	Sampling Depth, (m)	Coordinates	Description
1	Brgy. Pura, Datu Blah Sinsuat	5	07° 04’ 00.5” N 124° 00’ 57.8”E	Marine Protected Area of DBS. No seagrass found. Collected Phytoplankton, Zooplankton and Macroinvertebrates. Conducted Fish Visual Census and Coral Assessment (Line Intercept Technique). Underwater photo documentation. Presence of small river, nipa, patches of mangroves.
2	Brgy. Tubuan, Datu Blah Sinsuat	3	07° 02’ 13.8” N 123° 59’ 56.9”E	Rivermouth station, No seagrass, corals and reef fish. Collected Phytoplankton, Zooplankton and Macroinvertebrates. Underwater photo documentation

Station No.	Location	Sampling Depth, (m)	Coordinates	Description
3	Brgy. Nalkan, Datu Blah Sinsuat	4	07° 00' 47.8" N 123° 59' 37.5"E	Marine Protected Area of DBS. No seagrass found. Collected Phytoplankton, Zooplankton and Macroinvertebrates. Conducted Fish Visual Census and Coral Assessment (Line Intercept Technique). Underwater photo documentation. Presence of small river, nipa, patches of mangroves.
4	Brgy. Kinimi, Datu Blah Sinsuat	3	06° 55' 20.7" N 123° 57' 47.1"E	Collected Phytoplankton, Zooplankton and Macroinvertebrates. Conducted Fish Visual Census and Coral Assessment (Line Intercept Technique). Underwater photo documentation. No seagrass found
5	Brgy. Lepakan, Datu Blah Sinsuat	2	06°49'25.68"N 123°56'47.36"E	Patchy corals, boundary of Brgys. Resa and Lepaken. Collected Phytoplankton, Zooplankton and Macroinvertebrates. Conducted Fish Visual Census and Coral Assessment (Line Intercept Technique). Underwater photo documentation. No seagrass found
6	Brgy. Sedem, Datu Blah Sinsuat	4	06° 47' 11.7" N 123° 59' 42.4"E	Collected Phytoplankton, Zooplankton and Macroinvertebrates. Conducted Fish Visual Census and Coral Assessment (Line Intercept Technique). Underwater photo documentation. With seagrass and mangrove

Source: JICA Study Team

Source: JICA Study Team

Figure 7.10.4-4 Location of Marine Ecology Sampling Stations, Datu Blah Sinsuat, Maguindanao. Tapian-Lebak Coastal Road Project

Survey on terrestrial flora and fauna was undertaken in 12 sampling sites within the proposed alignment in 14 covering coastal barangays of Datu Blah. Sampling for plant species composition and observation of prevailing fauna species within the proposed alignment was undertaken in the same selected locations. Barangays covered the sampling sites include Barangay Sinipak, Lapaken, Resa, Kinimi, Tambak, Nalkan, Tubuan and Penanseran, all in the municipality of Datu Blah. Geographic coordinates of observation sites are shown in the table below.

Table 7.10.4-8 Locations of sampling sites for flora and fauna

Municipality	Site	Barangay	Geographic coordinates	
			Northing	Easting
Datu Blah	1	Penanseran	7° 3'9.20"N	124° 0'56.92"E
	2	Tubuan	7° 1'56.94"N	124° 0'7.25"E
	3	Nalkan	7° 0'49.51"N	123°59'44.92"E
	4	Tambak	6°57'12.13"N	123°58'22.82"E
	5	Kinimi	6°54'58.84"N	123°57'49.34"E
	6	Resa	6°52'38.87"N	123°58'32.59"E
	7	Resa	6°50'37.91"N	123°57'26.40"E
	8	Resa	6°50'17.46"N	123°57'38.10"E
	9	Lapaken	6°49'7.95"N	123°57'20.52"E
	10	Lapaken	6°48'11.99"N	123°57'55.64"E
	11	Sinipak	6°47'42.05"N	124° 1'24.02"E
	12	Sinipak	6°47'22.07"N	124° 1'44.31"E

Source: JICA Study Team

Source: JICA Study Team

Figure 7.10.4-5 Terrestrial flora and fauna sampling sites

(7) Mitigation Measures and Environmental Management Plan

A proposed mitigation plans during and after construction are shown in **Table 7.10.4-9**. All mitigation measures are included in the submitted EIS Report by DPWH. All cost for mitigation measures will be finalized in detailed engineering design phase.

Table 7.10.4-9 Environmental Management Plan

Category	No.	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
Pollution	1	Air pollution (Air quality & noise)	(Dust) Water sprinkling near residential area 20 kph speed limit for construction machines at construction sites adjacent to settlement areas	(NO_2, SO_2 and TSP) Setting up green buffer zone along the road (the zone and planting trees are carried out during construction)	Contractor	[During Const.] DPWH [Operation Phase] Datu Blah Sinsuat, Lebak
	2	Water pollution (Water quality)	[Turbid water and other items] - Discharge through sedimentation pond and silt fence -Installation of portable toilet for workers - Appropriate waste and construction machines management	Not required	Contractor	DPWH
	3	Waste (Abandonment)	[Construction waste (trees and waste soil)] - After considering the possibility of reuse, construction waste is disposed at designated disposal site Note) [Muck soil from tunnel section] -Reuse or disposed at designated disposal site after treatment [Garbage from base camp] - Garbage at workers camp and waste oil shall be brought to disposal site or facility [Night soil] -Temporary sanitation facility such as septic tank shall be introduced to the workers camp.	Not required	Contractor	DPWH
	4	Soil contamination (soil quality)	-Reuse or disposed at designated disposal site after treatment	Not required	Contractor	DPWH
	5	Noise and vibration (Noise)	[Construction noise] - Installing noise barrier and selecting low-noise equipment. - Avoiding works of heavy equipment during night time. -Informing the construction schedule to surrounding communities to obtain their consensus	[Traffic noise] - Establishment of green belt as buffer zone along the road - Secure sufficient distance from boundary of the road to residential area after construction of the road (secure noise decay distance) on land use plan along the road - Installation of noise barrier near sensitive facility, if required	Contractor	DPWH
	6	Sediment quality (Soil quality)	-Reuse or disposed at designated disposal site after treatment	Not required	Contractor	DPWH

Category	No.	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
Natural Environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	-Relocation & replanting trees along the road in ROW -Tree planting of indigenous species specifically the two identified critically endangered species in the area the Kamagong (*Diospyros blancoi*) and Narra (*Pterocarpus indicus*)at sites designated by DENR -Create ecotone habitats in consideration of Amphibia and other fauna, if the existing habitats along the river are impacted by the project	- Appropriate land use management not to develop natural area along the road	[Const.] Contractor [Operation] Datu Blah Sinsuat, Lebak	[Const.] DPWH [Operation] Datu Blah Sinsuat, Lebak
	11	Hydrology (Hydrology and oceanography)	Designing of bridges with sufficient capacity Installation of sufficient drainage facilities on bypass Secure waterways in construction area	Not required	Contractor	DPWH
	12	Topography and geology (Geography, topography and landslides	- Installation of slope protection measures	Not required	Contractor	DPWH
Social Environment	13	Involuntary resettlement (People)	Appropriate compensation and social assistance in accordance with RAP	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	DPWH	Datu Blah Sinsuat, Lebak
	14	The poor (People)	Appropriate social assistance in accordance with RAP	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	DPWH	Datu Blah Sinsuat, Lebak
	15	Indigenous and ethnic people (Indigenous people)	Appropriate compensation and/or relocation in accordance with RAP for affected Tidurays However situation of religious group(s) such as Islamic group shall be monitored and adequate assistance and coordination shall be given, if necessary.	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP (for affected Tidurays) However situation of minority religious group(s) such as Islamic group shall be monitored and adequate assistance and coordination shall be given, if necessary. (See **Chapter 17.4.2** for the Indigenous People (IP) Plan)	DPWH	Datu Blah Sinsuat, Lebak
	16	Local economy such as employment and livelihood	Appropriate compensation and social assistance in accordance with RAP	Not required	DPWH	Datu Blah Sinsuat, Lebak

Category	No.	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
	17	Land use and utilization of local resources (Land use and classification)	Appropriate land acquisition and compensation for agricultural area	Management of appropriate land use in accordance with approved detailed zoning map	[Const.] DPWH [Operation] P Datu Blah Sinsuat, Lebak	Datu Blah Sinsuat, Lebak
	18	Water usage (Hydrology / Hydrogeology/ Water quality)	Installation of alternative water distribution system when unexpected situation such as reduction of spring water and water level of wells	Installation of alternative water distribution system when unexpected situation such as reduction of spring water and water level of well	DPWH, Datu Blah Sinsuat, Lebak	Datu Blah Sinsuat, Lebak
	19	Existing social infrastructures and services	Appropriate compensation and/or relocation in accordance with RAP	Not Required	Contractor and DPWH	DPWH, Datu Blah Sinsuat, Lebak
	22	Local conflict of interests	Local workforce is prioritized for construction of the road	Not required	Contractor	DPWH
	23	Cultural heritage	No cultural heritage to be affected. Mitigation not required	Not required		
	27	Infectious diseases such as dengue and HIV/AIDS	- Installation of sufficient drainage facilities not to provide habitat for vector mosquito - Provision of adequate temporary sanitation facilities - Enforcement of medical screening and periodical medical check-up - In order to prevent spread of infectious diseases such as HIV/AIDS, awareness of the labors is promoted	Not Required	Contractor,	DPWH,
	28	Labor environment (including work safety)	Complying with relevant laws and regulations by the contractor under observation of DPWH	Not required	Contractor,	DPWH,
Others	29	Accidents (Traffic situation)	· Deploying flagman at the gate and crossing points of the construction vehicles · Installation of safety sign board · Installing fence around the construction site to keep out local people such as children · Installation of lightning in the night time · Installation of parking for idling construction machines · Safety training for the workers · Safety patrol at the construction site by supervisors	Not Required	Contractor	DPWH
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	Replanting endemic/ native trees and other agricultural trees such as coconuts	Not required	Contractor	DPWH

(8) Environmental Monitoring Plan and Budget

A proposed monitoring plan during and after construction are shown in **Table 7.10.4-10** and **Table 7.10.4-11** respectively**.** All monitoring plans are included in the submitted EIA by DPWH to EMB. The monitoring in operation phase shall be carried out for two (2) years at least.

Proposed items to be monitored by JICA are shown in **Table 7.10.4-12**. Air, water quality, noise, ecosystem, resettlement and livelihood of relocated people shall be monitored during and after construction.

Table 7.10.4-10 Environmental Monitoring Plan (Pre and During Construction)

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
Pollution	1	Air pollution (Air quality & noise	TSP, SO_2, NO_2 and PM_{10}	1.TSP –Gravimetric 2.SO2 –Pararosaniline 3.NO2 – Griess Saltzman Reaction 4. PM_{10}–Direct Reading (Gas Analyzer)	3 sites (same locations of baseline survey) (see **Table 7.10.4-6** and **Figure 7.10.4-2**)	2 times	800,000	TSP, SO_2, NO_2 and PM_{10} 150 µg/Ncm
	2	Water pollution (Water quality)	pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Methodologies are described in DAO 34-1990 and EMBDENR Manual for Ambient Water Quality Monitoring Volume I	6 sites (same locations of baseline survey) **Table 7.10.4-6** and **Figure 7.10.4-3**)	2 times	600,000	For Class "C" freshwater pH – 6.5 to 8.5 DO – 5.0 mg/L Oil & Grease – 2.0 mg/L BOD – 7.0 mg/L TSS – not more than 30 mg/L increase
	3	Waste (Abandonment	Volume of waste soil, cutting tree and domestic garbage	Record volume of generated waste	Cutting land section, tunnel section, cutting tree section and workers camp	4 times	200,000	Generated waste shall be reused or disposed at designated site.
	4	Noise and vibration (Noise	Ambient and road side noise (dB(A)LAeq)	LAeq, 10min during morning, daytime, evening and night time	3 sites (same locations of baseline survey) (see **Table 7.10.4-6** and **Figure 7.10.4-2**)	2 times	400,000	For "A" categorized areas (general area) Morning: 50 dB(A) Daytime: 60 dB(A) Evening: 50 dB(A) Night: 45 dB(A) For "B" categorized areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night: 55 dB (A)
Natural Environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology	Monitoring of the cutting of tress.	Ocular inspection	Major bridge section (see **Table 7.10.4-7** and **Figure 7.10.4-4)**	4 times	200,000	Cutting tree area is limited on ROW
	11	Hydrology (Hydrology and oceanography)	Flooding situation	Flood level measurement during high precipitation periods Interview with local residents	Flood-prone areas, particularly near major river systems	4 times	200,000	Project activities and structures does not cause flooding
	12	Topography and geology (Geography, topography and landslides)	Stability of slope	Ocular inspection	High cut and high embankment section	4 times	200,000	Must be continuously undertaken until slopes are fairly stable and vegetation cover achieves high survival rate
S ∞	13	Involuntary resettlement (People)	Payment and implementation n of	Consultation Meeting and/or Survey with the project affected persons (PAPs)	Affected barangays	Monthly	500,000	Must be completed prior to construction stage

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
			social assistance in accordance with RAP					
	14	The poor (People)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	15	Indigenous and ethnic people (Indigenous people)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	16	Local economy such as employment and livelihood	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	19	Existing social infrastructures and services	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	22	Local conflict of interests	Construction n worker's native barangay	Confirmation of workers list from contractor	All barangays on the affected route	4 times	500,000	Employment opportunity shall be provided fairly
	27	Infectious diseases such as HIV/AIDS	Number of infected patient	Confirmation of health check list from contractor	All construction workers	4 times	500,000	Infection disease rate shall be less than average rate
	28	Labor environment (including work safety)	Number of workers with required instrument such as helmet	Count numbers of workers with instrument	All construction workers (weekly meeting place)	4 times	500,000	All workers shall have designated device such as helmet

Source: JICA Study Team

Table 7.10.4-11 Environmental Monitoring Plan (Operation Phase)

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
Pollution	1	Air pollution (Air quality & noise	TSP, SO2, NO2 and PM_{10}	1.TSP –Gravimetric 2.SO2 –Pararosaniline 3. NO2 – Griess Saltzman Reaction 4. . PM_{10}- Direct Reading (Gas Analyzer)	3 sites (same locations of baseline survey)	1 times	400,000	TSP 300µg/Ncm SO2 340 µg/Ncm NO2 260 µg/Ncm PM_{10} 150 µg/Ncm
	2	Water pollution (Water quality)	pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Methodologies are described in DAO 34-1990 and EMBDENR Manual for Ambient Water Quality Monitoring Volume I	6 sites (same locations of baseline survey)	1 times	600,000	For Class "C" freshwater pH – 6.5 to 8.5 DO – 5.0 mg/L Oil & Grease – 2.0 mg/L BOD – 7.0 mg/L TSS – not more than 30 mg/L increase

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
	4	Noise and vibration (Noise	Ambient and road side noise (dB(A)LAeq)	LAeq, 10min during morning, daytime, evening and night tim	3 sites (same locations of baseline survey)	1 times	200,000	For "A" categorized areas (general area) Morning: 45 dB(A) Daytime: 50 dB(A) Evening: 45 dB(A) Night : 40 dB(A) For "B" categorized Areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)
Natural Environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology	Ecosystem (Terrestrial Biology Freshwater or marine ecology	Situation of Cutting tree area	Ocular inspection	Major bridge section	1 times	100,000
	11	Hydrology (Hydrology and oceanography)	Hydrology (Hydrology and oceanography)	Flooding situation	Flood level measurement during high precipitation periods Interview with local residents	Flood-prone areas, particularly near major river systems	1 times	100,000
	12	Topography and geology (Geography, topography and landslides)	Topography and geology (Geography, topography and landslides)	Stability of slope	Ocular inspection	High cut and high embankment section	4 times	200,000
Social Environment	13	Involuntary resettlement (People)	Payment and implementation of social assistance in accordance with RAP	Consultation meeting and/or Survey with the project affected persons (PAPs)	Affected barangays	Monthly		Must be completed prior to construction
	14	The poor (People)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	15	Indigenous and ethnic people (Indigenous people)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	16	Local economy such as employment and livelihood	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	19	Existing social infrastructures and services	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	22	Local conflict of interests	Construction worker's native barangay	Confirmation of workers list from contractor	All barangays on the affected route	Quarterly	500,000	Employment opportunity shall be provided fairly
	27	Infectious diseases such as HIV/AIDS	Number of infected patient	Confirmation of health check list from contractor	All construction workers	Quarterly	500,000	Infection disease rate shall be less than average rate
	28	Labor environment (including work safety)	Number of workers with required instrument such as helmet	Count numbers of workers with instrument	All construction workers (weekly meeting place)	4 times	500,000	All workers shall have designated device such as helmet

Source: JICA Study Team

Table 7.10.4-12 Environmental Monitoring Form (JICA Form)

-If environmental reviews indicate the need of monitoring by JICA, JICA undertakes monitoring for necessary items that are decided by environmental reviews. JICA undertakes monitoring based on regular reports including measured data submitted by the project proponent. When necessary, the project proponent should refer to the following monitoring form for submitting reports.

-When monitoring plans including monitoring items, frequencies and methods are decided, project phase or project life cycle (such as construction phase and operation phase) should be considered

1. Relevant Permission and Public Consultation

Monitoring Item	Monitoring Results during Report Period
Confirmation of relevant written permissions and minutes of meetings for held consultations and meetings	

2. Mitigation Measures/Monitoring

- Air Quality（Traffic /Ambient Air Quality

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
TSP	µg/Ncm	32.7	37.3	230µg/Ncm	0.2 mg/m3	-Same points as baseline survey (see **Table 7.10.4-6**) -Two (2) time a year during construction -Once a year during operation -TSP = Gravimetric - SO2 =Pararosaniline - NO2 = Griess Saltzman Reaction - PM_{10} = Gravimetric (Gas Analyzer
NO2	µg/Ncm	2.5	2.7	150ug/Ncm	0.04-0.06 ppm	
SO2	Mg/Ncm	2.6	2.6	180ug/Ncm	0.1 ppm	
PM10	ppm	4.8	5.5	150ug/Ncm		

- Water Quality（Physico-chemical Analyses of Surface Water）

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
pH	-	7.4	7.9	6.5-9	6.5-8.5	-Upstream and downstream portion - Same points as baseline survey (see **Table 7.10.4-6**) -Two (2) time a year during construction -Once a year during operation -grab sampling
DO	mg/L	7.7	9.0	5ppm min.	5 ppm	
TSS	mg/L	38.5	195	80	25	
BOD	mg/L	1.7	3.0	7	3	
Turbidity	NTU	0.5	2.0	-		
Temperature	℃	29.6	31.2	25-31		

-Noise/Vibration

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
Noise level	dB(A)	Morning 51 Daytime 51 Evening 51 Night time 50	Morning 53 Daytime 52 Evening 54 Night time 52	For "A" categorized areas (general / residential area) Morning: 45 dB(A) Daytime: 50 dB(A) Evening: 45 dB(A) Night : 40 dB(A) For "B" categorized Areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)	Daytime: (6:00-22:00) 50dB(AA) 55 dB(A) 55 dB(B) 60 dB(C) EveningTime: (22:00-6:00) 40 dB(AA) 45 dB(A) 45 dB(B) 55 dB(C)	- Same points as baseline survey (see **Table 7.10.4-6**) - 2 times a year during construction - Once a year during operation - Digital sound level meter

- Odor

Monitoring Item	Monitoring Results during Report Period
Not required	

3. Natural Environment

- Ecosystem

Monitoring Item	Monitoring Results during Report Period
Situation of cutting tree area (during construction) Situation of replanting area along the road (operation phase)	

4. Social Environment

- Resettlement (During and after Construction)

Monitoring Item	Monitoring Results during Report Period
Number of PAPs including IPs to be resettled/ relocated/ provided livelihood assistance where required. (during Construction)	
Inventory and valuation of PAPS affected assets (during Construction)	
Notice period given to PAPs before shifting them from their original locations within the ROW (Pre and during construction)	
Number of grievances recorded and redressed (Pre and during Construction)	
Conflicts between religions (Pre, during and after construction)	

- Living / Livelihood

Monitoring Item	Monitoring Results during Report Period
Pre-and post-resettlement incomes and livelihood of PAPs especially for poor people (during and after construction)	

(9) Institutional Arrangement for EMP Implementation

Institutional Arrangement for EMP Implementation is described in **Section 7.5**.

(10) Stakeholders Meeting for EIA

A total of 20 stakeholders' meetings were held for Sub-Project 6, two (2) stakeholders' meetings were held at municipal level and one (1) was held at barangay level for barangay scoping**.** The first stakeholders' meetings at municipal level are prescript Information Education Communication meetings (IEC meeting) based on the Philippine EIA guidelines held in the municipalities of Datu Blah Sinsuat and Lebak attended by the affected stakeholders, barangay and municipal officials, and concerned LGU offices such as Assessors, MPDC. The second stakeholders' meetings at municipal level presented the results of the baseline surveys. These meetings were attended by a total of 712 participants composed of 498 males and 214 females.

The major questions of the participants brought out during the 1st and 2nd public consultations are enumerated below. All questions, comments and suggestions were answered by DPWH ARMM, JICA Cotabato, RAP, and EIA Study team, and it seemed that all questioners understood and agreed all answers as shown in Table **7.10.4-13.**

Overall, the proposed Sub-Project 6 is socially acceptable based on the responses and feedbacks of the stakeholders. They are willing to be compensated and suggested to implement the project early from schedule.

Municipal Level

1st Public Consultation Municipal level

1. What will happen to the landowner without land titles and proof of ownership;
2. Who will compensate the affected land, crops, and other structures;
3. What happen to the affected land, properties, tress and fruit bearings;
4. Necessary documents for claims and compensations;
5. Requested to include bridge in the proposed project connecting to other barangay;
6. Some landowner have land titles but deposited to Landbank;
7. Prioritized road project (farm to market road)connecting to the other barangay and the proposed project;
8. Remaining land of the IP outside the 30m width (alignment) will not be claimed by the government in the future;
9. Realigned the project near to the community;
10. Who will determine the price of the affected;
11. Proper knowledge on the process of compensations and needed documents;
12. Affected community can work during the implementation of the project; and
13. Schedule of payment to the affected landowners.

2nd Public Consultation Municipal level

1. Considers concreting the road from Brgy. Tran going to Brgy. Datu Karon
2. Brgy. Officials of Kalamongog requested a water system in sitio Tubak
3. Requested to concrete/construct a road from Sitio Molave to Sitio Narra to Sitio Kiaray to Sitio Giya to Sitio Kilam

Prioritization of local hire during the 1st public consultations, the women's emphasized the importance of proper compensation for the affected landowners, livelihood programs, and business opportunities. While in 2nd Public Consultation, some expressed their support while others requested for concreting of barangay roads.

Overall, the proposed Sub-Project 6 is socially acceptable based on the responses and feedbacks from the stakeholders. They are willing to be compensated because they are always longing for a road to make life easier especially during the emergencies. They suggested to implement the project as soon as possible.

Table 7.10.4-13 Contents of Stakeholder Meeting Municipal Level

Date (venues)	Objectives of the meeting	Major Agenda	Participants	No. of Participants		
				Location	Male	Female
1st Public Consultations Dec. 9 and 14, 2017 1. Barangay Kalamongog Conference Room in Lebak 2. Barangay Covered Court od Taguisa in Lebak 3. Municipal Conference Room of Datu Blah Sinsuat	Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	1. Inform and generate awareness and understanding of the concerned public about the project; 2. Provide the stakeholders and avenue to ventilate salient issues and concerns regarding the project; 3. Give an opportunity to the stakeholders to have an open discussion with the Preparers, Proponents and LGU about the project; 4. Educate the stakeholders of their rights and privileges; and 5. Enable the stakeholders to effectively participate and make informed and guided decisions.	Municipal Officials, Project-Affected Persons (PAPs) and Barangay Officials, RAP, DPWH ARMM and JICA Study Team	Kalamongog,Lebak Kalamongog, Lebak Datu Blah Sinsuat	61 61 31	18 12 6
2nd Public Consultations February 26 and March 3, 2018 1.Barangay Taguisa Covered Court, Taguisa, Lebak 2.Pura Elementary School	Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	To present and validate the results of environmental impact assessment	Municipal Officials, Project-Affected Persons (PAPs) and Barangay Officials, and JICA Study Team	Lebak Datu Blah Sinsuat	45 70	12 38

Source: JICA Study Team

Table 7.10.4-14 Major Opinions in Stakeholder Meeting Municipal Level

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
1st Public Consultations Dec. 9 and 14, 2017 Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	1. Introduce the project and discuss the project objectives and the benefits that can be derived. 2. EIA and RAP Process 3. Tentative Schedules 4. Solicit queries, comments, concerns and suggestions on the project	Land	Properties	1. (Lebak) What happen to the tenant and owner of the land and the trees, structures in the affected area for the project? Are both compensated?	1. Tenant and the land owner will receive the compensation or payment from DPWH. Make sure that the tenant has a special power of attorney, or other documents stating that the trees or structures are named to the tenant. This is the basis for the payment of the DPWH.
		Socio/The People	Infrastructure (Farm to Market Roads/Bridges/Alignment)	2. (Lebak) Requesting to include in the project the construction of bridge from Tran to Tapian. We hope that they can prioritize this.	2. Yes, we will include the construction of the bridge in the propose project.
				3. (Lebak) We hope that every barangay have a road connecting to every barangay for the accessibility of the people in the community from farm to market road.	3. We will recommend to JICA for the possibility of the proposed road to every barangay. But the municipal officials can propose or submit a proposal to DPWH for the inclusion on their future project.
				4. (Lebak) Requesting to include the bridge in the propose project to pass through to other barangay.	4. The bridge is included in the proposed project. The road cannot pass through to other area if bridge is not included
		Socio/The People	Infrastructure (Farm to Market Roads/Bridges/Alignment)	5. (Lebak) We hope that the bridge will be aligned in Sitio Kabuling, Tran to Brgy. Kalamangog for the accessibility of the people.	5. The alignment of the project is not final. There are alternative route as options but the presented alignment is the best. What is the best for the people is the main consideration.
				6. (Lebak) We hope that the construction will be implemented as soon as possible. Because some of our road was not functional	6. For now we still conducting a study. We hope that the LGU should always cooperate to the project undertakings and provide the needed data of the study team.
				7. (Lebak) We hope that the alignment can divert to other area that need the road.	7. We will see the possibility after the study. The results of the RAP is one of our basis to realign the propose project as much as possible.
				8. (Lebak) If the propose road is for the Brgy. Tran, how will Bargy. Datu Karon will benefit?	8. The mayor's office invited you in the consultation to know you and your community that there is a project to be implemented in your municipality. Your barangay will also benefit
			Properties	9. (Lebak)What are the documents need to claim for the compensation?	9. The documents needed to avail or claim the compensation are Brgy. Certificate, certificate of land title or the tax certificate.
				10. (Lebak) What happen to the people that will be affected with only have rights and no other documents?	10. Based on our existing law, until you don't have the land title you are not entitled to claim the compensation from DPWH. We need to comply the needed documents or requirements by DPWH. We will provide the final results of the inventory in every affected barangay for their information and confirmation on the results of RAP.
				11. (Lebak) The project will traversed to the property of the people in the community. They are qualified for compensation?	11. Yes, they are included to claim the amount to be compensated from DPWH based on the market value.

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
				12. (Lebak) Some of the land owner have a land title but deposited to landbank. They are included for the compensation?	12. They will claim the compensation. DPWH will do the payment.
				13. (Lebak)There are some people in our community who have a house or structures but the land is public land. They can be compensated?	13. DPWH will compensate for the amount of the house and structures but they cannot claim the compensation for the lot/land because it's public property.
				14. (Datu Blah Sinsuat) What will happen to land owners without land title?	14. Based on the discussion with JICA during our meeting in Manila last November 2017, DPWH will compensate the affected land owner. In absence of land/lot title and other supporting documents will not be compensated from DPWH. Land owners should secure proper documents. We strictly follow the guidelines of DPWH.
				15. (Datu Blah Sinsuat) Recommend of the road realignment? When is the schedule of the payment for the affected property?	15. The alignment of the project is not yet final. We need to be sure that the affected families can relocate and construct a house, and live a life.
		Socio/The People	Properties	16. (Datu Blah Sinsuat) What will happen to the affected property without land title?	16. Based on the law, this will be included in the inventory with fair market value. DPWH and assessor's office will validate on the submitted report.
			Livelihood	17. (Lebak) Is it possible that the people in our community can work or hire during the construction/ implementation of the project?	17. This will be recommended to the proponent considering that they are qualified to the job. The qualifications for hiring is at least they are skilled and fit to work.
			Indigenous People	18. (Datu Blah Sinsuat) On the affected areas of the IP. Are we assured that we owned our remaining property in the future?	18. The inclusion of the land acquisition or part of the RAP inventory is within the 30 meter width while the remaining land beyond the road width can be utilized by the owner. During the steering meeting in Manila last November 2017, those owner without land titles will be assisted by the LGU. The LGU will help the affected owner to acquire land titles.

2nd Public Consultations February 26 and March 3, 2018 Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	To present and validate the results of environmental impact assessment	Socio/The People	Infrastructure (Farm to Market Roads/Bridges/Alignment)	1. (Lebak) DPWH, 2nd District R12 are not aware on the proposed project and the compensations for the affected people. He said that DPWH will not the one who handle the distribution of payment since the project is not a national highway.	1. The team explained that the project is a national highway and the project proponent is DPWH Central Office. Also, the team informed Engr. Lu to coordinate to DPWH Central for the information or details of the project. The team informed the DPWH 2nd District of Region XII to provide the copy of the result of the land acquisition
				2. (Lebak) Consider concreting the road from Brgy. Tran going to Brgy. Datu Karon since Brgy. Datu Karon is not included in the new alignment of the road project.	2. The team stated that their concerns and requests were noted and informed the residents that these will be recommended to the proponent
				3. (Lebak) Brgy. Officials of Kalamongog requested a water system in sitio Tubak	3. The team stated that their concerns and requests is not included in the project but were noted and informed them that these will be recommended to the proponent for future projects
				4. Requested to concrete/construct a road from Sitio Molave to Sitio Narra to Sitio Kiaray to Sitio Giya to Sitio Kilam since the new alignment will not traversed to their barangay. Also, they requested to construct a bridge. With this, their product will be easily transferred to other areas.	4. The team stated that their concerns and requests is not included in the project but were noted and informed them that these will be recommended to the proponent for future projects
				5. Chairman, Brgy. Nalkan) What will happen for the road from Brgy. Pura and Brgy. Matuber?	5. The road project will start from Brgy. Penansaran to Lebak. The existing road in Brgy. Pura and Matuber will be connected to the proposed road project Tapian-Lebak.
		Socio/The People	Livelihood	6. (DBS) Hopefully some of the skilled workers/residents from brgy level can be hire as worker/laborer during the constructions. It will give additional income to their family	6. This can be requested to the proponent provided that they are qualified to the job.

Source: JICA Study Team

1) Barangay Scoping

The barangay scoping meetings were held in fourteen (14) barangays within the direct affected community as shown in **Table 7.10.4-15**. These meetings discussed the project background and objectives, and the positive and negative impacts of the proposed project to the people, health, habitat, and among others. The major opinions of the participants are the process of land acquisitions and compensations as shown in **Table 7.10.4-16.** The queries and comments on the barangay scoping checklist was responded by the Study team.

Table 7.10.4-15 Contents of Stakeholder Meeting on Scoping Stage Barangay Level

Date (venues)	Objectives of the meeting	Major Agenda	Participants	No. of Participants		
				Datu Blah Sinsuat		
				Barangay	Male	Female
Feb 12 to 17, 2018 Barangay Hall	Barangay Scoping in accordance with Philippines EIA Guidelines	1. Inform and generate awareness and understanding of the concerned public about the project; 2. To gather and address the queries and concerns and provide responses and clarifications to queries on the proposed project; and 3. To identify the foreseeable positive and negative effect of the Project based on the barangay scoping matrix.	Barangay Officials, Project-Affected Persons (PAPs), RAP, and JICA Study Team	Sedem	16	15
				Laguitan	11	9
				Sinipak	16	12
				Meti	24	9
				Lapakin	19	4
				Kinimi	28	13
				Resa	15	6
				Tambak	11	10
				Tubuan	15	11
				Penansaran	20	3
				Lebak, SK		
				Taguisa	4	17
				Datu Karon	12	8
				Kalamongog	19	7
				Tran	20	4

Source: JICA Study Team

Table 7.10.4-16 Major Opinions in Stakeholder Meetings on Scoping Barangay Level

Date and Objectives; Agenda	Item on EIA		Major Opinion	Answers (RAP, and JICA Survey Team's answers has been accepted and understood basically)
Feb 12-17, 2018 Barangay Scoping in accordance with Philippines EIA Guidelines Agenda: Introduce the project and discuss the project objectives and the positive and negative impacts of the project.	Land	Properties	1. (Brgy. Sedem) Mr. Adam Salik, Barangay Chairman mentioned that there are properties to be affected such as coconut trees, mango and other fruit trees. However, owners are open for settlement and negotiation.	1. Residents especially the private property owners will be informed that all properties to be affected by the road project are subject for settlement and compensation prior to road project implementation considering the policies implemented by DPWH.
			2. (Brgy. Laguitan) The road project will traverse coconut trees, banana, cassava, corn and rice fields. Owners, however, are open for settlement and negotiation.	2. Residents especially the private property owners will be informed that all properties to be affected by the road project are subject for settlement and compensation prior to road project implementation considering the policies implemented by DPWH. Affected owner should prepare all documents for claims.
			3. (Brgy. Meti) The road project will traverse certain number of fruit tress such as coconut, mango and banana. Owners however, are open for settlement and negotiation.	3. Owners are informed that properties affected by the road project are subject to a settlement and just compensation based on DPWH guidelines. They are advised to prepare proof of ownership like land titles, certification or tax declaration and have them presented to the RAP Team during validation. Also, they are advised to wait for a further update(s) with regards to the schedule of validation.
		Properties	4. (Brgy. Sinipak) Farming and fishing are the main livelihood of the people in the barangay, and they are concerned on the farm lots affected by the road project where their crops are planted like coconut, banana, corn, and wheat rice. Aside from these plantations, a household with eight (8) members is also affected by the crossing of the road.	4. Residents especially the private property owners will be informed that all properties to be affected by the road project are subject for settlement and compensation prior to road project implementation considering the policies implemented by DPWH. Affected owner should prepare all documents for claims.
			5. (Brgy. Lapakin) Private properties are also affected by the road project like coconut plantations, durian, lansones, mango, marang, and others. Owners are concerned about those affected fruit trees since they find living from them. Aside from these plantations, the road project will also traverse households made up of light materials. Owners, however, are open for settlement/ negotiation.	5. Owners are informed that properties affected by the road project are subject to a settlement and just compensation based on DPWH guidelines. They are advised to prepare proof of ownership like land titles, certification or tax declaration and have them presented to the RAP Team during validation. Also, they are advised to wait for a further update(s) with regards to the schedule of validation.
			6. (BrgyNalkan) The road project will traverse a river named "Tubuan River", fruit trees like coconut, mango, and banana. Also, coffee and corn.	6. Barangay officials and residents were informed that all private properties affected by the road project will be compensated if they have legal document considering the policy implemented by DPWH.
			7. (Brgy. Penansaran) The road project will affect properties such as coconut trees, corn fields, and wheat rice. However, owners are open for negotiation and settlement.	7. They are informed that properties affected by the road project are subject to a settlement and just compensation based on DPWH guidelines. Also, they are advised to wait for a further update(s) with regards to the schedule of validation.
			8. (Brgy. Kalamongog) Mr. Bonifacio F. Aguada, barangay chairman and a retired Army, expressed his positive outlook towards the road project. He added that "No one left behind" once the project is already implemented. He enumerated possible affected properties as follows: household; coconut trees; church; and river. But those properties are nothing compared to the road project that is believed to bring enormous impact in the lives of people. Barangay chairman has	8. RAP team will be the one who will assess the affected properties. All the said affected are considered and subject for compensation if legal documents will be provided considering the policy implemented by DPWH.

Date and Objectives; Agenda	Item on EIA		Major Opinion	Answers (RAP, and JICA Survey Team's answers has been accepted and understood basically)
			emphasized that he will give his full support to the implementation of the road project.	
		Infrastructure (Farm to Market Roads/Bridges)	9. (Brgy. Kinimi) Residents expressed their desire of having health center, water system, and farm to market road.	9. These are not part of the project, but the barangay officials can request through writing a resolution and submit it to the Municipal Office. Still, the team noted their requests and recommendations.
			10. (Brgy. Tambak) According to barangay officials, The road project will also traverse river and irrigation. They are requesting for bridge.	10. This will be noted for consideration of the study team. Regarding the request for bridge, it is not part of the project, but the barangay officials can request through writing a resolution and submit it to the Municipal Office. Still, the team noted their requests and recommendations.
			11. (Brgy. Tambak) Mr. Freddie Mulantong, Barangay Kagawad/ IPMR, request for a "farm to market road" intended for their crops.	11. This will be noted for consideration of JICA/DPWH.
			12. (BrgyNalkan) IP's requested for a farm to market road even just a concrete path for an easy delivery of their product to the market.	12. This is noted for considerations of JICA/DPWH.
			13. (Brgy. Tran) Mr. Caludtiag also asked for construction of bridge along the Tran River.	13. This will be noted for consideration of JICA/DPWH
	Socio (People)	Livelihood	14. (Brgy. Sedem) Fishermen are asking for fishing supplies since fishing is one of the main sources of their living.	14. This is not part of the project, but the barangay officials can request through writing a resolution and submit it to the Municipal Office. Still, the team noted their requests and recommendations.
			15. (Brgy. Lapakin) Mr. Sadik Maulana, barangay resident at the same time a fisherman, is asking for fishing supplies for living.	15. This is not part of the project, but the barangay officials can request through writing a resolution and submit it to the Municipal Office. Still, the team noted their requests and recommendations.
			16. (Brgy. Tambak) Residents request for school buildings, health center/facilities and livelihood programs.	16. These are not part of the project, but the barangay officials can request through writing a resolution and submit it to the Municipal Office. Still, the team noted their requests and recommendations.
			17. (BrgyNalkan) Mr. Delmar Morfing, barangay IPMR, asked for "farm to market road" for easier access of their harvested crops; cellular sites/ network signal; livelihood programs and school for the IP's who are noted to be the majority among the residents of the barangay.	17. These are not part of the project, but the barangay officials can request through writing a resolution and submit it to the Municipal Office. Still, the team noted their requests and recommendations.
			18. (Brgy. Penansaran) Women are appealing for livelihood projects for their extra income.	18. This will be noted for consideration of the project proponent.
			19. (Brgy. Laguitan) Ms. Sumatra T. Haman appealed to hire their locals as construction workers when road project is already implemented.	19. This will be recommended to the proponent as long as they are qualified for the job.
			20. (Brgy. Kinimi) Mr. Venger Abdullah, barangay kagawad, appealed to hire their locals as construction workers when road project is already implemented.	20. This will be recommended to the proponent considering that they are qualified for the job.
			21. (Brgy. Resa) Mr. Alex Dalmba, barangay kagawad, requested to hire their locals as construction workers when road project is already implemented.	21. This will be recommended to the proponent as long as they are qualified for the job.
			22. (BrgyNalkan) Barangay officials are appealing to hire their locals as construction workers when road project is already implemented.	22. This will be recommended to the proponent as long as they are qualified for the job.

Date and Objectives; Agenda	Item on EIA		Major Opinion	Answers (RAP, and JICA Survey Team's answers has been accepted and understood basically)
		Infrastructure (Utilities/ Telecommunications)	23. (Brgy. Meti) Mr. MangiSulaiman, Barangay Secretary, appealed for an immediate implementation of the road project. Also, he expressed his desire of having electricity/ solar power.	23. The electricity is not part of the project, but the barangay officials can request through writing a resolution and submit it to the Municipal Office. Still, the team noted their requests and recommendations.
			24. (Brgy. Datu Karon) Residents are also requesting for water system.	24. This is not part of the project. Still, the team noted their requests and recommendations.
			25. (Brgy. Penansaran) Some are requested for a cellular site(s) because almost, if not all barangay in Datu Blah Sinsuat have no network signal	25. This is not part of the project, but the barangay officials. Still, the team noted their requests and recommendations.
			26. (Brgy. Datu Karon) Mrs. HadjaJubaicaUnos, barangay resident, asked for cellular sites/ network tower.	26. This is not part of the project. Still, the team noted their requests and recommendations.
		Structures/Housing/ Flood Control	27. Barangay officials of Lapakin are asking for realignment of the road project avoidance to Muslim cemetery.	27. This will be noted for considerations of the study team.
			28. (Brgy. Kinimi) Mr. VerdaditaBulosan, barangay kagawad, is asking for additional teachers to be deployed in their barangay. There are existing classrooms but have no teachers.	28. This is not part of the project, but the barangay officials can request through writing a resolution and submit it to the Municipal Office. Still, the team noted their requests and recommendations.
			29. (Brgy. Resa) Mr. Datu Hassanal Sinsuat, barangay treasurer, has a serious concern whether their parents will allow the project to traverse their lands. The family will still talk about it. The area to be traversed by the road project is mainly the shelter of their animals. He appealed to the project proponent to provide a fence for their new shelter.	29. All project affected will be inventoried subject for assessment. Affected people will be compensated if they have legal documents for ownership. This is still subject for DPWH implemented policy for land and property acquisition.
			30. (Brgy Nalkan) Mr. Erol Kuga, barangay chairman, expressed his earnest desire for a housing project to be implemented in their barangay.	30. This is not part of the project. Still, the team noted their requests and recommendations.
			31. (BrgyNalkan) Barangay officials are also asking for a Flood Control and Weather Control (Sea wall).	31. These are not part of the project. Still, the team noted their requests and recommendations.
			32. Other requests are: • Sports equipment; • Scholarship programs; • Additional school building; and • Livelihood programs,	32. These are not part of the project. Still, the team noted their requests and recommendations.
			33. (Brgy. Datu Karon) Mrs. Hadja Hasma Karon, Barangay Secretary, stated that their barangay is not included in the alignment of the road project. It was being confirmed to them during meeting with the municipal officials and JICA Study team. On the road map showed to them, Barangay Datu Karon is no longer included in the alignment of the road. Mrs. Karon is appealing to the project proponent for the realignment of the road project to cross in their barangay or suggested to a farm to market road in the event it will not be approved.	33. This will be noted for consideration of the JICA/DPWH.
			34. (Brgy. Tran) Mr. Loy S. Caludtiag, Barangay Chairman, seriously appealed to the project proponent for the alignment of the road that it will also cross in their barangay. They are open for negotiation and settlement to whatever areas to be affected. They are interested to the inclusion of their barangay in the road alignment.	34. The inclusion of the barangay is considered. This will be finalized in the final scoping in the municipal office to be scheduled later February or early March.

Source: JICA Study Team

7.10.5 Summary of Environmental Impact Assessment (EIA) for Sub-Project 7

(1) Description of the Project Components

The Project Components are described in **Chapter 13**.

(2) Baseline of the Environmental and Social Condition

Baseline of the Environmental and Social Condition is described in **Chapter 13** and **Section 7.2**.

(3) Laws, Regulations, and Organizations related to Environmental and Social Considerations for EIA

Laws, Regulations, and Organizations related to Environmental and Social Considerations for EIA are described in **Section 7.1** and **Section 7.3.1**.

(4) Analysis of Alternative Alignments

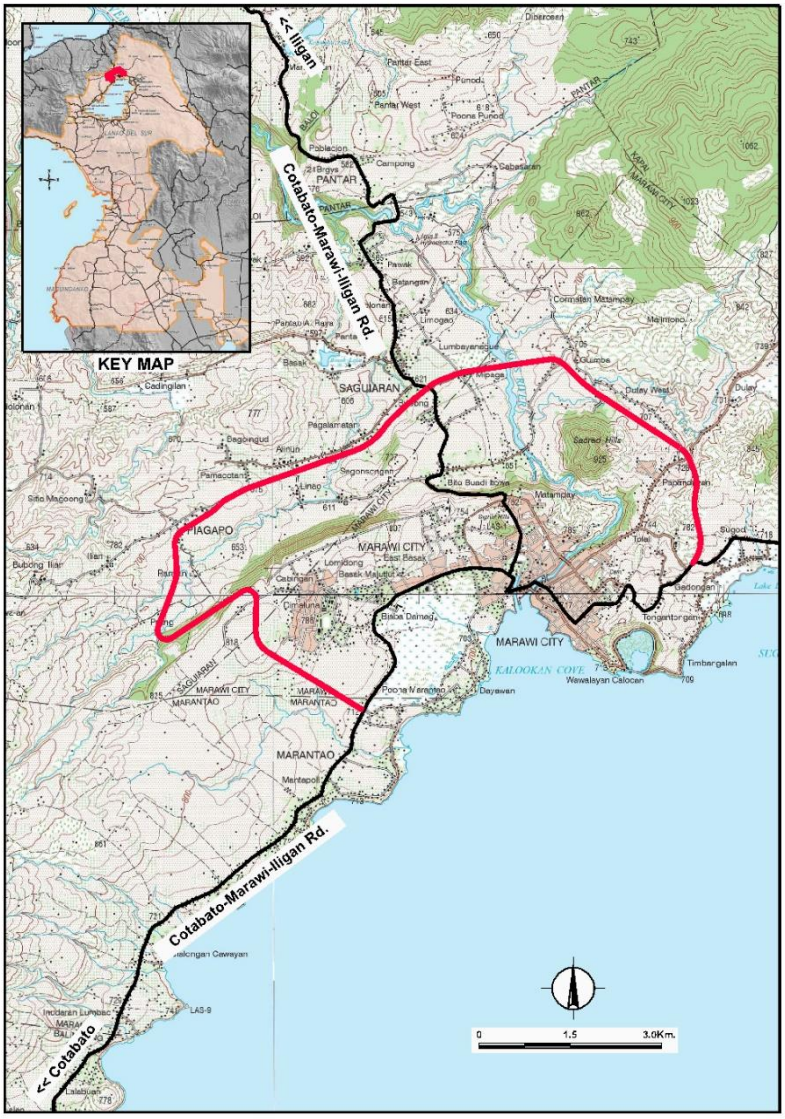
The comparative analysis of alternatives was described in **Chapter 12** and **Chapter 14**. The summary is shown below.

1) Alignment Selection Criteria

The criteria for alignment selection are as follows;

- Length, Construction Cost, Construction period (road length, no of bridges and culverts, etc.)
- Economic Impact (population along the alignment, agricultural land areas to be served, etc.)
- Environmental Impact (high-filling section length, high-cutting section length, no. of buildings to be affected)
- Technical feature (total no. of curves no. of curves < 300m, length of vertical grade >= 5%)

Figure 7.10.5-1 shows the recommended alignment for the road.



Source: JICA Study team

Figure 7.10.5-1 Selected Alignment

2) Zero option

The zero option (with / without Sub-Project) of this project is shown in **Chapter 11** and **Chapter 22**.

(5) Scoping and Survey item for Environmental and Social Considerations Survey

Scope of the EIA study for the project is discussed in this section. The environmental scoping is conducted based on an environmental reconnaissance by the JICA Survey Team.

The result of scoping is indicated on the Leopold scoping matrix as shown in **Table 7.10.5-1** and reason for scoping tables as shown in **Table 7.10.5-2**.

The scoping matrix below shows the impact factors, impacted item and impact degree based on JICA's guidelines and Philippine items. According to the scoping matrix, majority of the items or seventeen (18) items are rated as "B-" (Some impact is expected) due to huge earth work volume and significant

social impacts, No.14 (The poor) is rated as "B+/-" (Some impact is expected), four (4) items are rated as "C" (unknown impact is expected) and seven (7) are rated as "D" (Few impacts are expected).

Table 7.10.5-1 Draft Scoping Matrix Based on JICA's Guidelines and Philippines Items

	No	Affected Activities / Impact Items (JICA)	(Philippines)	Overall Rating	Pre/ During Construction Phase: Land acquisition and Loss of properties	Change of Land use plan, Control of various activities by regulations for the construction	Reclamation of Wetland, etc.	Deforestation	Alteration to ground by cut land, filling, drilling, tunnel, etc.	Operation of Construction Equipment and Vehicles	Construction of Roads, tollgates, parking lots, Access roads for bridges and other related facilities	Traffic Restriction in construction area	Influx of construction workers, construction of base camp	Operation Phase: Increase of Through Traffic	Appearance/ Occupancy of Roads and related building structures including tunnel and embankment	Increasing influx of settlers
Pollution	1	Air Pollution	Air quality & noise	B-	D	D	D	B-	B-	B-	B-	B-	B-	B-	B-	D
	2	Water pollution	Water quality	B-	D	D	D	D	B-	B-	B-	D	B-	D	D	D
	3	Waste	Abandonment	B-	D	D	D	B-	B-	B-	B-	D	B-	D	D	D
	4	Soil contamination	Soil quality/fertility	B-	D	B-	B-	D	B-	B-	B-	D	B-	D	D	D
	5	Noise and Vibration	Noise	B-	D	D	D	B-	B-	B-	B-	B-	B-	B-	B-	D
	6	Ground Subsidence	Subsidence/ collapse	D	D	D	D	D	D	D	D	D	D	D	D	D
	7	Odor		D	D	D	D	D	D	D	D	D	D	D	D	D
	8	Sediment quality	Soil quality	B-	D	D	D	D	B-	D	B-	D	D	D	D	D
Natural Environment	9	Protected Area	Environmentally Critical Areas (ECAs)	B-	D	D	C	B-	D	C	C	D	D	D	C	D
	10	Ecosystem	Terrestrial Biology Freshwater or marine ecology	B-	B-	B-	D	B-	B-	C	B-	D	B-	D	B-	B-
	11	Hydrology	Hydrology and oceanography	B-	D	D	B-	D	B-	D	D	D	D	D	B-	D
	12	Topography and geology	Geography, topography and landslides	B-	D	D	B-	D	B-	D	D	D	D	D	D	D
Social Environment	13	Involuntary resettlement	People	B-	B-	D	D	D	D	D	B-	D	D	D	D	D
	14	The poor	People	B+/-	B+/-	D	D	D	D	D	B+/-	D	D	D	D	C
	15	Indigenous and ethnic people	Indigenous people (IPs)	B-	B-	D	D	D	D	D	D	B-	B-	D	D	B-
	16	Local economy such as employment and livelihood	People	B-	D	D	D	D	D	D	B-	D	B-	D	D	C
	17	Land use and utilization of local resources	Land use and classification	D	D	D	D	D	D	D	D	D	D	D	D	D
	18	Waste Usage	Hydrology / Hydrogeology/ Water quality	B-	D	D	D	D	D	D	D	D	B-	D	D	D

	No	Affected Activities / Impact Items (JICA)	(Philippines)	Overall Rating	Pre/ During Construction Phase: Land acquisition and Loss of properties	Change of Land use plan, Control of various activities by regulations for the construction	Reclamation of Wetland, etc.	Deforestation	Alteration to ground by cut land, filling, drilling, tunnel, etc.	Operation of Construction Equipment and Vehicles	Construction of Roads, tollgates, parking lots, Access roads for bridges and other related facilities	Traffic Restriction in construction area	Influx of construction workers, construction of base camp	Operation Phase: Increase of Through Traffic	Appearance/ Occupancy of Roads and related building structures including tunnel and embankment	Increasing influx of settlers
	19	Existing social infrastructures and services	People	**B-**	**B-**	D	D	D	D	D	**B-**	D	D	D	D	**B-**
	20	Social institutions such as social infrastructure and local decision making institutions		D	D	D	D	D	D	D	D	D	D	D	D	D
	21	Misdistribution of benefit and damage		D	D	D	D	D	D	D	D	D	D	D	D	D
	22	Local conflict of interests	People	**C**	D	**C**	D	D	D	D	D	D	D	D	D	D
	23	Cultural Heritage	People	**C**	**C**	D	D	D	D	D	**C**	D	D	D	D	D
	24	Landscape		D	D	D	D	D	D	D	D	D	D	D	D	D
	25	Gender		D	D	D	D	D	D	D	D	D	D	D	D	D
	26	Right of Children		D	D	D	D	D	D	D	D	D	D	D	D	D
	27	Infectious diseases such as HIV/AIDS	People	**C**	D	D	D	D	D	D	D	D	**C**	D	D	D
	28	Labor environment (including work safety)		**B-**	D	D	D	D	D	D	**B-**	D	**B-**	D	D	D
Others	29	Accidents	Traffic situation	**B-**	D	D	D	D	D	**B-**	D	**B-**	C	**B-**	D	D
Others	30	Cross Boundary impacts and climate change	Meteorology / Climatology	**C**	D	D	D	**C**	D	D	D	D	D	**C**	D	D

Note) Rating:

A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.

Source: JICA Study Team

Table 7.10.5-2 Reasons for Draft Scoping

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating: Pre/During Construction	Rating: Operation Phase	Reasons of the Rating
Pollution	1	Air pollution (Air quality & noise)	**B-**	**B-**	**Construction phase:** Temporary negative impacts are expected on air quality due to fugitive dust emissions from construction activities such as land clearing, grading, excavation, and the transport and movement of construction materials. **Operation phase:** Negative impacts on air quality are expected due to emission from vehicles passing on the new road.

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
	2	Water pollution (Water quality)	B-	D	**Construction phase:** Domestic wastewater will be generated from construction workers. Surface water will become turbid due to solids generated from earth works and drilling in the site. Oil and grease and petroleum hydrocarbons may pollute water that may come from vehicles and construction equipment. **Operation phase:** No serious impacts are expected.
	3	Waste (Abandonment)	B-	D	**Construction phase:** Construction waste such as waste soil and cutting trees are expected to be generated by deforestation, cutting, land clearing and drilling. Solid wastes from construction workers may be generated from construction base camp. Hazardous wastes such as busted lamps, used oil, used paints etc. maybe generated from construction site. **Operation phase:** No serious impacts are expected
	4	Soil contamination (soil quality)	B-	D	**Construction phase:** Removal of vegetation may affect the soil quality due to oil & grease and petroleum hydrocarbon contamination from construction equipment and vehicles. **Operation phase:** No serious impacts are expected.
	5	Noise (Noise)	B-	B-	**Construction phase:** Increased noise levels will be significant due to heavy construction vehicles moving to and from the site, drilling and excavation activities. **Operation phase:** Noise generation is expected by vehicles passing on the new road.
	6	Ground subsidence (Subsidence)	D	D	No impacts are expected. There will be no groundwater extraction during the construction and operation activities.
	7	Odor	D	D	Few impacts are expected. Obnoxious odor may come from vehicle exhaust, clearing & dredging of river banks.
	8	Sediment quality (Soil quality)	B-	D	**Construction phase:** Surface water runoff which may have caused the sediment transport is expected during construction activities due to earthworks, land clearing, excavation etc. **Operation phase:** Road operation which causes impacts on sediment quality is not expected.
Natural environment	9	Protected area (ECAs)	B-	C	**Construction and operation phase:** Extent of impact is unknown, but the case is Lake Lanao Watershed ※and Sacred Mountain National Park are protected areas in Marawi City, however, the project identified road alignment will not pass through the National Park, thus there will be no anticipated impacts on the protected areas. Further study will provide clearer indication as to the extent of the impact. ※Lake Lanao Watershed is not applicable to the protected area, the government specifically designated for protection of nature and cultural heritage by laws and regulations, under the JICA Environmental Guidelines.
	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	B-	B-	**Construction and Operation phase:** With the implementation of the project, during the construction phase, land clearing and topography alteration will require removal of existing vegetation cover within the road Right of way. Clearing of remaining vegetation will also possibly affect remaining wildlife and its habitats to give way for the construction of road project. Impacts of the project will be assessed based on the result of the terrestrial survey and to be able to come up with apt recommendations to mitigate such impacts. The result of the survey also serves as the basis for monitoring during the Operation phase.
	11	Hydrology (Hydrology and oceanography)	B-	B-	**Construction Phase:** Rating B- under Reclamation of Wetland, etc. - Extent of impact is unknown. The road alignment may not cross wetland and/or swamps. In case the final road alignment will traverse the wetlands, survey and analysis should be done to make sure that the road network will not hamper the natural flow of water prior to the road construction. **Construction and Operation Phase** Rating B- under Alteration to ground by cut land, land filling, drilling, tunnel, etc. - Some impact is expected. The proposed road will traverse through generally flat terrain and rolling grounds drainage impact is expected. This may change the drainage flow to other directions and may cause flooding in some areas. Flooding that is expected maybe due to rainwater flow restrictions and natural blocking of surface water runoff in the construction site.
	12	Topography and geology (Geography, topography and landslides)	B-	D	**Construction and Operation Phase**: Earthworks such as land filling and land cutting would affect the topographic condition along the proposed road alignment. Risk associated with landslides maybe expected in sections passing steep terrain. Slope protection measures could be necessary during the operation phase. No protected geological site is located in the project area.

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
Social Environment	13	Involuntary resettlement	**B-**	D	**Pre-Construction Phase:** Settlements and private lands will be acquired to give way for the road construction. This will cause involuntary resettlement (physical and economic) **Operation Phase:** No impact is expected since it was already settled during pre-construction period
	14	The poor	**B+/-**	**C**	**Construction Phase:** Some impacts (positive/negative) is expected considering the socio-economic condition of the community in the project area **Operation Phase:** Extent of impacts are still unknown but looks forward to easier access of the poor to public services
	15	Indigenous and ethnic people	D	D	**Construction and Operation Phase**: The existence of indigenous people has not been confirmed in project area. No impacts are expected.
	16	Local economy such as employment and livelihood	**B-**	**C**	**Pre-Construction phase:** Livelihood of residents and farmers may be affected by resettlement and acquisition of agricultural area **Operation Phase:** Few impacts are expected.
	17	Land use and utilization of local resources	**B-**	**B-**	**Pre-Construction phase:** Some agricultural areas will be affected by the project. **Operation Phase:** Roadside area may be developed as commercial or industrial area in non-designated land use area. Such unplanned development and influx of new settlers may give impact on land use and local resources.
	18	Waste Usage	**B-**	D	**Construction Phase:** Earth works such as cutting land and drilling of tunnel may give impact on drinking water resources such as springs and wells. **Operation phase:** No impact is expected.
	19	Existing social infrastructures and services	**B-**	**B-**	**Pre-construction and Construction Phase:** Relocation of religious facilities, school, cemetery and other public facilities need to be considered. **Operation Phase:** Existence of the road may disturb commuting/ going to school and hospital
	20	Social institutions such as social infrastructure and local decision making institutions	D	D	Impacts are not expected, since local decision making institute represented by local governments will continue after the road construction.
	21	Misdistribution of benefit and damage	D	D	Misdistribution of benefit and damage caused by the road constructions not expected.
	22	Local conflict of interests	**C**	D	**Construction Phase:** Local inhabitants and local authorities may request to ensure job opportunities as construction workers. **Operation phase:** No impact is expected.
	23	Cultural Heritage	**C**	D	**Pre-construction and Construction Phase:** Impact will be assessed based on confirmation of cultural heritages around the project site.
	24	Landscape	D	D	No impact is expected.
	25	Gender	D	D	Negative impact specified for women are not expected
	26	Right of Children	D	D	Negative impact specified for children are not expected
	27	Infectious diseases such as HIV/AIDS	**C**	D	**Construction Phase:** Infectious diseases such as STD are possible to be spread due to inflow of construction workers. Furthermore, alteration to ground by cut land and filling may provoke to provide habitats of mosquito that possibly transmits dengue fever **Operation phase:** Road operations which causes infectious diseases are not expected

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
	28	Labor environment (including work safety)	**B-**	D	**Construction Phase:** Construction work environment needs to be considered in accordance with relevant laws and regulations **Operation phase:** No impact is expected.
Others	29	Accidents (Traffic situation)	**B-**	**B-**	**Construction Phase:** Construction vehicles may use existing local road near residential areas, thus number of traffic accident. **Operation phase:** Quantitative analysis based on baseline survey
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	**C**	**C**	**Construction phase:** Deforestation for land clearance may give impact on cross boundary impacts and climate change. **Operation phase:** Greenhouse gas emissions from vehicles that pass by along the new roads maybe generated which will have an impact in the protection of ozone layer as a result of climate change.

Note) Rating:

A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.

Source: JICA Study Team

Table 7.10.5-3 Baseline Survey and Forecast Analysis for Draft Scoping

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/ During Constructio	Operation Phase		
Pollution	1	Air pollution (Air quality & noise)	**B-**	**B-**	-Site measurement (1 sites) TSP,PM_{10}, NO_2 and SO_2 -Secondary data collection, if any	**Construction Phase:** Qualitative analysis **Operation Phase:** - Quantitative analysis(PM_{10}, NO_2, and SO_2) (Puf model : calm wind model)
	2	Water pollution (Water quality)	**B-**	D	-Site measurement (1 sites: river water) DO, TSS, BOD, COD, pH, Total/Fecal Coliform, temperature -Secondary data collection, if any	**Construction Phase:** Qualitative analysis
	3	Waste (Abandonment)	**B-**	D	Review of specification on design and construction plan	**During Construction Phase:** Quantitative analysis of volume of cutting trees by type and excavated or drilling soil and muck
	4	Soil contamination (soil quality)	**B-**	D	Review of specification on design and construction plan	**During Construction Phase:** Qualitative analysis
	5	Noise and vibration (Noise)	**B-**	**B-**	Noise -Site measurement (1 sites) $L_{Aeq,\ 10min}$ weekday (in accordance with DENR regulation) -Secondary data collection, if any	**During Construction Phase:** Qualitative analysis based on construction machines on standard formation **Operation Phase:** - Quantitative analysis(ASJ RTN-Model 2013)
	8	Sediment quality (Soil quality)	**B-**	D	Literature survey (land use history on affected land of the project)	**During Construction Phase:** Qualitative analysis base on the literature survey
Natural environment	9	Protected area (ECAs)	**B-**	**C**	Literature survey	
	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	B-	B-	Literature survey and site survey for fauna and flora. (Terrestrial: 9sites)	**During construction and operation phase:** Qualitative analysis base on the literature survey, site survey and construction plan & traffic volume in the future
	11	Hydrology (Hydrology and oceanography)	**B-**	**B-**	Literature survey and referring to hydrographic and geological survey result on feasibility study and designing	**During construction and operation phase:** Quantitative analysis on following items base on the hydrographic analysis for bridge and drainage designing. - Impact on hydrological situation on the rivers and streams

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/ During Constructio	Operation Phase		
						-Impact on water vein underground -Impact on flooding situation
	12	Topography and geology (Geography, topography and landslides)	**B-**	D	Literature survey and topographic survey for designing	**During construction and operation phase:** Qualitative analysis base on the topographic analysis for designing
Social environment	13	Involuntary resettlement (People)	B-	D	Literature survey and a series of RAP surveys (Inventory of loss assets, census, social economic survey and replacement cost study)	**During construction phase:** Quantitative analysis based on RAP surveys
	14	The poor (People)	**B+/-**	**C**	Literature survey and a series of RAP surveys	**During construction phase:** Quantitative analysis based on RAP surveys
	16	Local economy such as employment and livelihood (People)	**B-**	C	Literature survey and a series of RAP surveys	**During construction phase:** Qualitative analysis based on RAP surveys
	17	Land use and utilization of local resources (Land use and classification)	**B-**	**B-**	Literature survey and a series of RAP surveys	**During construction phase:** Quantitative analysis based on RAP surveys (area of land acquisition by land use)
	18	Water usage (Hydrology / Hydrogeology/Water quality)	**B-**	D	Literature survey, geological survey and water usage survey (identification of springs and wells around tunnel and cutting land areas based on the data from RAP survey)	**During construction phase:** Qualitative analysis base on the baseline survey for following items - Impact on springs and wells - Impact on watershed area
	19	Existing social infrastructures and services (People)	**B+**	**B-**	Literature survey and a series of RAP surveys	**During construction and operation phase:** Quantitative analysis based on RAP surveys
	22	Local conflict of interests (People)	C	D	Collection of information and opinions in stakeholder meeting(s)	**During construction:** Qualitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
	23	Cultural heritage (People)	C	D	Literature survey, a series of RAP surveys and collection of local information through stakeholder meeting(s)	**During construction:** Quantitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
	27	Infectious diseases such as HIV/AIDS (People)	C	D	Literature survey and collection of local information through stakeholder meeting(s)	**During construction phase:** Qualitative analysis based on baseline survey. Followings impacts are considered - Risks of HIV/AIDS - Risks of dengue fever - Other specific infection disease
	28	Labor environment (including work safety)	**B-**	D	Literature survey, a series of RAP surveys and collection of local information through stakeholder meeting(s)	**During construction:** Quantitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
Others	29	Accidents (Traffic situation)	**B-**	**B-**	Collection of traffic accident data from police station	**During construction and operation phase::** Quantitative analysis based on baseline survey
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	**C**	**C**	-Estimation of affected forest area and traffic conditions based on the project plan	**During construction and operation phase::** Quantitative analysis based on baseline survey

Note) Rating:

A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.

Source: JICA Study Team

(6) Summary of Baseline Survey, Forecast and Impact Assessment

The summarized result of baseline survey and forecast of impacts are shown in **Table 7.10.5-4**. The baseline data and quantitative forecast is shown in **Table 7.10.5-5** and survey points of air & noise and water quality is shown in **Table 7.10.5-6**.

In terms of pollution items such as air, water and noise, all the forecasted values are within the allowable limits, thus it is not likely provided serious impact in these items. However, construction waste soil from cutting land and drilling in the tunnel section shall be reused or disposed in appropriate designated disposal site.

With regard to IUCN List, although some species are identified through the baseline survey on flora and fauna, these species are distributed around the around the sub-project area. The estimated numbers of resettlers are 55, appropriate compensation and mitigation measures are necessary on the resettlement action plan.

Table 7.10.5-4 Result of baseline and Forecast on Main Items

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
Pollution	1	Air Pollution (Air Quality & Noise)	B-	B-	B-	B-	Result of (TSP, PM_{10}, SO_2, NO_2) at 1 stations are below the standard values (See **Table 7.10.5-6**)	Forecast value do not exceed standard values	Expected impacts by the project are not significant because all the forecasted values are within the standard values Quantitative Standards as shown in **Table 7.10.5-5.**
	2	Water pollution (water Quality)	B-	D	B-	D	Result of (pH, Temp, BOD, TSS, DO) are within the guidelines (See **Table 7.10.5-6**)	During construction activities may cause turbidity water and oil and grease contamination. Likewise, domestic waste may be discharge from the camp	Impacts may be minimized or mitigated by provision of erosion control measures such as settling traps, use of portable toilet, etc. Quantitative Standards as shown in **Table 7.10.5-5.**
	3	Waste	B-	D	B-	D	Not required	Clearing and deforestation activities are expected to generate construction waste such as soil, debris, cut trees Also, additional domestic waste may be generated from the construction camp.	Impacts can be mitigated by proper management and disposal of waste like practice ecological waste management, segregation at source, 3R, etc.
	4	Soil Contamination (Soil Quality)	B-	D	B-	D	Not required	Soil maybe contaminated from the construction equipment and transportation.	Impacts can be mitigated by proper maintenance of equipment and transportation, proper containment and disposal of oil, etc.
	5	Noise	B-	B-	B-	B-	There are some measurement of noise that exceeded the standard particularly during the night due to presence of insects like crickets that make noise during the dark and usual in the rural areas. (See **Table 7.10.5-6**)	Forecast value exceed Philippines standard values (Class A (General)), but the value do not exceed Japanese standard values (Class B2). (See **Table 7.10.5-6**)	Impacts may be mitigated by avoidance and other measures such as no construction during the night or use of muffler or sound proof barrier. Quantitative Standards as shown in **Table 7.10.5-5.**
	6	Ground Subsidence	D	D	D	D	The terrain is undulating to steep. The proximity of active faults to the proposed road alignments indicates that strong to very strong ground shaking could be felt in the project area. Sub-Project 7 is not prone to tsunami since the area is located farther inland. Some sections of the roads located on slope of ridges, steep slopes with limited space for the alignment, and slopes with loose soil and rock materials in Sub-Project 7 may require protections of the cut slopes. This assumption should be confirmed further by appropriate geological and	No impact is expected	No impact is expected. If necessary, · Conduct Probabilistic Seismic Hazard Assessment (PSHA). · Detailed assessment of the identified active fault intersecting the road alignment. · Appropriate geotechnical investigation to evaluate potential liquefiable soil layers.

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
							geotechnical site investigation prior to the construction of the Project. Flood susceptibility in the Marawi City Ring Road is generally considered low. The Marawi City Ring Road is underlain by volcanic and/or sedimentary rocks which are not considered susceptible to liquefaction.		
	7	Odor	D	D	D	D	Not required	Few impacts are expected. Obnoxious odor may come from vehicle exhaust, clearing & dredging of river banks.	Qualitative measurements based on sensitivity of receptors against unobjectionable odor
	8	Sediment Quality	B-	D	B-	D	Not required	During construction sediment will most likely erode into the water particularly during heavy rains	Impacts may be mitigated through erosion /sedimentation control measures, or stoppage of soil clearing during heavy rains, use of silt trap
Natural Environment	9	Protected Area	D	D	B-	C	**Lake Lanao** is a proclaimed watershed reserve by virtue of Proclamation No.871 and is included in the initial components of the National Protected Areas System (NIPAS) governed under NIPAS Act of 1992 (Republic Act No. 7586). Current land uses that will be traverse by the proposed alignment are primarily agricultural areas planted with tree crops, varieties of fruit bearing trees and cash crops. Other areas are shrublands adjacent to some settlement areas. Most of the areas traverse by the alignment are under ownership/claimed by different individuals.	Implementation of the project will require to convert portions of the agricultural lands and shrub lands into a road network which entails to the removal of some vegetation cover.	Prior to project implementation the proponent will coordinate with the Department of Environment and Natural Resources (DENR) and the provincial government of Lanao del Sur to seek clearance regarding the requirements of the Integrated Natural Resources and Environment Management Project (INREMP) for Lake Lanao River Basin. Conduct of tree inventory for the issuance of tree cutting permit from the DENR will be secured first by the proponent. Tree planting along roads as natural buffer and in areas that will be designated by the DENR will be undertaken in replacement of trees cut in compliance to the DENR Memorandum Order no. 05 s. 2012.
	10	Ecosystem (Terrestrial Flora and Fauna)	B-	C	B-	C	Floristic composition of the alignment is relatively low comprised of 63 species dominated by trees. Recorded species are common and naturally growing in the area. The result of assessment showed that only 1 is included in the IUCN list of vulnerable species. The faunal composition of the alignment is nominal with only 25 species dominated by Avifauna. Recorded species are common and locally sited in different ecosystems in the lowland	The project development will require removal of vegetation cover to give way for the construction of the proposed road project. Further loss of vegetation cover as a result of land clearing may encourage movement/migration of wildlife species in the area aggravated by the loss of habitat/abode and remaining sources of food for survival. Likewise, wildlife disturbance due to noise pollution brought about by the operation of heavy equipment's during construction will force some	Prior to project implementation the proponent will coordinate to the DENR and Philippine Coconut Authority (PCA) to seek clearance for the identification of required documents for the issuance of needed tree and coconut cutting permits (PD 705). Moreover, to compensate the loss of habitats, the proponent will replace the number of trees removed/cut and plant them in nearby areas or in accordance with the advice of the DENR. Species that will be used for the reforestation must be indigenous trees and/or fruit bearing trees

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
							areas including agricultural areas, shrub land, grassland, and settlements areas. These species also thrive even in highly disturb areas including cities. Four (4) species are endemic in the study area dominated by Aves. Only one (1) species is vulnerable in the category of the IUCN.	faunal species to migrate to other or nearby areas/habitat where disturbance is less.	endemic in the place that can attract wildlife species. Planting of trees will help in sequestering carbon in the environment. As per DENR Memorandum Order no. 05 of 2012 mandated that "Uniform replacement ratio for cut or relocated trees" item 2.2 "For planted trees in private land and forest lands... tree replacement shall be 1:50 while naturally growing trees in the same area, including those affected by the project, shall be 1:100 ratio in support of the National Greening Program (NGP) and Climate Change Initiatives of the Government". Compensation for affected coconut palms shall be based on Section 5 of Republic Act No. 8048, an act providing for the regulation of the cutting of coconut palms. Replacement ratio of cut coconut palm shall be 1:1.
	11	Hydrology (Hydrology and oceanography)	B-	B-	C	C	The river systems that affect the proposed road alignment are the Agus River and its tributaries. Based on the data from the National Water Resources Board (NWRB) and from Local Water Utilities Administration (LWUA), twenty eight groundwater wells were listed. All of these wells are within the Marawi City area	Earthworks may cause turbidity of river water and as to the springs reported on the alignment will most likely affected	Impacts may be mitigated by sediment and silt traps .Appropriate assistance for other source of water
	12	Topography and Geology (Geography, topography and landslides)	B-	B-	B-	B-	The ground elevation reaches up to 825 masl while low-lying areas have an elevation of 600 masl giving rise to undulating to steep terrain.	The proximity of active faults exposes the project to strong to very strong ground shaking. The project could be susceptible to ground rupture as it directly straddles or located within a narrow zone of active fault trace. Some sections passing through steep to very steep, hilly to mountainous terrain may be susceptible to slope failure, soil erosion, and rock fall.	Conduct Probabilistic Seismic Hazard Assessment (PSHA). Appropriate geotechnical investigation to evaluate potential liquefiable soil layers. Impacts may be mitigated by slope protection.

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
Social Environment	13	Involuntary resettlement (People)	B-	D	B-	D	Based on the RAP survey, 10 affected dwellings and 72 resettlers are identified	Land acquisition may cause acquisition of agricultural land, crops and resettlement. Thus, RAP is prepared in accordance with JICA Guidelines and Philippine Laws.	Appropriate compensation and assistance in accordance with RAP is prepared to minimize adverse social impacts.
	14	The Poor (People)	B+	C	B+/-	C	Based on the profiles of the respondents during perception survey, 39.13% have a total monthly income of PhP11,000-PhP15,000, 26.09% earned PhP5,000 to PhP10,000, and 20.11% earned PhP16,000-PhP20,000. This composed of the total income of the households per month which only reflects that small percentage are living in poverty.	Land acquisition by the project gives some adverse impact to poor people under poverty line	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of livelihood/income to the poor may be consider.
	15	Indigenous and ethnic people (Indigenous People)	D	D	D	D	Not required	Not required	The existence of indigenous people has not been confirmed in project area. No impacts are expected.
	16	Local Economy such as employment and livelihood (People)	B-	D	B-	D	Based on the occupation or source of income of the respondents, most of them depend on farming 25.82% in the project area. Barangay Daaningud and Palao in Marantao Municipality, and Rantian Piagapo recorded as the highest number of farmers. Most of their crops are corn, banana, and rice. Around 16.03% are employed such as local government unit (LGU) officials and teacher. While remaining 13.59 % are engaged in business occupation from barangays in Piagapo, Marantao, and Saguiaran Municipalities. Most of the non-working or 30.43% surveyed respondents come from barangays in Marawi City. Majority of them are affected by the Marawi siege and all of their animals and livings are lost after they return home.	Land acquisition by the project gives some adverse impact to tenant farmers and employees of the shops.	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of livelihood/income to the poor may be consider
	17	Land Use and utilization of local resources (Land	B-	D	B-	D	The project alignment is passing through mainly agricultural area such as plantation and residential zone	In terms of the Agricultural Land Zone (AG), impacts are considered as both positive and negative. Positive in the sense that the road can	Some impacts are expected; thus these impacts and risks are minimized by appropriate land management

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
		Use and classification)						provide better and faster way, and as such more economical way of transporting products from these areas to trading centers and other distribution sites. Negative in the sense that there is an imminent danger of illegal conversion into other uses	
	18	Water usage (hydrology/ hydrogeology/water quality)	B-	B-	B-	B-	Majority of the respondents utilizes water from local water district for their domestic and drinking water needs. Other drinking water sources include from spring.	Earthworks may cause turbidity of river water as being use for domestic.	Minimized by control measures like silt trap, sedimentation pond, etc.
	19	Existing Social infrastructures and services (People)	B-	D	B-	D	There are 5 electric post, 4 cemetery and 1 school identified in the proposed alignment	The project does not give any impact to social infrastructures. Thus it is not likely to give any serious impacts on this item	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts, if any impacts are expected in the detailed design
	20	Social institutions such as social infrastructure and local decision-making institutions	C	C	C	C	Impacts are not expected, since local decision-making institute represented by local governments will continue after the road construction.	Impacts not Expected	Not required
	21	Misdistribution of benefit and damage	D	D	D	D	Misdistribution of benefit and damage caused by the road constructions not expected.	Impacts not Expected	Not required
Social Environment	22	Local Conflict of interest (People)	C	D	C	D	Most of the stakeholders requested to provide work opportunities as a construction worker during construction in the stakeholder meetings on scoping stage	The local conflicts regarding work opportunities between local communities may be raised in case of unfair employment.	This risk is minimized by mitigation measures such as provision of priority in hiring during construction period.
	23	Cultural Heritage (People)	C	D	C	D	No cultural heritage affected.	Impacts not Expected	Not required
	24	Landscape	D	D	D	D	Not required	Few impact is expected	Not required
	25	Gender	D	D	D	D	LGU has implemented GAD projects	Impacts on Gender are mostly positive since opportunity for livelihood is expected (small business to women, employment to men)	Prioritization in hiring during construction and assistance for livelihood development
	26	Right of Children	D	D	D	D	Not required	Not required	Not required

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
	27	Infectious diseases such as HIV/AIDS (People)	B-	D	B-	D	No infectious illness recorded in the project area. Project should not to create a habitat of mosquito that transmits dengue fever in incidental pond in the construction area without appropriate drainage.	Infectious diseases such as STD are possible to be spread due to inflow of construction workers. Furthermore, alteration to ground by cut land and filling may provoke to provide habitats of mosquito that possibly transmits dengue fever	This risk is minimized by mitigation measures such as construction of sufficient drainage, management of construction yard and health check & education for workers.
	28	Labor environment (including Work safety)	B-	D	B-	D	Not required	There are risks for workers during construction, if the construction contractor does not comply with relevant labor laws and regulations.	These risks are avoided and minimized by complying with relevant laws and regulations by the contractor under observation of DPWH
Others	29	Accident (Traffic Situation)	B-	B-	B-	B-	No serious problem on traffic	Construction vehicles may use existing local road near residential areas, thus number of traffic accident may increase	These risks are avoided and minimized by installation of traffic signage such as sign board, reflector/lighting in the night, safety personnel and parking for construction machines
	30	Cross boundary impacts and climate change (Meteorology /climatology)	D	D	D	D	Not required	During Construction, deforestation will incur. On loss of vegetation, the project development will require removal of vegetation cover to give way for the construction of road project. The removal of vegetation will also result in the reduction in the population of plant species growing within the project area. Future vegetation will face a great threat during the clearing activity. This activity will hinder the opportunity of these regenerants to grow and replace those mature vegetation in the area. During operations, generation of carbon monoxide and other gases will be generated from exhaust vehicles which will impact the ozone layer	On loss of vegetation: During site preparation, clearing of the road ROW will result to the removal of of an estimated tree above ground biomass (using large of trees with dbh of 10 cm and above, and pole size tress with > 5 cm dbh to 9.5 cm) of 1.59 x 10^{-4} and 2.87 x 10-4 megaram per hectare, and with estimated Carbon stored value of 3.53 x 10-4 and 6.38 x 10-4 megagram per hectare, respectively. It was computed using the brown allometric equation.

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

Table 7.10.5-5 Summary of Baseline and Forecasted Value (Air, Noise, Water)

No.	Item			Baseline Value (Standard Value)					Quantitative Forecast Analysis (Standard Value)			
1	Air Pollution	St.	Location	TSP (230μg/Ncm)	PM_{10} (150μg/Ncm)	NO_2 (150μg/Ncm)	SO_2 (180μg/Ncm)		TSP (230μg/Ncm)	PM_{10} (150μg/Ncm)	NO_2 (150μg/Ncm)	SO_2 (180μg/Ncm)
		1	Brgy. Salaman, Kapatagan	18.1	4.6	1.7	1.0		-	4.7	1.8	1.0
2	Water Pollution (Water Quality)	St	Location	pH (6.5-9)	Temp, ºC (25-31)	BOD (7)	TSS (80)	DO (5ppm min.)	Basically, waste water is not discharged during and after construction, thus quantitative forecast has not been conducted.			
		1	Budas River	7.5	29.0	2	23	8				
5	Noise	St	Location	Morning (50)	Daytime (55)	Evening (50)	Night time (45)		Morning (50) <65>	Evening (55) <65>	Evening (50) <65>	Night Time (45) <60>
		1	Brgy Salaman, Kapatagan	**53**	53	**53**	**51**		**54**	55	**54**	**52**

( ) : Philippine Standard Values
< > : Japanese Standard Values
Source: JICA Study Team

Table 7.10.5-6 shows sampling stations for Noise, Air and Water Sampling Sites, Coordinates, Date and Time of Samplings and **Figure 7.10.5-2** shows the sampling location for air and noise.

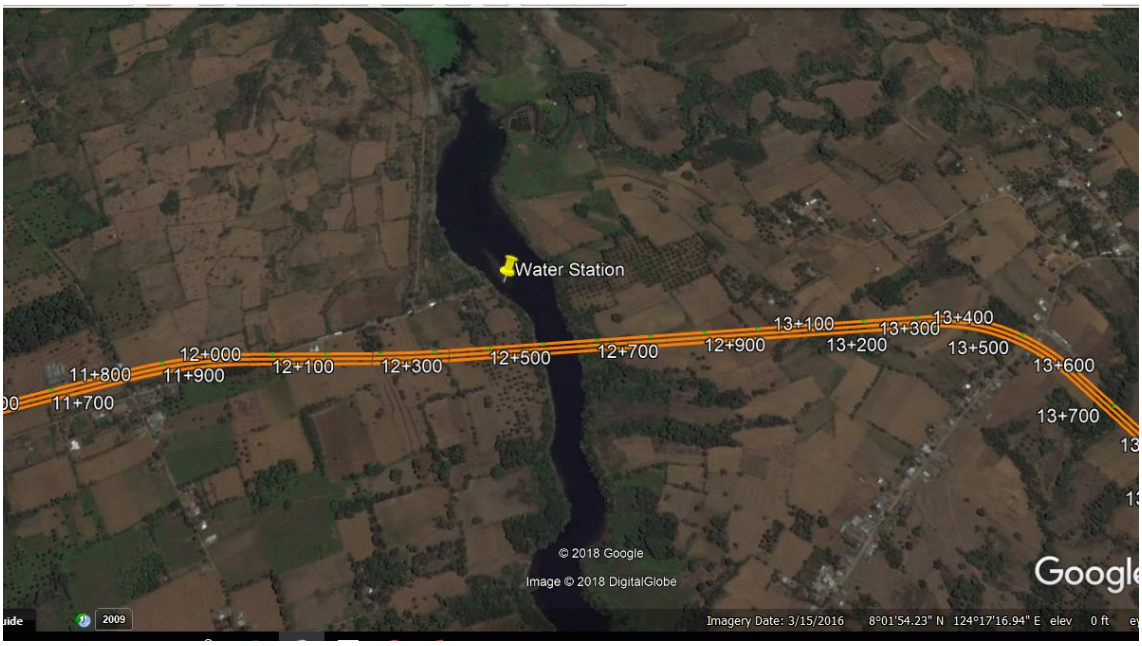
Table 7.10.5-6 Sampling points for Noise, Air and Water Quality

	Station No.	Sampling Stations	Coordinates	Date and Time of Samplings
Noise	N1	Brgy. Bubong, Saguiaran, Lanao del Sur	8° 1'37.68" N 124°16'19.36" E	January 18-19, 2018,1415H
Air	A1	Brgy. Bubong, Saguiaran, Lanao del Sur	8° 1'41.02"N 124°16'17.83"E	January 18-19, 2018,1415H
Water	W1	Agus River, Brgy. Mipaga, Saguiaran, Lanao del Sur	8° 2'7.22"N 124°17'1.89"E	January 18, 2018,

Source: JICA Study Team

Source: JICA Study team

Figure 7.10.5-2 Sampling location map of air and noise covered by Marawi City Ring Road



Source: JICA Study team

Figure 7.10.5-3 Water Sampling Map covered by Marawi City Ring Road

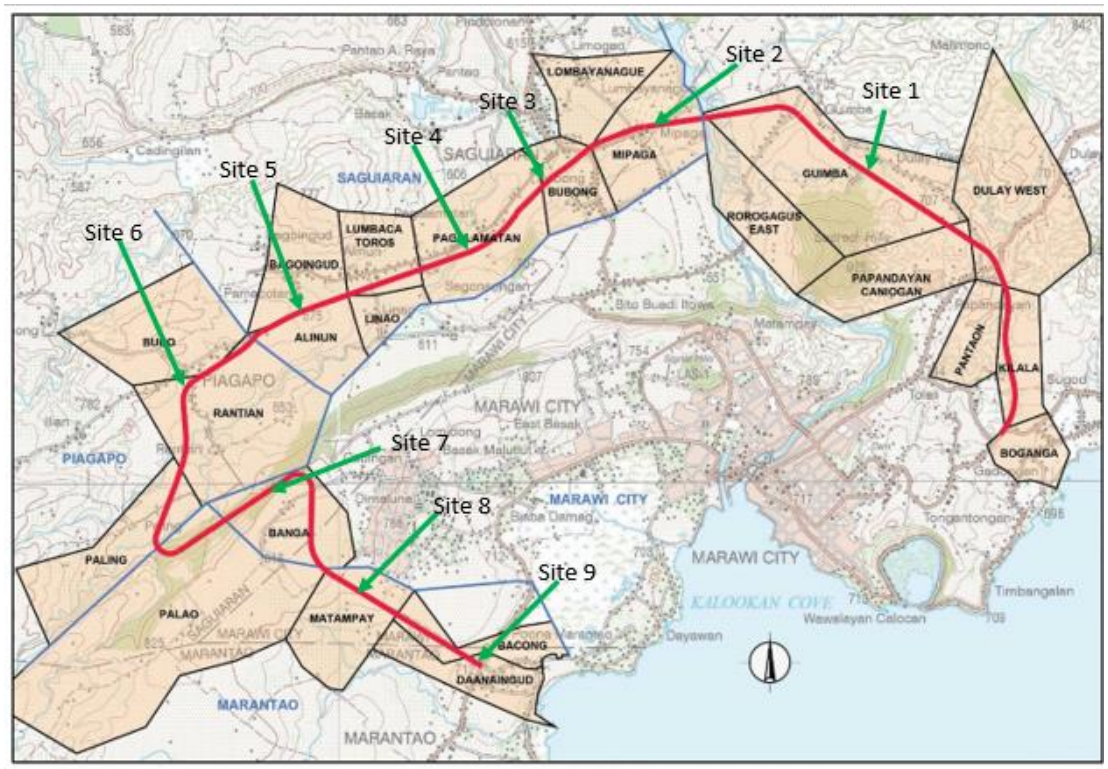
Survey on terrestrial flora and fauna was undertaken in 9 sampling sites within the proposed alignment in 22 covering barangays of Marantao, Piagapo, Saguiaran and City of Marawi. Sampling for plant species composition and observation of prevailing fauna species within the proposed alignment was undertaken in the same selected locations. Barangays covered the sampling sites include Guimba, Mipaga, Bubong, Pagalamatan, Bagoingud, Bobo, Banga, Matampay and Daanaingud, in the municipality of Marantao, Piagapo, Saguiaran and City of Marawi.

Geographic coordinates of observation sites are shown in the table below,

Table 7.10.5-7 Locations of sampling sites for flora and fauna

Municipality	Site	Barangay	Geographic coordinates	
			Northing	Easting
Marawi City	1	Guimba	8° 1'44.89"	124°18'2.53"
Saguiran	2	Mipaga	8° 2'0.44"	124°16'44.55"
Saguiran	3	Bubong	8° 1'37.35"	124°16'6.81"
Saguiran	4	Pagalamatan	8° 1'9.66"	124°15'21.59"
Saguiran	5	Bagoingud	8° 0'57.85"	124°14'47.39"
Piagapo	6	Bobo	8° 0'30.74"	124°14'7.91"
Marawi City	7	Banga	7°59'58.01"	124°14'36.91"
Marantao	8	Matampay	7°59'19.49"	124°15'13.22"
Marantao	9	Daanaingud	7°58'58.35"	124°15'46.92"

Source: JICA Study Team



Source: JICA Study team

Figure 7.10.5-4 Terrestrial flora and fauna sampling sites

(7) Mitigation Measures and Environmental Management Plan

A proposed mitigation plans during and after construction are shown in **Table 7.10.5-8**. All mitigation measures are included in the submitted EIS Report by DPWH. All cost for mitigation measures will be finalized in detailed engineering design phase.

Table 7.10.5-8 Environmental Management Plan

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
Pollution	1	Air pollution (Air quality & noise)	(Dust} - Water sprinkling near residential area - 20 kph speed limit for construction machines at construction sites adjacent to settlement areas	(NO_2, SO_2 and TSP) - Setting up green buffer zone along the road (the zone and planting trees are carried out during construction)	Contractor	[During Const.] DPWH [Operation **Phase]** Marawi, Marantao, Piagapo, Saguiaran
	2	Water pollution (Water quality)	[Turbid water and other items] - Discharge through sedimentation pond and silt fence - Installation of portable toilet for workers - Appropriate waste and construction machines management	Not required	Contractor	DPWH
Pollution	3	Waste (Abandonment)	[Construction waste (trees and waste soil)] - After considering the possibility of reuse, construction waste is disposed at designated disposal site Note) [Muck soil from tunnel section] - Reuse or disposed at designated disposal site after treatment [Night soil] - Garbage at workers camp and waste oil shall be brought to disposal site or facility [Garbage from base camp] - Temporary sanitation facility such as septic tank shall be introduced to the workers camp.	Not required	Contractor	DPWH
	4	Soil contamination (soil quality)	- Reuse or disposed at designated disposal site after treatment	Not required	Contractor	DPWH
	5	Noise and vibration (Noise)	[Construction noise] - Installing noise barrier and selecting low-noise equipment. - Avoiding works of heavy equipment during night time. - Informing the construction schedule to surrounding communities to obtain their consensus	[Traffic noise] - Establishment of green belt as buffer zone along the road - Secure sufficient distance from boundary of the road to residential area after construction of the road (secure noise decay distance) on land use plan along the road - Installation of noise barrier near sensitive facility, if required	Contractor	DPWH
	6	Sediment quality (Soil quality)	- Reuse or disposed at designated disposal site after treatment	Not required	Contractor	DPWH

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
Natural Environment	9	Protected Area (Lake Lanao watershed Reservation)	- Pre and during construction phase monitoring and management plan as required by the DENR and the provincial government of Lanao del Sur relative to the Integrated Natural Resources and Environment Management Project (INREMP) for Lake Lanao River Basin. - Limit land clearing within the road ROW only (during site preparation) - Establishment of vegetational buffer along the road ROW thru planting of trees (during construction and operation phase) - Relocation of potentially affected trees (young) to DENR designated sites and/along the road ROW - Replacement of trees cut in support to the DENR National Greening Program (NGP) in compliance to DENR MO no. 05 s. 2012 - Prohibit hired workers/employees to get involved in any wildlife poaching and trading - Compliance of Ecological Solid Waste Management Act of 2000 (during construction)	- Monitoring, maintenance and protection of planted trees - Installation of ecologically significant signages along road network	DPWH, contractor	DPWH, LGU, DENR
	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	- Relocation & replanting trees along the road in ROW - Tree planting at sites designated by DENR - Create ecotone habitats in consideration of Amphibia and other fauna, if the existing habitats along the river are impacted by the project	Appropriate land use management not to develop natural area along the road	[Const.] Contractor [Operation] Marawi, Marantao, Piagapo, Saguiaran	[Const.] DPWH [Operation] Marawi, Marantao, Piagapo, Saguiaran
Natural Environment	11	Hydrology (Hydrology and oceanography)	- Designing of bridges with sufficient capacity - Installation of sufficient drainage facilities on bypass - Secure waterways in construction area	Not required	Contractor	DPWH
	12	Topography and geology (Geography, topography and landslides	- Installation of slope protection measures	Not required	Contractor	DPWH
Social Environment	13	Involuntary resettlement (People)	Appropriate compensation and social assistance in accordance with RAP	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	DPWH	Marawi, Marantao, Piagapo, Saguiaran
	14	The poor (People)	Appropriate social assistance in accordance with RAP	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	DPWH	Marawi, Marantao, Piagapo, Saguiaran
	15	Indigenous and ethnic people (Indigenous people)	Not required However, situation of minority religious group (s) such as Islamic group shall be monitored and adequate assistance and coordination shall be given, if necessary	Not required for designated Indigenous and Ethnic group specially if NCIP has been issued. However situation of minority Religious group such as Islamic group shall be monitored and adequate assistance and coordination shall be given, if necessary	–	–

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
	16	Local economy such as employment and livelihood	Appropriate compensation and social assistance in accordance with RAP	Not required	DPWH	Marawi, Marantao, Piagapo, Saguiaran
	17	Land use and utilization of local resources (Land use and classification)	Appropriate land acquisition and compensation for agricultural area	Management of appropriate land use in accordance with approved detailed zoning map	[Const.] DPWH [Operation] Marawi, Marantao, Piagapo, Saguiaran	Marawi, Marantao, Piagapo, Saguiaran
	18	Water usage (Hydrology / Hydrogeology/ Water quality)	Installation of alternative water distribution system when unexpected situation such as reduction of spring water and water level of wells	Installation of alternative water distribution system when unexpected situation such as reduction of spring water and water level of wells	DPWH, Marawi, Marantao, Piagapo, Saguiaran	Marawi, Marantao, Piagapo, Saguiaran
	19	Existing social infrastructures and services	Appropriate compensation and/or relocation in accordance with RAP	Not Required	Contractor and DPWH	DPWH, Marawi, Marantao, Piagapo, Saguiaran
	22	Local conflict of interests	Local workforce is prioritized for construction of the road	Not required	Contractor	DPWH
	23	Cultural heritage	No cultural heritage to be affected. Mitigation not required	Not required	-	-
	27	Infectious diseases such as dengue and HIV/AIDS	- Installation of sufficient drainage facilities not to provide habitat for vector mosquito - Provision of adequate temporary sanitation facilities - Enforcement of medical screening and periodical medical check-up - In order to prevent spread of infectious diseases such as HIV/AIDS, awareness of the labors is promoted	Not Required	Contractor,	DPWH,
	28	Labor environment (including work safety)	Complying with relevant laws and regulations by the contractor under observation of DPWH	Not required	Contractor,	DPWH
Others	29	Accidents (Traffic situation)	- Deploying flagman at the gate and crossing points of the construction vehicles - Installation of safety sign board - Installing fence around the construction site to keep out local people such as children - Installation of lightning in the night time - Installation of parking for idling construction machines - Safety training for the workers - Safety patrol at the construction site by supervisors	Not Required	Contractor	DPWH
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	Replanting endemic/ native trees and other agricultural trees such as coconuts	Not required	Contractor	DPWH

Source: JICA Study Team

(8) Environmental Monitoring Plan and Budget

A proposed monitoring plan during and after construction are shown in **Table 7.10.5-9** and **Table 7.10.5-10** respectively**.** All monitoring plans are included in the submitted EIA by DPWH to EMB. The monitoring in operation phase shall be carried out for two (2) years at least.

Proposed items to be monitored by JICA are shown in **Table 7.10.5-11**. Air, water quality, noise, ecosystem, resettlement and livelihood of relocated people shall be monitored during and after construction.

Table 7.10.5-9 Environmental Monitoring Plan (Pre and During Construction)

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
Pollution	1	Air pollution (Air quality & noise)	TSP, SO_2, NO_2 and PM_{10}	1.TSP –Gravimetric 2.SO2 –Pararosaniline 3.NO2 – Griess Saltzman Reaction 4. PM_{10}–Direct Reading(Gas Analyzer)	1 sites (same locations of baseline survey) (See **Table 7.10.5-6** and **Figure 7.10.5-2**)	2 times	800,000	TSP 300μg/Ncm SO_2 340 μg/Ncm NO_2 260 μg/Ncm PM_{10} 150 μg/Ncm
	2	Water pollution (Water quality)	pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Methodologies are described in DAO 34-1990 and EMBDENR Manual for Ambient Water Quality Monitoring Volume I	1 sites (same locations of baseline survey) (See **Table 7.10.5-6** and **Figure 7.10.5-3**)	2 times	600,000	For Class "C" freshwater pH – 6.5 to 8.5 DO – 5.0 mg/L Oil & Grease – 2.0 mg/L BOD – 7.0 mg/L TSS – not more than 30 mg/L increase
	3	Waste (Abandonment	Volume of waste soil, cutting tree and domestic garbage	Record volume of generated waste	Cutting land section, tunnel section, cutting tree section and workers camp	4 times	200,000	Generated waste shall be reused or disposed at designated site.
	4	Noise and vibration (Noise	Ambient and road side noise (dB(A) LAeq)	L_{Aeq}, 10min during morning, daytime, evening and night time	1 sites (same locations of baseline survey) (See **Table 7.10.5-6** and **Figure 7.10.5-2**)	2 times	400,000	For "A" categorized areas (general area) Morning: 50 dB(A) Daytime: 60 dB(A) Evening: 50 dB(A) Night: 45 dB(A) For "B" categorized areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night: 55 dB (A)
Natural Environment	9	Protected Area	Tree Inventory, tree planting along roads as natural buffer and in areas that will be designated by the DENR will be undertaken in replacement of trees cut in compliance to the DENR Memorandum Order no. 05 s. 2012.	Ocular/physical inspection	Major road and bridge section	Annual	1,000,000	Cutting tree area is limited on ROW
	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology	Situation of Cutting tree area	Ocular inspection	Major bridge section (See **Table 7.10.5-6** and **Figure 7.10.5-4)**	4 times	200,000	Cutting tree area is limited on ROW
Natural	11	Hydrology (Hydrology and oceanography)	Flooding situation	Flood level measurement during high precipitation periods Interview with local residents	Flood-prone areas, particularly near major river systems	4 times	200,000	Project activities and structures does not cause flooding

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
	12	Topography and geology (Geography, topography and landslides)	Stability of slope	Ocular inspection	High cut and high embankment section	4 times	200,000	Must be continuously undertaken until slopes are fairly stable and vegetation cover achieves high survival rate
Social Environment	13	Involuntary resettlement (People)	Payment and implementation n of social assistance in accordance with RAP	Consultation Meeting and/or Survey with the project affected persons (PAPs)	Affected barangays	Monthly	500,000	Must be completed prior to construction stage
	14	The poor (People)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	16	Local economy such as employment and livelihood	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	19	Existing social infrastructures and services	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	22	Local conflict of interests	Construction n worker's native barangay	Confirmation of workers list from contractor	All barangays on the affected route	4 times	500,000	Employment opportunity shall be provided fairly
	27	Infectious diseases such as HIV/AIDS	Number of infected patient	Confirmation of health check list from contractor	All construction workers	4 times	500,000	Infection disease rate shall be less than average rate
	28	Labor environment (including work safety)	Number of workers with required instrument such as helmet	Count numbers of workers with instrument	All construction workers (weekly meeting place)	4 times	500,000	All workers shall have designated device such as helmet

Source: JICA Study Team

Table 7.10.5-10 Environmental Monitoring Plan (Operation Phase)

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
Pollution	1	Air pollution (Air quality & noise	TSP, SO_2, NO_2 and PM_{10}	1.TSP –Gravimetric 2.SO2 –Pararosaniline 3. NO2 – Griess Saltzman Reaction 4. PM_{10}–Direct Reading (Gas Analyzer)	1 sites (same locations of baseline survey)	1 times	400,000	TSP 300μg/Ncm SO2 340 μg/Ncm NO2 260 μg/Ncm PM_{10} 150 μg/Ncm
	2	Water pollution (Water quality)	pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Methodologies are described in DAO 34-1990 and EMBDENR Manual for Ambient Water Quality Monitoring Volume I	1 sites (same locations of baseline survey)	1 times	600,000	For Class "C" freshwater pH – 6.5 to 8.5 DO – 5.0 mg/L Oil & Grease – 2.0 mg/L BOD – 7.0 mg/L TSS – not more than 30 mg/L increase

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
	4	Noise and vibration (Noise)	Ambient and road side noise (dB(A)L_{Aeq})	L_{Aeq}, 10min during morning, daytime, evening and night time	2 sites (same locations of baseline survey)	1 times	200,000	For "A" categorized areas (general area) Morning: 45 dB(A) Daytime: 50 dB(A) Evening: 45 dB(A) Night : 40 dB(A) For "B" categorized Areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)
Natural Environment	9	Protected Area	Situation of Cutting tree area	Ocular inspection	Major bridge section	1 times	100,000	Cutting tree area is limited on ROW
	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology	↑ditto	↑ditto	↑ditto	↑ditto	100,000	↑ditto
	11	Hydrology (Hydrology and oceanography)	Flooding situation	Flood level measurement during high precipitation periods Interview with local residents	Flood-prone areas, particularly near major river systems	1 times	100,000	Project activities and structures does not cause flooding
	12	Topography and geology (Geography, topography and landslides)	Stability of slope	Ocular inspection	High cut and high embankment section	4 times	200,000	Must be continuously undertaken until slopes are fairly stable and vegetation cover achieves high survival rate
Social Environment	13	Involuntary resettlement (People)	Payment and implementation of social assistance in accordance with RAP	Consultation meeting and/or Survey with the project affected persons (PAPs)	Affected barangays	Monthly	500,000	Must be completed prior to construction stage
	14	The poor (People)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	16	Local economy such as employment and livelihood	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	19	Existing social infrastructures and services	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	22	Local conflict of interests	Construction worker's native barangay	Confirmation of workers list from contractor	All barangays on the affected route	Quarterly	500,000	Employment opportunity shall be provided fairly
	27	Infectious diseases such as HIV/AIDS	Number of infected patient	Confirmation of health check list from contractor	All construction workers	Quarterly	500,000	Infection disease rate shall be less than average rate
	28	Labor environment (including work safety)	Number of workers with required instrument such as helmet	Count numbers of workers with instrument	All construction workers (weekly meeting place)	4 times	500,000	All workers shall have designated device such as helmet

Source: JICA Study Team

Table 7.10.5-11 Environmental Monitoring Form (JICA Form)

-If environmental reviews indicate the need of monitoring by JICA, JICA undertakes monitoring for necessary items that are decided by environmental reviews. JICA undertakes monitoring based on regular reports including measured data submitted by the project proponent. When necessary, the project proponent should refer to the following monitoring form for submitting reports.

-When monitoring plans including monitoring items, frequencies and methods are decided, project phase or project life cycle (such as construction phase and operation phase) should be considered

1. Relevant Permission and Public Consultation

Monitoring Item	Monitoring Results during Report Period
Confirmation of relevant written permissions and minutes of meetings for held consultations and meetings	

2. Mitigation Measures/Monitoring

- Air Quality（Traffic /Ambient Air Quality

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
TSP	µg/Ncm	15.7	15.7	230µg/Ncm	0.2 mg/m3	-Same points as baseline survey (see **Table 7.10.5-6)** -Two (2) time a year during construction -Once a year during operation -TSP = Gravimetric - SO_2 =Pararosaniline - NO_2 = Griess Saltzman Reaction - PM_{10} = Gravimetric (Gas Analyzer)
NO_2	µg/Ncm	3.9	3.9	150ug/Ncm	0.04-0.06 ppm	
SO_2	Mg/Ncm	ND	ND	180ug/Ncm	0.1 ppm	
PM_{10}	ppm	11.7	11.7	150ug/Ncm	-	
ND:Not Detected						

- Water Quality（Physico-chemical Analyses of Surface Water）

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
pH	-	6.7	6.7	6.5-9	6.5-8.5	-Upstream and downstream portion -Same points as baseline survey (see **Table 7.10.5-6)** -Two (2) time a year during construction -Once a year during operation -grab sampling
DO	mg/L	7.2	7.2	5ppm min.	5 ppm	
TSS	mg/L	5.0	5.0	80	25	
BOD	mg/L	1.0	1.0	7	3	
Turbidity	NTU	10.0	10.0	-	-	
Temperature	℃	26.5	26.5	25-31		

-Noise/Vibration

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
Noise level	dB(A)	Morning 53dB Daytime 53dB Evening 53dB Night time 51dB	Morning 54dB Daytime 54dB Evening 53dB Night time 52dB	For "A" categorized areas (general / residential area) Morning: 45 dB(A) Daytime: 50 dB(A) Evening: 45 dB(A) Night : 40 dB(A) For "B" categorized Areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)	Daytime: (6:00-22:00) 50dB(AA) 55 dB(A) 55 dB(B) 60 dB(C) Evening Time: (22:00-6:00) 40 dB(AA) 45 dB(A) 45 dB(B) 55 dB(C)	- Same points as baseline survey (see **Table 7.10.5-6)** - 2 times a year during construction - Once a year during operation - Digital sound level meter

- Odor

Monitoring Item	Monitoring Results during Report Period
Not required	

3. Natural Environment

- Ecosystem

Monitoring Item	Monitoring Results during Report Period
Situation of cutting tree area (during construction) Situation of replanting area along the road (operation phase)	

4. Social Environment

- Resettlement (During and after Construction)

Monitoring Item	Monitoring Results during Report Period
Number of PAPs including IPs to be resettled/ relocated/ provided livelihood assistance where required. (during Construction)	
Inventory and valuation of PAPS affected assets (during Construction)	
Notice period given to PAPs before shifting them from their original locations within the ROW (Pre and during construction)	
Number of grievances recorded and redressed (Pre and during Construction)	
Conflicts between religions (Pre, during and after construction)	

- Living / Livelihood

Monitoring Item	Monitoring Results during Report Period
Pre-and post-resettlement incomes and livelihood of PAPs especially for poor people (during and after construction)	

(9) Institutional Arrangement for EMP Implementation

Institutional Arrangement for EMP Implementation is described in **Section 7.5**.

(10) Stakeholders Meeting for EIA

A total of 23 stakeholders' meetings were held for Sub-Project 7, two (2) stakeholders' meetings were held at municipal level and one (1) was held at barangay level for barangay scoping**.** The first stakeholders' meetings at municipal level are prescript Information Education Communication meetings (IEC meeting) based on the Philippine EIA guidelines held in the municipalities of Marantao, Piagapo and Saguiaran and Marawi City attended by the affected stakeholders, barangay and municipal officials, and concerned LGU offices such as Assessors, MPDC. The second stakeholders' meetings at municipal level presented the results of the baseline surveys. These meetings were attended by a total of 346 participants (Male-390 and Female-118) while the barangay scoping's' were attended by 272 male and 373 female.

The major questions of the participants brought out during the 1st and 2nd public consultations are enumerated below. All questions, comments and suggestions were answered by DPWH ARMM, JICA Cotabato, RAP, and EIA Study team, and it seemed that all questioners understood and agreed all answers as shown in **Table 7.10.5-13**.

1st Public Consultation

a) Affecting existing road will be upgrade to the standard of Sub-Project 7;
b) Conduct ocular inspection for the exact affected barangays in Marawi city;
c) Boundaries of barangays are not accurate
d) Value of payment for the property, land, crops and among others are the same with other barangays;
e) Schedule of the payment of the affected by the road project;
f) Who will shoulder the ROW payment;
g) What will happen to the landowner without land titles and proof of ownership;
h) Realignment of proposed road to avoid the Muslim Cemetery and less affected households;
i) Marantao to include the neglected provincial road adjacent to Sub-Project 7;
j) Final alignment of proposed road;
k) What happen to the affected land, properties, tress and fruit bearings;
l) Necessary documents for claims and compensations; and
m) Work force from the affected communities.

2nd Public Consultation

a) Former Mayor of Marantao requested copy of implementation schedule of Marawi Ring Road project for their monitoring on the status of the progress of the project;
b) Brgy. Palao Ranaranao, utilized and align the proposed road project to the existing road to avoid the possible removal of properties or structures, and displacement of family. The proposed project is far from the community and the community could not benefit the proposed road;
c) Brgy. Daaningud, overlapping of ongoing 600 meters road construction with the proposed Sub-Project 7;
d) Brgy. Matampay, realigned the Sub-Project 7 along the barangay center were more communities can benefit;
e) Brgy. Bacong, Saguiaran, requested realignment of the road near the spring source beside mosque;

f) Brgy. Pagalamatan, Saguiaran, requested realignment to avoid the two storey new constructed HS building;
g) Brgy. Bagoingud, Saguiaran, requested realignment to avoid the Muslim cemetery at Sta. 7+800 to 7+900; and cultural heritage of Datu Ambiong at Sta. 8+200 to 8+300;
h) Saguiaran, realignment to NPC compound to avoid damage of property and land which is the source of income of the owner;
i) Barangay Chairman Ramal Panacawan, ABC President of Piagapo, informed the team that Abaca is the major source of income of the affected community, particularly Barangay Paling; portion of the alignment will affect the Abaca Plantation within the barangay;
j) Mr. Jamal Mague, Private Sector of Barangay Ratian, Piagapo, informed us that there are 9 reservoir and source that will be affected by the road alignment; and might cause of shortage water supply;
k) Piagapo, who will file for the clearance of cutting trees;
l) Compensate the affected owner prior the implementation to avoid problems;
m) Marawi, difference of ring road project and transition road project because he is not aware on the two ongoing study;
n) Marawi, value of the affected land, crops and property will be the same from the other barangays and municipalities; and
o) Necessary documents for claims and compensations.

During the 1st public consultations, the women's emphasized the importance of proper compensation for the affected landowners and livelihood projects for extra income during construction. While in 2nd Public Consultation, some requested realignment on the affected Muslim cemetery and cultural heritage of Datu Ambiong and ensure that compensation and coordination to affected people be undertaken.

Table 7.10.5-12 Contents of Stakeholder Meetings Municipal Level

Date (venues)	Objectives of the meeting	Major Agenda	Participants	No. of Participants		
				Location	Male	Female
1st Public Consultations Jan. 15-17, 2018 1. Marawi City Bagong Bayan Hall 2. Saguiaran Session Hall 3. Piagapo ABC Hall 4. Municipal Conference Hall in Marantao	Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	1. Inform and generate awareness and understanding of the concerned public about the project; 2. Provide the stakeholders and avenue to ventilate salient issues and concerns regarding the project; 3. Give an opportunity to the stakeholders to have an open discussion with the Preparers, Proponents and LGU about the project; 4. Educate the stakeholders of their rights and privileges; and 5. Enable the stakeholders to effectively participate and make informed and guided decisions.	Municipal Officials, Project-Affected Persons (PAPs) and Barangay Officials, RAP, DPWH ARMM and JICA Study Team	Marawi Saguiaran Piagapo Marantao	53 60 40 57	19 25 21 31
2nd Public Consultations Mar 7-8, 2018 1. Municipal Conference Hall in Marantao 2. Saguiaran Session Hall 3. Piagapo Training Center 4. Bagong Bayan Marawi City Hall	Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	To present and validate the results of environmental impact assessment	Municipal Officials, Project-Affected Persons (PAPs) and Barangay Officials, and JICA Study Team	Marawi Saguiaran Piagapo Marantao	56 56 39 29	11 30 24 20

Source: JICA Study Team

Table 7.10.5-13 Major Opinions in Stakeholder Meetings Municipal Level

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
1st Public Consultations Jan. 15-17, 2018 Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	1. Introduce the project and discuss the project objectives and the benefits that can be derived. 2. EIA and RAP Process 3. Tentative Schedules 4. Solicit queries, comments, concerns and suggestions on the project	Socio/ The People	Infrastructures (Alignment/Boundaries)	1. (Chairman Yashier P. Batabor, Rorogagus East, Marawi) Does the affected existing road will be upgrade because this existing road was constructed by NPC year 1985. Base on the presented alignment, there are missing barangays like Rorogagus Proper if the alignment will traverse the Rorogagus bridge.	1. This is an initial road alignment and will be validated during ocular and field work. There will be a geotagging and survey to determine the affected land and properties, and barangays.
				2. (Chairwoman Ozamah Macabagan, ABC President / Barangay Kilala, Marawi) I would suggest to conduct ocular inspection before the inventory so that the affected barangays will know especially those who are not present today and not included in the shown map. You must coordinate to MPDC the data to be used before the barangay scoping.	2. This shown map is just an initial alignment and will be validated on-site. Those barangays mentioned that are not shown in the alignment will be verified. Barangays will still need to be validated. Those barangays present during the 1st public consultation but will not be included after the inventory will still benefit the proposed road. Our data will be gathered from Municipal and Provincial Assessors, DENR and DPWH ARMM offices, and overlay this to the proposed road alignment. From this data, the affected barangays can be verified.
				3. (Mr. Sadick Mohammad, LGU Marawi Consultant) Does the presented road alignment feasible? I suggest to use the land use map to finalize the alignment. The value for payment of land and other property is the same?	3. This alignment is subject for validation. We will gather data and use the prevailing price.
				4. (Chairman Yashier P. Batabor, Rorogagus East, Marawi) I would suggest to conduct ocular inspections along the road alignment.	4. Before the ocular inspection, we still need to gather data to establish the political boundary. We will be coordinating with the affected barangays and ask assistance from the barangay officials during the inventory. This will also include the current value of the materials to be used for the cost estimates.
				5. (Mr. Sadick Mohammad, LGU Marawi Consultant) I would suggest to clarify the classifications (functions and administrative) of the road.	5. This will be noted.
				6. (Saguiaran - Engr. Delion G. Binumbanan, DPWH ARMM) Did you check on the location of NPC compound near Somrorang road which will be affected by the proposed road alignment?	6. The team will conduct an inventory and mapping on January 22, 2018 and validate if the NPC compound will be affected.
				7. (Engr. Aga A. Sampal, MPDC Saguiaran) The boundaries of the barangays are not accurate.	7. This will be validated on site. Barangays will still need to be validated. Those barangays that are included in the list and 1st public consultation, but will not be

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
					traversed in the alignment after the inventory would still benefit the proposed road. They can still use this to transport products easily from farm to market.
			Peace and Order	8. (Mr. Jamal Mague, Private Sector of Barangay Bubo, Piagapo) In Lanao del Sur and Norte are also affected and suffered by terrorism attacked in Islamic City of Marawi. I would like to suggest that during construction, the contractors should hire locals from Piagapo Municipality.	8. Job opportunities which will benefit the locals especially the affected barangays are included in the documentation of EIA. Local hires are priority in the project to be screened thru DPWH and Municipality. Locals should be suitable to the needed skilled workers of DPWH. Minimum age requirement is 18 years old and above. Not only local workers can benefit the project but all the residents. Like for example in Pigcawayan, the women's organization requested to have eatery for the construction worker during construction of the road.
			Properties	9. (Chairman Maning C. Dalupan, ABC President and Brgy. Chairman of Bago-Ingud, Saguiaran) Is the price of lot same? Because the problem of Maranao has no land title, we can only provide assistance to the group. We avoid to be the fore front of the project to avoid political issues. We will be wise on the claims of the affected lot owners because the past road projects of the government are not paid until now. What will be the schedule of payment? Who will shoulder the payment of the Right-of-way (ROW)?	9. Our data will be gathered from Municipal and Provincial Assessors, DENR and DPWH ARMM offices, the prevailing price will be used. This will be computed considering the factor value of the properties and among others. The results of the RAP will be submitted to DPWH National and Region. They will validate the results considering the basis of the prices and estimates. We will recommend to compensate the affected properties and lots before the start of the civil works. This payment will be used by the affected owners for their expenses on rentals or relocations. The DPWH as the implementing agency will handle all the payments. The proponent of this ring road project is DPWH. The expenses of the implementation will be loan to JICA. During implementation, if you notice problems, you can file complaints to the Mayor's office because he is member of the steering committee of the project. JICA contracted consultants to make sure that the ECC requirements will be gathered and documented.
				10. (Engr. Aga A. Sampal, MPDC Saguiaran) The project will be implemented within schedule if this project will be handled by LGU to shorten the procurement process. One problem we foresee is no land titles because majority are not paying taxes. How do we determine if he/she is the legal owner of the properties and lot?	10. We will gather data and inventory on the affected lot, properties among others. We will be coordinating with the barangay officials during the inventory and request assistance to help us certify that they are the owners of the lot and properties along the alignment. The results will be submitted to JICA and DPWH National. They will validate and will study on how to compensate those without land titles.

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
				Mr. Basarie Dicamaling, Municipal Assessor, In addition to the questions of MPDC, can you assist us in the survey of the affected lots because the owners cannot afford the Php 20,000 for the payment of the survey. Can you include this survey in your study so that we can also help and support the study team on the tax map? We are requesting that this can have a land title because our existing Tax maps are from year 1970s.	Our framework basis is the PD29 – since birth or more than 30 years of residences, and will be certified by barangay officials thru barangay resolutions. All alienable and disposable land can be compensated but the lots that are declared as military reserves will not be considered. We can use the cadastral map from DENR and data from provincial assessors to validate our inventory. The results of FS stage will be validated during the Detailed Engineering Design (DED) stage. The role of the barangay officials will be needed during the inventory to identify and certify the land owners. Because the land survey is not part of the TOR. If you have problems on the presented inventory results to those without land titles, barangay official should find a solutions to avoid delays of the project. Barangays will issue resolutions to support the inventory results and will be certified by the Mayor's office. I would suggest that the LGUs should help the project to convince the affected land and property owner's.
				Piagapo Mayor Ali L. Sumandar was very thankful on having a road project in Piagapo. He would like to encourage his constituents to pay the taxes to avoid problems during payment and claims because the owners should provide proper documents such a tax declaration or land titles before the payment. Those affected lands without land titles especially lands within the military reservation will not be compensated if there is no tax declaration. This military reservation area will be claimed by the LGU and offer for free to the project.	
				11. (Mr. Jamal Mague, Private Sector of Barangay Bubo, Piagapo) In Lanao del Sur and Norte are also affected and suffered by terrorism attacked in Islamic City of Marawi. I would like to suggest that during construction, the contractors should hire locals from Piagapo Municipality.	11. Job opportunities which will benefit the locals especially the affected barangays are included in the documentation of EIA. Local hires are priority in the project to be screened thru DPWH and Municipality. Locals should be suitable to the needed skilled workers of DPWH. Minimum age requirement is 18 years old and above. Not only local workers can benefit the project but all the residents. Like for example in Pigcawayan, the women's organization requested to have eatery for the construction worker during construction of the road.

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
				12. (Dr. Mosib P. Sarip, MPDC Executive Secretary) Majority of our land here in Marantao without land titles, how this land can be compensated? LGU should serve as the prime holder to assist the landowner to secure land titles. If no land titles how this can be paid? The LGU is very concern on this matter.	12. RAP team will conduct inventory and identify the land owner with the supervision of the barangay officials. If there will be no land titles and tax declaration, we will request the barangay to certify that he/she is the land owner of the affected properties. The certification of the barangay will be certified by the Municipal Mayor and can be used to apply for a tax declaration in the Municipal assessor's office. Then the owner will apply a parcelary survey to secure land title. Additional documents to secure a land title will also need cost estimates and land area, with the aid of the LGUs. Landowner should have tax declaration in absence of land titles because this tax declaration will be the proper document to issue land title. Tax declaration is the basis for cost estimates because during Detailed Engineering Design (DED) the parcelary survey should be conducted to know the land area or properties will be affected by the proposed road alignment.
				13. (Mr. Mosib D. Sarip, Exe. Secretary of MPDC) We would like to request to include in your study the neglected provincial road almost near the proposed road alignment.	13. Noted on the request.
			Properties	14. (Mr. Quirino M. Pangandaman, LGU Technical Staff) How much is the payment of the land. We will committed to help the study team and the project such as security for the development of the municipality and community so that we will not feel difficulties in our way of life. We are asking the group to have fair value of the land.	14. Regarding the payment of the land. We will consider the highest or prevailing price considering the gathered data and information from the Assessor, DENR, DPWH, and Provincial Offices.
				15. (Mr. Nurhussien V. Batoali, MPDO Marantao) Regarding the value of the land, I'm requesting the barangay officials to be the front and supervised during the inventory. The compensation of the road alignment is separate from land, crops, and properties and among others.	15. The value of the land in the area will be much higher if the road already available.
				(Administrator H. Datu Rascal Agama) We need your coordination and unity for this road project. A matter of meter, please provide the land for the road development. This road project will be the start of the development of the municipality. Barangay officials should supported/assisted the study team for Marantao. This road project is for all of us. If this road will be constructed, we don't have problem such emergency and transporting our product to other neighboring municipalities. Please coordinates those with problems of land titles. Forgot your relatives today, think for the future of the new generations because this road is for the development. We will support the project.	

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
				(Chairman Saidamen Naga of Barangay Daaningud) This road project is a help and project from JAPAN. We will negotiated the affected landowners for this project to be implemented. We are very thankful to the study team and JICA to have this road project.	
			Properties	(Chairwoman Mamadra "Barang"Limbona of Barangay Matampay) Thank you to the speakers and consultants. For my constituents, we should help each other for the success of the road project. This project is for the development of the community, economy, and help for the farmers to transport their products to the market, peace and order, emergency and health. In our barangay, we are located in the remote area and this road project will be a big help all of us. Our access is always our problem. The current situation of our farmers is very difficult especially bringing their products to the market. We from Barangay Matampay will support and help the road project. We will do our best to resolve any problems because this road project will help our community.	
2nd Public Consultations Mar. 7-8, 2018 Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	To present and validate the results of environmental impact assessment	Land	Monitoring	1. (Former Mayor Mohammadali Abboh Abinal, Marantao) Stated to provide copy of the proposal for Sub-Project 7 so that the LGU can monitor the status of the project. Because for so many years, the municipality is blind on the progress of the municipality, particularly road projects from the Provincial Government and DPWH.	1. Being part of the steering committee of Sub-Project 7, the requested will be noted and recommended to the proponent.
			Properties	2. (Mr. Waida Abbas, Piagapo) Who will file for the clearance of cutting trees?	2. The team explained that the contractor of DPWH will file for the clearance during the implementation.
		Socio/The People	Infrastructure (alignment)	3. (Kagawad Rabat Omar, Barangay Palao Ranaranao, Marantao) Can we utilized and align the proposed road project to the existing road to avoid the possible removal of properties or structures, and displacement of family. The proposed project is far from the community and the community could not benefit the proposed road.	3.The concerns will be noted and recommended to the proponent
				4. (Chairman Saidamen Naga of Barangay Daaningud, Marantao) He informed us that there is an on-going 600 meters road from Brgy. Bacong which is now 300 meters completed. There will be an overlapping to the proposed Sub-Project 7. Can we negotiate with DPWH to utilize the budget to other road project.	4. DPWH explained that this will be validated. The ROW standard of JICA will still be consider during the implementation.
				5. (Chairwoman Mamadra "Barang"Limbona of Barangay Matampay, Marantao) She stated that the Provincial Engineering Office (PEO) of Lanao del Sur visited the area and conducted a survey using drone camera last week. She added that the PEO team mentioned that Governor instructed them to inspect the realignment of the ring road project (four alternatives).	5. The team explained that there are four alternatives for Sub-Project 7. The alignment showed is the most viable and recommended by JICA and DPWH base on their assessment. Also, the team informed the chairwoman that the concerns will be noted and part of the recommendations to the proponent. This will be clarified and subject for verification with RAP team, and further recommendation with the proponent.

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
				She further added that the current alignment of the road is not beneficial to the community of barangay Matampay, and ask on the status of the conducted site visit of PEO team. (Mr. Khalid D. Rasuman, Saguiaran) He explained that he is the local guide during the RAP survey. He's concerns are the following: Brgy. Bacong – possible alignment of spring source beside mosque; Brgy. Pagalamatan – Affected two storey new constructed High School building; and Brgy. Bagoingud – Realign the proposed road to avoid the cemetery (between sta. 7+800 to 7+900) and the cultural heritage of Datu Ambiong Compound (between stat. 8+200 to 8+300).	
				6. (Barangay Chairman Faharodin Ampuan, Brgy. Mipaga Saguiaran) Requested to realign the road to NPC compound to avoid damage of property and utilize the land which is the source of income of the owner.	6. The concerns will be noted and recommended to the proponent.
				7. (Barangay Chairman Ramal Panacawan, ABC President, Piagapo) He informed the team that Abaca is the major source of income of the affected community, particularly Barangay Paling; portion of the alignment will affect the Abaca Plantation within the barangay.	7. The concerns will be noted and recommended to the proponent.
				8. (Former Mayor Mohammadali Abboh Abinal, Marantao) Stated to provide copy of the proposal for Sub-Project 7 so that the LGU can monitor the status of the project. Because for so many years, the municipality is blind on the progress of the municipality, particularly road projects from the Provincial Government and DPWH.	8. Being part of the steering committee of Sub-Project 7, the requested will be noted and recommended to the proponent.
				(Mayor Ali Sumandar, Piagapo) He mentioned that Piagapo is the major provider of the whole Lanao del Sur.	
				9. (Mr. Jamal Mague, Private Sector of Barangay Ratian) He informed us that there are 9 reservoir and source that will be affected by the road alignment; and might cause of shortage water supply.	9. DPWH explained that this concern will be subject for verification based on the results of the RAP survey, and will be informed the community on the results and recommendations.
				(Mayor Ali Sumandar, Piagapo) He reminded the participants to apply for a tax declaration to avoid issues and problems during the negotiation process of compensation. The tax from January 2018 onwards should be paid to obtain a tax declaration.	
				10. (Ms. Nor-asin Abdulrahim, Piagapo) She is not affected on the road alignment but ask if she also avail the above mentioned including the survey.	10. DENR CENRO Mangorak Macaunog said that owner should file so that you can claim amnesty for the property to received compensation.

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
			Utilities	11. (Mr. Waida Abbas, Piagapo) Who will file for the clearance of cutting trees?	11. The team explained that the contractor of DPWH will file for the clearance during the implementation.
			Livelihood	12. Mr. Kharis Miranda mentioned on the recommendations of livelihood program for the women/housewifes.	12. Mayor Sumandar suggested that all of the concerns will be should be informed to the barangays official so that this will be included in our monthly sessions.
			Project details	13. Barangay Chairman Adelaidah Decampong of Brgy. Papandayan Caniogan, Marawi requested to compensate the affected owner prior the implementation to avoid problems.	13. This will be noted and recommended to the proponent.
			Project details	14. (Mr. Talib Canayat, Marawi) Why Japan and not China is the funding agency of the project?	14. The team explained that the project is a national highway and the project proponent is DPWH Central Office. JICA has been supporting not only Philippines in rehabilitation and construction of road and bridges. We are very blessed that JICA include Lanao del Sur to be part of the master plan of the construction of new road network throughout the Philippines
			Project details	15. Engr. Zaiton Solaiman, Chief of City Planning & Design of Marawi inquired on the difference of ring road project and transition road project because he is not aware on the two ongoing study.	15. The team explained that they different project.
				16. Barangay Chairwoman Junaid Awar of Marawi inquired if the value of the affected land, crops and property will be the same from the other barangays and municipalities.	16. The team explained that the value will be the same; whatever is higher and acceptable to the community.

Source: JICA Study Team

1) Barangay Scoping

The barangay scoping meetings were held in 23 barangays within the direct affected community as shown in **Table 7.10.5-14**. These meetings discussed the project background and objectives, and the positive and negative impacts of the proposed project to the people, health, habitat, and among others. The major opinions of the participants are the process of land acquisitions and compensations as shown in **Table 7.10.5-15**. The queries and comments on the barangay scoping checklist was responded by the Study team.

Table 7.10.5-14 Contents of Stakeholder Meeting on Scoping Stage Barangay Level

Date (venues)	Objectives of the meeting	Major Agenda	Participants	No. of Participants		
				Barangay	Male	Female
Jan 16 to 18, 2018 March 5, 8, 2018 Barangay Hall	Barangay Scoping in accordance with Philippines EIA Guidelines	1. Inform and generate awareness and understanding of the concerned public about the project; 2. To gather and address the queries and concerns and provide responses and clarifications to queries on the proposed project; and 3. To identify the foreseeable positive and negative effect of the Project based on the barangay scoping matrix.	Barangay Officials, Project-Affected Persons (PAPs), RAP, and JICA Study Team	Piagapo		
				Bobo	9	15
				Paling	3	19
				Rantian	16	7
				Marantao		
				Matampay	8	26
				Daaningud	38	33
				Palao	12	14
				Bacong	15	5
				Saguiaran		
				Mipaga	12	13
				Bubong	8	7
				Pagalamatan	13	15
				Lumbaca Toros	4	9
				Bagoingud	6	13
				Alinun	4	12
				Linao	9	9
				Lombayanague	11	12
				Marawi		
				Boganga	7	28
				Banga	2	17
				Kilala	20	34
				Pantaon	13	2
				Dulay West	5	17
				Caniogan	3	8
				Guimba	38	40
				Rorogagus East	27	8

Source: JICA Study Team

Table 7.10.5-15 Major Opinions in Stakeholder Meetings on Scoping Barangay Level

Date and Objectives /Agenda	Item on EIA		Major Opinion	Answers (RAP, and JICA Survey Team's answers has been accepted and understood basically)
Jan. 16-18, 2018, and Mar 7-8, 2018 Barangay Scoping in accordance with Philippines EIA Guidelines 1. Introduce the project and discuss the project objectives and the positive and negative impacts of the project.	Social / The People	Labor	1. (Bobo) Is it possible that the people in our community can work or be hired during the construction/ implementation of the project?	1. This local hire will be one of the priority of the project which is part of the barangay scoping checklist considering that they are qualified on the job.
		Land and Properties	2. (Bobo) What will happen to the affected properties and land without land titles?	2. Based on Philippine Law's, this will be negotiated and compensated. The land owner should submit the necessary requirements such as the tax declaration or certified documents from the barangay officials and LGUs that you owned the land.
		Water Usage	3. (Paling) Check on the existing springs that are sourced for drinking water, cooking, bathing among others.	3. We will inform our hydrologist to validate the spring source if this will be along or can be affected by the road alignment.
		Labor	4. (Paling) Is it possible that the people in our community can work or be hired during the construction/ implementation of the project?	4. This local hire will be one of the priority of the project thru DPWH considering that they are qualified on the job.
		Realign ment	5. (Rantian) (Mr. Talib Diripo) Is it possible to realign the proposed road from barangay Rantian going Barangay Laling?	5. This will be noted and included on our report because currently we are in the study stage.
		Labor	6. (Rantian) (Messrs. Salic Mamacol and Cabugatan Macabangkit) Is it possible that the people in our community can work or be hired during the construction/ implementation of the project?	6. This local hire is the priority of the project considering that the local is qualified in the job. DPWH will be the implementing agency and thru barangay recommendations.
		Sanitation	7. (Rantian) (Mr. Ismael Abdul) My query is not connected with the project but I am hoping that JICA will consider my recommendation. The garbage from MSU are mostly thrown in the river and wash out going to Barangay Rantian during heavy rains. JICA might have a solution on this problem?	7. We will noted the issue and included in our recommendations to the proponent.
		Liveli hood	8. (Rantian) Do you have livelihood programs for the affected community?	8. This will be part of our recommendations to the proponent.
		Properties	9. (Palao) (Mr. Ostad Lawi Sampuan) What will happen to the affected houses that will be affected by the proposed road alignment?	9. This affected lands and properties will be negotiated and compensated following the Philippine Laws. The RAP team will conduct inventory and cut-off date with the supervision of the barangay officials. In absence of land titles and tax declarations, the barangay officials and Marantao Mayor will certify so that the landowner can apply a tax declaration to the Assessor's office.

Date and Objectives /Agenda	Item on EIA		Major Opinion	Answers (RAP, and JICA Survey Team's answers has been accepted and understood basically)
		Livelihood	10. (Palao) (Mr. Ostad Lawi Sampuan Can we put up a business near the construction sites and after the construction of the road?	10. All is welcome to put up a business on the safest area of the construction sites with permission from DPWH for the safety of the business owners. You can also put business beside the road after the construction.
		Labor	11. (Palao) (Mr. Ostad Lawi Sampuan) Is it possible to apply as worker?	11. Yes, local hires is the priority of the project thru the barangay and DPWH considering that they are qualified in the job.
		Lands and Properties	12. (Palao) (Mr. Ostad Lawi Sampuan) How far is the proposed road alignment from the community of barangay Palao?	12. Majority of the affected in along Palao are farm lands. Based on the development map, the alignment is far from the community.
			13. (Palao) (Mr. Mino Lomano) If theres a possibility that there will be properties, lands, and crops affected, we are willing to be paid.	13. The Resettlement action plan (RAP) team will conduct an inventory process with the supervisions of the barangay officials. This identified landowners will be compensated based on the type of properties, area of the land that is affected by the alignment. The land owner should submit the proper requirements such as the tax declaration or certified documents from the barangay officials and LGUs that you owned the land and properties among others.
		Labor	14. (Bacong) (Mr. Jamal Guro) Is it possible that our youth can work or be hired during the construction/ implementation of the project.	14. This local hire is the priority of the project. DPWH as implementing agency will follow the DOLE guidelines to hire 18 years old and above, and qualified in the job.
		Land and Properties	15. (Bacong) (Mr. Solaiman Macabalang) What will happen to the affected land and properties?	15. The RAP team will conduct an inventory on the affected properties and land along with the supervision of the barangay officials to certify that they are the landowners. Proper documentation should be the requirements for the claims such as the certificate of land titles or tax declaration.
		Labor	16. (Daaningud) Is it possible that the people in our community can work or be hired during the construction/ implementation of the project?	16. This local hire will be one of the priority of project thru DPWH and barangay officials considering that they are qualified on the job.
		Land and Properties	17. (Daaningud) (Mr. Juhari Abinac) What will happen to the affected properties and land that will be affected by the proposed road alignment?	17. The Resettlement action plan (RAP) team will identify the affected landowner thru an inventory process with the supervisions of the barangay officials. This identified landowners will be compensated based on the type of properties, area of the land that is affected by the alignment. The land owner should submit the proper requirements such as the tax declaration or certified documents from the barangay officials and LGUs that you owned the land and properties among others.

Date and Objectives /Agenda	Item on EIA		Major Opinion	Answers (RAP, and JICA Survey Team's answers has been accepted and understood basically)
		Land and Properties	18. (Matampay) (Mr. Mohammad Hajidaod) What will happen to the affected land and houses that will be affected by the proposed road alignment?	18. This affected lands and properties will be compensated following the Philippine Laws. The other team will identified along the supervision of the barangay officials. In absence of land titles, the barangay officials will certify so that the landowner can apply a tax declaration to the Assessor's office.
		Labor	19. (Matampay) (Ms. Mohmena Ditingki) Is it possible that the people in our community can work or be hired during the construction/ implementation of the project?	19. This local hire is the priority of the project thru DPWH considering that they are qualified in the job. The DPWH is the implementing agency of the ring road project, local hire should apply thru the barangay and recommended to the DPWH.
		Land and Properties	20. (Matampay) (Mr. Juhari Abinac) What will happen to the affected properties and land that will be affected by the proposed road alignment?	20. The Resettlement action plan (RAP) team will identify the affected landowner thru an inventory process or cut off dates with the supervisions of the barangay officials. This identified landowners will be compensated based on the type of properties, area of the land that is affected by the alignment. The land owner should submit the proper requirements such as the tax declaration or certified documents from the barangay officials and LGUs that you owned the land and properties among others.
		Farm to Market road and Bridge	21. Matampay Barangay Chairwoman Limbona requested a farm and market road starting from the MSUI highway across the proposed ring road project to the barangay hall of Matampay. This farm and market road can be used for the emergency and transportation of products to the market. Majority of the farm land located in the barangay proper. She further requested to construct a small bridge along the river (refer photos below) for the people of barangay Matampay.	21. This requested will be recommended to the proponent and part of the report.
		Land and crops	22. (Pagalamatan) (Ms. Aguimah Rambago Gariel) What will happen to the affected crops and land?	22. The RAP team will conduct inventory and cut off dates with the supervision of the barangay officials. The affected land owner should submit tax declaration or land titles which is the proper documents for claims. Those without land titles will ask support from the barangay officials and Mayor's office for a certification of ownership. This certification will be applied to the assessor's office for a tax declaration.

Date and Objectives /Agenda	Item on EIA		Major Opinion	Answers (RAP, and JICA Survey Team's answers has been accepted and understood basically)
		Water Usage	23. (Alinun) (Haji Said Manaradumagay) We have Pansor Spring near the proposed road alignment which supplied drinking and other uses for four (4) barangays including Barangay Alinun. This spring also a tourist spot. Can we check if the spring can be affected by the project?	23. This spring will be verified by our hydrologist and will be included in our report.
		Labor	24. Bagoingud Barangay Chairman Maning Dalupan stated that portion of the work labor will be coming from the barangay.	24. Recommendations from the barangay chairman and labors should be qualified in the job. The age will be 18 and above to follow guidelines of DOLE.
		Compensation	25. He added that the compensation of the owner should be prior the project implementation.	25. DPWH will be the implementing agency and will handle the compensation of the affected.
		Labor, and affected Land and Properties	26. (Bubong Barangay Chairman Mackil Ali) What will happen to the affected land and would it be possible local hire in the community?	26. The RAP team will conduct inventory and cut off dates with the supervision of the barangay officials. The affected land owner should tax declaration or land titles. Those without land titles will ask support from the barangay officials and Mayor's office for a certification of ownership. This certification will be applied to the assessor's office for a tax declaration. This is part of the process for the claims of compensations. For local hire, this will be the priority of the project thru DPWH as implementing agency. I would suggest that local should apply from the barangay considering that they are qualified to the job.
		Re-alignment	27. (Linao) What will happen to the cemetery along the alignment of the proposed road? Is it possible to reroute the alignment?	27. During the conduct of inventory of the RAP team. If there will be heritage such as cemetery will be affected by the proposed road. The RAP team will recommend to the proponent on the rerouting of the road. We respect the culture of the community.
		No proof of ownership	28. (Lumbayanague) (Mr. H. Nasser R. Dalupang and Abubakar Jalacubin) What will happen to the affected property without land titles?	28. This affected lands and properties will be negotiated and compensated following the Philippine Laws. In absence of land titles, the barangay officials and Saguiaran Mayor will issue certification to the landowner to apply for a tax declaration to the Assessor's office.
		No proof of ownership	29. (Lumbayanague) (Ms. Salie Hakayo) In addition, what will happen to the lease land without land titles that will be affected by the alignment of the proposed road alignment?	29. The RAP team will conduct an inventory to the affected lands along the alignment. There will be a negotiation process for the affected lands and properties thru LGU officials and DPWH.

Date and Objectives /Agenda	Item on EIA		Major Opinion	Answers (RAP, and JICA Survey Team's answers has been accepted and understood basically)
		Re-alignment	30. (Mipaga) (Messrs. Kadi Aslima Mikunug, Kadi Madali Malik, Ibrahim Dimacaling) We are suggesting that the proposed road alignment will reroute at NPC area because majority of the lands in Barangay Mipaga are owned by NPC. Our community will majority lost their property and land if this alignment will be implemented.	30. This will be noted and included on our report because currently we are in the study stage.
		Labor	31. (Mipaga) (Barangay Chairman) Is it possible that the people in our community can work or be hired during the construction/ implementation of the project?	31. This local hire is the priority of the project considering that the local is qualified in the job. DPWH will be the implementing agency and thru barangay recommendations.
		Labor	32. Boganga Brgy. Chairman Macacuna Yusoph suggested to prioritized workers for the road construction is coming from the communities because mostly the source of income of his constituents are business within the most affected area (MAA) in Marawi siege.	32. This will be noted and included in the report. Barangay chairman has a major duty in recommending the workers considering that they are fit and capable on the job.
		Livelihood	33. (Boganga) Mrs. Ricah M. Yusok, wife of Brgy. Chairman Yusok, requested livelihood program	33. This will be part of our recommendations to the proponent.
		Compensation	34. Banga Barangay Chairman Junaid Awar requested the following: • Compensation should be paid in front of the landowner and barangay officials; • Avoid different value from the other barangays or municipalities;	34. • DPWH will be the implementing agency and will handle the compensation of the affected landowner. • DPWH will validated the submitted survey results and basis of the cost computations of RAP team. The value will depend on the affected properties, structures and should be the same to value to every affected communities.
		Livelihood	• Livelihood program for the housewife to help their husband which is majority are farmers; and	• This will be part of our recommendations to the proponent.
		Labor	• Worker from the barangay during the implementation of the road.	• This local hire will be one of the priority of the project which is part of the barangay scoping checklist considering that they are qualified on the job.
			35. Kilala Barangay Councilor Aminola Mamli said that during the RAP inventory, the alignment will not traverse the barangay.	35. This will be noted and subject for verification by DPWH for the exact affected barangay.
		Farm to Market	36. Pantaon Barangay Chairman Khalil Rascal said that majority of the affected are land because the alignment is far from the community. He requested the following: • Farm to Market road (Brgy. Pantaon to Brgy. Papandayan);	36. • This will be part of our recommendations to the proponent.

Date and Objectives /Agenda	Item on EIA		Major Opinion	Answers (RAP, and JICA Survey Team's answers has been accepted and understood basically)
		Livelihood	• Livelihood program for the women;	• This will be part of our recommendations to the proponent.
		Labor	• Worker from the community during the implementation of the road; and	• This local hire is the priority of the project. DPWH as implementing agency will follow the DOLE guidelines to hire 18 years old and above, and qualified in the job.
		Compensation	• Negotiation with the landowners with regards to the compensation on the affected land and crops; and	• DPWH will be the implementing agency and will handle the compensation of the affected landowner.
		Infrastructure	• Health center.	• This will be part of our recommendations to the proponent.
			Wife of Dulay West Barangay Chairman, Ms. Camama Janisah, said that the animals like cow, goat and chicken are lost after the Marawi siege. They return in their homes on Dec. 9, 2017 with nothing and lost their sower machines. She added that majority of the women's are sower and one of the supplier of "kumbong" for the whole Lanao del Sur. She further added that they have lost everything after the Marawi siege, and at present, the women's have no income and capital.	
		Labor	37. (Dulay West) Mrs. Tempo Unti requested that worker for the construction should be from their barangays because majority of their husbands are farmers. She added that after their return, her husband start a small garden for their food same as the others.	37. This local hire is the priority of the project. DPWH as implementing agency will follow the DOLE guidelines to hire 18 years old and above, and qualified in the job.
		Livelihood	38. (Dulay West) Ms. Nor-ain Didato requested JICA to donate sower machines for the women and cash support to buy cloth for a new start.	38. This will be part of our recommendations to the proponent.
			39. (Caniogan) Ms. Kintawan Samira requested livelihood projects for the affected families of Marawi siege.	39. This will be part of our recommendations to the proponent.
		Water Usage	40. (Caniogan) Chairwoman Adelaida Decampong requested rehabilitation of deep well and additional water supply for the barangay.	40. This will be part of our recommendations to the proponent.

Date and Objectives /Agenda	Item on EIA		Major Opinion	Answers (RAP, and JICA Survey Team's answers has been accepted and understood basically)
		Livelihood	41. (Caniogan) Dra. Rubina Macabunar, Civil Society, said that she will support assistance on any livelihood projects to be provided by JICA. Because it's her advocacy to lifted the life of the single mothers in their barangay.	41. This will be noted and part of our recommendations to JICA.
		Compensation	42. (Guimba) Barangay Chairman Hadji Nassif Pundamdag asked if what will be included in the compensation with the same value like the other barangays and municipalities.	42. DPWH will be the implementing agency and will handle the compensation of the affected landowner.
		Properties	43. (Guimba) Barangay Kagawad Asnawi Padoman Daud requested on the list of landowner that will be affected by the proposed road and exact map of the surveyed road alignment by RAP team.	43. The list will be presented by RAP team to the affected barangay upon the profiling of the affected landowners are completed.
			44. (Guimba) Mr. Abdul Daud said the landowner is not present during the inventory. There are hearsay that the land of his father and mother is within the alignment. This issue should be confirmed so that the landowner will be notified by the barangay officials if they are willing to be paid to avoid problems prior the compensation schedule.	44. This will be noted and recommended to RAP team, DPWH and JICA.
		Water Usage	45. (Guimba) Barangay Kagawad Asnawi Daud requested to have additional reservoir and improvement of water system and distribution lines. He said that the water source of the barangay is spring.	45. This will be part of our recommendations to the proponent.
		Livelihood	46. (Guimba) Ms. Rica Pidao requested livelihood program for the housewives.	46. This will be part of our recommendations to the proponent.
			47. (Rorogagus East) Barangay Chairman Yashier Batabor said that their barangay is not included in the alignment based on the results of the RAP survey. His requested are the following:	47.
		Livelihood	• Livelihood for the community;	• This will be part of our recommendations to the proponent.
			• Need food supply for the returnee residence after the Marawi siege;	• This will be part of our recommendations to the proponent.
		Water Usage	• Improvement of water system to be source from Rorogagus river; and	• This will be part of our recommendations to the proponent.
		Labor	• Worker from the barangay during the implementation of the road.	• This local hire is the priority of the project. DPWH as implementing agency will follow the DOLE guidelines to hire 18 years old and above, and qualified in the job.

Source: JICA Study Team

7.10.6 Summary of Environmental Impact Assessment (EIA) for Sub-Project 8

(1) Description of the Project Components

The Project Components are described in **Chapter 13**.

(2) Baseline of the Environmental and Social Condition

Baseline of the Environmental and Social Condition is described in **Chapter 13** and **Section 7.2**.

(3) Laws, Regulations, and Organizations related to Environmental and Social Considerations for EIA

Laws, Regulations, and Organizations related to Environmental and Social Considerations for EIA are described in **Section 7.1** and **Section 7.3.1**.

(4) Analysis of Alternative Alignments

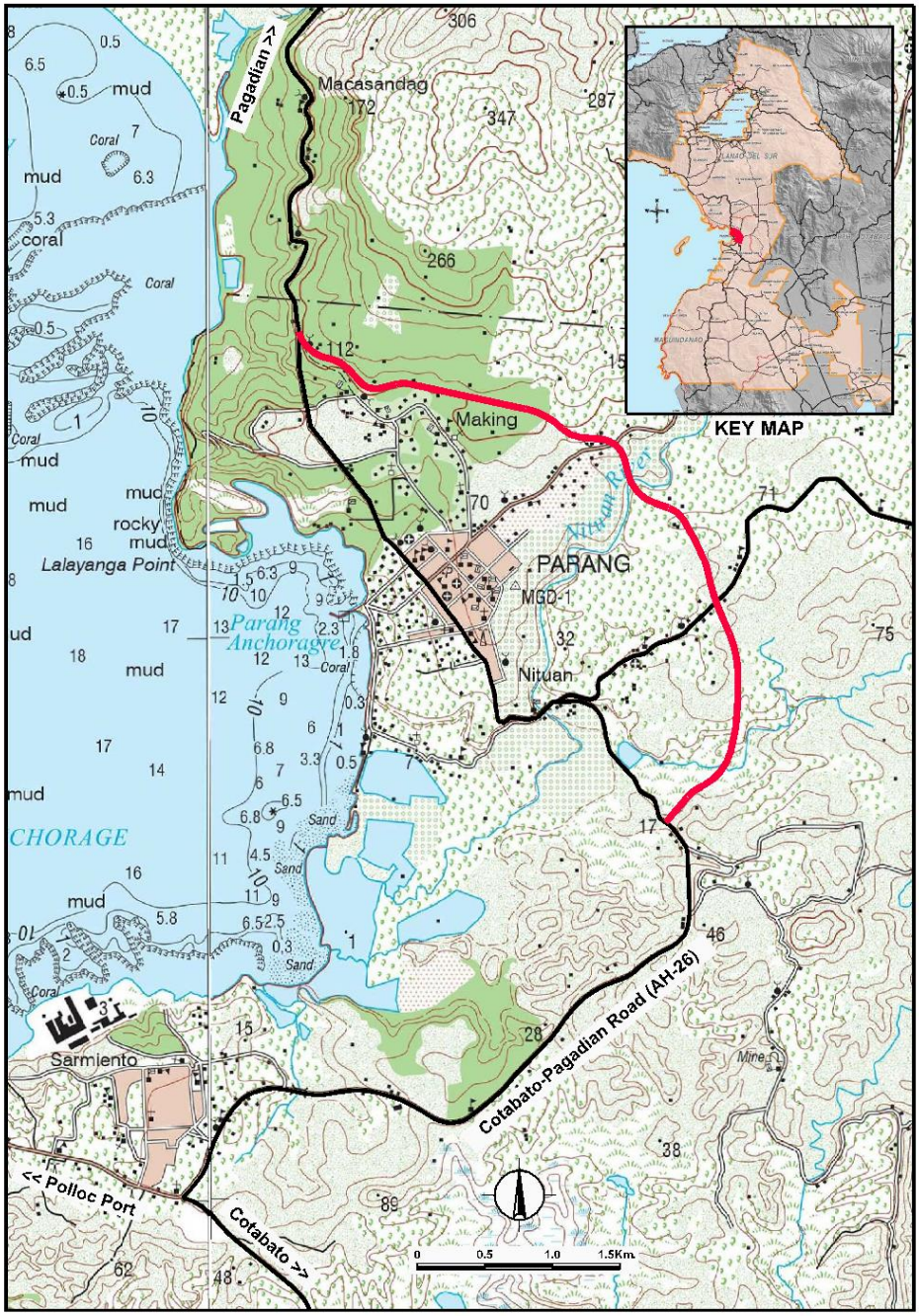
The comparative analysis of alternatives was described in **Chapter 12** and **Chapter 14**. The summary is shown below.

1) Alignment Selection Criteria

The criteria for alignment selection are as follows;

- Length, Construction Cost, Construction period (road length, no of bridges and culverts,etc.)
- Economic Impact (population along the alignment, agricultural land areas to be served, etc.)
- Environmental Impact (high-filling section length, high-cutting section length, no. of buildings to be affected)
- Technical feature (total no. of curves no. of curves < 300m, length of vertical grade >= 5%)

Figure 7.10.6-1 shows the recommended alignment for the road.



Source: JICA Study team

Figure 7.10.6-1 Recommended Alignment

2) Zero option

The zero option (with / without Sub-Project) of this project is shown in **Chapter 11** and **Chapter 22**.

(5) Scoping and Survey item for Environmental and Social Considerations Survey

Scope of the EIA study for the project is discussed in this section. The environmental scoping is conducted based on an environmental reconnaissance by the JICA Survey Team.

The result of scoping is indicated on the Leopold scoping matrix and reason tables as shown in **Table 7.10.6-1** and **Table 7.10.6-2**.

The scoping matrix below shows the impact factors, impacted item and impact degree based on JICA's guidelines and Philippine items. According to the scoping matrix, majority of the items or sixteen (16) items are rated as "B-" (Some impact is expected) due to huge earth work volume and significant social impacts, No.14 (The poor) is rated as "B+/-" (Some impact is expected), four (4) items are rated as "C" (unknown impact is expected) and nine (9) are rated as "D" (Few impacts are expected).

Table 7.10.6-1 Draft Scoping Matrix Based ion JICAs Guidelines and Philippines Items

	No	Impact Items (JICA)	(Philippines)	Overall Rating	Pre/ During Construction Phase: Land acquisition and Loss of properties	Change of Land use plan, Control of various activities by regulations for the construction	Reclamation of Wetland, etc.	Deforestation	Alteration to ground by cut land, filling, drilling, tunnel, etc.	Operation of Construction Equipment and Vehicles	Construction of Roads, tollgates, parking lots, Access roads for bridges and other related facilities	Traffic Restriction in construction area	Influx of construction workers, construction of base camp	Operation Phase: Increase of Through Traffic	Appearance/ Occupancy of Roads and related building structures including tunnel and embankment	Increasing influx of settlers
Pollution	1	Air Pollution	Air quality & noise	B-	D	D	D	B-	B-	B-	B-	B-	B-	B-	B-	D
	2	Water pollution	Water quality	B-	D	D	D	D	B-	B-	B-	D	B-	D	D	D
	3	Waste	Abandonment	B-	D	D	D	B-	B-	B-	B-	D	B-	D	D	D
	4	Soil contamination	Soil quality/fertility	B-	D	B-	B-	D	B-	B-	B-	D	B-	D	D	D
	5	Noise and Vibration	Noise	B-	D	D	D	B-	B-	B-	B-	B-	B-	B-	B-	D
	6	Ground Subsidence	Subsidence/ collapse	D	D	D	D	D	D	D	D	D	D	D	D	D
	7	Odor		D	D	D	D	D	D	D	D	D	D	D	D	D
	8	Sediment quality	Soil quality	B-	D	D	D	D	B-	D	B-	D	D	D	D	D
Natural Environment	9	Protected Area	Environmentally Critical Areas (ECAs)	D	D	D	D	D	D	D	D	D	D	D	D	D
	10	Ecosystem	Terrestrial Biology Freshwater or marine ecology	B-	B-	B-	D	B-	B-	C	B-	D	B-	D	B-	B-
	11	Hydrology	Hydrology and oceanography	B-	D	D	B-	D	B-	D	D	D	D	D	B-	D
	12	Topography and geology	Geography, topography and landslides	B-	D	D	B-	D	B-	D	D	D	D	D	D	D
Social Environment	13	Involuntary resettlement	People	B-	B-	D	D	D	D	D	B-	D	D	D	D	D
	14	The poor	People	B+/ B-	B +/B-	D	D	D	D	D	B+/ B-	D	D	D	D	C
	15	Indigenous and ethnic people	Indigenous people (IPs)	D	D	D	D	D	D	D	D	D	D	D	D	D
	16	Local economy such as employment and livelihood	People	B-	D	D	D	D	D	D	B-	D	B-	D	D	C
	17	Land use and utilization of local resources	Land use and classification	B-	D	B-	D	D	D	D	D	D	B-	D	D	B-
	18	Waste Usage	Hydrology / Hydrogeology/ Water quality	B-	D	D	D	D	D	D	D	D	B-	D	D	D

	No	Affected Activities / Impact Items (JICA)	(Philippines)	Overall Rating	Pre/ During Construction Phase: Land acquisition and Loss of properties	Change of Land use plan, Control of various activities by regulations for the construction	Reclamation of Wetland, etc.	Deforestation	Alteration to ground by cut land, filling, drilling, tunnel, etc.	Operation of Construction Equipment and Vehicles	Construction of Roads, tollgates, parking lots, Access roads for bridges and other related facilities	Traffic Restriction in construction area	Influx of construction workers, construction of base camp	Operation Phase: Increase of Through Traffic	Appearance/ Occupancy of Roads and related building structures including tunnel and embankment	Increasing influx of settlers
	19	Existing social infrastructures and services	People	**B-**	**B-**	D	D	D	D	D	**B-**	D	D	D	D	**B-**
	20	Social institutions such as social infrastructure and local decision-making institutions		D	D	D	D	D	D	D	D	D	D	D	D	D
	21	Misdistribution of benefit and damage		D	D	D	D	D	D	D	D	D	D	D	D	D
Social Environment	22	Local conflict of interests	People	**C**	D	**C**	D	D	D	D	D	D	D	D	D	D
	23	Cultural Heritage	People	**C**	**C**	D	D	D	D	D	**C**	D	D	D	D	D
	24	Landscape		D	D	D	D	D	D	D	D	D	D	D	D	D
	25	Gender		D	D	D	D	D	D	D	D	D	D	D	D	D
	26	Right of Children		D	D	D	D	D	D	D	D	D	D	D	D	D
	27	Infectious diseases such as HIV/AIDS	People	**C**	D	D	D	D	D	D	D	D	**C**	D	D	D
	28	Labor environment (including work safety)		**B-**	D	D	D	D	D	D	**B-**	D	**B-**	D	D	D
Others	29	Accidents	Traffic situation	**B-**	D	D	D	D	D	**B-**	D	**B-**	C	**B-**	D	D
	30	Cross Boundary impacts and climate change	Meteorology / Climatology	**C**	D	D	D	**C**	D	D	D	D	D	**C**	D	D

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

Table 7.10.6-2 Reasons for Draft Scoping

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating: Pre/During Construction	Rating: Operation Phase	Reasons of the Rating
Pollution	1	Air pollution (Air quality & noise)	**B-**	**B-**	**Construction phase:** Temporary negative impacts are expected on air quality due to fugitive dust emissions from construction activities such as land clearing, grading, excavation, and the transport and movement of construction materials.
					Operation phase: Negative impacts on air quality are expected due to emission from vehicles passing on the new road.

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/During Construction	Operation Phase	
	2	Water pollution (Water quality)	**B-**	D	**Construction phase:** Domestic wastewater will be generated from construction workers. Surface water will become turbid due to solids generated from earth works and drilling in the site. Oil and grease and petroleum hydrocarbons may pollute water that may come from vehicles and construction equipment. **Operation phase:** No serious impacts are expected.
	3	Waste (Abandonment)	**B-**	D	**Construction phase:** Construction waste such as waste soil and cutting trees are expected to be generated by deforestation, cutting, land clearing and drilling. Solid wastes from construction workers may be generated from construction base camp. Hazardous wastes such as busted lamps, used oil, used paints etc. maybe generated from construction site. **Operation phase:** No serious impacts are expected
	4	Soil contamination (soil quality)	**B-**	D	**Construction phase:** Removal of vegetation may affect the soil quality due to oil & grease and petroleum hydrocarbon contamination from construction equipment and vehicles. **Operation phase:** No serious impacts are expected.
	5	Noise (Noise)	**B-**	**B-**	**Construction phase:** Increased noise levels will be significant due to heavy construction vehicles moving to and from the site, drilling and excavation activities. **Operation phase:** Noise generation is expected by vehicles passing on the new road.
	6	Ground subsidence (Subsidence)	D	D	No impacts are expected. There will be no groundwater extraction during the construction and operation activities.
	7	Odor	D	D	Few impacts are expected. Obnoxious odor may come from vehicle exhaust, clearing & dredging of river banks.
	8	Sediment quality (Soil quality)	**B-**	D	**Construction phase:** Surface water runoff which may have caused the sediment transport is expected during construction activities due to earthworks, land clearing, excavation etc. **Operation phase:** Road operation which causes impacts on sediment quality is not expected.
Natural environment	9	Protected area (ECAs)	D	D	**Construction and operation phase:** No protected area such as designated conservation zone is observed in the project affected area.
	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	**B-**	**B-**	**Construction and Operation phase:** With the implementation of the project, during the construction phase, land clearing and topography alteration will require removal of existing vegetation cover within the road Right of way. Clearing of remaining vegetation will also possibly affect remaining wildlife and its habitats to give way for the construction of road project. Impacts of the project will be assessed based on the result of the terrestrial survey and to be able to come up with apt recommendations to mitigate such impacts. The result of the survey also serves as the basis for monitoring during the Operation phase.
	11	Hydrology (Hydrology and oceanography)	**B-**	**B-**	**Construction Phase:** Rating B- under Reclamation of Wetland, etc. - Extent of impact is unknown. The road alignment may not cross wetland and/or swamps. In case the final road alignment will traverse the wetlands, survey and analysis should be done to make sure that the road network will not hamper the natural flow of water prior to the road construction. **Construction and Operation Phase** Rating B- under Alteration to ground by cut land, land filling, drilling, tunnel, etc. - Some impact is expected. The proposed road will traverse through generally flat terrain and rolling grounds drainage impact is expected. This may change the drainage flow to other directions and may cause flooding in some areas. Flooding that is expected maybe due to rainwater flow restrictions and natural blocking of surface water runoff in the construction site.
	12	Topography and geology (Geography, topography and landslides)	**B-**	D	**Construction and Operation Phase**: Earthworks such as land filling and land cutting would affect the topographic condition along the proposed road alignment. Risk associated with landslides maybe expected in sections passing steep terrain. Slope protection measures could be necessary during the operation phase. No protected geological site is located in the project area.

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/During Construction	Operation Phase	
Social Environment	13	Involuntary resettlement	**B-**	D	**Pre-Construction Phase:** Settlements and private lands will be acquired to give way for the road construction. This will cause involuntary resettlement (physical and economic) **Operation Phase:** No impact is expected since it was already settled during pre-construction period
	14	The poor	**B+/-**	**C**	**Construction Phase:** Serious impacts (positive/negative) is expected considering the socio-economic condition of the community in the project. area. Negative impacts include the loss of livelihood for the poor who depends on farming. Positive impact it will provide the poor opportunities for work **Operation Phase:** Extent of impacts are still unknown but looks forward to easier access of the poor to public services
	15	Indigenous and ethnic people	**D**	**D**	**Construction and Operation Phase**: The existence of indigenous people has not been confirmed in project area. No impacts are expected.
	16	Local economy such as employment and livelihood	**B-**	**C**	**Pre-Construction phase:** Livelihood of residents and farmers may be affected by resettlement and acquisition of agricultural area **Operation Phase:** Few impacts are expected.
	17	Land use and utilization of local resources	**B-**	**B-**	**Pre-Construction phase:** Some agricultural areas will be affected by the project. **Operation Phase:** Roadside area may be developed as commercial or industrial area in non-designated land use area. Such unplanned development and influx of new settlers may give impact on land use and local resources.
	18	Waste Usage	**B-**	D	-
	19	Existing social infrastructures and services	**B-**	**B-**	**Pre-construction and Construction Phase:** Affected government facilities such as irrigation canals need to be considered. **Operation Phase:** No impact is expected.
	20	Social institutions such as social infrastructure and local decision-making institutions	D	D	Impacts are not expected, since local decision-making institute represented by local governments will continue after the road construction.
	21	Misdistribution of benefit and damage	D	D	Misdistribution of benefit and damage caused by the road constructions not expected.
	22	Local conflict of interests	**C**	D	**Construction Phase:** Local inhabitants and local authorities may request to ensure job opportunities as construction workers. **Operation phase:** No impact is expected.
	23	Cultural Heritage	**C**	D	**Pre-construction and Construction Phase:** No cultural heritage affected
	24	Landscape	D	D	Construction Phase: Few impact is expected
	25	Gender	D	D	Negative impact specified for women are not expected
	26	Right of Children	D	D	Negative impact specified for children are not expected
	27	Infectious diseases such as HIV/AIDS	**C**	D	**Construction Phase:** Infectious diseases such as STD are possible to be spread due to inflow of construction workers. Furthermore, alteration to ground by cut land and filling may provoke to provide habitats of mosquito that possibly transmits dengue fever **Operation phase:** Road operations which causes infectious diseases are not expected
	28	Labor environment (including work safety)	**B-**	D	**Construction Phase:** Construction work environment needs to be considered in accordance with relevant laws and regulations **Operation phase:** No impact is expected.

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/During Construction	Operation Phase	
Others	29	Accidents (Traffic situation)	**B-**	**B-**	**Construction Phase:** Construction vehicles may use existing local road near residential areas, thus number of traffic accident. **Operation phase:** Quantitative analysis based on baseline survey
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	**C**	**C**	**Construction phase:** Deforestation for land clearance may give impact on cross boundary impacts and climate change. **Operation phase:** Greenhouse gas emissions from vehicles that pass by along the new roads maybe generated which will have an impact in the protection of ozone layer as a result of climate change.

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

Table 7.10.6-3 Baseline Survey and Forecast Analysis for Draft Scoping

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre//During Construction	Operation Phase		
Pollution	1	Air pollution (Air quality & noise)	**B-**	**B-**	--Site measurement (2 sites) TSP,PM_{10}, NO_2 and SO_2 -Secondary data collection, if any	**Construction Phase:** Qualitative analysis **Operation Phase:** -Quantitative analysis (PM_{10}, NO_2, and SO_2) (Puf model : calm wind model)
	2	Water pollution (Water quality)	**B-**	D	-Site measurement (2 sites: river water) DO, TSS, BOD, COD, pH, Total/Fecal Coliform, temperature -Secondary data collection, if any	**Construction Phase:** Qualitative analysis
	3	Waste (Abandonment)	**B-**	D	Review of specification on design and construction plan	**During Construction Phase:** Quantitative analysis of volume of cutting trees by type and excavated or drilling soil and muck
	4	Soil contamination (soil quality)	**B-**	D	Review of specification on design and construction plan	**During Construction Phase:** Qualitative analysis
	5	Noise and vibration (Noise)	**B-**	**B-**	Noise -Site measurement (2 sites) $L_{Aeq,\ 10min}$ weekday (in accordance with DENR regulation) -Secondary data collection, if any	**During Construction Phase:** Qualitative analysis based on construction machines on standard formation ---------- **Operation Phase:** - Quantitative analysis(ASJ RTN-Model 2013)
	8	Sediment quality (Soil quality)	**B-**	D	Literature survey (land use history on affected land of the project)	**During Construction Phase:** Qualitative analysis base on the literature survey
Natural environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	**B-**	**B-**	Literature survey and site survey for fauna and flora. (5 sites)	**During construction and operation phase:** Qualitative analysis base on the literature survey, site survey and construction plan & traffic volume in the future
	11	Hydrology (Hydrology and oceanography)	**B-**	**B-**	Literature survey and referring to hydrographic and geological survey result on feasibility study and designing	**During construction and operation phase:** Quantitative analysis on following items base on the hydrographic analysis for bridge and drainage designing. - Impact on hydrological situation on the rivers and streams - Impact on water vein underground - Impact on flooding situation

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/During Construction	Operation Phase		
	12	Topography and geology (Geography, topography and landslides)	**B-**	D	Literature survey and topographic survey for designing	**During construction and operation phase:** Qualitative analysis base on the topographic analysis for designing
	13	Involuntary resettlement (People)	**B-**	D	Literature survey and a series of RAP surveys	**During construction phase:** Quantitative analysis based on RAP surveys
Social environment	14	The poor (People)	**B+/-**	**C**	Literature survey and a series of RAP surveys	**During construction phase:** Quantitative analysis based on RAP surveys
	16	Local economy such as employment and livelihood (People)	**B-**	**C**	Literature survey and a series of RAP surveys	**During construction phase:** Qualitative analysis based on RAP surveys
	17	Land use and utilization of local resources (Land use and classification)	**B-**	**B-**	Literature survey and a series of RAP surveys	**During construction phase:** Quantitative analysis based on RAP surveys (area of land acquisition by land use)
Social environment	18	Water usage (Hydrology / Hydrogeology/Water quality)	**B-**	D	Literature survey, geological survey and water usage survey (identification of springs and wells around tunnel and cutting land areas based on the data from RAP survey)	**During construction phase:** Qualitative analysis base on the baseline survey for following items - Impact on springs and wells - Impact on watershed area
	19	Existing social infrastructures and services (People)	**B-**	**B-**	Literature survey and a series of RAP surveys	**During construction and operation phase:** Quantitative analysis based on RAP surveys
	22	Local conflict of interests (People)	**C**	D	Collection of information and opinions in stakeholder meeting(s)	**During construction:** Qualitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
	23	Cultural heritage (People)	**C**	D	Literature survey, a series of RAP surveys and collection of local information through stakeholder meeting(s)	**During construction:** Quantitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
	27	Infectious diseases such as HIV/AIDS (People)	**C**	D	Literature survey and collection of local information through stakeholder meeting(s)	**During construction phase:** Qualitative analysis based on baseline survey. Followings impacts are considered - Risks of HIV/AIDS - Risks of dengue fever - Other specific infection disease
	28	Labor environment (including work safety)	**B-**	D	Literature survey, a series of RAP surveys and collection of local information through stakeholder meeting(s)	**During construction:** Quantitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
Others	29	Accidents (Traffic situation)	**B-**	**B-**	Collection of traffic accident data from police station	**During construction and operation phase::** Quantitative analysis based on baseline survey
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	**C**	**C**	-Estimation of affected forest area and traffic conditions based on the project plan	**During construction and operation phase::** Quantitative analysis based on baseline survey

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

(6) Summary of Baseline Survey, Forecast and Impact Assessment

The summarized result of baseline survey and forecast of impacts are shown in **Table 7.10.6-4**. The baseline data and quantitative forecast value is shown in **Table 7.10.6-5**, and survey points of air & noise and water quality is shown in **Table 7.10.6-6**.

In terms of pollution items such as air, water and noise, all the forecasted values are within the allowable limits, thus it is not likely give serious impact in these items. However, construction waste soil from cutting land and drilling in the tunnel section shall be reused or disposed in appropriate designated disposal site.

With regard to IUCN List, although some species are identified through the baseline survey on flora and fauna, these species are distributed around the around the Sub-Project area. The estimated numbers of resettlers are 120, appropriate compensation and mitigation measures are necessary on the resettlement action plan.

Table 7.10.6-4 Result of baseline and Forecast on Main Items

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
Pollution	1	Air Pollution (Air Quality & Noise)	B-	B-	B-	B-	Result of (TSP, PM10, SO2, NO2) at 2 stations are below the standard values (See **Table 7.10.6-6**)	Forecast value do not exceed standard values	Expected impacts by the project are not significant because all the forecasted values are within the standard values Quantitative Standards as shown in **Table 7.10.6-5..**
	2	Water pollution (water Quality)	B-	D	B-	D	Result of (pH, Temp, BOD, TSS, DO) are within the criteria guidelines (See **Table 7.10.6-6**)	Forecast value do not exceed standard values	Expected impacts by the project are not significant because all the forecasted values are within the standard values Quantitative Standards is shown in **Table 7.10.6-5.**
	3	Waste	B-	D	B-	D	Not required	Clearing and deforestation activities are expected to generate construction waste such as soil, debris, cut trees Also, additional domestic waste may be generated from the construction camp.	Impacts can be mitigated by proper management and disposal of waste like practice ecological waste management, segregation at source, 3R, etc
	4	Soil Contamination (Soil Quality)	B-	D	B-	D	Not required	Soil maybe contaminated from the construction equipment and transportation.	Impacts can be mitigated by proper maintenance of equipment and transportation, proper containment and disposal of oil, etc
	5	Noise	B-	B-	B-	B-	There are some measurement of noise that exceeded the standard particularly during the night due to presence of insects like crickets that make noise during the dark (See **Table 7.10.6-6**)	Forecast value exceed Philippines standard values (Class A (General)), but the value do not exceed Japanese standard values (Class B2). (See **Table 7.10.6-6**)	Impacts may be mitigated by avoidance and other measures such as no construction during the night or use of muffler or sound proof barrier. Quantitative Standards is shown in **Table 7.10.6-5.**

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
	6	Ground Subsidence	D	D	D	D	The ground terrain is characterized by low relief and gently undulating to rolling topography.	No impact is expected.	Detailed quantitative survey is not necessary.
	7	Odor	D	D	D	D	Not required	Few impacts are expected. Obnoxious odor may come from vehicle exhaust, clearing & dredging of river banks.	Qualitative measurements based on sensitivity of receptors against unobjectionable odor
	8	Sediment Quality	B-	D	B-	D	Not required	During construction sediment will most likely erode into the water particularly during heavy rains	Impacts may be mitigated through erosion /sedimentation control measures, or stoppage of soil clearing during heavy rains, use of silt trap
Natural Environment	9	Protected Area	D	D	D	D	Not required	Not required	No protected area is observed in the area.
	10	Ecosystem (Terrestrial Flora and Fauna)	C	C	C	C	Floristic composition of the alignment is relatively low comprised of 46 species dominated by trees. Recorded species are common and naturally growing in the area. Result of the assessment reveals that there are no threatened species under the IUCN categories. Fauna composition of the area is very low with only 22 species recorded dominated by avifauna. Recorded species are common in the lowland areas including in the agricultural areas, shrub land, grassland and even settlements areas. These species also thrive even in highly disturb areas including cities. Five (5) species are endemic in the study area dominated by Aves. No endangered or threatened species are included in the IUCN list.	The project development will require removal of vegetation cover to give way for the construction of the proposed road project. Further loss of vegetation cover as a result of land clearing may encourage movement/migration of wildlife species in the area aggravated by the loss of habitat/abode and remaining sources of food for survival. Likewise, wildlife disturbance due to noise pollution brought about by the operation of heavy equipment's during construction will force some faunal species to migrate to other or nearby areas/habitat where disturbance is less.	Prior to project implementation the proponent will coordinate to the DENR and Philippine Coconut Authority (PCA) to seek clearance for the identification of required documents for the issuance of needed tree and coconut cutting permits (PD 705). Moreover, to compensate the loss of habitats, the proponent will replace the number of trees removed/cut and plant them in nearby areas or in accordance with the advice of the DENR. Species that will be used for the reforestation must be indigenous trees and/or fruit bearing trees endemic in the place that can attract wildlife species. Planting of trees will help in sequestering carbon in the environment. As per **DENR Memorandum Order no. 05 of 2012** mandated that "Uniform replacement ratio for cut or relocated trees"

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
									item 2.2 "For planted trees in private land and forest lands... tree replacement shall be 1:50 while naturally growing trees in the same area, including those affected by the project, shall be 1:100 ratio in support of the National Greening Program (NGP) and Climate Change Initiatives of the Government". Compensation for affected coconut palms shall be based on Section 5 of Republic Act No. 8048, an act providing for the regulation of the cutting of coconut palms. Replacement ratio of cut coconut palm shall be 1:1.
	11	Hydrology	B	B	B	B	The river systems that affect the proposed road alignment are the Nituan River and one of its tributary. During the conduct of field investigation, no ground water wells or springs were found that may be affected by the project and based on the data from the National Water Resources Board (NWRB) and from Local Water Utilities Administration (LWUA)	Most likely not affected as no wells were found on the alignment	Not give serious impact on the ground water
	12	Topography and Geology	B	B	B	B	In general, Maguindanao for its part has 45% plain and 55% sloping areas. Its southwestern part consists of mountain cluster of the Binica and Blit Mountains. The biggest and longest river is the Rio Grande de Mindanao which flows through	Slope failure, soil erosion, and rock fall may potentially occur along high cut slope sections by unstable soil layers of sand and gravel due to cut, weathering, erosion and water infiltration.	Impacts may be mitigated by slope protection

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
							Liguasan Marsh before emptying into the Moro Gulf.		
Social Environment	13	Involuntary resettlement (People)	B-	D	B-	D	Based on the RAP survey, 20 affected dwellings and 120 resettlers are identified.	Land acquisition may cause acquisition of agricultural land, crops and resettlement. Thus, RAP is prepared in accordance with JICA Guidelines and Philippine Laws.	Appropriate compensation and assistance in accordance with RAP is prepared to minimize adverse social impacts.
	14	The Poor (People)	B+/B-	C	B+/B-	C	Based on the profiles of the respondents during perception survey, 50% of the households are earning below poverty line (PhP5,000 to PhP10,000/month). This composed of the total income of the households per month which only reflects that half of the respondents are living in poverty	Land acquisition by the project gives some adverse impact to poor people under poverty line	Appropriate compensation and and assistance in accordance with RAP is prepared to minimize adverse social impacts
	15	Indigenous and ethnic people (Indigenous People)	D	D	D	D	Not required	Not required	The existence of indigenous people has not been confirmed in project area. No impacts are expected.
	16	Local Economy such as employment and livelihood (People)	B-	D	B-	D	Based from the occupation or source of income of the respondents, most of them depend on farming 45.10% and laborers 35.29% in the project area. Farming is the most strategic form of work due to the proximity of these people to the community. Around 19.61% are employed and employed as laborers while 9.80% are self-employed.	Land acquisition by the project gives some adverse impact to tenant farmers and employees of the shops.	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of livelihood/income to the poor may be consider

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
	17	Land Use and utilization of local resources (Land Use and classification)	B-	D	B-	D	The project alignment is passing through mainly agricultural area such as plantation and residential zone	In terms of the Agricultural Land Zone (AG), impacts are considered as both positive and negative. Positive in the sense that the road can provide better and faster way, and as such more economical way of transporting products from these areas to trading centers and other distribution sites. Negative in the sense that there is an imminent danger of illegal conversion into other uses	some impacts are expected; thus, these impacts and risks are minimized by appropriate land management
	18	Water usage (hydrology/ hydrogeology/wat er quality)	B-	B-	B-	B-	Majority of the respondents utilizes water from local water district for their domestic and drinking water needs. Other drinking water sources include from spring.	Earthworks may cause turbidity of river water as being use for domestic.	Minimized by control measures like silt trap, sedimentation pond, etc.
	19	Existing Social infrastructures and services (People)	B-	D	B-	D	No social infrastructure and services identified in the proposed alignment	The project does not give any impact to social infrastructures. Thus it is not likely to give any serious impacts on this item	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts, if any impacts are expected in the detailed design
	20	Social institutions such as social infrastructure and local decision-making institutions	C	C	C	C	Impacts are not expected, since local decision-making institute represented by local governments will continue after the road construction.	Impacts not Expected	Not required
	21	Misdistribution of benefit and damage	D	D	D	D	Misdistribution of benefit and damage caused by the road constructions not expected.	Impacts not Expected	Not required
Social Enviro	22	Local Conflict of interest (People)	C	D	C	D	Most of the stakeholders requested to provide work opportunities as a construction	The local conflicts regarding work opportunities between local communities may be raised in case of unfair employment.	This risk is minimized by mitigation measures such as provision of priority in hiring during construction period.

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
							worker during construction in the stakeholder meetings on scoping stage		
	23	Cultural Heritage (People)	C	D	C	D	No cultural heritage affected.	Impacts not Expected	Not required
	24	Landscape	D	D	D	D	Not required	Few impact is expected	Not required
	25	Gender	D	D	D	D	LGU has implemented GAD projects	Impacts on Gender are mostly positive since opportunity for livelihood is expected (small business to women, employment to men)	Prioritization in hiring during construction and assistance for livelihood development
	26	Right of Children	D	D	D	D	Not required	Few impact is expected	Not required
	27	Infectious diseases such as HIV/AIDS (People)	B-	D	B-	D	No infectious illness recorded in the project area. Project should not to create a habitat of mosquito that transmits dengue fever in incidental pond in the construction area without appropriate drainage.	Infectious diseases such as STD are possible to be spread due to inflow of construction workers. Furthermore, alteration to ground by cut land and filling may provoke to provide habitats of mosquito that possibly transmits dengue fever	This risk is minimized by mitigation measures such as construction of sufficient drainage, management of construction yard and health check & education for workers.
	28	Labor environment (including Work safety)	B-	D	B-	D	Not required	There are risks for workers during construction, if the construction contractor does not comply with relevant labor laws and regulations.	These risks are avoided and minimized by complying with relevant laws and regulations by the contractor under observation of DPWH
Others	29	Accident (Traffic Situation)	B-	B-	B-	B-	No serious problem on traffic	Construction vehicles may use existing local road near residential areas, thus number of traffic accident may increase	Can be minimized by installing traffic sign boards, lighting in the night, trained personnel and use of PPEs.
	30	Cross boundary impacts and climate change (Meteorology/climatology)	D	D	D	D	Not required	During Construction, deforestation will incur. On loss of vegetation, the project development will require removal of vegetation cover to give way for the construction of road project. The removal of vegetation will also result in the reduction in the population of plant species	On loss of vegetation: During site preparation, clearing of the road ROW will result to the removal of of an estimated tree above ground biomass (using large of trees with dbh of 10 cm and above, and pole size tress with ≥ 5 cm dbh to 9.5

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact assessment at scoping		Impact assessment based on survey results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
								growing within the project area. Future vegetation will face a great threat during the clearing activity. This activity will hinder the opportunity of these regenerants to grow and replace those mature vegetation in the area. During operations, generation of carbon monoxide and other gases will be generated from exhaust vehicles which will impact the ozone layer	cm) of 1.59 x 10^{-4} and 2.87 x 10^{-4} megaram per hectare, and with estimated Carbon stored value of 3.53 x 10^{-4} and 6.38 x 10^{-4} megagram per hectare, respectively. It was computed using the Brown allometric equation.

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

Table 7.10.6-5 Summary of Baseline and Forecasted Value (Air, Noise, Water)

No.	Item			Baseline Value (Standard Value)					Quantitative Forecast Analysis (Standard Value)			
1	Air Pollution	St.	Location	TSP (230μg/Ncm)	PM_{10} (150μg/Ncm)	NO_2 (150μg/Ncm)	SO_2 (180μg/Ncm)		TSP (230μg/Ncm)	PM_{10} (150μg/Ncm)	NO_2 (150μg/Ncm)	SO_2 (180μg/Ncm)
		1	Purok Dulangan I, Brgy. Nituan, Parang	25.5	6.4	2.7	1.2		-	6.4	2.7	1.2
		2	Near Reservoir Area, Brgy. Making, Parang	22.7	4.6	3.6	1.4		-	4.6	3.8	1.4
2	Water Pollution (Water Quality)	St	Location	pH (6.5-9)	Temp, ºC (25-31)	BOD (7)	TSS (80)	DO (5ppm min.)	Basically, waste water is not discharged during and after construction, thus quantitative forecast has not been conducted.			
		1	Nituan River	7.7	28.9	1	11	8				
		2	Nituan Irrigation	6.9	30.5	2	21	6				
5	Noise	St	Location	Morning (50)	Daytime (55)	Evening (50)	Night time (45)		Morning (50) <65>	Evening (55) <65>	Evening (50) <65>	Night Time (45) <60>
		1	Purok Dulangan I, Brgy. Nituan, Parang	**51**	50	48	**49**		**54**	54	49	**50**
		2	Near Reservoir Area, Brgy. Making, Parang	48	48	48	**48**		**53**	53	49	**49**

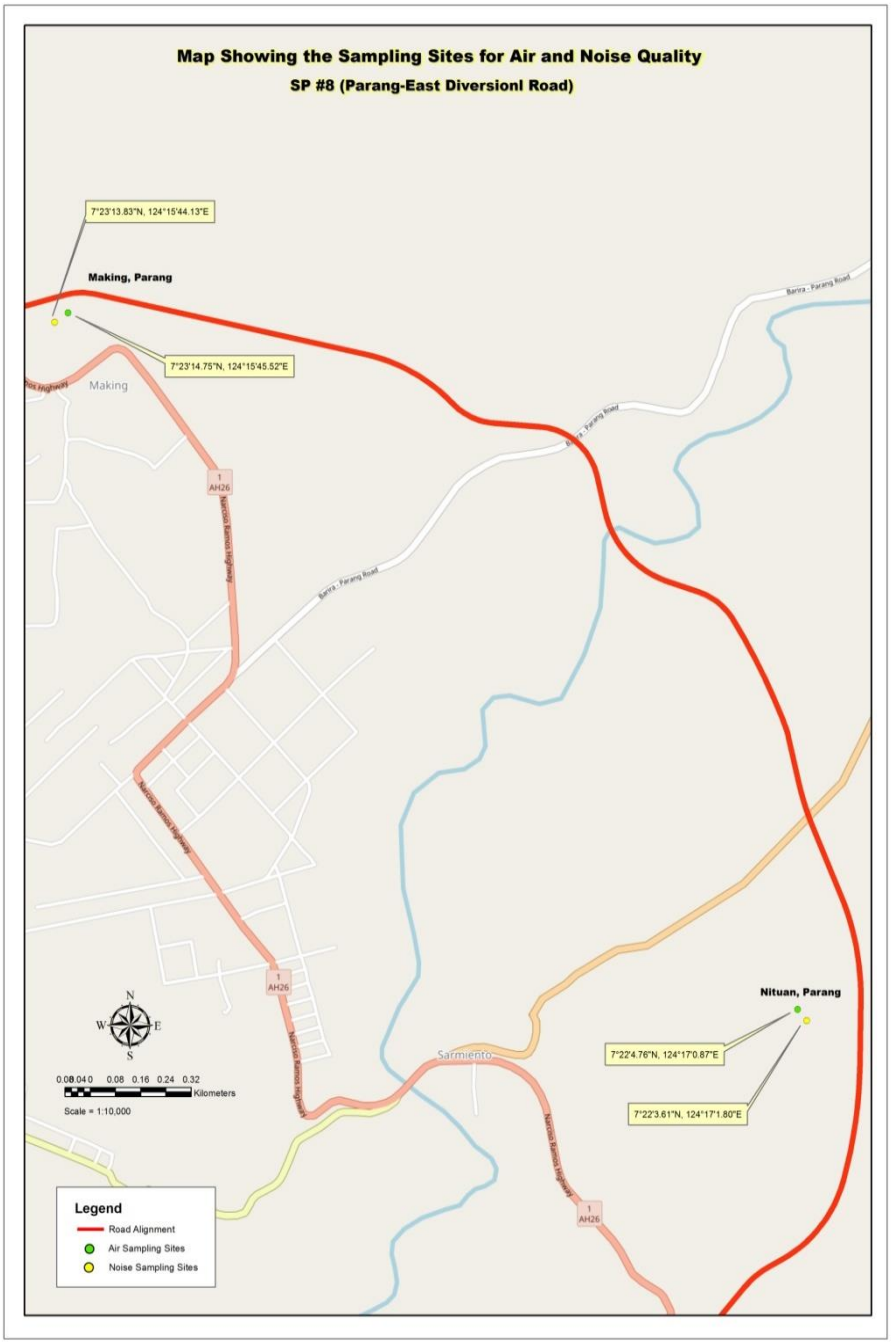
( ): Philippine Standard Values
< >: Japanese standard Values
Source: JICA Study Team

Table 7.10.6-6 shows sampling stations for Noise, Air and Water Sampling Sites, Coordinates, Date and Time of Samplings and **Figure 7.10.6-2** and **Figure 7.10.6-3** show the sampling location for air, noise and water.

Table 7.10.6-6 Sampling points for Noise, Air and Water Quality

Station No.	Sampling Stations	Coordinates	Date and Time of Samplings
Noise Quality			
N1	Purok Dulangan I, Brgy. Nituan, Parang	7°22'4.64" N 124° 17'1.90" E	December 7-8, 2017, 1120H
N2	Near Reservoir Area, Brgy. Making, Parang	7°23'14.51" N 124°15'44.24" E	December 8-9, 2017, 1245H
Air Quality			
A1	Purok Dulangan I, Brgy. Nituan, Parang	7°22'4.76" N 124° 17'0.87" E	December 7-8, 2017, 1120H
A2	Near Reservoir Area, Brgy. Making, Parang	7°23'14.75" N 124° 15'45.52" E	December 8-9, 2017, 1245H
Water Quality			
W1	Nituan River	7°22'53.0" N 124° 16'44.2" E	December 5, 2017, 1347H
W2	Nituan Irrigation	7°21'42.2" N 124° 16' 41.8" E	December 5, 2017, 1532H

Source: JICA Study Team



Source: JICA Study Team

Figure 7.10.6-2 Sampling location for air at Sub-Project 8 Parang East Diversion Road

Source: JICA Study Team

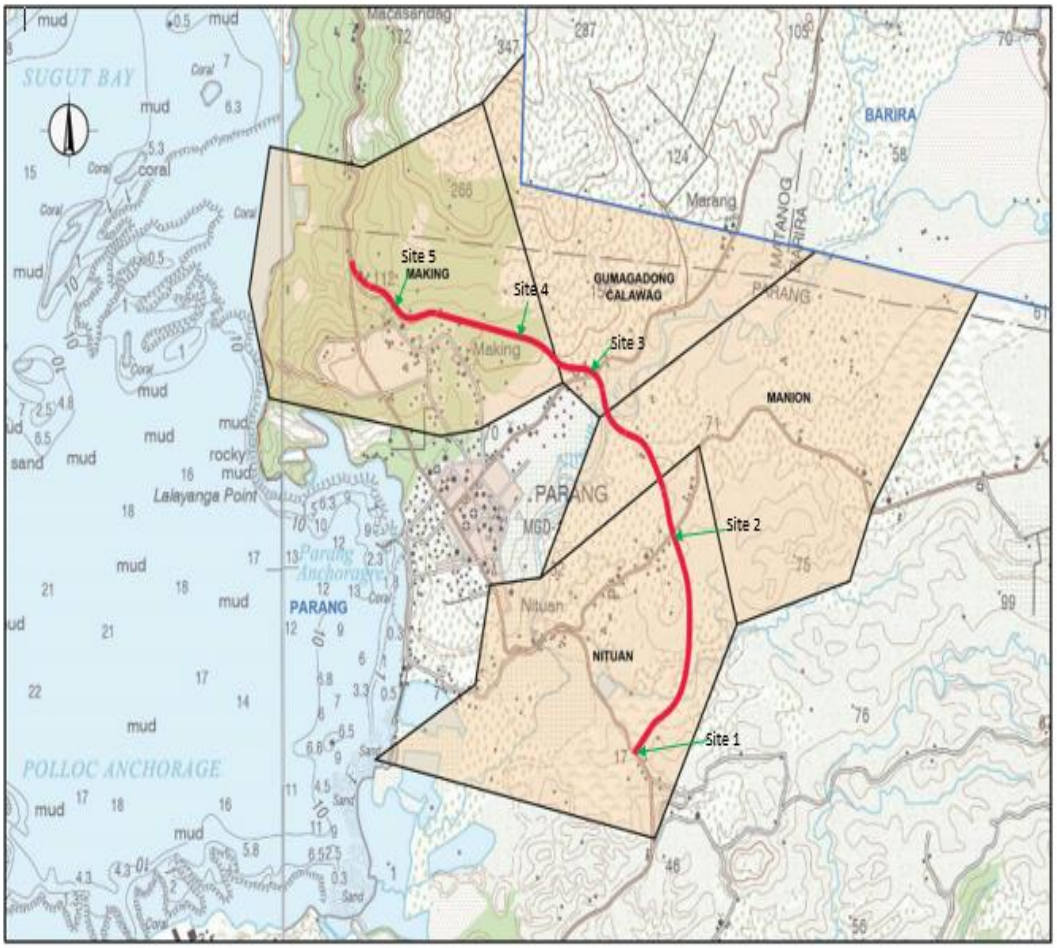
Figure 7.10.6-3 Water Sampling Map covered by Parang-East Diversion Road

Survey on terrestrial flora and fauna was undertaken in five (5) selected sampling sites located within the Municipality of Parang covering Barangays Nituan, Gumagandong Calawag and Making. **Table 7.10.6-7** shows the geographic coordinates of sampling sites and name of covering barangays. **Figure 7.10.6-4** presents map of the proposed alignment and location of sampling plots.

Table 7.10.6-7 Locations of sampling sites for flora and fauna

Municipality	Barangay	Geographic coordinates	
		Northing	Easting
Parang	Nituan	7°21'31.10"	124°16'50.41"
	Nituan	7°22'24.52"	124°17'1.60"
	Gumagandong Calawag	7°23'1.59"	124°16'38.17"
	Making	7°23'11.51"	124°16'10.65"
	Making	7°23'16.49"	124°15'44.36"

Source: JICA Study Team



Source: JICA Study Team

Figure 7.10.6-4 Terrestrial flora and fauna sampling sites

(7) Mitigation Measures and Environmental Management Plan

A proposed mitigation plans during and after construction are shown in **Table 7.10.6-8**. All mitigation measures are included in the submitted EIS Report by DPWH. All cost for mitigation measures will be finalized in detailed engineering design phase.

Table 7.10.6-8 Environmental Management Plan

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
Pollution	1	Air pollution (Air quality & noise)	(Dust) - Water sprinkling near residential area - 20 kph speed limit for construction machines at construction sites adjacent to settlement areas	(NO_2, SO_2 and TSP) - Setting up green buffer zone along the road (the zone and planting trees are carried out during construction)	Contractor	[During Const.] DPWH [Operation Phase] Parang
	2	Water pollution (Water quality)	[Turbid water and other items] - Discharge through sedimentation pond and silt fence -Installation of portable toilet for workers - Appropriate waste and construction machines management	Not required	Contractor	DPWH
	3	Waste (Abandonment)	[Construction waste (trees and waste soil)] - After considering the possibility of reuse, construction waste is disposed at designated disposal site Note) [Muck soil from tunnel section] -Reuse or disposed at designated disposal site after treatment [Garbage from base camp] - Garbage at workers camp and waste oil shall be brought to disposal site or facility [Night soil] -Temporary sanitation facility such as septic tank shall be introduced to the workers camp.	Not required	Contractor	DPWH
	4	Soil contamination (soil quality)	-Reuse or disposed at designated disposal site after treatment	Not required	Contractor	DPWH
	5	Noise and vibration (Noise)	[Construction noise] - Installing noise barrier and selecting low-noise equipment. - Avoiding works of heavy equipment during night time. -Informing the construction schedule to surrounding communities to obtain their consensus	[Traffic noise] - Establishment of green belt as buffer zone along the road - Secure sufficient distance from boundary of the road to residential area after construction of the road (secure noise decay distance) on land use plan along the road - Installation of noise barrier near sensitive facility, if required	Contractor	DPWH
	6	Sediment quality (Soil quality)	-Reuse or disposed at designated disposal site after treatment	Not required	Contractor	DPWH

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
Natural Environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	- Relocation & replanting trees along the road in ROW -Tree planting of indigenous species at sites designated by DENR -Create ecotone habitats in consideration of Amphibia, if the existing habitats along the river are impacted by the project	- Appropriate land use management not to develop natural area along the road	[Const.] Contractor [Operation] Parang	[Const.] DPWH [Operation] Parang
Natural Environment	11	Hydrology (Hydrology and oceanography)	- Designing of bridges with sufficient capacity - Installation of sufficient drainage facilities on bypass - Secure waterways in construction area	Not required	Contractor	DPWH
	12	Topography and geology (Geography, topography and landslides	- Installation of slope protection measures	Not required	Contractor	DPWH
Social Environment	13	Involuntary resettlement (People)	Appropriate compensation and social assistance in accordance with RAP	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	DPWH	Parang
	14	The poor (People)	Appropriate social assistance in accordance with RAP	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	DPWH	Parang
	15	Indigenous and ethnic people (Indigenous people)	Not required for designated indigenous and ethnic group However, situation of religious group(s) such as Islamic group shall be monitored and adequate assistance and coordination shall be given, if necessary.	Not required for designated indigenous and ethnic group because NCIP has been issued. However, situation of minority religious group(s) such as Islamic group shall be monitored and adequate assistance and coordination shall be given, if necessary.	—	—
	16	Local economy such as employment and livelihood	Appropriate compensation and social assistance in accordance with RAP	Not required	DPWH	Parang
	17	Land use and utilization of local resources (Land use and classification)	Appropriate land acquisition and compensation for agricultural area	Management of appropriate land use in accordance with approved detailed zoning map	[Const.] DPWH [Operation] Parang	Parang
	18	Water usage (Hydrology /	Installation of alternative water distribution system when unexpected situation such as reduction of spring water and water level of wells	Installation of alternative water distribution system when unexpected situation such as reduction of spring water and water level of well	DPWH, Parang	Parang

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
		Hydrogeology/ Water quality)				
	19	Existing social infrastructures and services	Appropriate compensation and/or relocation in accordance with RAP	Not Required	Contractor and DPWH	DPWH, Parang
	22	Local conflict of interests	Local workforce is prioritized for construction of the road	Not required	Contractor	DPWH
	23	Cultural heritage	No cultural heritage to be affected. Mitigation not required	Not required		
	27	Infectious diseases such as dengue and HIV/AIDS	- Installation of sufficient drainage facilities not to provide habitat for vector mosquito - Provision of adequate temporary sanitation facilities - Enforcement of medical screening and periodical medical check-up - In order to prevent spread of infectious diseases such as HIV/AIDS, awareness of the labors is promoted	Not Required	Contractor	DPWH
	28	Labor environment (including work safety)	Complying with relevant laws and regulations by the contractor under observation of DPWH	Not required	Contractor	DPWH
Others	29	Accidents (Traffic situation)	- Deploying flagman at the gate and crossing points of the construction vehicles - Installation of safety sign board - Installing fence around the construction site to keep out local people such as children - Installation of lightning in the night time - Installation of parking for idling construction machines - Safety training for the workers - Safety patrol at the construction site by supervisors	Not Required	Contractor	DPWH
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	Replanting natural native trees and other agricultural trees such as coconuts	Not required	Contractor	DPWH

Source: JICA Study Team

(8) Environmental Monitoring Plan and Budget

A proposed monitoring plan during and after construction are shown in **Table 7.10.6-9** and **Table 7.10.6-10** respectively**.** All monitoring plans are included submitted EIA by DPWH to EMB. The monitoring in operation phase shall be carried out for two (2) years at least.

Proposed items to be monitored by JICA are shown in **Table 7.10.6-11**. Air, water quality, noise, ecosystem, resettlement and livelihood of relocated people shall be monitored during and after construction.

Table 7.10.6-9 Environmental Monitoring Plan (Pre and During Construction)

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
Pollution	1	Air pollution (Air quality & noise	TSP, SO2, NO2 and PM_{10}	1. TSP –Gravimetric 2. SO_2 –Pararosaniline 3. NO_2 – Griess Saltzman Reaction 4. and PM_{10} –Direct Reading (Gas Analyzer)	2 sites (same locations of baseline survey) (See **Table 7.10.6-6** and **Figure 7.10.6-2**)	2 times	800,000	TSP 300µg/Ncm SO_2 340 µg/Ncm NO_2 260 µg/Ncm PM_{10} 150 µg/Ncm
	2	Water pollution (Water quality)	pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Methodologies are described in DAO 34-1990 and EMBDENR Manual for Ambient Water Quality Monitoring Volume I	2 sites (same locations of baseline survey) (See **Table 7.10.6-6** and **Figure 7.10.6-3**)	2 times	600,000	For Class "C" freshwater pH – 6.5 to 8.5 DO – 5.0 mg/L Oil & Grease – 2.0 mg/L BOD – 7.0 mg/L TSS – not more than 30 mg/L increase
	3	Waste (Abandonment)	Volume of waste soil, cutting tree and domestic garbage	Record volume of generated waste	Cutting land section, tunnel section, cutting tree section and workers camp	4 times	200,000	Generated waste shall be reused or disposed at designated site.
	4	Noise and vibration (Noise	Ambient and road side noise (dB(A)LAeq)	LAeq, 10min during morning, daytime, evening and night time	2 sites (same locations of baseline survey) (See **Table 7.10.6-6** and **Figure 7.10.6-2**)	2 times	400,000	For "A" categorized areas (general area) Morning: 50 dB(A) Daytime: 60 dB(A) Evening: 50 dB(A) Night : 45 dB(A) For "B" categorized areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A
	5	Ecosystem (Terrestrial Biology Freshwater or marine ecology	Situation of Cutting tree area	Ocular inspection	Same site locations (See **Table 7.10.6-6** and **Figure 7.10.6-4)**	4 times	200,000	Cutting tree area is limited on ROW
	11	Hydrology (Hydrology and oceanography)	Flooding situation	Flood level measurement during high precipitation periods Interview with local residents	Flood-prone areas, particularly near major river systems	4 times	200,000	Project activities and structures does not cause flooding
	12	Topography and geology (Geography, topography and landslides)	Stability of slope	Ocular inspection	High cut and high embankment section	4 times	200,000	Must be continuously undertaken until slopes are fairly stable and vegetation cover achieves high survival rate

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
Social Environment	13	Involuntary resettlement (People)	Payment and implementation n of social assistance in accordance with RAP	Consultation Meeting and/or Survey with the project affected persons (PAPs)	Affected barangays	Monthly	500,000	Must be completed prior to construction stage
	14	The poor (People)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	16	Local economy such as employment and livelihood	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	19	Existing social infrastructures and services	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	22	Local conflict of interests	Construction n worker's native barangay	Confirmation of workers list from contractor	All barangays on the affected route	4 times	500,000	Employment opportunity shall be provided fairly
	27	Infectious diseases such as HIV/AIDS	Number of infected patient	Confirmation of health check list from contractor	All construction workers	4 times	500,000	Infection disease rate shall be less than average rate
	28	Labor environment (including work safety)	Number of workers with required instrument such as helmet	Count numbers of workers with instrument	All construction workers (weekly meeting place)	4 times	500,000	All workers shall have designated device such as helmet

Source: JICA Study Team

Table 7.10.6-10 Environmental Monitoring Plan (Operation Phase)

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
Pollution	1	Air pollution (Air quality & noise	TSP, SO2, NO2 and PM_{10}	1. TSP –Gravimetric 2. SO2 –Pararosaniline 3. NO2 – Griess Saltzman Reaction 4- PM_{10} = Gravimetric (Gas Analyzer	2 sites (same locations of baseline survey)	1 times	400,000	TSP 300µg/Ncm SO2 340 µg/Ncm NO2 260 µg/Ncm PM_{10} 150 µg/Ncm
	2	Water pollution (Water quality)	pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Methodologies are described in DAO 34-1990 and EMBDENR Manual for Ambient Water Quality Monitoring Volume I	2 sites (same locations of baseline survey)	1 times	600,000	For Class "C" freshwater pH – 6.5 to 8.5 DO – 5.0 mg/L Oil & Grease – 2.0 mg/L BOD – 7.0 mg/L TSS – not more than 30 mg/L increase

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (PhP)	Standard
	4	Noise and vibration (Noise	Ambient and road side noise (dB(A)LAeq)	LAeq, 10min during morning, daytime, evening and night tim	2 sites (same locations of baseline survey)	1 times	200,000	For "A" categorized areas (general area) Morning: 45 dB(A) Daytime: 50 dB(A) Evening: 45 dB(A) Night : 40 dB(A) For "B" categorized Areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)
	5	Ecosystem (Terrestrial Biology Freshwater or marine ecology	Situation of Cutting tree area	Ocular inspection	same locations of baseline survey	1 times	100,000	Cutting tree area is limited on ROW
	11	Hydrology (Hydrology and oceanography)	Flooding situation	Flood level measurement during high precipitation periods Interview with local residents	Flood-prone areas, particularly near major river systems	1 times	100,000	Project activities and structures does not cause flooding
	12	Topography and geology (Geography, topography and landslides)	Stability of slope	Ocular inspection	High cut and high embankment section	4 times	200,000	Must be continuously undertaken until slopes are fairly stable and vegetation cover achieves high survival rate
	13	Involuntary resettlement (People)	Payment and implementation n of social assistance in accordance with RAP	Consultation Meeting and/or Survey with the project affected persons (PAPs)	Affected barangays	Monthly	500,000	Must be completed prior to construction stage
Social Environment	14	The poor (People)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	16	Local economy such as employment and livelihood	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	19	Existing social infrastructures and services	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	22	Local conflict of interests	Construction worker's native barangay	Confirmation of workers list from contractor	All barangays on the affected route	Quarterly	500,000	Employment opportunity shall be provided fairly
	27	Infectious diseases such as HIV/AIDS	Number of infected patient	Confirmation of health check list from contractor	All construction workers	Quarterly	500,000	Infection disease rate shall be less than average rate

Source: JICA Study Team

Table 7.10.6-11 Environmental Monitoring Form (JICA Form)

-If environmental reviews indicate the need of monitoring by JICA, JICA undertakes monitoring for necessary items that are decided by environmental reviews. JICA undertakes monitoring based on regular reports including measured data submitted by the project proponent. When necessary, the project proponent should refer to the following monitoring form for submitting reports.

-When monitoring plans including monitoring items, frequencies and methods are decided, project phase or project life cycle (such as construction phase and operation phase) should be considered

1. Relevant Permission and Public Consultation

Monitoring Item	Monitoring Results during Report Period
Confirmation of relevant written permissions and minutes of meetings for held consultations and meetings	

2. Mitigation Measures/Monitoring

- Air Quality (Traffic /Ambient Air Quality

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
TSP	µg/Ncm	24.1	25.5	230µg/Ncm	0.2 mg/m3	-Same points as baseline survey (see **Table 7.10.6-6**) -Two (2) time a year during construction -Once a year during operation -TSP = Gravimetric - SO2 =Pararosaniline - NO2 = Griess Saltzman Reaction - PM_{10} = Gravimetric (Gas Analyzer)
NO2	µg/Ncm	3.7	4.6	150ug/Ncm	0.04-0.06 ppm	
SO2	Mg/Ncm	1.3	1.4	180ug/Ncm	0.1 ppm	
PM10	ppm	5.0	6.4	150ug/Ncm		

- Water Quality (Physico-chemical Analyses of Surface Water)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
pH	-	7.3	7.7	6.5-9	6.5-8.5	-Upstream and downstream portion -Same points as baseline survey (see **Table 7.10.6-6**) Two (2) time a year during construction -Once a year during operation -grab sampling
DO	mg/L	7.0	8	5ppm min.	5 ppm	
TSS	mg/L	16	21	80	25	
BOD	mg/L	1.5	2	7	3	
Turbidity	NTU	3.1	4.1	-		
Temperature	℃	29.7	30.5	25-31		

- Noise/Vibration

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
Noise level	dB(A)	Morning 50 Daytime 49 Evening 49 Night time 50	Morning 51 Daytime 51 Evening 50 Night time 50	For "A" categorized areas (general / residential area) Morning: 45 dB(A) Daytime: 50 dB(A) Evening: 45 dB(A) Night : 40 dB(A) For "B" categorized Areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)	Daytime: (6:00-22:00) 50dB(AA) 55 dB(A) 55 dB(B) 60 dB(C) EveningTime: (22:00-6:00) 40 dB(AA) 45 dB(A) 45 dB(B) 55 dB(C)	- Same points as baseline survey (see **Table 7.10.6-6**) - 2 times a year during construction - Once a year during operation - Digital sound level meter

- Odor

Monitoring Item	Monitoring Results during Report Period
Not required	

3. Natural Environment

- Ecosystem

Monitoring Item	Monitoring Results during Report Period
Situation of cutting tree area (during construction) Situation of replanting area along the road (operation phase)	

4. Social Environment

- Resettlement (During and after Construction)

Monitoring Item	Monitoring Results during Report Period
Number of PAPs including IPs to be resettled/ relocated/ provided livelihood assistance where required. (during Construction)	
Inventory and valuation of PAPS affected assets (during Construction)	
Notice period given to PAPs before shifting them from their original locations within the ROW (Pre and during construction)	
Number of grievances recorded and redressed (Pre and during Construction)	
Conflicts between religions (Pre, during and after construction)	

- Living / Livelihood

Monitoring Item	Monitoring Results during Report Period
Pre-and post-resettlement incomes and livelihood of PAPs especially for poor people (during and after construction)	

(9) Institutional Arrangement for EMP Implementation

Institutional Arrangement for EMP Implementation is described in **Section 7.5**.

(10) Stakeholders Meeting for EIA

A total of 6 stakeholders' meetings were held for Sub-Project 8, two (2) stakeholders' meetings were held at municipal level and one (1) was held at barangay level for barangay scoping**.** The first stakeholders' meetings at municipal level are prescript Information Education Communication meetings (IEC meeting) based on the Philippine EIA guidelines held in the municipality of Parang attended by the affected stakeholders, barangay and municipal officials, and concerned LGU offices such as Assessors, MPDC. The second stakeholders' meetings at municipal level presented the results of the baseline surveys. These meetings were attended by a total of 199 participants composed of 157 males and 42 females.

The major opinions of the participants are the rerouting of the proposed Sub-Project 8, the process of compensation of the affected landowners, determination of amount of the affected land and properties, and land under military camp. All questions, comments and suggestions are answered by DPWH ARMM, JICA Cotabato, RAP, and EIA Study team as shown in **Table 7.10.6-13** and summarized below.

1st Public Consultation

a. What will happen to the landowner without land titles and proof of ownership;
b. What will happen to the land under military reservation;
c. Realignment of proposed road to avoid the Muslim Cemetery and less affected households;
d. Road alignment should consider the PWD with signage;
e. Final alignment of proposed road;
f. Who will compensate the affected land, crops, and other structures;
g. What will happen to the household that depends their income to the affected land and crops;
h. What happen to the affected land, properties, tress and fruit bearings; and
i. Necessary documents for claims and compensations.

2nd Public Consultation

a. Realignment to lessen the affected people
b. Prioritization of local hire

During the 1st public consultations, the women emphasized the importance of proper compensation for the affected landowners and livelihood programs for extra income. As stated earlier, two group of consultations were conducted.

Overall, the proposed Sub-Project 8 is socially acceptable based on the responses and feedbacks of the stakeholders. They are willing to negotiated and compensated and suggested to implement the project early from schedule.

Table 7.10.6-12 Contents of Stakeholder Meetings Municipal Level

Date (venues)	Objectives of the meeting	Major Agenda	Participants	No. of Participants		
				Location	Male	Female
1st Public Consultations Dec. 7, 2017 1. Parang Municipal Conference Room	Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	1. Inform and generate awareness and understanding of the concerned public about the project; 2. Provide the stakeholders and avenue to ventilate salient issues and concerns regarding the project; 3. Give an opportunity to the stakeholders to have an open discussion with the Preparers, Proponents and LGU about the project; 4. Educate the stakeholders of their rights and privileges; and 5. Enable the stakeholders to effectively participate and make informed and guided decisions.	Municipal Officials, Project-Affected Persons (PAPs) and Barangay Officials, DPWH, RAP and JICA Study Team	Parang	66	8
2nd Public Consultations February 27, 2018 1. Parang Municipal Conference Room	Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	To present and validate the results of environmental impact assessment	Municipal Officials, Project-Affected Persons (PAPs) and Barangay Officials, DPWH, and JICA Study Team	Parang	45	13

Source: JICA Study Team

Table 7.10.6-13 Major Opinions in Stakeholder Meetings Municipal Level

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
1st Public Consultations Dec. 7, 2017 Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	1. Introduce the project and discuss the project objectives and the benefits that can be derived. 2. EIA and RAP Process 3. Tentative Schedules 4. Solicit queries, comments, concerns and suggestions on the project	Land	Properties	1. (Parang) Are the trees also included in the compensation? Is the fruit-bearing trees included to be paid or compensated?	1. Yes, they will be compensated as long as included in the inventory or during cut offs. All trees that will be affected with the project will be paid or compensated especially the fruit-bearing trees. DPWH will pay the trees based on their guidelines. It depends on the size, and height of the trees.
			Land Use	2. (Parang) What will happen to the land under military reservation?	2. The alignment of the project is not yet final. We will provide a copy of the results of the inventory per Barangay level for their information and confirmation.
		Socio/The People	Properties	3. (Parang) What will happen to land owners without land title?	3. Based on the discussion with JICA during our meeting in Manila last November 2017, DPWH will compensate the affected land owners. However, in the absence of land/lot title and other supporting documents, DPWH will review and validate whatever just and fair to

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
					affected people. Land owners should secure proper documents. We strictly follow the guidelines of DPWH.
				4. (Parang) What are the needed documents for claims?	4. You need to secure certificate of land title or tax declaration.
				5. (Parang) Who will pay for all the structures like houses that will be affected by the project?	5. DPWH will be the implementing agency and will pay the acquisition of all affected land, structures after the inventory of RAP team.
			Livelihood	6. (Parang) What will happen to our families if almost all of the land area will be acquired? How can the project help us if we lose our property and livelihood?	6. DPWH along with the LGU will negotiate and help those who will be affected.
			Infrastructure (Alignment)	7. (Parang) Can we request that the alignment avoid the cemetery of Muslim?	7. We will always considered and respect the heritage area for the benefit of the culture of the affected community. We need your cooperation during the survey in your community. Please provide us the right information so that we will not encounter any problem during the project implementation.
				8. (Parang) Affected people/areas are requesting for the possibility to move the alignment to avoid them or move to an area where there will be less affected.	8. We will request to the proponent to provide the affected community the final road alignment.
				9. (Parang) Is there any way to realign the road to another area?	9. For now this is a proposed or under the feasibility study stage. There are proposed alternatives and best alignment. This consultation meeting is part of the study to discuss or confirm you if you are in favor on the proposed project. We need this road for easier access and to avoid traffic.
				10.(Parang) Where is the exact alignment of the project?	10. There are alternative options for the road alignment. The presented alignment is the feasible and will be finalized after the RAP inventory.
			Vulnerable People	11.(Parang) What is the design of the road? Is it accessible to all, with signage and Person With Disability (PWD) friendly?	11. The road will follow the design road guidelines of DPWH. It includes the signage and pedestrians especially for schools. We will always considered the needs of our PWD but there always a limitations.

Date and Objectives	Agenda	Item on EIA		Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
2nd Public Consultations February 27, 2018 Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	To present and validate the results of environmental impact assessment	Land	Crops/ Trees	1. (Parang) Requested to hire the community on cutting the trees affected	1. This depends to DENR. They have processes regarding tree cutting but we will take note for consideration.
		Socio/The People	Infrastructures (Alignment)	2. (Parang) Requested that the diversion road in Making going to Macasandag can be transferred or realigned to upper side because original alignment will affect more people and structures	2. The team stated that their concerns and requests were noted and informed them that this will be recommended to the proponent
				3. (Parang) Requested for the realignment of the road project. If possible to realign from Sitio Nabunturan, Making to Brgy. Gumagadong Calawag.	3. The team stated that their concerns and requests were noted and informed them that this will be recommended to the proponent. The team advised them to provide a resolution signed by the Brgy officials and Municipal Mayor

Source: JICA Study Team

1) Barangay Scoping

The barangay scoping meetings were held in 4 barangays within the direct affected community as shown in **Table 7.10.6-14**. These meetings discussed the project background and objectives, and the positive and negative impacts of the proposed Sub-Project 8 to the people, health, habitat, and among others. The major opinions of the participants are the process of land acquisitions and compensations as shown in

Table 7.10.6-15. The queries and comments on the barangay scoping checklist was responded by the Study team.

Table 7.10.6-14 Major Opinions in Stakeholder Meetings on Scoping Stage Barangay Level

Date (venues)	Objectives of the meeting	Major Agenda	Participants	No. of Participants		
				Datu Blah Sinsuat		
				Barangay	Male	Female
Jan. 11 & 12, 2018 Barangay Hall	Barangay Scoping in accordance with Philippines EIA Guidelines	1. Inform and generate awareness and understanding of the concerned public about the project; 2. To gather and address the queries and concerns and provide responses and clarifications to queries on the proposed project; and 3. To identify the foreseeable positive and negative effect of the Project based on the barangay scoping matrix.	Barangay Officials, Project-Affected Persons (PAPs), RAP, and JICA Study Team	Manion	15	0
				Making	14	8
				Nituan	12	2
				Gumagadong Calawag	5	11

Source: JICA Study Team

Table 7.10.6-15 Major Opinions in Stakeholder Meetings on Scoping Barangay Level

Date and Objectives	Agenda	Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
Jan. 11 & 12, 2018 Barangay Scoping in accordance with Philippines EIA Guidelines	1. Introduce the project and discuss the project objectives and the positive and negative impacts of the project.	1. (Brgy. Manion and Chairman Belinda Molina of Brgy. Gumagadong Calawag) Barangay officials appealed to prioritize locals in hiring construction workers.	1. Yes, this will be the priority of the project and will be recommended to the proponent considering that they are qualified for the job.
		2. (Brgy. Captain Reynaldo Quitor) the affected owners of the private properties should be compensated prior to the road implementation. In case that the owner cannot present the proof of ownership, the barangay chairman committed to intervene for any form of negotiations and settlement.	2. Private property owners are advised to present proof of ownership like land titles, certifications or tax declaration, and have them presented to the RAP Team during survey inventory/validation.
		3. (Brgy. Captain Precious Johanney Binwar) Informed the team that there is irrigation canal to be traversed by the project.	3. This will be noted for considerations of JICA in designing the project.

Source: JICA Study Team

7.10.7 Summary of Environmental Impact Assessment (EIA) for Sub-Project 9

(1) Description of the Project Components

The Project Components are described in **Chapter 13**.

(2) Baseline of the Environmental and Social Condition

Baseline of the Environmental and Social Condition is described in **Chapter 13** and **Section 7.2**.

(3) Laws, Regulations, and Organizations related to Environmental and Social Considerations for EIA

Laws, Regulations, and Organizations related to Environmental and Social Considerations for EIA are described in **Section 7.1** and **Section 7.3.1**.

(4) Analysis of Alternative Alignments

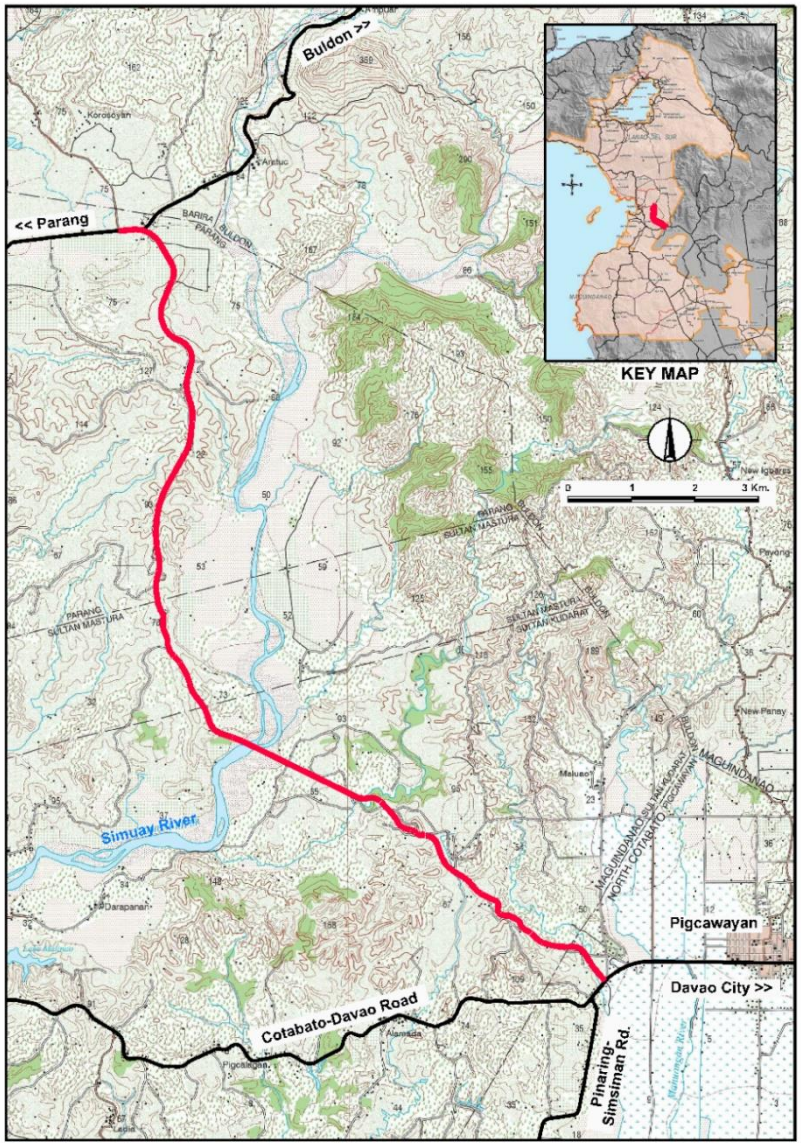
The comparative analysis of alternatives was described in **Chapter 12** and **Chapter 14**. The summary is shown below.

1) Alignment Selection Criteria

The criteria for alignment selection are as follows;

- Length, Construction Cost, Construction period (road length, no of bridges and culverts,etc.)
- Economic Impact (population along the alignment, agricultural land areas to be served, etc.)
- Environmental Impact (high-filling section length, high-cutting section length, no. of buildings to be affected)
- Technical feature (total no. of curves no. of curves < 300m, length of vertical grade >= 5%)

Figure 7.10.7-1 shows the recommended alignment for the road.



Source: JICA Study team

Figure 7.10.7-1 Recommended Alignment

2) Zero option

The zero option (with / without Sub-Project) of this project is shown in **Chapter 11** and **Chapter 22**.

(5) Scoping and Survey item for Environmental and Social Considerations Survey

Scope of the EIA study for the project is discussed in this section. The environmental scoping is conducted based on an environmental reconnaissance by the JICA Survey Team on 30th November.

The result of scoping is indicated on the Leopold scoping matrix and reason tables as shown in **Table 7.10.7-1** and **Table 7.10.7-2**.

The scoping matrix below shows the impact factors, impacted item and impact degree based on JICA's guidelines and Philippine items. According to the scoping matrix, majority of the items or sixteen (16)

items are rated as "B-" (Some impact is expected) due to huge earth work volume and significant social impacts, No.14 (The poor) is rated as "B+/-" (Some impact is expected), five (5) items are rated as "C" (unknown impact is expected) and eight (8) are rated as "D" (Few impacts are expected).

Table 7.10.7-1 Draft Scoping Matrix Based on JICA'S Guidelines and Philippines Items

	No	Affected Activities / Impact Items (JICA)	(Philippines)	Overall Rating	Pre/ During Construction Phase									Operation Phase		
					Land acquisition and Loss of properties	Change of Land use plan, Control of various activities by regulations for the construction	Reclamation of Wetland, etc.	Deforestation	Alteration to ground by cut land, filling, drilling, tunnel, etc.	Operation of Construction Equipment and Vehicles	Construction of Roads, tollgates, parking lots, Access roads for bridges and other related facilities	Traffic Restriction in construction area	Influx of construction workers, construction of base camp	Increase of Through Traffic	Appearance/ Occupancy of Roads and related building structures including tunnel and embankment	Increasing influx of settlers
Pollution	1	Air Pollution	Air quality & noise	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	D
	2	Water pollution	Water quality	**B-**	D	D	D	D	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	3	Waste	Abandonment	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	4	Soil contamination	Soil quality/fertility	**B-**	D	**B-**	**B-**	D	**B-**	**B-**	**B-**	D	**B-**	D	D	D
	5	Noise and Vibration	Noise	**B-**	D	D	D	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	**B-**	D
	6	Ground Subsidence	Subsidence/ collapse	D	D	D	D	D	D	D	D	D	D	D	D	D
	7	Odor		D	D	D	D	D	D	D	D	D	D	D	D	D
	8	Sediment quality	Soil quality	**B-**	D	D	D	D	**B-**	D	**B-**	D	D	D	D	D
Natural Environment	9	Protected Area	Environmentally Critical Areas (ECAs)	D	D	D	D	D	D	D	D	D	D	D	D	D
	10	Ecosystem	Terrestrial Biology Freshwater or marine ecology	**B-**	**B-**	**B-**	D	**B-**	**B-**	C	**B-**	D	**B-**	D	**B-**	**B-**
	11	Hydrology	Hydrology and oceanography	**B-**	D	D	**B-**	D	**B-**	D	D	D	D	D	**B-**	D
	12	Topography and geology	Geography, topography and landslides	**B-**	D	D	**B-**	D	**B-**	D	D	D	D	D	D	D
Social Environment	13	Involuntary resettlement	People	**B-**	**B-**	D	D	D	D	D	**B-**	D	D	D	D	D
	14	The poor	People	**B+/B-**	**B+/B-**	D	D	D	D	D	**B+/B-**	D	D	D	D	**C**
	15	Indigenous and ethnic people	Indigenous people (IPs)	D	D	D	D	D	D	D	D	D	D	D	D	D
	16	Local economy such as employment and livelihood	People	**B-**	D	D	D	D	D	D	**B-**	D	**B-**	D	D	**C**
	17	Land use and utilization of local resources	Land use and classification	**B-**	D	**B-**	D	D	D	D	D	D	**B-**	D	D	**B-**
	18	Waste Usage	Hydrology / Hydrogeology/ Water quality	**B-**	D	D	D	D	D	D	D	D	**B-**	D	D	D

	No	Affected Activities / Impact Items (JICA)	(Philippines)	Overall Rating	Pre/ During Construction Phase									Operation Phase		
					Land acquisition and Loss of properties	Change of Land use plan, Control of various activities by regulations for the construction	Reclamation of Wetland, etc.	Deforestation	Alteration to ground by cut land, filling, drilling, tunnel, etc.	Operation of Construction Equipment and Vehicles	Construction of Roads, tollgates, parking lots, Access roads for bridges and other related facilities	Traffic Restriction in construction area	Influx of construction workers, construction of base camp	Increase of Through Traffic	Appearance/ Occupancy of Roads and related building structures including tunnel and embankment	Increasing influx of settlers
	19	Existing social infrastructures and services	People	**B-**	**B-**	D	D	D	D	D	**B-**	D	D	D	D	**B-**
	20	Social institutions such as social infrastructure and local decision making institutions		D	D	D	D	D	D	D	D	D	D	D	D	D
	21	Misdistribution of benefit and damage		D	D	D	D	D	D	D	D	D	D	D	D	D
Social Environment	22	Local conflict of interests	People	**C**	D	**C**	D	D	D	D	D	D	D	D	D	D
	23	Cultural Heritage	People	**C**	**C**	D	D	D	D	D	**C**	D	D	D	D	D
	24	Landscape		D	D	D	D	D	D	D	D	D	D	D	D	D
	25	Gender		D	D	D	D	D	D	D	D	D	D	D	D	D
	26	Right of Children		D	D	D	D	D	D	D	D	D	D	D	D	D
	27	Infectious diseases such as HIV/AIDS	People	**C**	D	D	D	D	D	D	D	D	**C**	D	D	D
	28	Labor environment (including work safety)		**B-**	D	D	D	D	D	D	**B-**	D	**B-**	D	D	D
Others	29	Accidents	Traffic situation	**B-**	D	D	D	D	D	**B-**	D	**B-**	C	**B-**	D	D
	30	Cross Boundary impacts and climate change	Meteorology / Climatology	**C**	D	D	D	**C**	D	D	D	D	D	**C**	D	D

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown **(serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

Table 7.10.7-2 Reasons for Draft Scoping

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating: Pre/ During Construction	Rating: Operation Phase	Reasons of the Rating
Pollution	1	Air pollution (Air quality & noise)	**B-**	**B-**	**Construction phase:** Temporary negative impacts are expected on air quality due to fugitive dust emissions from construction activities such as land clearing, grading, excavation, and the transport and movement of construction materials. **Operation phase:** Negative impacts on air quality are expected due to emission from vehicles passing on the new road.
	2	Water pollution (Water quality)	**B-**	D	**Construction phase:** Domestic wastewater will be generated from construction workers. Surface water will become turbid due to solids generated from earth works and drilling in the site. Oil and grease and petroleum hydrocarbons may pollute water that may come from vehicles and construction equipment. **Operation phase:** No serious impacts are expected.

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
	3	Waste (Abandonment)	**B-**	D	**Construction phase:** Construction waste such as waste soil and cutting trees are expected to be generated by deforestation, cutting, land clearing and drilling. Solid wastes from construction workers may be generated from construction base camp. Hazardous wastes such as busted lamps, used oil, used paints etc. maybe generated from construction site. **Operation phase:** No serious impacts are expected
	4	Soil contamination (soil quality)	**B-**	D	**Construction phase:** Removal of vegetation may affect the soil quality due to oil & grease and petroleum hydrocarbon contamination from construction equipment and vehicles. **Operation phase:** No serious impacts are expected.
	5	Noise (Noise)	**B-**	**B-**	**Construction phase:** Increased noise levels will be significant due to heavy construction vehicles moving to and from the site, drilling and excavation activities. **Operation phase:** Noise generation is expected by vehicles passing on the new road.
	6	Ground subsidence (Subsidence)	D	D	No impacts are expected. There will be no groundwater extraction during the construction and operation activities.
	7	Odor	D	D	Few impacts are expected. Obnoxious odor may come from vehicle exhaust, clearing & dredging of river banks.
	8	Sediment quality (Soil quality)	**B-**	D	**Construction phase:** Surface water runoff which may have caused the sediment transport is expected during construction activities due to earthworks, land clearing, excavation etc. **Operation phase:** Road operation which causes impacts on sediment quality is not expected.
Natural environment	9	Protected area (ECAs)	D	D	**Construction and operation phase:** No protected area such as designated conservation zone is observed in the project affected area.
	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	**B-**	**B-**	**Construction and Operation phase:** With the implementation of the project, during the construction phase, land clearing and topography alteration will require removal of existing vegetation cover within the road Right of way. Clearing of remaining vegetation will also possibly affect remaining wildlife and its habitats to give way for the construction of road project. Impacts of the project will be assessed based on the result of the terrestrial survey and to be able to come up with apt recommendations to mitigate such impacts. The result of the survey also serves as the basis for monitoring during the Operation phase.
	11	Hydrology (Hydrology and oceanography)	**B-**	**D**	**Construction Phase:** Rating B- under Reclamation of Wetland, etc. - Extent of impact is unknown. The road alignment may not cross wetland and/or swamps. In case the final road alignment will traverse the wetlands, survey and analysis should be done to make sure that the road network will not hamper the natural flow of water prior to the road construction. **Construction and Operation Phase** Rating B- under Alteration to ground by cut land, land filling, drilling, tunnel, etc. - Some impact is expected. The proposed road will traverse through generally flat terrain and rolling grounds drainage impact is expected. This may change the drainage flow to other directions and may cause flooding in some areas. Flooding that is expected maybe due to rainwater flow restrictions and natural blocking of surface water runoff in the construction site.
	12	Topography and geology (Geography, topography and landslides)	**B-**	D	**Construction and Operation Phase**: Earthworks such as land filling and land cutting would affect the topographic condition along the proposed road alignment. Risk associated with landslides maybe expected in sections passing steep terrain. Slope protection measures could be necessary during the operation phase. No protected geological site is located in the project area.
Social Environment	13	Involuntary resettlement	**B-**	D	**Pre-Construction Phase:** Settlements and private lands will be acquired to give way for the road construction. This will cause involuntary resettlement (physical and economic) **Operation Phase:** No impact is expected since it was already settled during pre-construction period

Category	№	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Reasons of the Rating
			Pre/ During Construction	Operation Phase	
	14	The poor	**B+/-**	**C**	**Construction Phase:** Some impacts (positive/negative) is expected considering the socio-economic condition of the community in the project area **Operation Phase:** Extent of impacts are still unknown but looks forward to easier access of the poor to public services
	15	Indigenous and ethnic people	D	D	**Construction and Operation Phase**: The existence of indigenous people has not been confirmed in project area. No impacts are expected.
	16	Local economy such as employment and livelihood	**B-**	**C**	**Pre-Construction phase:** Livelihood of residents and farmers may be affected by resettlement and acquisition of agricultural area **Operation Phase:** Few impacts are expected.
	17	Land use and utilization of local resources	**B-**	**B-**	**Pre-Construction phase:** Some agricultural areas will be affected by the project. **Operation Phase:** Roadside area may be developed as commercial or industrial area in non-designated land use area. Such unplanned development and influx of new settlers may give impact on land use and local resources.
	18	Waste Usage	**B-**	**D**	**Construction Phase:** Earth works such as cutting land and drilling of tunnel may give impact on drinking water resources such as springs and wells. **Operation phase:** No impact is expected.
	19	Existing social infrastructures and services	**B-**	**B-**	**Pre-construction and Construction Phase:** Relocation of religious facilities, school, cemetery and other public facilities need to be considered. **Operation Phase:** Existence of the road may disturb commuting/ going to school and hospital
	20	Social institutions such as social infrastructure and local decision-making institutions	D	D	Impacts are not expected, since local decision-making institute represented by local governments will continue after the road construction.
	21	Misdistribution of benefit and damage	D	D	Misdistribution of benefit and damage caused by the road constructions not expected.
	22	Local conflict of interests	**C**	D	**Construction Phase:** Local inhabitants and local authorities may request to ensure job opportunities as construction workers. **Operation phase:** No impact is expected.
	23	Cultural Heritage	**C**	D	**Pre-construction and Construction Phase:** Impact will be assessed based on confirmation of cultural heritages around the project site.
	24	Landscape	D	D	No impact is expected.
	25	Gender	D	D	Negative impact specified for women are not expected
	26	Right of Children	D	D	Negative impact specified for children are not expected
	27	Infectious diseases such as HIV/AIDS	**C**	D	**Construction Phase:** Infectious diseases such as STD are possible to be spread due to inflow of construction workers. Furthermore, alteration to ground by cut land and filling may provoke to provide habitats of mosquito that possibly transmits dengue fever **Operation phase:** Road operations which causes infectious diseases are not expected
	28	Labor environment (including work safety)	**B-**	D	**Construction Phase:** Construction work environment needs to be considered in accordance with relevant laws and regulations **Operation phase:** No impact is expected.
Others	29	Accidents (Traffic situation)	**B-**	D	**Construction Phase:** Construction vehicles may use existing local road near residential areas, thus number of traffic accident. **Operation phase:** Quantitative analysis based on baseline survey
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	**C**	D	**Construction phase:** Deforestation for land clearance may give impact on cross boundary impacts and climate change. **Operation phase:** Greenhouse gas emissions from vehicles that pass by along the new roads maybe generated which will have an impact in the protection of ozone layer as a result of climate change.

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

Table 7.10.7-3 Baseline Survey and Forecast Analysis for Draft Scoping

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/ During Construction	Operation Phase		
Pollution	1	Air pollution (Air quality & noise)	**B-**	**B-**	-Site measurement (2 sites) TSP,PM_{10}, NO_2 and SO_2 -Secondary data collection, if any	**Construction Phase:** Qualitative analysis **Operation Phase:** - Quantitative analysis(TSP,PM_{10}, NO_2 and SO_2 (Puf model : calm wind model)
	2	Water pollution (Water quality)	**B-**	D	-Site measurement (2 sites: river water) DO, TSS, BOD, COD, pH, Total/Fecal Coliform, temperature -Secondary data collection, if any	**Construction Phase:** Qualitative analysis
	3	Waste (Abandonment)	**B-**	D	Review of specification on design and construction plan	**During Construction Phase:** Quantitative analysis of volume of cutting trees by type and excavated or drilling soil and muck
	4	Soil contamination (soil quality)	**B-**	D	Review of specification on design and construction plan	**During Construction Phase:** Qualitative analysis
	5	Noise and vibration (Noise)	**B-**	**B-**	Noise -Site measurement (2 sites) $L_{Aeq,\ 10min}$ weekday (in accordance with DENR regulation) -Secondary data collection, if any	**During Construction Phase:** Qualitative analysis based on construction machines on standard formation **Operation Phase:** - Quantitative analysis(ASJ RTN-Model 2013)
	8	Sediment quality (Soil quality)	**B-**	D	Literature survey (land use history on affected land of the project)	**During Construction Phase:** Qualitative analysis base on the literature survey
Natural environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	**B-**	**B-**	Literature survey and site survey for fauna and flora.(6 sites0	**During construction and operation phase:** Qualitative analysis base on the literature survey, site survey and construction plan & traffic volume in the future
	11	Hydrology (Hydrology and oceanography)	**B-**	**B-**	Literature survey and referring to hydrographic and geological survey result on feasibility study and designing	**During construction and operation phase:** Quantitative analysis on following items base on the hydrographic analysis for bridge and drainage designing. - Impact on hydrological situation on the rivers and streams - Impact on water vein underground - Impact on flooding situation
	12	Topography and geology (Geography, topography and landslides)	**B-**	D	Literature survey and topographic survey for designing	**During construction phase:** Qualitative analysis base on the topographic analysis for designing
Social environment	13	Involuntary resettlement (People)	**B-**	D	Literature survey and a series of RAP surveys (Inventory of loss assets, census, social economic survey and replacement cost study)	**During construction phase:** Quantitative analysis based on RAP surveys
	14	The poor (People)	**B+/B-**	**C**	Literature survey and a series of RAP surveys	**During construction and operation phase:** Quantitative analysis based on RAP surveys
	15	Indigenous and ethnic people (Indigenous people)	**C**	**C**	Literature survey and a series of RAP surveys	**During construction and operation phase:** Quantitative analysis based on RAP surveys
	16	Local economy such as employment and livelihood (People)	**B-**	**C**	Literature survey and a series of RAP surveys	**During construction and operation phase:** Qualitative analysis based on RAP surveys
	17	Land use and utilization of local resources (Land use and classification)	**B-**	**B-**	Literature survey and a series of RAP surveys	**During construction and operation phase:** Quantitative analysis based on RAP surveys (area of land acquisition by land use)

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating		Baseline Survey	Forecast Analysis
			Pre/ During Construction	Operation Phase		
	18	Water usage (Hydrology / Hydrogeology/Water quality)	**B-**	**D**	Literature survey, geological survey and water usage survey (identification of springs and wells around tunnel and cutting land areas based on the data from RAP survey)	**During construction phase:** Qualitative analysis base on the baseline survey for following items - Impact on springs and wells - Impact on watershed area
	19	Existing social infrastructures and services (People)	**B+**	**B-**	Literature survey and a series of RAP surveys	**During construction and operation phase:** Quantitative analysis based on RAP surveys
	22	Local conflict of interests (People)	**C**	D	Collection of information and opinions in stakeholder meeting(s)	**During construction:** Qualitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
	23	Cultural heritage (People)	**C**	D	Literature survey, a series of RAP surveys and collection of local information through stakeholder meeting(s)	**During construction:** Quantitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
	27	Infectious diseases such as HIV/AIDS (People)	**C**	D	Literature survey and collection of local information through stakeholder meeting(s)	**During construction phase:** Qualitative analysis based on baseline survey. Followings impacts are considered - Risks of HIV/AIDS - Risks of dengue fever - Other specific infection disease
	28	Labor environment (including work safety)	**B-**	D	Literature survey, a series of RAP surveys and collection of local information through stakeholder meeting(s)	**During construction:** Quantitative analysis based on RAP surveys and opinions through stakeholder meeting(s)
Others	29	Accidents (Traffic situation)	**B-**	**D**	Collection of traffic accident data from police station	**During construction and operation phase:** Quantitative analysis based on baseline survey
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	**C**	**D**	-Estimation of affected forest area and traffic conditions based on the project plan	**During construction and operation phase:** Quantitative analysis based on baseline survey

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

(6) Summary of Baseline Survey, Forecast and Impact Assessment

The summarized result of baseline survey and forecast of impacts are shown in **Table 7.10.7-4**. The baseline data and quantitative forecast value is shown in **Table 7.10.7-5** and survey points of air & noise and water quality is shown in **Table 7.10.7-6**.

In terms of pollution items such as air, water and noise, all the forecasted values are within the allowable limits, thus it is not likely provided serious impact in these items. However, construction waste soil from cutting land and drilling in the tunnel section shall be reused or disposed in appropriate designated disposal site.

With regard to IUCN List, although some species are identified through the baseline survey on flora and fauna, these species are distributed around the around the Sub-Project area. The estimated numbers of resettlers are 76, appropriate compensation and mitigation measures are necessary on the resettlement action plan.

Table 7.10.7-4 Result of baseline and Forecast on Main Items

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact Assessment at Scoping		Impact Assessment Based on Survey Results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
Pollution	1	Air Pollution (Air Quality & Noise)	B-	B-	B-	B-	Result of (TSP, PM_{10}, SO_2, NO_2) at 2 stations are below the standard values (See **Table 7.10.7-6**)	Forecast value do not exceed standard values	Expected impacts by the project are not significant because all the forecasted values are within the standard values Quantitative Standards as shown in **Table 7.10.7-5.**
	2	Water pollution (water Quality)	B-	D	B-	D	Result of (pH, Temp, BOD, TSS, DO) are within the criteria guidelines (See **Table 7.10.7-6**)	Forecast value do not exceed standard values	Expected impacts by the project are not significant because all the forecasted values are within the standard values Quantitative Standards is shown in **Table 7.10.7-5.**
	3	Waste	B-	D	B-	D	Not required	Clearing and deforestation activities are expected to generate construction waste such as soil, debris, cut trees Also, additional domestic waste may be generated from the construction camp.	Impacts can be mitigated by proper management and disposal of waste like practice ecological waste management, segregation at source, 3R, etc
	4	Soil Contamination (Soil Quality)	B-	D	B-	D	Not required	Soil maybe contaminated from the construction equipment and transportation.	Impacts can be mitigated by proper maintenance of equipment and transportation, proper containment and disposal of oil, etc
	5	Noise	B-	B-	B-	B-	There are some measurement of noise that exceeded the standard particularly during the night due to presence of insects like crickets that make noise during the dark (See **Table 7.10.7-6**)	Forecast value exceed Philippines standard values (Class A (General)), but the value do not exceed Japanese standard values (Class B2). (See **Table 7.10.7-6**)	Impacts may be mitigated by avoidance and other measures such as no construction during the night or use of muffler or sound proof barrier. Quantitative Standards is shown in **Table 7.10.7-5.**
	6	Ground Subsidence	D	D	D	D	The ground terrain is characterized by low relief and gently undulating to rolling topography.	No impact is expected.	Detailed quantitative survey is not necessary.
	7	Odor	D	D	D	D	Not required	Few impacts are expected. Obnoxious odor may come from vehicle exhaust, clearing & dredging of river banks.	Qualitative measurements based on sensitivity of receptors against unobjectionable odor

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact Assessment at Scoping		Impact Assessment Based on Survey Results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
	8	Sediment Quality	B-	D	B-	D	Not required	During construction sediment will most likely erode into the water particularly during heavy rains	Impacts may be mitigated through erosion /sedimentation control measures, or stoppage of soil clearing during heavy rains, use of silt trap
Natural Environment	9	Protected Area	D	D	D	D	Not required		No protected area is observed in the area.
	10	Ecosystem (Terrestrial Flora and Fauna)	B-	B-	B-	C	Floristic composition of the alignment relatively low comprised of 64 species dominated by trees. Recorded species are common and naturally growing in the area. Conservation status of recorded species showed that one (1) species is critically endangered and three (3) species are vulnerable in the category listing of the IUCN. Faunal composition of the alignment is nominal with only 29 species recorded dominated by avifauna. Most of the species are common and locally sited in different ecosystems including the agricultural areas, shrub land, grassland and settlements areas. These species also thrive even in highly disturb areas including cities. *Three* (3) species are endemic in the study area dominated by Aves. Two (2) species is vulnerable in the category of the IUCN.	The project development will require removal of vegetation cover to give way for the construction of the proposed road project. Further loss of vegetation cover as a result of land clearing may encourage movement/migration of wildlife species in the area aggravated by the loss of habitat/abode and remaining sources of food for survival. Likewise, wildlife disturbance due to noise pollution brought about by the operation of heavy equipment's during construction will force some faunal species to migrate to other or nearby areas/habitat where disturbance is less.	Prior to project implementation the proponent will coordinate to the DENR and Philippine Coconut Authority (PCA) to seek clearance for the identification of required documents for the issuance of needed tree and coconut cutting permits (PD 705). Moreover, to compensate the loss of habitats, the proponent will replace the number of trees removed/cut and plant them in nearby areas or in accordance with the advice of the DENR. Species that will be used for the reforestation must be indigenous trees and/or fruit bearing trees endemic in the place that can attract wildlife species. Planting of trees will help in sequestering carbon in the environment. As per **DENR Memorandum Order no. 05 of 2012** mandated that "Uniform replacement ratio for cut or relocated trees" item 2.2 "For planted trees in private land and forest lands, tree replacement shall be 1:50 while naturally growing trees in the same area, including those affected by the project, shall be 1:100 ratio in support of the National Greening Program (NGP) and Climate Change Initiatives of the Government". Compensation for affected coconut palms shall be based on Section 5 of Republic Act No. 8048, an act providing for the regulation of the cutting of coconut palms. Replacement ratio of cut coconut palm shall be 1:1.
	11	Hydrology	B-	B-	C	D	The river systems that affect the proposed road alignment are the tributaries of Simuay River.	Earthworks may cause turbidity of river water and as to the springs reported on the alignment will most likely affected	Impacts may be mitigated by sediment and silt traps. Appropriate assistance for other source of water
	12	Topography and Geology	B-	D	B-	B-	The terrain is slightly undulating with difference in elevation reaching up to 75 masl.	• The proximity of active faults exposes the project to moderate to strong ground shaking.	• Conduct Probabilistic Seismic Hazard Assessment (PSHA).

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact Assessment at Scoping		Impact Assessment Based on Survey Results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
								• Some sections may be prone to liquefaction due to presence of loose/unconsolidated sediments with shallow water table. Some sections passing through steep to very steep, hilly to mountainous terrain may be susceptible to slope failure, soil erosion, and rock fall.	• Appropriate geotechnical investigation to evaluate potential liquefiable soil layers. • Impacts may be mitigated by slope protection
Social Environment	13	Involuntary resettlement (People)	B-	D	B-	D	Based on the RAP survey, 11 affected dwellings and 76 resettlers are identified.	Land acquisition may cause acquisition of agricultural land, crops and resettlement. Thus, RAP is prepared in accordance with JICA Guidelines and Philippine Laws.	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts.
	14	The Poor (People)	B+/-	C	B+/-	C	Based on the profiles of the respondents during perception survey, 68.75% of the households are earning below poverty line (PhP5,000 to PhP10,000 /month). This composed of the total income of the households per month which only reflects that more than half of the respondents are living in poverty	Land acquisition by the project gives some adverse impact to poor people under poverty line	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of livelihood/income to the poor may be consider
	15	Indigenous and ethnic people (Indigenous People)	D	D	D	D	Not required	Not required	The existence of indigenous people has not been confirmed in project area. No impacts are expected.
	16	Local Economy such as employment and livelihood (People)	B-	D	B-	D	Based from the occupation or source of income of the respondents, most of them depend on farming 45.10% and laborers 35.29% in the project area. Farming is the most strategic form of work due to the proximity of these people to the community. Around 19.61% are employed and employed as laborers while 9.80% are self-employed.	Land acquisition by the project gives some adverse impact to tenant farmers and employees of the shops.	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts. Provision of livelihood/income to the poor may be consider
	17	Land Use and utilization of local resources (Land Use and classification)	B-	D	B-	D	The project alignment is passing through mainly agricultural area such as plantation and residential zone	In terms of the Agricultural Land Zone (AG), impacts are considered as both positive and negative. Positive in the sense that the road can provide better and faster way, and as such more economical way of transporting products from these areas to trading centers and other distribution sites. Negative in the sense that there is an imminent danger of illegal conversion into other uses	some impacts are expected; thus, these impacts and risks are minimized by appropriate land management

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact Assessment at Scoping		Impact Assessment Based on Survey Results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
	18	Water usage (hydrology/ hydrogeology/water quality)	B-	B-	B-	B-	Majority of the respondents utilizes water from local water district for their domestic and drinking water needs. Other drinking water sources include from spring.	Earthworks may cause turbidity of river water as being use for domestic.	Minimized by control measures like silt trap, sedimentation pond, etc.
	19	Existing Social infrastructures and services (People)	B-	D	B-	D	There are 17 electric post, 2 mosques identified in the proposed alignment	The project does not give any impact to social infrastructures. Thus it is not likely to give any serious impacts on this item	Appropriate compensation and social assistance in accordance with Resettlement Action Plan (RAP) is prepared and minimize the adverse social impacts, if any impacts are expected in the detailed design
	20	Social institutions such as social infrastructure and local decision-making institutions	D	D	D	D	Impacts are not expected, since local decision-making institute represented by local governments will continue after the road construction.	Impacts not Expected	Not required
	21	Misdistribution of benefit and damage	D	D	D	D	Misdistribution of benefit and damage caused by the road constructions not expected.	Impacts not Expected	Not required
	22	Local Conflict of interest (People)	C	D	C	D	Most of the stakeholders requested to provide work opportunities as a construction worker during construction in the stakeholder meetings on scoping stage	The local conflicts regarding work opportunities between local communities may be raised in case of unfair employment.	This risk is minimize by mitigation measures such as provision of priority in hiring during construction period.
	23	Cultural Heritage (People)	C	D	C	D	No cultural heritage affected.	Few impact is expected	Not required
	24	Landscape	D	D	D	D	Not required	Few impact is expected	Not required
	25	Gender	D	D	D	D	LGU has implemented GAD projects	Impacts on Gender are mostly positive since opportunity for livelihood is expected (small business to women, employment to men)	Prioritization in hiring during construction and assistance for livelihood development
	26	Right of Children	D	D	D	D	Not required	Few impact is expected	Not required
	27	Infectious diseases such as HIV/AIDS (People)	C	D	C	D	No infectious illness recorded in the project area. Project should not to create a habitat of mosquito that transmits dengue fever in incidental pond in the construction area without appropriate drainage.	Infectious diseases such as STD are possible to be spread due to inflow of construction workers. Furthermore, alteration to ground by cut land and filling may provoke to provide habitats of mosquito that possibly transmits dengue fever	This risk is minimized by mitigation measures such as construction of sufficient drainage, management of construction yard and health check & education for workers.
	28	Labor environment (including Work safety)	B-	D	B-	D	Not required	There are risks for workers during construction, if the construction contractor does not comply with relevant labor laws and regulations.	These risks are avoided and minimized by complying with relevant laws and regulations by the contractor under observation of DPWH

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Rating				Summary of Results		
			Impact Assessment at Scoping		Impact Assessment Based on Survey Results				
			Pre/ During Construction	Operation Phase	Pre/ During Construction	Operation Phase	Baseline	Forecast	Evaluation (Quantitative Standard)
Others	29	Accident (Traffic Situation)	B-	D	B-	D	No serious problem on traffic	Construction vehicles may use existing local road near residential areas, thus number of traffic accident may increase	These risks are avoided and minimized by installation of traffic signage such as sign board, reflector/lighting in the night, safety personnel and parking for construction machines
	30	Cross boundary impacts and climate change (Meteorology/climatology)	C	D	C	D	Not required	During Construction, deforestation will incur. On loss of vegetation, the project development will require removal of vegetation cover to give way for the construction of road project. The removal of vegetation will also result in the reduction in the population of plant species growing within the project area. Future vegetation will face a great threat during the clearing activity. This activity will hinder the opportunity of these regenerants to grow and replace those mature vegetation in the area. During operations, generation of carbon monoxide and other gases will be generated from exhaust vehicles which will impact the ozone layer	On loss of vegetation: During site preparation, clearing of the road ROW will result to the removal of of an estimated tree above ground biomass (using large of trees with dbh of 10 cm and above, and pole size tress with $\geq$ 5 cm dbh to 9.5 cm) of 1.59×10^{-4} and 2.87×10^{-4} megaram per hectare, and with estimated Carbon stored value of 3.53×10^{-4} and 6.38×10^{-4} megagram per hectare, respectively. It was computed using the brown allometric equation.

Note) Rating:
A+/-: Serious impact is expected. B+/-: Some impact is expected. C: Extent of impact is unknown (**serious impacts are not expected, but survey and analysis shall be done**) D: Few impacts are expected. Detailed quantitative survey is not necessary.
Source: JICA Study Team

Table 7.10.7-5 Summary of Baseline and Forecasted Value (Air, Noise, Water)

No.	Item			Baseline Value (Standard Value)					Quantitative Forecast Analysis (Standard Value)			
1	Air Pollution	St.	Location	TSP (230μg/Ncm)	PM_{10} (150μg/Ncm)	NO_2 (150μg/Ncm)	SO_2 (180μg/Ncm)		TSP (230μg/Ncm)	PM_{10} (150μg/Ncm)	NO_2 (150μg/Ncm)	SO_2 (180μg/Ncm)
		1	Brgy. Orandang, Parang, Maguindanao	30.9	5.9	3.0	1.4		-	6.0	3.1	1.4
		2	Brgy. North Manuangan, Pigcawayan, Cotabato	36.7	2.1	5.7	1.6		-	2.1	5.8	1.6
2	Water Pollution (Water Quality)	St	Location	pH (6.5-9)	Temp, ºC (25-31)	BOD (7)	TSS (80)	DO (5ppm min.)	Basically, waste water is not discharged during and after construction, thus quantitative forecast has not been conducted.			
		1	Matengen Creek	7.7	28.6	3	25	7				
		2	Simuay River	8.1	30.4	2	62	8				
5	Noise	St	Location	Morning (50)	Daytime (55)	Evening (50)	Night time (45)		Morning (50) <65>	Evening (55) <65>	Evening (50) <65>	Night Time (45) <60>
		1	Brgy. Orandang, Parang, Maguindanao	51	50	51	49		52	52	52	50
		2	Brgy. North Manuangan, Pigcawayan, Cotabato	53	52	52	48		54	53	53	49

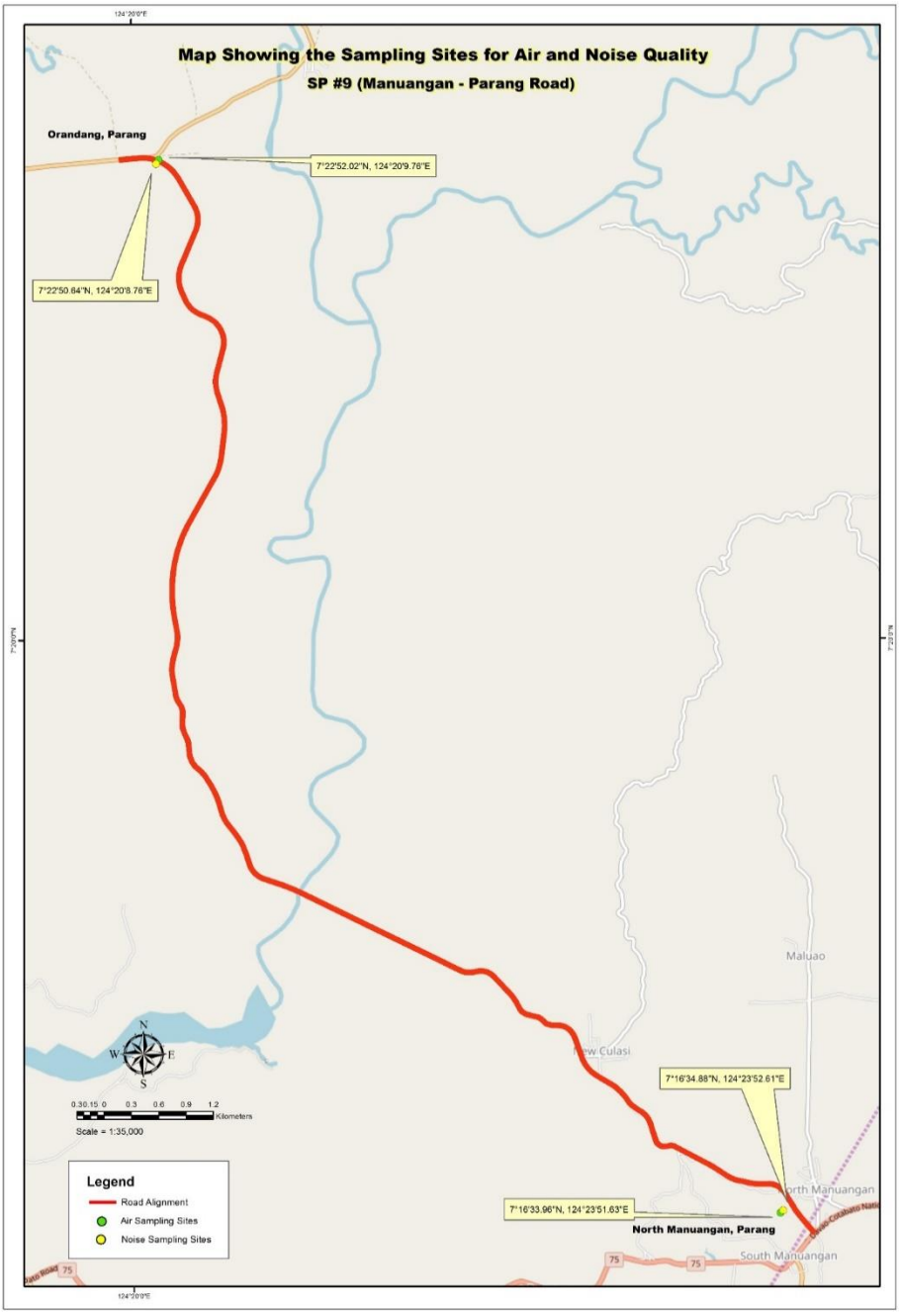
( ) : Philippine Standard Values
< > : Japanese Standard Values
Source: JICA Study Team

Table 7.10.7-6 shows sampling stations for Noise, Air and Water Sampling Sites, Coordinates, Date and Time of Samplings and **Figure 7.10.7-2** shows the sampling location for air and noise.

Table 7.10.7-6 Sampling points for Noise, Air and Water Quality

Station No.	Sampling Stations	Coordinates	Date and Time of Samplings
Noise Quality			
N1	Brgy. Orandang, Parang, Maguindanao	7°22'53.21"N 124°20'11.17"E	December 10-11, 2017, 1540H
N2	Brgy. North Manuangan, Pigcawayan, Cotabato	7°16'34.88"N 124°23'52.61"E	December 16-17, 2017, 1300H
Air Quality			
A1	Brgy. Orandang, Parang, Maguindanao	7°22'52.02"N 124°20'9.76"E	December 10-11, 2017, 1540H
A2	Brgy. North Manuangan, Pigcawayan, Cotabato	7°16'33.96"N 124°23'51.63"E	December 16-17, 2017, 1300H
Water Quality			
W1	Matengen Creek, Brgy. Matengen	7°17’28.8” N 124° 20’46.9” E	November 15, 2017, 1144H
W2	Simuay River	7°17’39.0” N 124° 19’ 52.0” E	November 15, 2017, 1245H

Source: JICA Study Team



Source: JICA Study Team

Figure 7.10.7-2 Sampling location for air and noise at Sub-Project 9 Manuangan-Parang Road

Source: JICA Study Team

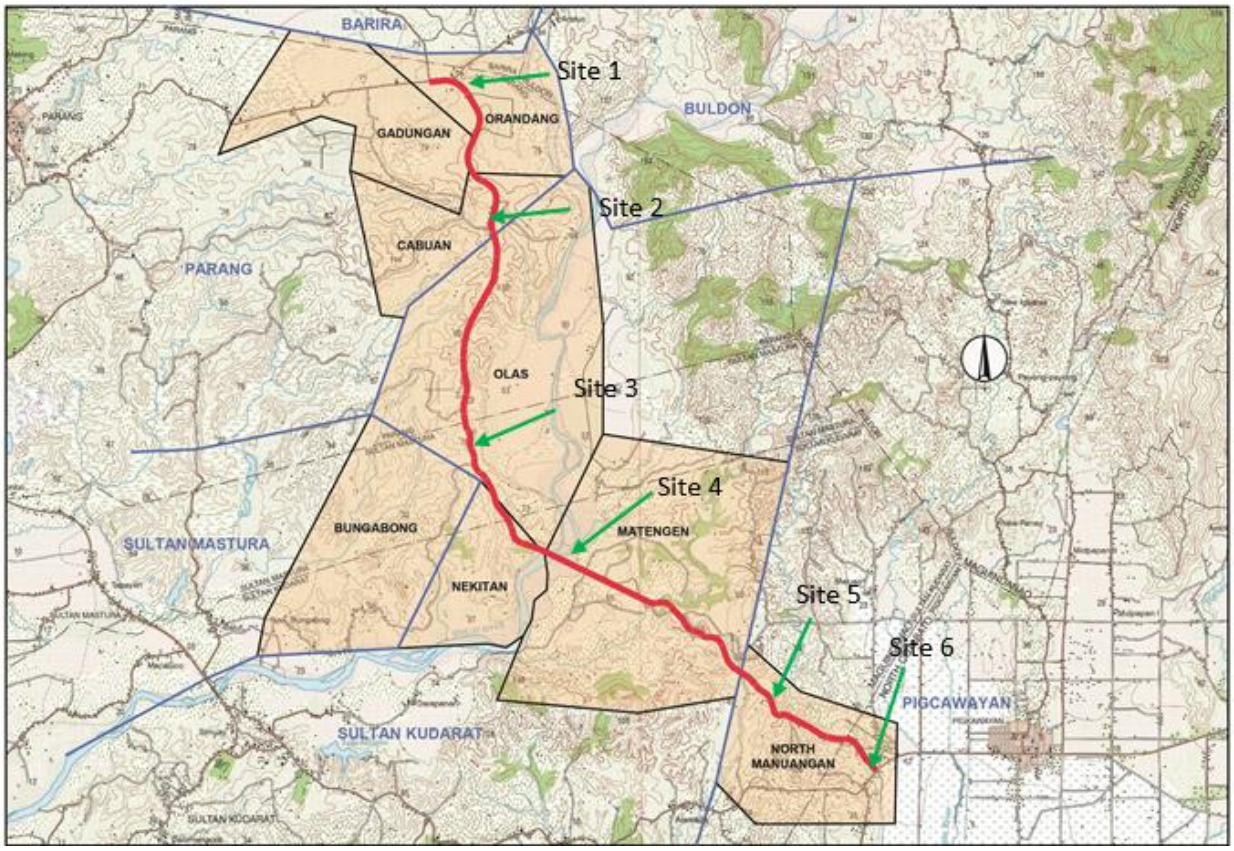
Figure 7.10.7-3 Water Sampling Map covered by Manuangan-Parang Road

Survey on terrestrial flora and fauna was undertaken in 6 selected sampling sites located within the Municipality of Sultan Kudarat, Parang and Pigcawayan. **Table 7.10.7-7** shows the geographic coordinates of sampling sites and name of covering barangays. **Figure 7.10.7-4** presents map of the proposed alignment and location of sampling plots.

Table 7.10.7-7 Locations of sampling sites for flora and fauna

Municipality	Barangay	Geographic coordinates	
		Northing	Easting
Parang	Orandang	7°22'51.18"	124°20'10.69"
	Cabuan	7°21'25.12"	124°20'31.58"
Sultan Kudarat	Olas	7°19'17.56"	124°20'20.26"
	Matengan	7°18'17.88"	124°21'22.92"
Pigkawayan	South Manuangan	7°17'3.69"	124°23'5.76"
	North Manuangan	7°16'28.29"	124°24'2.34"

Source: JICA Study Team



Source: JICA Study Team

Figure 7.10.7-4 Terrestrial flora and fauna sampling sites

(7) Mitigation Measures and Environmental Management Plan

A proposed mitigation plans during and after construction are shown in **Table 7.10.7-8**. All mitigation measures are included in the submitted EIS Report by DPWH. All cost for mitigation measures will be finalized in detailed engineering design phase.

Table 7.10.7-8 Environmental Management Plan

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
Pollution	1	Air pollution (Air quality & noise)	(Dust) - Water sprinkling near residential area - 20 kph speed limit for construction machines at construction sites adjacent to settlement areas	(NO_2, SO_2 and TSP) - Setting up green buffer zone along the road (the zone and planting trees are carried out during construction)	Contractor	[During Const.] DPWH [Operation Phase] Parang, Sultan Kudarat, Pigcawayan
	2	Water pollution (Water quality)	[Turbid water and other items] - Discharge through sedimentation pond and silt fence -Installation of portable toilet for workers - Appropriate waste and construction machines management	Not required	Contractor	DPWH
	3	Waste (Abandonment)	[Construction waste (trees and waste soil)] - After considering the possibility of reuse, construction waste is disposed at designated disposal site Note) [Muck soil from tunnel section] -Reuse or disposed at designated disposal site after treatment [Garbage from base camp] - Garbage at workers camp and waste oil shall be brought to disposal site or facility [Night soil] -Temporary sanitation facility such as septic tank shall be introduced to the workers camp.	Not required	Contractor	DPWH
	4	Soil contamination (soil quality)	-Reuse or disposed at designated disposal site after treatment	Not required	Contractor	DPWH
	5	Noise and vibration (Noise)	[Construction noise] - Installing noise barrier and selecting low-noise equipment. - Avoiding works of heavy equipment during night time. -Informing the construction schedule to surrounding communities to obtain their consensus	[Traffic noise] - Establishment of green belt as buffer zone along the road - Secure sufficient distance from boundary of the road to residential area after construction of the road (secure noise decay distance) on land use plan along the road - Installation of noise barrier near sensitive facility, if required	Contractor	DPWH
	6	Sediment quality (Soil quality)	-Reuse or disposed at designated disposal site after treatment	Not required	Contractor	DPWH

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
Natural Environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology)	- Relocation & replanting trees along the road in ROW -Tree planting at sites designated by DENR -Create ecotone habitats in consideration of Amphibia, if the existing habitats along the river are impacted by the project	- Appropriate land use management not to develop natural area along the road	[Const.] Contractor [Operation] Parang, Sultan Kudarat, Pigcawayan	[Const.] DPWH [Operation] Parang, Sultan Kudarat, Pigcawayan
	11	Hydrology (Hydrology and oceanography)	- Designing of bridges with sufficient capacity - Installation of sufficient drainage facilities on bypass - Secure waterways in construction area	Not required	Contractor	DPWH
	12	Topography and geology (Geography, topography and landslides	- Installation of slope protection measures	Not required	Contractor	DPWH
Social Environment	13	Involuntary resettlement (People)	Appropriate compensation and social assistance in accordance with RAP	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	DPWH	Parang, Sultan Kudarat, Pigcawayan
	14	The poor (People)	Appropriate social assistance in accordance with RAP	Assessing whether resettlement have been met, particularly with regards to livelihood and restoration and/or enhancement of living standards in accordance with RAP	DPWH	Parang, Sultan Kudarat, Pigcawayan
	15	Indigenous and ethnic people (Indigenous people)	Not required for designated indigenous and ethnic group However situation of religious group(s) such as Islamic group shall be monitored and adequate assistance and coordination shall be given, if necessary.	Not required for designated indigenous and ethnic group because NCIP has been issued. However situation of minority religious group(s) such as Islamic group shall be monitored and adequate assistance and coordination shall be given, if necessary.	–	–
	16	Local economy such as employment and livelihood	Appropriate compensation and social assistance in accordance with RAP	Not required	DPWH	Parang, Sultan Kudarat, Pigcawayan
	17	Land use and utilization of local resources (Land use and classification)	Appropriate land acquisition and compensation for agricultural area	Management of appropriate land use in accordance with approved detailed zoning map	[Const.] DPWH [Operation] Parang, Sultan Kudarat, Pigcawayan	Parang, Sultan Kudarat, Pigcawayan
	18	Water usage (Hydrology / Hydrogeology/ Water quality)	Installation of alternative water distribution system when unexpected situation such as reduction of spring water and water level of wells	Installation of alternative water distribution system when unexpected situation such as reduction of spring water and water level of well	DPWH, Parang, Sultan Kudarat, Pigcawayan	Parang, Sultan Kudarat, Pigcawayan

Category	No	Impacted Item on JICA Guidelines (Philippines Item)	Major Mitigation Measures		Responsibility	
			Pre and During Construction Phase	Operation Phase	Implementation Agency	Responsible Agency
	19	Existing social infrastructures and services	Appropriate compensation and/or relocation in accordance with RAP	Not Required	Contractor and DPWH	DPWH, Parang, Sultan Kudarat, Pigcawayan
	22	Local conflict of interests	Local workforce is prioritized for construction of the road	Not required	Contractor	DPWH
	23	Cultural heritage	No cultural heritage to be affected. Mitigation not required	Not required		
	27	Infectious diseases such as dengue and HIV/AIDS	- Installation of sufficient drainage facilities not to provide habitat for vector mosquito - Provision of adequate temporary sanitation facilities - Enforcement of medical screening and periodical medical check-up - In order to prevent spread of infectious diseases such as HIV/AIDS, awareness of the labors is promoted	Not Required	Contractor	DPWH
	28	Labor environment (including work safety)	Complying with relevant laws and regulations by the contractor under observation of DPWH	Not required	Contractor	DPWH
Others	29	Accidents (Traffic situation)	- Deploying flagman at the gate and crossing points of the construction vehicles - Installation of safety sign board - Installing fence around the construction site to keep out local people such as children - Installation of lightning in the night time - Installation of parking for idling construction machines - Safety training for the workers - Safety patrol at the construction site by supervisors	Not Required	Contractor	DPWH
	30	Cross boundary impacts and climate change (Meteorology / Climatology)	Replanting natural native trees and other agricultural trees such as coconuts	Not required	Contractor	DPWH

Source: JICA Study Team

(8) Environmental Monitoring Plan and Budget

A proposed monitoring plan during and after construction are shown in **Table 7.10.7-9** and **Table 7.10.7-10** respectively. All monitoring plans are included submitted EIA by DPWH to DENR-ARMM. The monitoring in operation phase shall be carried out for two (2) years at least.

Proposed items to be monitored by JICA are shown in **Table 7.10.7-11**. Air, water quality, noise, ecosystem, resettlement and livelihood of relocated people shall be monitored during and after construction.

Table 7.10.7-9 Environmental Monitoring Plan (Pre and During Construction)

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (peso)	Standard
Pollution	1	Air pollution (Air quality & noise	TSP, SO_2, NO_2 and PM_{10}	1. TSP –Gravimetric 2. SO_2 –Pararosaniline 3. NO_2 – Griess Saltzman Reaction 4. PM_{10}–Direct Reading (Gas Analyzer)	2 sites (same locations of baseline survey) **Table 7.10.7-6** and **Figure 7.10.7-2**)	2 times	800,000	TSP 300μg/Ncm SO_2 340 μg/Ncm NO_2 260 μg/Ncm PM_{10} 150 μg/Ncm
	2	Water pollution (Water quality)	pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Methodologies are described in DAO 34-1990 and EMBDENR Manual for Ambient Water Quality Monitoring Volume I	2 sites (same locations of baseline survey)	2 times	600,000	For Class "C" freshwater pH – 6.5 to 8.5 DO – 5.0 mg/L Oil & Grease – 2.0 mg/L BOD – 7.0 mg/L TSS – not more than 30 mg/L increase
	3	Waste (Abandonment)	Volume of waste soil, cutting tree and domestic garbage	Record volume of generated waste	Cutting land section, tunnel section, cutting tree section and workers camp	4 times	200,000	Generated waste shall be reused or disposed at designated site.
	4	Noise and vibration (Noise	Ambient and road side noise (dB(A)L_{Aeq})	L_{Aeq}, 10min during morning, daytime, evening and night time	2 sites (same locations of baseline survey) (see **Table 7.10.7-6** and **Figure 7.10.7-2**)	2 times	400,000	For "A" categorized areas (general area) Morning: 50 dB(A) Daytime: 60 dB(A) Evening: 50 dB(A) Night : 45 dB(A) For "B" categorized areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)
Natural Environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology	Situation of Cutting tree area	Ocular inspection	Major bridge section (see **Table 7.10.7-7** and **Figure 7.10.7-4)**	4 times	200,000	Cutting tree area is limited on ROW
	11	Hydrology (Hydrology and oceanography)	Flooding situation	Flood level measurement during high precipitation periods Interview with local residents	Flood-prone areas, particularly near major river systems	4 times	200,000	Project activities and structures does not cause flooding
	12	Topography and geology (Geography, topography and landslides)	Stability of slope	Ocular inspection	High cut and high embankment section	4 times	200,000	Must be continuously undertaken until slopes are fairly stable and vegetation cover achieves high survival rate
Social Environment	13	Involuntary resettlement (People)	Payment and implementation n of social assistance in accordance with RAP	Consultation Meeting and/or Survey with the project affected persons (PAPs)	Affected barangays	Monthly	500,000	Must be completed prior to construction stage

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (peso)	Standard
	14	The poor (People)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	16	Local economy such as employment and livelihood	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	19	Existing social infrastructures and services	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	22	Local conflict of interests	Construction n worker's native barangay	Confirmation of workers list from contractor	All barangays on the affected route	4 times	500,000	Employment opportunity shall be provided fairly
	27	Infectious diseases such as HIV/AIDS	Number of infected patient	Confirmation of health check list from contractor	All construction workers	4 times	500,000	Infection disease rate shall be less than average rate
	28	Labor environment (including work safety)	Number of workers with required instrument such as helmet	Count numbers of workers with instrument	All construction workers (weekly meeting place)	4 times	500,000	All workers shall have designated device such as helmet

Source: JICA Study Team

Table 7.10.7-10 Environmental Monitoring Plan (Operation Phase)

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (peso)	Standard
Pollution	1	Air pollution (Air quality & noise	TSP, SO2, NO2 and PM_{10}	1. TSP –Gravimetric 2. SO2 –Pararosaniline 3. NO2 – Griess Saltzman Reaction 4. PM_{10} –Direct Reading (Gas Analyzer)	2 sites (same locations of baseline survey)	1 times	400,000	TSP 300µg/Ncm SO2 340 µg/Ncm NO2 260 µg/Ncm PM_{10} 150 µg/Ncm
	2	Water pollution (Water quality)	pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Methodologies are described in DAO 34-1990 and EMBDENR Manual for Ambient Water Quality Monitoring Volume I	2 sites (same locations of baseline survey)	1 times	600,000	For Class "C" freshwater pH – 6.5 to 8.5 DO – 5.0 mg/L Oil & Grease – 2.0 mg/L BOD – 7.0 mg/L TSS – not more than 30 mg/L increase
	4	Noise and vibration (Noise	Ambient and road side noise (dB(A) LAeq)	LAeq, 10min during morning, daytime, evening and night time	2 sites (same locations of baseline survey)	1 times	200,000	For "A" categorized areas (general area) Morning: 45 dB(A) Daytime: 50 dB(A) Evening: 45 dB(A) Night : 40 dB(A) For "B" categorized Areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)

Category	No	Impacted Item on JICA Guidelines (Philippine Items)	Parameter	Method	Location	Frequency a year	Cost (peso)	Standard
Natural Environment	10	Ecosystem (Terrestrial Biology Freshwater or marine ecology	Situation of Cutting tree area	Ocular inspection	Major bridge section	1 times	100,000	Cutting tree area is limited on ROW
	11	Hydrology (Hydrology and oceanography)	Flooding situation	Flood level measurement during high precipitation periods Interview with local residents	Flood-prone areas, particularly near major river systems	1 times	100,000	Project activities and structures does not cause flooding
	12	Topography and geology (Geography, topography and landslides)	Stability of slope	Ocular inspection	High cut and high embankment section	4 times	200,000	Must be continuously undertaken until slopes are fairly stable and vegetation cover achieves high survival rate
Social Environment	13	Involuntary resettlement (People)	Payment and implementation n of social assistance in accordance with RAP	Consultation Meeting and/or Survey with the project affected persons (PAPs)	Affected barangays	Monthly	500,000	Must be completed prior to construction stage
	14	The poor (People)	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	16	Local economy such as employment and livelihood	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	19	Existing social infrastructures and services	↑ditto	↑ditto	↑ditto	↑ditto	500,000	↑ditto
	22	Local conflict of interests	Construction worker's native barangay	Confirmation of workers list from contractor	All barangays on the affected route	Quarterly	500,000	Employment opportunity shall be provided fairly
	27	Infectious diseases such as HIV/AIDS	Number of infected patient	Confirmation of health check list from contractor	All construction workers	Quarterly	500,000	Infection disease rate shall be less than average rate

Source: JICA Study Team

Table 7.10.7-11 Environmental Monitoring Form (JICA Form)

-If environmental reviews indicate the need of monitoring by JICA, JICA undertakes monitoring for necessary items that are decided by environmental reviews. JICA undertakes monitoring based on regular reports including measured data submitted by the project proponent. When necessary, the project proponent should refer to the following monitoring form for submitting reports.
-When monitoring plans including monitoring items, frequencies and methods are decided, project phase or project life cycle (such as construction phase and operation phase) should be considered

1. Relevant Permission and Public Consultation

Monitoring Item	Monitoring Results during Report Period
Confirmation of relevant written permissions and minutes of meetings for held consultations and meetings	

2. Mitigation Measures/Monitoring

- Air Quality（Traffic /Ambient Air Quality

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
TSP	µg/Ncm	33.8	36.7	230µg/Ncm	0.2 mg/m3	-Same points as baseline survey (see **Table 7.10.7-6**) -Two (2) time a year during construction -Once a year during operation -TSP = Gravimetric - SO2 =Pararosaniline - NO2 = Griess Saltzman Reaction - PM_{10} = Gravimetric (Gas Analyzer)
NO2	µg/Ncm	4.4	5.7	150ug/Ncm	0.04-0.06 ppm	
SO2	Mg/Ncm	1.5	1.6	180ug/Ncm	0.1 ppm	
PM10	ppm	4.0	5.9	150ug/Ncm		

- Water Quality（Physico-chemical Analyses of Surface Water）

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc.)
pH	-	7.9	8.1	6.5-9	6.5-8.5	-Upstream and downstream portion -Same points as baseline survey (see **Table 7.10.7-6**) Two (2) time a year during construction -Once a year during operation -grab sampling
DO	mg/L	7.5	8	5ppm min.	5 ppm	
TSS	mg/L	43.5	62.0	80	25	
BOD	mg/L	2.5	2.0	7	3	
Turbidity	NTU	11.7	17.0	-		
Temperature	℃	29.5	30.4	25-31		

- Noise/Vibration

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc)
Noise level	dB(A)	Morning 52 Daytime 51 Evening 53 Night time 50	Morning 53 Daytime 52 Evening 57 Night time 50	For "A" categorized areas (general / residential area) Morning: 45 dB(A) Daytime: 50 dB(A) Evening: 45 dB(A) Night : 40 dB(A) For "B" categorized Areas (general commercial areas) Morning: 60 dB(A) Daytime: 65 dB(A) Evening: 60 dB(A) Night : 55 dB(A)	Daytime: (6:00-22:00) 50dB(AA) 55 dB(A) 55 dB(B) 60 dB(C) Evening Time: (22:00-6:00) 40 dB(AA) 45 dB(A) 45 dB(B) 55 dB(C)	- Same points as baseline survey (see **Table 7.10.7-6**) - 2 times a year during construction - Once a year during operation - Digital sound level meter

- Odor

Monitoring Item	Monitoring Results during Report Period
Not required	

3. Natural Environment

- Ecosystem

Monitoring Item	Monitoring Results during Report Period
Situation of cutting tree area (during construction) Situation of replanting area along the road (operation phase)	

4. Social Environment

- Resettlement (During and after Construction)

Monitoring Item	Monitoring Results during Report Period
Number of PAPs including IPs to be resettled/ relocated/ provided livelihood assistance where required. (during Construction)	
Inventory and valuation of PAPS affected assets (during Construction)	
Notice period given to PAPs before shifting them from their original locations within the ROW (Pre and during construction)	
Number of grievances recorded and redressed (Pre and during Construction)	
Conflicts between religions (Pre, during and after construction)	

- Living / Livelihood

Monitoring Item	Monitoring Results during Report Period
Pre-and post-resettlement incomes and livelihood of PAPs especially for poor people (during and after construction)	

(9) Institutional Arrangement for EMP Implementation

Institutional Arrangement for EMP Implementation is described in **Section 7.5**.

(10) Stakeholders Meeting for EIA

A total of 18 stakeholders' meetings were held for Sub-Project 9, two (2) stakeholders' meetings were held at municipal level and one (1) was held at barangay level for barangay scoping**.** The first stakeholders' meetings at municipal level are prescript Information Education Communication meetings (IEC meeting) based on the Philippine EIA guidelines held in the municipalities of Parang, Sultan Mastura, Sultan Kudarat and Pigcawayan attended by the affected stakeholders, barangay and municipal officials, and concerned LGU offices such as Assessors, MPDC. The second stakeholders' meetings at municipal level presented the results of the baseline surveys. These stakeholders' meetings were attended by a total of 337 participants composed of 259 males and 78 females.

The major questions of the participants brought out during the 1st and 2nd public consultations are enumerated below. All questions, comments and suggestions were answered by DPWH ARMM, JICA Cotabato, RAP, and EIA Study team, and it seemed that all questioners understood and agreed all answers as shown in **Table 7.10.7-13**.

1st Public Consultation

a. What will happen to the landowner without land titles and proof of ownership;
b. What will happen to the land under military reservation;
c. Realignment of proposed road to avoid the Muslim Cemetery and less affected households;
d. Road alignment should consider the PWD with signage;
e. Final alignment of proposed road;
f. What will happen to the overlapping road (proposed Sub-Project 9 and existing);
g. Who will compensate the affected land, crops, and other structures;
h. What will happen to the household that depends their income to the affected land and crops;
i. What happen to the affected land, properties, tress and fruit bearings;
j. Necessary documents for claims and compensations;
k. Sultan Mastura requested to include barangay Bungabong in the alignment of Sub-Project 9;
l. Sultan Kudarat suggested to assess the classification of the soil because the affected barangays are prone to landslide and include drainage in the alignment;
m. Include forester policies to protect the perennial tress and habitat area; and
n. Work force from the affected communities.

2nd Public Consultation

a. Requested for the installation of water system in the barangay
b. Consider the widening of our barangay road.
c. Undertake close coordination to the LGU, MNLF and MILF
d. Convene Meeting with RAP suggested by the Mayor of Sultan Kudarat
e. Compensation of affected people
f. Peace and Order during implementation

Overall, the proposed Sub-Project 9 is socially acceptable based on the responses and feedbacks of the stakeholders. They are willing to be compensated and suggested to implement the project early from schedule.

Table 7.10.7-12 Contents of Stakeholder Meetings Municipal Level

Date (venues)	Objectives of the meeting	Major Agenda	Participants	No. of Participants		
				Location	Male	Female
1st Public Consultations Dec. 7, 12, and 13, 2017 1. Parang Municipal Conference Room 2. Sultan Mastura Municipal Conference Room 3. Sultan Kudarat Municipal Conference Room 4. Municipal Gymnasium of Pigcawayan	Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	1. Inform and generate awareness and understanding of the concerned public about the project; 2. Provide the stakeholders and avenue to ventilate salient issues and concerns regarding the project; 3. Give an opportunity to the stakeholders to have an open discussion with the Preparers, Proponents and LGU about the project; 4. Educate the stakeholders of their rights and privileges; and 5. Enable the stakeholders to effectively participate and make informed and guided decisions.	Municipal Officials, Project-Affected Persons (PAPs) and Barangay Officials, RAP and JICA Study Team	Parang	66	8
				Sultan Mastura	33	8
				Sultan Kudarat	23	14
				Pigcawayan	18	12
2nd Public Consultations February 27, March 1 and March 2, 2018 1. Parang Municipal Conference Room 2. Sultan Mastura Municipal Conference Room 3. Sultan Kudarat Municipal Conference Room 4. Municipal Conference Room of Pigcawayan	Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	To present and validate the results of environmental impact assessment	Municipal Officials, Project-Affected Persons (PAPs) and Barangay Officials, and JICA Study Team	Parang	45	13
				Sultan Mastura	18	5
				Sultan Kudarat	33	9
				Pigcawayan	23	18

Source: JICA Study Team

Table 7.10.7-13 Major Opinions in Stakeholder Meetings Municipal Level

Date and Objectives	Agenda	Item on EIA		Major Opinions	Answers (DPWH, RAP, EIA, and JICA Study Team's answers has been accepted and understood basically)
1st Public Consultations Dec. 7, 12 and 13, 2017 Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	1. Introduce the project and discuss the project objectives and the benefits that can be derived. 2. EIA and RAP Process 3. Tentative Schedules 4. Solicit queries, comments, concerns and suggestions on the project	Land	Properties/ (Crop/Trees)	1. (Parang) Are the trees also included in the compensation? Is the fruit-bearing trees included to be paid or compensated?	1. Yes, they will be compensated as long as included in the inventory or during cut offs. All trees that will be affected with the project will be paid or compensated especially the fruit-bearing trees. DPWH will pay the trees based on their guidelines. It depends on the size, and height of the trees.
			Land use	2. (Parang) What will happen to the land under military reservation?	2. The alignment of the project is not yet final. We will provide a copy of the results of the inventory per Barangay level for their information and confirmation.
		People	Infrastructure (Alignment)	3. (Parang) Affected people/areas are requesting for the possibility to move the alignment to avoid them or move to an area where there will be less affected.	3. We will request to the proponent to provide the affected community the final road alignment.
				4. (Parang) Is there any way to realign the road to another area?	4. For now this is a proposed or under the feasibility study stage. There are proposed alternatives and best alignment. This consultation meeting is part of the study to discuss or confirm you if you are in favor on the proposed project. We need this road for easier access and to avoid traffic.
			Infrastructure	5. (Parang) Where is the exact alignment of the project?	5. There are alternative options for the road alignment. The presented alignment is the feasible and will be finalized after the RAP inventory.
				6. (Parang) Can we request that the alignment avoid the cemetery of Muslim?	6. We will always consider and respect the heritage area for the benefit of the culture of the affected community. We need your cooperation during the survey in your community. Please provide us the right information so that we will not encounter any problem during the project implementation.
				7. (Sultan Mastura) Where is the alignment of the proposed road? What will happen to the existing road implemented by Mayor, would the proposed project is the continuation?	7. (Mayor Mastura) The proposed project is still initial, they are still in the study phase. The existing road will connect the proposed road. Barangay Bongabong is not part of the project but they are just here to inform the community that there will be a proposed project on the other municipality that we are also benefited, in terms of the easy access going to other municipality.

Date and Objectives	Agenda	Item on EIA		Major Opinions	Answers (DPWH, RAP, EIA, and JICA Study Team's answers has been accepted and understood basically)
				8. (Sultan Mastura) Based on the showed map, we are very sad because we are not included in this project. We would like to suggest that there should be Option 5. We suggested to be included in the road alignment.	8. We will take note on the suggestions and included this on the 2nd steering committee meeting on Dec. 20, 2017. In that meeting, we will discuss if there is a possible realignment and option. This showed map is just an initial.
			Properties	9. (Parang) What will happen to land owners without land title?	9. Based on the discussion with JICA during our meeting in Manila last November 2017, DPWH will compensate the affected land owner. In absence of land/lot title and other supporting documents will not be compensated from DPWH. Land owners should secure proper documents. We strictly follow the guidelines of DPWH.
				10. (Parang) Who will pay for all the structures like houses that will be affected by the project?	10. DPWH will be the implementing agency and will pay the acquisition of all affected land, structures after the inventory of RAP team.
				11. (Parang) What will happen to our families if almost all of the land area will be acquired? How can the project help us if we lose our property and livelihood?	11. DPWH along with the LGU will negotiate and help those who will be affected.
				12. (Parang) What are the needed documents for claims?	12. You need to secure certificate of land title or tax declaration.
				13. (Sultan Kudarat) There will be families in barangay Matengen that might be affected by the road alignment, can we reroute instead of relocating the families? Or what are your solutions on this problem?	13. This is an initial road alignment, we will document all the affected of the alignment and submit this to DPWH and JICA. For example, the affected families has no other place to live, it might be possible that we will adjust or will be dependent on the decision of DPWH because they are the implementing agency. We will conduct an inventory to all affected and make a unit price analysis to come up with an estimated cost. This will be submitted to Municipal Assessors office, DPWH local and national offices. We will also gather prices from local supplier within the municipality for the cost estimates. We also include in the estimates the time of relocation, means of transportation to the new location. For the trees, we will include the life span. All of this will be part in our research.
				14. (Sultan Kudarat) What if the owner of the affected property or land will not issue clearance to the project? What will happen?	14. We are hoping that this will be prevented, because JICA as much as possible to avoid any problems in ROW and the possibility that this project will not be implemented.

Date and Objectives	Agenda	Item on EIA		Major Opinions	Answers (DPWH, RAP, EIA, and JICA Study Team's answers has been accepted and understood basically)
				15. (Pigcawayan) What will be the solution of the affected private property in Barangay Manuangan?	15. All of the affected properties will be included in the inventory and will be computed (estimated cost). We will gathered data from assessor's office, from municipal and regional level. The estimated computations will be presented during the 2nd public consultations to be held in your barangay. We also have agreed value that will be suggested by the affected owners. This will be submitted to JICA and DPWH. DPWH make a compensation plan and validate in the barangay level. DPWH will determine on the true cost.
			Vulnerable	16. (Parang) What is the design of the road? Is it accessible to all, with signage and PWD friendly?	16. The road will follow the design road guidelines of DPWH. It includes the signage and pedestrians especially for schools. We will always considered the needs of our PWD but there always a limitations.
			Livelihood	17. (Pigcawayan) Local laborer must be hired from the affected barangays?	17. This is one of the requirements of DENR. Local labors will be coming from the barangay and will help the community while the project in the area is ongoing. The result of the inventory will be presented in the barangay public consultation. Also, one of the requirements of the DENR is the municipal and barangay resolution that will be signed by the community. The content of the resolution is that the community agreed on the presented estimated cost of the affected property and among others.
			GAD	18. (Pigcawayan, Women Group) Can we have a business/small canteen for the laborers during construction?	18. Yes, because during construction, many job or business opportunities will come in. Such as canteen because the laborers will also need this.

Date and Objectives	Agenda	Item on EIA		Major Opinions	Answers (DPWH, RAP, EIA, and JICA Study Team's answers has been accepted and understood basically)
			Hazard	19. (Sultan Kudarat) Mr. Blaim mentioned that based on the hazard assessment conducted by DENR, the affected 3 barangays are prone to landslides. 30% are affected by landslide during heavy rains. I suggest to check the area before the constructions and at the same time we need include drainage area both side of the road. Further he added, that this project will bring many improvements in the municipality. In addition, can we request to implement the forester policies to protect the perennial tress and areas with wild animals?	19. Landslide will be included in our study, we gathered data from MGB and study on the slope and other factors that will be affected by the road alignment. This will be submitted to DPWH and JICA. We are doing a comprehensive study on this road project such as flora and fauna that will be seen during the survey. All of this will be included in the EIA study. We have experts for geology, hydrology, and marines for the coastal areas. The geohazard aspects and slope protection will be part of the study; drainage canal will be included in the environmental management plan that will be recommended so that the implementing agency (DPWH) will conduct a geotechnical investigations to know the classification of the soil. Definitely engineering measures will be done before the construction stage to prevent the precious incident like in Baguio City. Further study for geotechnology for landslide prone areas will be implemented by DPWH. We will take note all of the suggestions.
2nd Public Consultation February 27, March 1 and March 2, 2018 Information Education and Communication (IEC) in accordance with Philippines EIA Guidelines	To present and validate the results of environmental impact assessment	Land	Crop/Trees	1. (Sultan Kudarat) The project is very important to us. The most affected area are agricultural lands and farming activities of the people however will be lessened the impact to the people if negotiation and consultation to the affected be undertaken.	1. The team explained that all affected of the project can be compensated based on DPWH rules and regulation. RAP will be implemented once the project is finalized.
				2. (PIgcawayan) How about those trees that will be affected? Can the affected people get that, so we can utilize it?	2. We can request that but there is a process that is followed by DENR in terms of tree cutting. This is subject for COA Audit
			Utilities	3. (Parang) The source of water (dug well) will be affected. He requested for the installation of water system in the barangay. He submitted a resolution/ request to the team for consideration	3. The team stated that their concerns and requests were noted and informed them that this will be recommended to the proponent
			Infrastructure (Farm to Market Road Widening)	4. (Sultan Mastura) We hope that the project will pushed through which will provide benefit to majority of the communities here. We also hope that a farm to market road will be implemented to maximized the benefit of the project.	4. The team are thankful for the support of the LGU to this study. They said that their concerns and requests were noted and informed them that this will be recommended to the proponent

Date and Objectives	Agenda	Item on EIA		Major Opinions	Answers (DPWH, RAP, EIA, and JICA Study Team's answers has been accepted and understood basically)
				5. (Sultan Mastura) They request that JICA will also consider the widening of our barangay road. We also hope that our road will not be abuse if ever trucks or other cars will use our road.	5. They said that their concerns and requests were noted and informed them that this will be recommended to the proponent. Regarding the abuse of road, there are monitoring's that will be undertaken part of it is the maintenance of road
				6. (Sultan Kudarat) Requested to the proponent to consider the concreting of the road from brgy. health center to the proposed road project because the proposed road is far from the residential area.	6. The team stated that this is not part of the project but their concerns and requests were noted and informed them that this will be recommended to the proponent. The team suggested to submit a resolution to the proponent signed by Brgy. Officials and Mayor of the Municipality of Sultan Kudarat for their request.
			Peace and Order	7. (Sultan Kudarat) Suggested that the proponent should undertake close coordination to the LGU, MNLF and MILF since this is very important to avoid conflict or war.	7. Yes, we will informed the proponent to closely coordinate with the LGU and the MNLF/MILF for smooth implementation of the project
				8. 8. (Pigcawayan) Is it safe to pass through the area once the road is implemented?	8. Based on the consultations with other LGUs, they will ensure the security once the project is implemented.
			Properties	9. (Pigcawayan) The request of the affected is proper compensation for them. What will happen to the land/lot with case or pawned?	9. The owner should settle first the required documents to be legible for compensation.
				10. (Pigcawayan) Affected families should be compensated first before construction of road.	10. Base on JICA guidelines, the project will not proceed unless all affected are settled. RAP will implemented once the projects is finalized.
			Properties	11. (Pigcawayan) some of his lot/land will be affected of the road project but it is okay for him.	11. The team is very thankful for his support to the project. The team informed Mr. Militar that he will be compensated considering the rules and regulation adopted by DPWH
				12. (Pigcawayan) The surveyor did not coordinate/informed to some of the affected people or families regarding that their properties that may be affected.	12. The RAP team will conduct consultation to present the result of the survey and you could raise your concern about affected properties. coordinate to RAP team for proper coordination and information dissemination to the affected families

Source: JICA Study Team

1) Barangay Scoping

The barangay scoping meetings were held in 4 barangays within the direct affected community as shown in **Table 7.10.7-14**. These meetings discussed the project background and objectives, and the positive and negative impacts of the proposed Sub-Project 9 to the people, health, habitat, and among others. The major opinions of the participants are the process of land acquisitions and compensations as shown in **Table 7.10.7-15**. The queries and comments on the barangay scoping checklist was responded by the Study team.

Table 7.10.7-14 Contents of Stakeholder Meeting on Scoping Stage Barangay Level

Date (venues)	Objectives of the meeting	Major Agenda	Participants	No. of Participants		
				Barangay	Male	Female
Jan. 12 & 13, 2018 Barangay Hall	Barangay Scoping in accordance with Philippines EIA Guidelines	1. Inform and generate awareness and understanding of the concerned public about the project; 2. To gather and address the queries and concerns and provide responses and clarifications to queries on the proposed project; and 3. To identify the foreseeable positive and negative effect of the Project based on the barangay scoping matrix.	Barangay Officials, Project-Affected Persons (PAPs), RAP, and JICA Study Team	Gadungan	15	4
				Orandang	9	3
				Cabuan	20	2
				Bungabong	18	5
				Nekitan	14	4
				Olas	15	3
				Matengen	16	4
				North Manuangan	5	2

Source: JICA Study Team

Table 7.10.7-15 Major Opinions in Stakeholder Meetings on Scoping Barangay Level

Date and Objectives	Agenda	Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
Jan. 12 & 13, 2018 Barangay Scoping in accordance with Philippines EIA Guidelines	Introduce the project and discuss the project objectives and the positive and negative impacts of the project.	1. (Mr. Tanto Tigasan- Brgy. Secretary, Brgy. Gadungan) The participants requesting to realign the alignment of the propose road to the area that more people can benefit of the project. They are requesting to realign the road to the Brgy. Road to improved access in their barangay	1. This will be noted for consideration of JICA and DPWH.
		2. (Brgy. Captain Aminodin Pendi, Brgy. Cabuan) Requested that the cemetery of the Muslim will not be affected by the propose project	2. This will be noted for considerations in the designing of the project
		3. (Brgy. Cabuan) The participants requested JICA and DPWH for a water supply for the people in the community. Because water is one of the problem. The source of water in the community is from dug well.	3. This is not part of the project but will be noted for recommendation for other projects to be prepared
		4. (Brgy. Kgwd. Udtog Sangban, Brgy. Cabuan) Is the houses, trees and lands to be affected by the project can be compensated?	4. These will be compensated as long as included in the inventory or during cut offs. DPWH will compensate affected structures. Make sure that all affected landowners have legal documents like Certificate of land title, tax declaration, etc.
		5. (Mr. Karis Bagua, Brgy Bungabong) The Brgy. Treasurer cited that in the proposed alignment, there is already an existing road from lump sum budget. They are requesting a road from farm to market.	5. This will be noted for considerations of JICA and DPWH.
		6. (Ms. Camela Gumander, Brgy. Bungabong) They are requesting a livelihood program for women, covered court and irrigation in the community.	6. This will be noted for considerations of JICA and DPWH.
		7. (Brgy. Captain Farhana Aron, Brgy. Orandang) There are few private properties that might be affected, the officials recommended to ensure that they will be compensated prior to the road construction.	7. Barangay officials are advised to inform the private property landowners to prepare proof of ownership like land title, certification or tax declarations, and present them to RAP team during the scheduled survey inventory/validation.
		8. (Brgy. Captain Farhana Aron, Brgy. Orandang) To consider local hire in the construction of the road as well as local materials since there is available construction materials in the area	8. This will be noted for considerations of JICA and DPWH.
		9. Barangay Kagawad, Gary Fernandez, Brgy. New Culasi raised a question about the source of fund to be used in the road implementation.	9. They were informed that it is the JICA that will fund the project and DPWH is the implementing agency.
		10. (Brgy. Kgwd. Gary Fernandez, Brgy. New Culasi) There are private properties to be affected by the road project such as: households, coconut trees, African oil trees.	10. The private property owners will be compensated prior to road construction. There is an ongoing inventory for all affected properties and crops/trees.
		11. (Brgy. Captain Rodrigo Onos, Brgy. South Manuangan) Barangay officials are grateful about the road project and they are looking forward for a Farm to Market road to be implemented in their barangay.	11. This will be noted for considerations of JICA and DPWH.
		12. (Ms. Alona Fernandez-Brgy. Kgwd., Brgy. South Manuangan) To some residents, the proposed road project will serve as an access for the terrorist.	12. Security will be tightened when project will be implemented. The government will not allow this to happen.

Date and Objectives	Agenda	Major Opinion	Answers (DPWH, RAP, and JICA Survey Team's answers has been accepted and understood basically)
		13. (Brgy. Captain Jesus Canja, Brgy. North Manuangan) The road project traverses some private properties such as houses, coconut trees, mango trees and coconut plantation but the owners are open for settlement.	13. The EIA team advised the barangay officials to ensure that private owners should present proof of ownership for the claims / compensation. They will be consulted once the inventory was finalized.
		14. (Brgy. Captain Norudin Tamboligao, Brgy. Olas) If the road already constructed, is it the same from Metro Manila that they will collect a toll fee to the cars passed by the road?	14. For now, it is not included in the plan. It is a government project.
		15. (Brgy. Olas) The participants requested JICA and DPWH for a water supply for the people in the community because of the scarcity of water in the area. The source of water in the community is from deep well.	15. This is not part of the project but will be noted for considerations on future plans/projects of JICA
		16. (Brgy. Captain Pangsayan Dalaig, Brgy. Nekitan) The participants requested to the proponent that the compensation/payment of the affected households of the project will directly give to them.	16. Yes, the payment will be directly paid and received by the affected owner.
		17. (Brgy. Nekitan) The participants requested JICA and DPWH for a water supply for the people in the community because of the scarcity of water in the area. The source of water in the community is from dug well.	17. This is not part of the project but will be noted for considerations on the future plans/projects of JICA and DPWH.
		18. (Mr. Samsodin Jhapar- Brgy. Kgwd., Brgy. Nekitan) Coconut Plantations will be affected. This is the main source of income of their family and source for tuition of their children for their school. With this, they are requesting to the proponent to compensate affected crops and give them a livelihood program that can help have extra income for their family.	18. This will be noted for considerations of JICA and DPWH. Affected crops such as coconut is considered for compensation.
		19. (Mr. Bacer Aro - Brgy. Secretary, Brgy. Matengen) Based on the survey conducted, most of the alignment of the proposed road is from cliff area. The participants requesting to realign the proposed road to the area that more people can benefit.	19. This will be noted for considerations in the final design of the project
		20. (Mr. Bacer Aro - Brgy. Secretary, Brgy. Matengen) Based on the team who conducted a survey/inventory, the coconut will be compensated. What will be the basis of the computations for the compensation of the affected coconuts?	20. The RAP team will present the basis for the computations of the compensation and the results of their inventory to the barangay and the affected community.
		21. (Brgy. Captain Kusain Sonsara, Brgy. Matengen) The participants requesting a road from farm to market road.	21. This will be noted for considerations on the future plans/projects of JICA and DPWH.
		22. (Brgy. Captain Kusain Sonsara) Brgy. Matengen have a source of sand. They are requesting to the proponent that if the project will pursue, they request that the sand to be use for the construction is from them to contribute to the income of the barangay.	22. This will be noted for considerations of DPWH and JICA.

Source: JICA Study Team

7.11 Resettlement Action Plan (RAP)

7.11.1 Summary of Resettlement Action Plan (RAP) for Sub-Project 1

(1) Social Environment Situation of Sub-Project 1

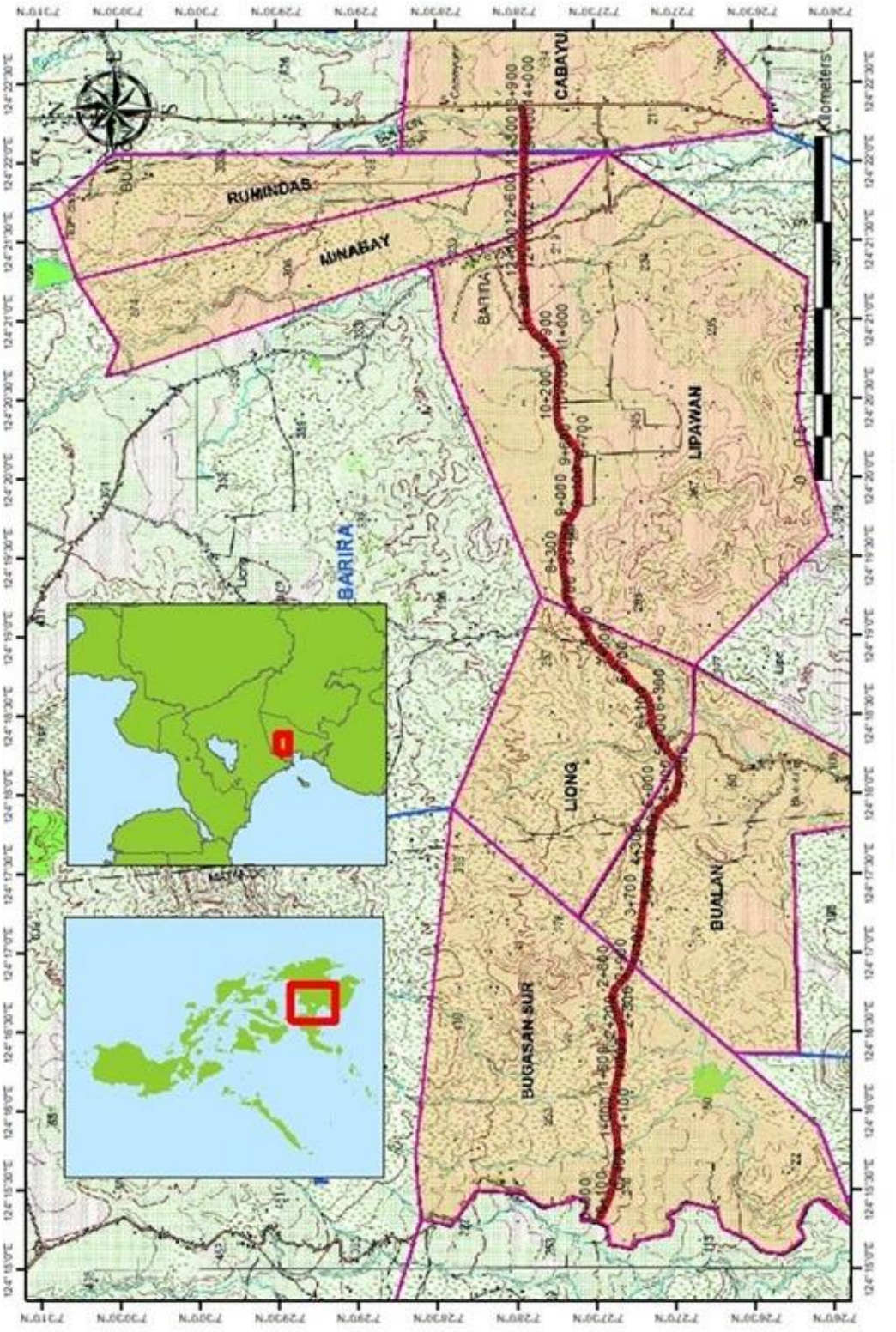
1) Project Description

The **Matanog-Barira-Alamada-Libungan Road**– Sub-Project 1 covers 13.9 km length and traverses from the municipalities of Matanog, Barira, and Buldon in Maguindanao (**Figure 7.11.1-1**). The alignment passes through barangays Bugasan Sur, Liong, Bualan, Lipawan, Rumidas, Minabay, and Cabayuan. This road segment aims to increase the flexibility of the network by linking primary-intercity road (Coatabato-Pagadian Road and Cotabato-Davao Road) to facilitate easier access of communities and their goods. It can also support peace building by improving access to MILF camps and other areas without stable road connection due to the long-protracted armed conflicts and provide better link to the areas with high poverty incidence to help them access social services and sell their products to urban centers with minimal transportation cost. Furthermore, the construction of this road will support fishermen by providing better access to the markets.

Table 7.11.1-1 Details of Matanog-Barira-Alamada-Libungan Road Alignment and Road Length

Province	Municipality	Barangay	Road Length (km)
Maguindanao	Matanog	Bugasan Sur	3.1
	Barira	Liong	2.2
		Bualan	2.5
		Lipawan	4.7
		Minabay	0.7
	Buldon	Cabayuan	0.5
		Rumidas	0.2
Total			**13.9**

Source: JICA Study Team



Source: JICA Study Team

Figure 7.11.1-1 Location Map of Matanog-Barira-Alamada-Libungan Road – Sub-Project 1

2) Socio-Economic Profile of the Project-affected Persons

Based on the conducted socio-economic survey, a total of twenty (20) affected household heads (AHHs) and ninety-eight (98) affected land lot owners were interviewed as shown in **Table 7.11.1-2**.

Table 7.11.1-2 Summary of Potential Number Affected Structures and Land Lots

Loss category	Matanog	Barira	Buldon	Grand Total
Affected House Heads	2	18	0	20
Affected Structures	2	18	0	20
Affected Land Lot Owners	4	86	8	98

Note: * 4 residential houses occupied and 1 house not occupied.
Source: JICA Study Team

A total of 402,346.25 sq.m of land with crops and trees will be affected by the alignment as summarized in **Table 7.11.1-3**. Majority of the cultivated crops that will be affected are corn and palay.

Table 7.11.1-3 Summary of Affected Land and Types of Cultivated Crops

Loss category	Unit	Parang	Balabagan	Matanog	Total
Affected agricultural lands with corn	m2	53,121.62	107,166.61	26,147.42	186,435.65
Affected agricultural lands with palay	m2	0	9,512.60	5,185	14,697.60
Affected Fruit bearing trees	No. of trees	1,004	2,219	44	3,267
Affected trees (Timber / non-fruit bearing)	No. of trees	0	6	0	6
Plant/Cash Trees	No. of trees	28	19	19	66

Source: JICA Study Team

Table 7.11.1-4 Affected Cemetery

Municipality	Affected Barangay	Cemetery
Barira	Lipwan	1
	Grand Total	**1**

Source: JICA Study Team

a. Household Size

Majority or 11 (55%) of the AHHs' size ranges from 6-10 members followed by AHHs' 1-5 (35%) and 11 – above members (10%).

Table 7.11.1-5 No. of Affected Household Heads by Household Size

Household Size	Total Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
1-5	7	0	0	7	35
6-10	9	2	0	11	55
11-above	2	0	0	2	10
Total	**18**	**2**	**0**	**20**	**100**

Source: JICA Study Team

Majority or 49 (50%) of the affected land lot owners' size ranges from 6-10 members while 42.86% have 1-5 members and 7.14% for 11-above members.

Table 7.11.1-6 No. of Affected Land Lots by Household Size

Household Size	Total Affected Land/Lots				
	Barira	Matanog	Buldon	Total	
				No.	%
1-5	38	4	0	42	42.86
6-10	41	0	8	49	50.00
11-above	7	0	0	7	7.14
Total	**86**	**4**	**8**	**98**	**100**

Source: JICA Study Team

b. Household Structure

The common family structure that can be observed along the Matanog-Barira-Alamada-Libungan Road Alignment was composed of nuclear structure (65%), a common Filipino family structure, which was made up of the parents and their children. About 15% is single household. The remaining 10% of the affected HHs have a joint and extended family structure where the grandparents and other close family members are staying with the family.

Table 7.11.1-7 No. of Affected Household Heads by Household Structures

Household Structure	Total Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
Single	3	0	0	3	15
Nuclear	13	0	0	13	65
Extended	0	2	0	2	10
Joint	2	0	0	2	10
Total	**18**	**2**	**0**	**20**	**100**

Source: JICA Study Team

In terms of family structure of the affected land lot owners, majority have household structure type of nuclear with 75.51% while10.20% have extended family structure where there are two or more families are staying in one house. About 9.18% of the affected HHs had a single structure where in there are only parents living without children, and the remaining 5.10% are joint structure.

Table 7.11.1-8 No. of Affected Land Lots by Household Structures

Household Structure	Total Affected Land/Lots				
	Barira	Matanog	Buldon	Total	
				No.	%
Single	9	0	0	9	9.18
Nuclear	62	4	8	74	75.51
Extended	10	0	0	10	10.20
Joint	5	0	0	5	5.10
Total	**86**	**4**	**8**	**98**	**100**

Source: JICA Study Team

c. Gender Distribution

In terms of gender distribution, there are more male (75%) household heads in the affected HHs than female heads (25%).

Table 7.11.1-9 No. of Affected Household Heads by Gender

Gender	Total Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
Male	13	2	0	15	75
Female	5	0	0	5	25
Total	**18**	**2**	**0**	**20**	**100**

Source: JICA Study Team

Consequently, 66 (67.35%) of the affected land owners were male while 32.65% are female.

Table 7.11.1-10 No. of Affected Lands Lots Owners by Gender

Gender	Total Affected Land/Lots				
	Barira	Matanog	Buldon	Total	
				No.	%
Male	60	1	5	66	67.35
Female	26	3	3	32	32.65
Total	**86**	**4**	**8**	**98**	**100**

Source: JICA Study Team

d. Civil Status

The civil status of most or 15 (75%) AHHs are married followed single (10%), single parents (10%), and others (5%).

Table 7.11.1-11 No. of Affected Household by Civil Status

Civil Status	Total Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
Single	2	0	0	2	10
Married	13	2	0	15	75
Window/er	0	0	0	0	0
Live-in	1	0	0	1	5
Single Parent	2	0	0	2	10
No Response	0	0	0	0	0
Total	**18**	**2**	**0**	**20**	**100**

Source: JICA Study Team

On the other hand, majority of the land lot owner's civil status are married (85.71%) followed by widow/er (9.81%), and single (5.10%) as shown in below table.

Table 7.11.1-12 No. of Lands/Lots by Civil Status

Civil Status	Total Affected Land/Lots				
	Barira	Matanog	Buldon	Total	
				No.	%
Single	5	0	0	5	5.10
Married	72	4	8	84	85.71
Window/er	9	0	0	9	9.81
Live-in	0	0	0	0	0
Single Parent	0	0	0	0	0
No Response	0	0	0	0	0
Total	**86**	**4**	**8**	**98**	**100**

Source: JICA Study Team

e. Age Distribution

Majority or 4 (20%) of the affected HHs' age ranges from 45-49, followed 15% of both ages ranges from 30-34 and 15-19, respectively. The remaining 50% of affected HHs' age ranges from 35-44 (10%), 40-44 (10%), 25-29 (5%),55-59 (5%), 60-64 (5%), and 65-69 (5%).

Table 7.11.1-13 No. of Affected Households by Age

Age	Total Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
15-19	3	0	0	3	15
20-24	0	0	0	0	0
25-29	1	0	0	1	5
30-34	3	0	0	3	15
35-39	2	0	0	2	10
40-44	1	1	0	2	10
45-49	3	1	0	4	20
50-54	2	0	0	2	10
55-59	1	0	0	1	5
60-64	1	0	0	1	5
65-69	1	0	0	1	5
70-74	0	0	0	0	0
75-79	0	0	0	0	0
80+	0	0	0	0	0
No response	0	0	0	0	0
Total	**18**	**2**	**0**	**20**	**100**

Source: JICA Study Team

Likewise, as observed in the age distribution of the affected land owners as shown in below table, most (22.45%) of the affected HHs' age ranges from 15-19. It was followed by 25-29years old (15.31%), 40-44years old (10.20%), 50-54 (8.16%),7.14% both ages that ranges 30-34 years old and 45-49, respectively.

Table 7.11.1-14 No. of Affected Land Lots Owners by Age

Age	Total Affected Land/Lots				
	Barira	Matanog	Buldon	Total	
				No.	%
15-19	22	0	0	22	22.45
20-24	2	0	0	2	2.04
25-29	14	0	1	15	15.31
30-34	3	0	4	7	7.14
35-39	3	0	2	5	3.06
40-44	10	0	0	10	10.20
45-49	7	0	0	7	7.14
50-54	7	0	1	8	8.16
55-59	3	1	0	4	4.08
60-64	3	3	0	6	6.12
65-69	3	0	0	3	4.08
70-74	3	0	0	3	3.06
75-79	0	0	0	0	0
80+	2	0	0	2	2.04
No response	4	0	0	4	4.08
Total	**86**	**4**	**8**	**98**	**100**

Source: JICA Study Team

f. Religious Affiliation

One-hundred percent (100%) of the affected HHs' are Islam.

Table 7.11.1-15 No. of Affected Household Heads by Religion

Religion	Total Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
Roman Catholic	0	0	0	0	0
Iglesiani Cristo	0	0	0	0	0
Baptist	0	0	0	0	0
Born Again Christian	0	0	0	0	0
Islam	18	2	0	20	100
Others	0	0	0	0	0
No Response	0	0	0	0	0
Total	**18**	**2**	**0**	**20**	**100**

Source: JICA Study Team

Majority or 80 (81.63%) of the affected HHs' are Islam followed by both Roman Catholic (3.06%) and other religious sectors (3.06%). The remaining 12.24% did not responded.

Table 7.11.1-16 No. of Affected Land Lots Owner by Religion

Religion	Total Affected Land/Lots				
	Barira	Matanog	Buldon	Total	
				No.	%
Roman Catholic	3	0	0	3	3.06
Iglesiani Cristo	0	0	0	0	0
Baptist	0	0	0	0	0
Born Again Christian	0	0	0	0	0
Islam	68	4	8	80	81.63
Others	3	0	0	3	3.06
No Response	12	0	0	12	12.24
Total	**86**	**4**	**8**	**98**	**100**

Source: JICA Study Team

g. Educational Attainment

Majority or 6 (30%) have no formal education followed by HS under graduated (20%), elementary graduated (15%). While the remaining 35% were college under grad, HS and college graduated. This indicates that remote communities were having difficulties in going to school due to access and expensive transportation.

Table 7.11.1-17 No. of Affected Household Heads by Educational Attainment

Education	Total Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
No formal education	6	0	0	6	30
Elem. level	0	0	0	0	0
Elem. Grad	3	0	0	3	15
HS Under grad	2	2	0	4	20
HS grad	2	0	0	2	10
Vocational/Technical	0	0	0	0	0
Certificate Courses	1	0	0	1	5
College Under grad	2	0	0	2	10

Education	Total Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
College grad	2	0	0	2	10
No response	0	0	0	0	0
Total	**18**	**2**	**0**	**20**	**100**

Source: JICA Study Team

As observed from **Table 7.11.1-18**, majority or 30 (30.61%) of the affected land owners were able to finish elementary followed by non-formal education (18.37%), HS graduated (14.29%), and 7.14% finished college.

Table 7.11.1-18 No. of Affected Land Lots by Educational Attainment

Education	Total Affected Lands/Lot				
	Barira	Matanog	Buldon	Total	
				No.	%
No formal education	14	1	3	18	18.37
Elem. level	0	0	0	0	0
Elem. Grad	28	0	2	30	30.61
HS Under grad	10	0	1	11	11.22
HS grad	14	0	0	14	14.29
Vocational/Technical	0	0	0	0	0
Certificate Courses	5	0	0	5	5.10
College Under grad	2	3	0	5	5.10
College grad	7	0	0	7	7.14
No response	6	0	2	8	8.16
Total	**86**	**4**	**8**	**98**	**100**

Source: JICA Study Team

h. Ethno-Linguistic Profile

In terms of the ethno-linguistic profile of the affected household heads, majority or 12 (60%) of the affected HHs are Iranun followed by Maranao (35%), and Cebuano (5%).

Table 7.11.1-19 No. of Affected Household Heads by Ethno-Linguistic

Ethno-Linguistic	Total Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
Maranao	5	2	0	7	35
Iranun	12	2	0	12	60
Maguindanao	0	0	0	0	0
Ilocano	0	0	0	0	0
Cebuano	1	0	0	1	5
Illonggo	0	0	0	0	0
Teduray	0	0	0	0	0
Lambangian	0	0	0	0	0
Dulangan Manobo	0	0	0	0	0
Higaonon	0	0	0	0	0
IP	0	0	0	0	0
Others	0	0	0	0	0
Total	**18**	**4**	**0**	**20**	**100**

Source: JICA Study Team

Consequently, majority or 60 (61.22%) of the affected land owners are Iranun followed by Maranao (31.63%), and Cebuano (7.14%).

Table 7.11.1-20 No. of Affected Land Lots by Ethno-Linguistic

Ethno-Linguistic	Total Affected Land/Lots				
	Barira	Matanog	Buldon	Total	
				No.	%
Maranao	22	1	8	31	31.63
Iranun	57	3	0	60	61.22
Maguindanao	7	0	0	7	7.14
Ilocano	0	0	0	0	0
Cebuano	0	0	0	0	0
Illonggo	0	0	0	0	0
Teduray	0	0	0	0	0
Lambangian	0	0	0	0	0
Dulangan Manobo	0	0	0	0	0
Higaonon	0	0	0	0	0
IP	0	0	0	0	0
Others	0	0	0	0	0
Total	**86**	**4**	**8**	**98**	**100**

Source: JICA Study Team

i. Occupation

Majority or 15 (78.95%) of the affected HHs were farmers while the remaining 21.05% were engaged in other works.

Table 7.11.1-21 No. of Affected Household Heads by Occupation

Occupation	Total Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
Farmer	13	2	0	15	78.95
Fisherman	1	0	0	1	5.26
Businessman	1	0	0	1	5.26
Govt. Employee	1	0	0	1	5.26
Driver	1	0	0	1	5.26
Teacher	0	0	0	0	0
Daycare Staff	0	0	0	0	0
Brgy. Official	0	0	0	0	0
Others	1	0	0	1	0
Total	**18**	**2**	**0**	**20**	**100**

Source: JICA Study Team

As observed from **Table 7.11.1-22**, 51.02% of the affected land owners were farmers while the remaining percentages were engaged other works.

Table 7.11.1-22 No. of Affected Land Lots by Occupation

Occupation	Total Affected Land/Lots				
	Barira	Matanog	Buldon	Total	
				No.	%
Farmer	41	1	8	50	51.02
Fisherman	0	0	0	0	0
Businessman	5	0	0	5	5.10
Govt. Employee	3	0	0	3	3.06
Driver	9	0	0	9	9.18
Teacher	2	0	0	2	2.04
Daycare Staff	0	0	0	0	0
Brgy. Official	3	0	0	3	3.06
Others	23	3	0	26	26.53
Total	**86**	**4**	**8**	**98**	**100**

Source: JICA Study Team

j. Family Income

Majority or 19 (95%) of the affected HHs' earnings PhP 10,000 and below while the remaining 5% earnings PhP PhP 10,001 to 20,000.

Table 7.11.1-23 No. of Affected Household Heads by Monthly Income Bracket

Monthly Income Bracket (PhP)	Total Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
10,000 and below	17	2	0	19	95
10,001 to 20,000	1	0	0	1	5
20,0001 to 30,000	0	0	0	0	0
30,001 to 40,000	0	0	0	0	0
40,001 to 50,000	0	0	0	0	0
50,001 to 60,000	0	0	0	0	0
60,001 to 70,000	0	0	0	0	0
70.001 to 80,000	0	0	0	0	0
80,001 to 90,000	0	0	0	0	0
90,001 to 100,000	0	0	0	0	0
100,001 to 200,000	0	0	0	0	0
200,001 and above	0	0	0	0	0
Total	**18**	**2**	**0**	**20**	**100**

Source: JICA Study Team

It was commonly observed that majority of the monthly income bracket of the affected land owners ranges from 10,000 and below.

Table 7.11.1-24 No. of Affected Land Lots by Monthly Income Bracket

Monthly Income Bracket (PhP)	Total Affected Land/Lots				
	Barira	Matanog	Buldon	Total	
				No.	%
10,000 and below	79	4	8	91	92.86
10,001 to 20,000	1	0	0	1	1.02
20,0001 to 30,000	1	0	0	1	1.02
30,001 to 40,000	1	0	0	1	1.02
40,001 to 50,000	1	0	0	1	1.02
50,001 to 60,000	1	0	0	1	1.02
60,001 to 70,000	1	0	0	1	1.02
70.001 to 80,000	1	0	0	1	1.02
80,001 to 90,000	0	0	0	0	0
90,001 to 100,000	0	0	0	0	0
100,001 to 200,000	0	0	0	0	0
200,001 and above	0	0	0	0	0
Total	**86**	**4**	**8**	**98**	**100**

Source: JICA Study Team

k. Willingness to relocate

In instances that there is a need to relocate the affected HHs, hundred percent (100%) of the households expressed their willingness to be displaced/ relocated for this project.

Table 7.11.1-25 Willingness to Relocate

Willingness to relocate	Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
Yes	18	2	0	20	0
No, but will consider	0	0	0	0	0
No	0	0	0	0	0
Don't know	0	0	0	0	0
No Response	0	0	0	0	0
Yes	0	0	0	0	0
Total	**18**	**2**	**0**	**20**	**100**

Source: JICA Study Team

l. Site Preference for Relocation

Preference of affected households for site relocation is shown in **Table 7.11.1-26**. Majority of 16 (80%) of the affected households expressed their willingness to be relocated in the same lot areas which were not affected by the alignment. While the remaining 20% within the same barangay.

Table 7.11.1-26 Site Preference for Relocation

Preferred Relocation Site of AHs	Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
Same Lot	15	1	0	16	80
Same Barangay	3	1	0	4	20
Other Barangay	0	0	0	0	0
Other Municipality	0	0	0	0	0
Relocation Site	0	0	0	0	0
Other Site					
No Response	0	0	0	0	0
Total	**18**	**2**	**0**	**20**	**100**

Source: JICA Study Team

m. Length of Residence

All of the affected HHs' stayed in the proposed road alignment area since birth.

Table 7.11.1-27 No. of Affected Household Heads by Length of Residence

Length of Residence	Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
Less than 1 year	0	0	0	0	0
1 - 5 years	0	0	0	0	0
6 - 10 years	0	0	0	0	0
Since birth	18	2	0	20	100
No response	0	0	0	0	0
Less than 1 year	0	0	0	0	0
Total	**18**	**2**	**0**	**20**	**100**

Source: JICA Study Team

All (100%) of the affected land owners stayed in the proposed road alignment area since birth.

Table 7.11.1-28 No. of Affected Land Lots by Length of Residence

Length of Residence	Affected Land/Lots				
	Barira	Matanog	Buldon	Total	
				No.	%
Less than 1 year	0	0	0	0	0
1 - 5 years	0	0	0	0	0
6 - 10 years	0	0	0	0	0
Since birth	86	4	8	98	100
No response	0	0	0	0	0
Less than 1 year	0	0	0	0	0
Total	**86**	**4**	**8**	**98**	**100**

Source: JICA Study Team

n. Project Acceptability

In terms of project acceptability, one-hundred percent (100%) were in favor of the proposed road alignment in their area. They were able to see more potential benefits in the onset of the project than with the negative effects. However, worries on inconvenience and displacement also surfaced in the survey.

Table 7.11.1-29 Project Acceptability

Project Acceptability	Affected Houses				
	Barira	Matanog	Buldon	Total	
				No.	%
Yes	18	2	0	20	0
No	0	0	0	0	0
Don't know	0	0	0	0	0
Total	**18**	**2**	**0**	**20**	**100**

Source: JICA Study Team

Majority or 97 (98.98%) of the affected landowners agreed of the proposed project, however, One or 1.02% were not infavor because they were worried of being displaced.

Table 7.11.1-30 No. of Affected Land Lots by Project Acceptability

Project Acceptability	Affected Land/Lots				
	Barira	Matanog	Buldon	Total	
				No.	%
Yes	85	4	8	97	98.98
No	1	0	0	1	1.02
Don't know	0	0	0	0	0
Total	**86**	**4**	**8**	**98**	**100**

Source: JICA Study Team

3) Barangays Affected

Table 7.11.1-31 shows the list of affected barangays and properties within the proposed 30 meters road alignment. In terms of the estimated land area per barangay, Municipality of Barira recorded the highest with 302,481.2 sq.m constitutes an estimated of 86 lot owners, followed by Municipality of Buldon with 23,569.05 sq.m consists of 8 lots owners while the least is Matanog which only covered Barangay Bugasan Sur with 76,296 sq.m constitutes of 4 lot owners.

Table 7.11.1-31 Affected Properties by Barangay

Municipalities	Barangays	Estimated affected land Area	No. of Affected Properties				
			Affected Land Lots Owner	Affected Structures	Affected HH Heads	Affected PPAPs	Lot and Structures
Barira	Lipawan	139,964.3	44	17	17	87	44
	Bualan	76,296.0	24	0	0	0	24
	Liong	65,720.1	18	1	1	10	18
	Minabay	20,500.80	0	0	0	0	0
	Sub-total	**302,481.2**	**86**	**18**	**18**	**97**	**86**
Buldon	Rumidas	7,620.95	5	0	0	0	5
	Cabayuan	15,948.10	3	0	0	0	3
	Sub-total	**23,569.05**	**8**	**0**	**0**	**0**	**8**
Matanog	Bugasan Sur	76,296.0	4	2	2	6	4
	Sub-total	**76,296.0**	**4**	**2**	**2**	**6**	**4**
	TOTAL	**402,346.25**	**98**	**20**	**20**	**103**	**98**

Source: JICA Study Team

4) Land Use and Areas Affected

The land use along the proposed alignment is classified into agricultural and residential areas. Since no Comprehensive Land Use Plan (CLUP) provided by the Local Government Units (LGUs)from the Municipalities affected to properly identify the delineation of the residential land, the survey team did an estimated delineation using a GPS.

Table 7.11.1-32 Land Use (sq. m)

Municipalities	Barangays	Residential	Agricultural	All Lands
Matanog	Bugasan Sur	0	76,296.00	76,296.00
	Sub-total	**0**	**76,296.00**	**76,296.00**
Barira	Liong	15,192.60	50,527.50	65,720.10
	Bualan		76,296.00	76,296.00
	Minabay		20,500.80	20,500.80
	Lipawan	73,637.80	66,326.50	139,964.30
	Sub Total	**88,830.40**	**213,650.8**	**302,481.20**
Buldon	Cabayuan		15,948.10	15,948.10
	Rumidas		7,620.95	7,620.95
	Sub Total		**23,569.05**	23,569.05
		88,830.40	**313,515.85**	**402,346.25**

Source: JICA Study Team

5) Structures and Improvements Affected

The structures that will be affected by the alignment are 21 structures (20 residential structures made up of concrete, semi-concrete, and shanty materials, and 1sari-sari store).

Table 7.11.1-33 Affected structures in the area

Municipalities	Barangays	No. of Structures Residential	No. of Structures Commercial
Matanog	Bugasan Sur	2	0
Barira	Liong	1	0
	Lipawan	17	0
	TOTAL	**20**	**0**

Source: JICA Study Team, Note: 1 sari-sari store making the total structure to 21

6) Crops and Trees Affected

Affected crops are summarized in **Table 7.11.1-34**. Most farmers in the area adapted the multi-storey cropping of corn. Palay were also affected by the road alignment for both Barangay Lipawan and Cabayuan.

Table 7.11.1-34 Affected Area Cultivated with Crops

Municipalities	Barangays	Affected area of crops (sq.m.)		Total
		Corn	Palay	
Matanog	Bugasan Sur	53,121.62	0	53,121.62
	Sub-Total	**53,121.62**	**0.00**	**53,121.62**
Barira	Liong	10,735.93	0	10,735.93
	Bualan	24,237.48	0	24,237.48
	Lipawan	72,193.20	9,512.60	81,705.80
	Sub-Total	**107,166.61**	**9,512.60**	**116,679.21**
Buldon	Rumidas	12,138.25	0	12,138.25
	Cabayuan	14,009.17	5,185.09	19,194.26
	Sub-Total	**26,147.42**	**5,185.09**	**31,332.51**
	TOTAL	**186,435.65**	**14,697.69**	**201,133.34**

Source: JICA Study Team

Affected trees along the proposed alignment were inventoried, most of the tree species planted are fruit bearing and harvestable timber as shown in **Table 7.11.1-35**.

Table 7.11.1-35 Affected Trees

Municipality	Affected Barangays	Trees (Fruit Bearing *)	Trees (Timber/ Non-fruit Bearing **)	Plant/ CashTrees ***	Total
Matanog	Bugasan Sur	1,004	0	28	1,032
Buldon	Cabayuan	32	0	0	32
	Rumidas	12	0	19	31
Barira	Liong	496	0	0	496
	Bualan	1,189	0	0	1,189
	Minabay	0	0	0	0
	Lipawan	534	6	19	559
	Total	**3,267**	**6**	**66**	**3,339**

Note:
* Fruit Bearing Trees: Mango, Coconut/ Buco, Jackfruit/ Langka, Santol, Kamatchile, Duhat, Tamarind/ Sampaloc, Aratiles/ Mansanitas, Guava/ Bayabas, Macopa, Kaimito, Avocado, Atis, Casoy/ Kasuy
** Timber, Non-friut Bearing Trees: Narra, Acacia, Talisay, Bangkal, Balite, Gmelina, Falcata, Mahogany
*** Plant, Cash Trees: Banana, Papaya, Atsuete, Cassava, Cacao
Source: JICA Study Team

7) Status of Land Ownership of Affected Lots

Table 7.11.1-36 shows the status of land ownership by category and the possible mitigating/ legal remedies/ options that may help implement the Task Force responsible for Right-of-Way Acquisition of DPWH (Unified Project Management Office). Number of lots shown in the matrix was identified through local guides such as Barangay Officials that helped the RAP team during the inventory. The final list of identified lots are submitted to the Municipal Assessor's Office for verification whether the identified land claimants can be found in their records either they have title or with tax declaration.

Table 7.11.1-36 Status of Land Ownership

Type	Definition	No. of Lots (People)				Total (A)+(B)
		Lots with House			Lots without House (B)	
		Lot owned	Lot not owned	Total (A)		
Case A	Land claimant has a land titled and paying taxes	2	0	2	8	10
		(11)	(0)	(11)	(55)	(66)
Case B	Land claimant has a land title but not paying taxes	4	0	4	14	18
		(20)	(0)	(20)	(98)	(118)
Case C	Claimant has no land title but paying taxes (Tax Declaration)	3	0	3	10	13
		(14)	(0)	(14)	(71)	(85)
Case D	No land title and No Tax Declaration	11	0	11	46	57
		(63)	(0)	(63)	(312)	(375)
TOTAL		**20**	**0**	**20**	**78**	**98**
		(108)	**(0)**	**(108)**	**(536)**	**(644)**

Note:*But in case the land to be acquired for ROW is classified as public land, concerned PAF/Ps will need to provide equity contribution for the purchase of land replacement; such equity contribution for a period of time (15-25 years). In the same manner claims related to resettlement or compensation of the agrarian reform under RA 3844, RA 6389 and RA 6657, the latter is also applicable.
Source: JICA Study Team

(2) Implementation Schedule for RAP

Table 7.11.1-37 summarizes the indicative schedules of the various interrelated activities in relation to the preparation and implementation of the RAP.

Table 7.11.1-37 Resettlement Schedule

Activity	2019				2020				2021				2022				2023				2024			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
First Disclosure																								
Parcellary Survey																								
Updating of RAP																								
Formulation of MRIC																								
Disclosure of Updated RAP to PAPs																								
Notification of PAPs																								
Compensation																								
Income Restoration																								
Detailed Design																								
ROW Acquisition and RAP																								
Procurement of Contractor																								
Construction																								
Construction Supervision																								
Monitoring and Evaluation																								
Internal Monitoring																								

Activity	2019				2020				2021				2022				2023				2024			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
External Monitoring & Evaluation																								

Source: JICA Study Team

(3) Cost Estimates, Compensation and Entitlements

1) Preliminary ROW Cost Estimates for Land

The current fair market values from the BIR Zonal Computation and an independent property appraiser (IPA) were compared (**Table 7.11.1-38**) to determine the Estimated ROW Cost of Land. To compute for the total ROW Cost of Land, the highest market value (which in this case was seen to be the current value by the independent property appraiser) was then multiplied by the total affected land area.

Table 7.11.1-38 Comparison of Current Market Value and BIR Zonal Value

Municipality	BIR Zonal Value			Current Market Value (IPA)		
	Residential	Commercial	Agricultural	Residential	Commercial	Agricultural
Matanog	99.00	165.00	149.00	400.00	750.00	15.00
Barira	99.00	165.00	149.00	400.00	750.00	15.00
Buldon	99.00	165.00	149.00	400.00	750.00	15.00

Source: JICA Study Team

Note:* The current market value that was set by the independent property appraiser was used for the computation of the estimated market values of the affected land.

Estimated market values of affected land in the assumption that all affected land owners have the complete land title is presented in **Table 7.11.1-39**.

Table 7.11.1-39 Estimated Market Values of Affected Land

Municipality	Land Classification	Affected Land (sq.m)	Unit Price (PhP)	Total Cost (PhP)
Matanog	Agricultural	76,296.0	15.0	1,144,440.00
Barira	Agricultural	213,650.8	15.0	3,204,762.00
	Residential	88,830.4	400.0	35,532,160.00
Buldon	Agricultural	23,569.05	15.0	353,535.75
Total		**402,346.25**		**40,234,897.75**

Note: The estimated market values of affected land were computed in the assumption that all claimants were qualified for the compensation, provided that they have the Original Certificate of Title and Tax Declarations, or any of the two.
Source: JICA Study Team

2) Preliminary ROW Replacement Cost Estimates for Structures and Improvements

The replacement cost of the affected structures, in this case were referred to the affected houses, was shown in **Table 7.11.1-40**.

Table 7.11.1-40 Replacement Cost of Residential houses

Municipality	No. of Structures	Total
Barira	18	180,000
Matanog	2	20,000
Total	**20**	**200,000**

Source: JICA Study Team

The replacement cost of the affected utilities, identified as electrical post traversing the proposed alignment site, was shown in **Table 7.11.1-41**.

Table 7.11.1-41 Replacement Cost for Affected Utilities

Municipality	Electric Post	Unit Cost (PhP)	Total Cost (PhP)
Barira	23	35,000	700,000.00
Total	**23**	**35,000**	**700,000.00**

Source: JICA Study Team

3) Preliminary Cost Estimates for Crops and Trees

Table 7.11.1-42 Replacement Cost for crops

Municipality	Crops (sq.m)	Total Area (sq.m)	Cost/ sq.m (PhP/sq.m)	Yield (kg/sq.m)	Total Cost (PhP)
Matanog	Corn	53,121.62	14.00	0.28	208,236.75
Barira	Corn	107,166.6	14.00	0.28	420,093.11
	Palay	9,512.60	16.01	0.36	54,826.82
Buldon	Corn	26,147.42	14.00	0.28	102,497.89
	Palay	5,185.09	16.01	0.36	29,884.78
Total		**201,133.33**			**760,712.53**

Source: JICA Study Team

Table 7.11.1-43 Replacement Cost for trees

Commodity	Municipality			Total Estimated Value
	Matanog	Barira	Buldon	
Fruit bearing trees	1,004	44	2,219	890,650.00
Timber / Non-fruit bearing trees	0	0	6	4,290.00
Plant/Cash Trees	28	19	19	558,010.00
Total	**1,032**	**63**	**2,244**	**1,452,950.00**

Source: JICA Study Team

4) Recommended Preliminary Compensation and Entitlement Packages

The recommended budget for RAP Implementation of Sub-Project 1 is PhP **52,498,047.73** and is part of government counterpart; however, the amount is exclusive of other entitlements that are yet to be determined after the completion of the Parcellary survey of the DPWH. The indicative budget items covering land acquisition and replacement cost of structures, and cost for external monitoring. Contingencies and admin cost are also included. **Table 7.11.1-44** shows the details of the indicative budget to implement this RAP.

Table 7.11.1-44 Indicative Budget for RAP Implementation

Description	Cost Item	Amount	Remarks
Land Acquisition and Structures	Land	40,234,897.75	Estimated based on the current fair market value of Land
	Structures	2,501,916.00	Estimated based the replacement cost
	Improvements	700,000.00	Estimated based the replacement cost
	Subtotal A	**43,436,813.75**	

Description	Cost Item	Amount	Remarks
Compensation	Trees and Cash crops	1,452,950	Estimated based on the current market values of the Maguindanao Provincial Assessor's Office and Lanao del Sur
	Damaged crops	760,712.53	Estimated based on the current market value of the Philippine Statistics Authority
	Subtotal for B	**2,213,662.53**	
External Monitoring		1,000,000.00	Estimated at PhP 1,000,000 per SP
	Subtotal for C	**1,000,000.00**	
Subtotal (A+B+C)		**45,650,476.28**	
Contingency	10%	4,565,047.63	
Admin Cost	5%	2,282,523.81	
GRAND TOTAL		**52,498,047.73**	

Source: JICA Study Team

(4) Stakeholders Meeting for RAP for Sub-Project 1

The affected LGUs, including municipalities and barangays, were informed on the date and venue of the public consultation meetings through a letter from the JICA Study Team. Following the protocol of the local process, a letter of invitation for public consultation meetings was handed down to the office of the Mayor for proper dissemination of information to the barangay level.

Table 7.11.1-45 Public Consultation Meetings conducted

Activity	Objective	Venue	Date	Participants	No. of participants	
					M	F
1st Round Meeting	Provide information to the possible Affected households regarding the: • project background • scope • objectives • benefits • update • basic resettlement policies (Philippines and JICA), • Cut-off-date and announcement of succeeding resettlement activities such as conduct of perception, census, socioeconomic survey and inventory of losses.	Barira municipal conference room	Dec. 8, 2017	LGU, DPWH, Project affected persons, Tourism and Barangay Officials	58	24
		Matanog municipal conference room	Dec. 8, 2017		25	16
		Buldon municipal conference room	Dec. 12, 2017		31	17

Table 7.11.1-46 Summary of Main Opinions and Concerns raised during the First Public Consultation

Major Opinions/Concerns	Reflections/Countermeasures
i. Barira	
Coordination on the progress and status of the project	Mayor Tomawis informed the study team to always coordinate with the LGU officials. Full support of the project has been pledged by the mayor to ensure its completion.

Major Opinions/Concerns	Reflections/Countermeasures
Final alignment of the road alignment	Feasibility stage is still ongoing so it is still uncertain to identify the final alignment. Three alternative routes are considered as options for the best alignment. The alignment will be finalized in consideration on what is good for the people in the affected community. A survey and study were being conducted to determine if the proposed alignment is favorable to the people and community that are affected. It will be reflected to the report once there is a recommendation of possible change of route.
Overlapping roads: existing and proposed	There is a possibility to improve the existing road alignment.
ii. Matanog	
Route or Best route to consider for the road alignment project	The reference of the on-going studies is the proposed alignment. There are other alternatives being proposed but after the study, it will be then possible to determine the best alignment which will be favorable to the people to access the road. If there are recommended routes, the barangay should submit a resolution to the municipality of Matanog and the mayor will then endorse it to DPWH for inclusion to the future project.
iii. Buldon	
Compensation of lands and houses	DPWH will pay the acquisition of all affected structures after conducting the RAP. Documents such as certificate of land title and tax declaration should be prepared and secured. Results of the inventory from the RAP team will be submitted to DPWH. The department will then decide about the right cost based on their guidelines. A copy of the results of the study will be provided to the barangay level for confirmation on their part. In the case where affected lands have no title, there will be no compensation for that from DPWH. The department is in charge to pay for the affected land owner.

Source: JICA Study Team

Table 7.11.1-47 Barangay Consultations Conducted

Activity	Objective	Venue	Date	Participants	No. of participants	
					PAPs	Non PAPs
2nd Round Meeting Provide information to the possible Affected households regarding the: • Proposed Projects	• To elicit further opinions from PAPs themselves about the project • To obtain the basic socioeconomic data from PAP's and to allow them to express their ideas, apprehensions, concerns and objections.	Barira Municipal Conference Room	Feb 21, 2018	Barangay Officials and PAPs	67	
		Matanog Municipal Conference Room	Feb 23, 2018	Barangay Officials and PAPs	5	

Table 7.11.1-48 Summary of Main Opinions and Concerns raised during Barangay Consultations

Major opinions/concerns	Reflections/countermeasures
i. Barira Municipality	
PAPs without TCT or any proof of ownership over the land they are cultivating for more than 30 years.	• Discussed the different forms of land ownership and one of which is the: **Predecessors-in-interest** who have been in open, continuous, exclusive and notorious possession and occupation of alienable and disposable lands of the public domain under a bona fide claim of ownership since June 12, 1945, or earlier, or by virtue of inheritance Provided by P.D 1529. It will be discussed further in the second public consultation with DPWH.
Concerns about the basis for compensating the properties will be affected.	• Section 4 of the R.A 10752 clearly states that the modes of acquiring real property are: (i) donation, (ii) negotiated sale, and (iii) expropriation. Property

Major opinions/concerns	Reflections/countermeasures
	valuation is market-based and undertaken using Government Financial Institutions (GFIs) or Independent Property Appraisers which help promotes unbiased property valuation. The assumption by the IA of the capital gains tax also provides supplementary incentive to the lot owners to negotiate with government. All these things will be further discussed by DPWH representatives and consultant in the second public consultation.
Mode of DPWH payments for the crops, trees and perennials.	• LARRIP, 2017 states that Cash compensation for the affected crops, trees, perennials at current market value as prescribed by DENR and LGUs
Assistance from the government aside from the compensation they will receive.	• Executive Order (EO) 1035**.** Specifically, the order specifies (i) the provision of financial assistance to displaced tenants, indigenous peoples, and settlers equivalent to the average annual gross harvest for the last 3 years and not less that PhP15, 000 per ha, (ii) disturbance compensation to agricultural lessee's equivalent to 5 times the average gross harvest during the last 5 years, and (iii) compensation for improvements on land acquired under Commonwealth Act 141.
Concerns about the mode of payment/ compensation for affected assets/ properties.	• The PAPs will be paid 100% compensation prior to removal of assets and properties. • The PAPs will not be displaced until after they have received in full the compensation and appropriate allowances due to them.
ii. Matanog Municipality	
Eligible persons qualified for compensation.	Specific to the project, the various types of APs are qualified, as follows: **(i) Landowners and Land Users** a. Legal owners (e.g., agricultural, residential, commercial and institutional) who have full title, tax declaration, or who are covered by customary law (e.g. possessory rights, usufruct, etc.) or other acceptable proof of ownership over the affected land. b. Users or occupants that have no land title or tax declaration over the affected land. c. Renters of the affected land. **(ii) PAPs with Structures** a. Owners of structures who have full title, tax declaration, or other acceptable proof of ownership (e.g. possessory rights, usufruct, etc.) b. Owners of structures, including shanty dwellers, who have no land title or tax declaration or other acceptable proof of ownership c. Renters **(iii) PAPs with Crops, Fruit Trees, and other Perennials** a. Owners of affected crops, fruit trees and perennials who have full title, tax declaration, or other acceptable proof of ownership (e.g. possessory rights, usufruct, etc.) b. Owners of affected crops, fruit trees and perennials who have no land title or tax declaration or other acceptable proof of ownership. **(iv) PAPs Affected by the Loss of Livelihood and Sources of Income** a. Owners of registered or unregistered shops, regardless of land tenure status, whose business operation will be interrupted temporarily or permanently due tothe project.

Major opinions/concerns	Reflections/countermeasures
	b. Hired labor (e.g., farm worker, house help, and store helper) who will lose their work temporarily or permanently due to the project.
Valid proof of ownership for land	PAP with Transfer/ Certificate of Title or tax Declaration (Tax declaration legalized to full title). The following topics are also discussed to them: • Holders of free or homesteads patens and Holders of Certificates of Land Ownership (CLOA) under CA 141. Public Lands act will be compensated on land improvements only. • Public Lands Act will be granted under Comprehensive Agrarian Reform Act shall be compensated for the land at Zonal value. • If granted under Voluntary Offer to sell by the Landowner. CLOA issued under CA 141 shall be subject to the provisions of Section 112 of Public Lands Act shall receive compensation for damaged crops at market value at the time of taking.
PAP's without any valid proof of ownership for land.	• PAP will be entitled to cash compensation for loss of entire structure at 100% of replacement cost. • Rental subsidy for the time between the submission of complete documents and the release of payment on land. • Cash compensation for damaged crops at market value at the time of taking. • Agricultural lessors are entitled to disturbance compensation equivalent to five times the average of the gross harvest for the past 3 years but not less than PhP 15,000. For improvement, PAP will be entitled to: • Cash compensation for the affected improvements at replacement costs For crops, trees and perennial, PAP will be entitled to: • Cash compensation for the affected crops, trees, perennials at current market value as prescribed by DENR and LGUs.

*Interview was administered by the help of Barangay Officials for those PAPs who were not able to attend during the consultation meeting.

(5) Focus Group Discussions among Women and Youth

In order to ensure public involvement, through the process of resettlement planning, Notre Dame University (NDU) conducted the focus group discussions (FGDs) for the vulnerable groups or persons, such as women and youth.

The date and venue of the FGD meetings was informed to the affected LGUs such as municipalities and barangays by the official request letter from NDU. In order to gather and reflect public opinions of the affected PAFs.

1) Awareness of the Project

Generally almost all of Sub-Project 1 respondents do not know about the project. Specifically, it is evident that only women group of Matanog is aware of the project but in Barira only the youth group comes to know the project. In the case of Buldon, all household heads do not know about the project while only one group of women and three groups of youth are aware of the project.

Table 7.11.1-49 Awareness of Road Constructions

Municipality	Barangays	Groups	
		Women	Youth
Matanog	Bugasan Sur	Not aware	Not aware
Barira	Liong	Not aware	Not aware
	Bualan	Not aware	Not aware
	Lipawan	Not aware	Aware
Buldon	Rumidas	Not aware	Not aware
	Minabay	Not aware	Aware
	Cabayuan	Not aware	Not aware
	Edcor	Not aware	Not aware
	Nuyo	Not aware	Not aware
	Oring	Not aware	Not aware
	Mataya	Aware	Not aware
	Pantawan	Not aware	Aware

Source: Social Survey of NDU

2) Impact of Poor Road

All of the residents in the identified barangays of Matanog, Barira and Buldon experience difficulty due to poor or lack of road to the community. The group respondents do have common plight in terms of problems encountered in transporting farm products to the market especially during rainy season. These problems are: delay in transporting farm products, high cost of transportation that causes low income among farmers. When horse has been used in transporting products, it damages products and consequently lowering its price. Answer often mentioned as well are difficulty in bringing patient to nearby hospital, delay among students in attending their classes and slow development and progress in these barangays.

Table 7.11.1-50 Impact of Road to the Community

Municipality	Barangays	Groups	
		Women	Youth
Matanog	Bugasan Sur	• Difficult to transport products • Difficult to visit nearby sitios • Slippery during rainy season • Patients cannot easily be brought to the hospital	• Students have to leave their houses before 4am going to school • Transporting products is difficult when raining • Products like banana are damaged during transportation • Vehicular accidents when the road is slippery.
Barira	Liong	• In sitio Kamuikan the only means of transportation is through horse back and mansback.	• When heavy rain falls, the road becomes muddy, big vehicles got stacked preventing other vehicles to pass through • In emergency situation, patient need to wait for hours be he/she can be transported to the hospital • Fatal accidents in the road • Students have to walk going to school.
	Bualan	• Residents of sitio center, Kawa and Talaid use kanga(karu), horses and big truck in transporting products • Expensive fare being charged to residents in these sitios • In case of emergency hospital is not accessible	• Difficult to come in and out of barangay • Prone to accident • Low improvements • Low income because of relay in delivering products. • Increase in the number of out of school youth
	Lipawan	• Less opportunities for women to engage into business • Fear among mothers of their children crossing Lipawan river • Difficulty of transporting farm products • In sitio Kakan people use horse in transportation. • Difficulty of transporting farm products • In sitio Kakan people use horse in transportation	• Difficulty in transporting farm product • Increase in our of school youth • Increase in mortality due to inaccessibility of transportation in case of emergency • The brgy. is left behind in terms of development.

Buldon	Rumidas	• Physical stress because of personally carrying products • Expensive fare • Difficulty going to market • Students spend more time walking	• Hiking/walking as only means of coming in and out of the barangay • Have to cross Kumagi river • Spoilage of products • Patients cannot be hospitalized.
	Minabay	• Residents from sitio Kabayunan, Diampal and Tambay do hiking going to the market. • Horse transporting products because it needs to cross Kumaguingking river • Residents also cross Kalpuan and Tuad-Tuad river before they can reach the market	• Development is slow • Not progressive livelihood • Patients need to wait for hours before they can be transported because of limited source/means of transportation • Increase in tardiness among students.
	Cabayuan	• Residents from sitio Campo Muslim only use horse as a means of transportation • People do hiking for them to go to the market	• Delay in the delivery of farm products • Difficulty in getting in and out of the barangay • Increase of out of school youth • Slow development in the barangay.
	Edcor	• Difficult and expensive the transport farm products to market.	• Not safe to travel • Difficult of farmers to transport farm products. • In case of emergency, patients are difficult to bring to the hospital.
	Nuyo	• Difficulty in transporting farm products • Expensive fare for transporting products • Farmers usually experienced break-even during harvest season, can not save anything for their future.	• Slow progress • Not safe to travel • Difficulty in transporting farm products • The road becomes muddy after the rain.
	Oring	• When it rains, the road is slippery that causes accident and difficulty of reaching the community. • Students have difficulty going to school. • Delay in bringing patients to the hospital,	• Difficult to travel and transporting products to the market. • Students difficulty in going to school • Difficult for patients to be brought to the hospital.
	Mataya	• Difficulty of transporting products • Delay in hospitalizing patients • Difficult to be in and out of the area • Difficult for students to go to school	• Time consuming in going to school • Very difficult to go to other areas in the barangay.
	Pantawan	• Takes time to transport products to the market • Physical stress because of hiking • Many horses died due to difficulty/no better road. • Students going to school is difficult	• Only horse as a means of transportation. • The road is muddy and slippery • Products cannot transported when it rains. • Progress and development are slow.

Source: Social Survey of NDU

3) Main Source of Economic

Majority of the respondents have coconut as their main source of income followed by corn and there are some who engage in business, rice production and fruits as a source of livelihood.

Table 7.11.1-51 Main Source of Economic Means

Municipality	Barangay	Main source of Economic Means/Income			
		First	Second	Third	Fourth
Matanog	Bugasan Sur	Coconut farming	business	farm labor	Driving
Barira	Liong	Coconut farming	banana	upland rice	Small business
	Bualan	Coconut farming	corn	Fruits	Palay
	Lipawan	coconut	corn	Palay	Banana
Buldon	Rumidas	coconut	corn	Banana	Palay
	Minabay	coconut	corn	Fruits	Palay
	Cabayuan	coconut	corn	Palay	Fruits
	Edcor	corn	coconut	Palay	Banana
	Nuyo	corn	coconut	Banana	Palay
	Oring	coconut	Laborer (banana plantation)	Business	Driving
	Mataya	coconut	business	Corn	Banana
	Pantawan	corn	palay	coconut	Vegetables

Source: Social Survey of NDU

4) Negative Impact of Road Construction and Proposed Solutions

When the group respondents were asked about the negative impact of road construction by DPWH, there are significant member of barangay residents who cannot think of the answer because they badly needed the road regardless of who will construct it. Some of the common answers shared by the barangay people are: increase in road accidents due to over speeding, car racing and reckless driving. There are few who said that the military or soldiers can easily enter their area and a possible corruption might happen in DPWH as contractor. With these negative impacts identified by the barangay people, they also proposed their solutions, for each. These are: set up speed limit, put up signages in the road and training/seminar for drivers as well as formulation of ordinance regulating driving in the barangay. With regard to the accessibility of military soldiers in the area, they revealed that passing and approving the BBL will stop their fears. On the issue of DPWH corruption, respondents suggest for other group who can do the construction of the road.

Table 7.11.1-52 Negative Impact of Road Constructions

Municipality	Barangays	Negative Impact of Road Project	
		Women	Youth
Matanog	Bugasan Sur	• escalation of rido: settlement of rido • military can access the area: checkpoints should have CCTV. • Overspeeding of vehicles: provisions of signage like “slow down”	• less income for horse/vehicle owners (lesser fare might be implemented): conduct meeting to draft an ordinance • children are prone to accident caused by reckless drivers: implement speed limit • lawless elements can easily: enter put checkpoint with CCTV.
Barira	Liong	• no answer	• occurrence of road accident: implement an ordinance regulating speed limit in the barangay
	Bualan	• now answer	• increase in number of road accidents involving motorcycles: establish outpost, road signs and warning devices. • possible increase in family fluid because of unsettled difference between individuals in using the road: trainings or seminars for residents.
	Lipawan	• no answer	• increase in road accidents: implement speed limit, road signs and warnings, putting humps • increase in family feuds: intervention of local government police and other stakeholders.
Buldon	Rumidas	• road accidents: discipline the children • rido that caused by garbage thrown on the road and placing animals (carabaos) (or goals) near the road: barangay ordinance o military can easily enter the barangay: agreement between military and MILF.	• road accident: put road signs, humps and BPA post, training for drivers. • rido: intervention of barangay officials.
	Minabay	• no answer	• noise pollution: prohibit open pipe motor • road accident: training or seminar for drivers residing in the area, put road sign and warnings.
	Cabayuan	• no answer	• road accident: set up speed limit • increase in crime: be vigilant, intensify patrol activities in the barangay
	Edcor	• more road accidents: put signages and BPAT guard the road	• road accident: put signages • motor/car racing: ordinance prohibiting racing • crime rate might increase: intensify patrolling activities.

	Nuyo	• no answer	• road accident: speed limit, signages/warnings
	Oring	• road accidents: stop sign, slowdown speed limit • children can be prone to accident: houses should have gates.	• accident prone: put signages • lawless elements can access the brgy: put checkpoints • increase in population people in the barangay: monitor the people
	Mataya	• accident can occur: put signages • children will play in the road: discipline the children	• accident prone: put signages • landslides: plant trees • increase in the number of people in the brgy. monitor them
	Pantawan	• military/soldiers can easily enter in the brgy. pass the BBL and there will be no more fear	• road accidents: ordinance prohibiting motor rate.

Source: Social Survey of NDU

5) Perception towards DPWH as Road Contractor

On the perception of the barangay people towards DPWH as constructor, majority of them gave their 100% support to DPWH to construct the road by agreeing when they are asked about it. Their common reasons for giving thumbs up to DPWH as constructors are: they are expert in the field of road construction and the road will open opportunities for business and development in the barangay. There are conditions expressed by the respondents to DPWH along with their decision to agree; these are: they have to finish the construction and let their males in the barangay be part of the working force.

On the other hand, there was one group who blatantly disagreed to DPWH as constructor because they would like the Engineering Batallion of the AFP to do the construction so that there would be continuity of the road project.

6) Community Support to DPWH

When the barangay people were asked about the support that they can give to DPWH Project team, all of them guaranteed to provide security for the team, meaning they will take care of the people working in the project and secure the equipment for construction in their area. Most of the barangay people promised to provide food, shelter and labor force aside from the security.

7) Summary

The barangay consultation shows that majority of the respondents are not aware of the project. The household heads, women and youth group revealed their common experience on the negative impact of poor or lack of road that is their difficulty in transporting their products from farm to market. This also hindered them in going in and out of the barangay.

Farming as the main source of their livelihood necessitates the availability of the road to facilitate the easy transportation of their farm products. However, the respondents expressed the possible accidents that may occur due to the construction of the road and consequently proposed solutions for the problem which include strict implementation of laws regulating driving in their area, set up speed limit and provide signages as well.

Meanwhile, majority of the barangay people gave their one hundred percent (100%) support to DPWH as contractor of the road project. They pledged to provide security for both DPWH personnel and their equipment for construction. Further, they said could provide food, shelter and water for workers once construction will be started in the community.

7.11.2 Summary of Resettlement Action Plan (RAP) for Sub-Project 2

(1) Social Environment Situation of Sub-Project 2

1) Project Description

The Parang – Balabagan Road – Sub-Project 2 covers 35.3 km length and traverses from the municipalities of Balabagan and Kapatagan in Lanao Del Sur, and Matanog and Parang in Maguindanao (**Figure 7.11.2-1**). The alignment passes through barangays Macasandag, Sapad, Kidama, Salaman, Matimos, Bakikis, Lusain, Banago, Narra, Lorenzo, Molimoc, Barorao, Batuan, and Budas. This road segment aims to increase the flexibility of the network by linking primary-intercity road (Narciso Ramos Highway) and to connect the municipalities of Balabagan and Kapatagan to Cotabato City to facilitate easier access of communities and their goods. As such it will also support in the promoting the local tourism spot by providing access to the beautiful beaches of Illana Bay and provide better link to the areas with high poverty incidence to help them access social services and sell their products to urban centers with minimal transportation cost. Furthermore, the construction of this road will support fishermen by providing better access to the markets.

Table 7.11.2-1 Details of Parang- Balabagan Road Alignment and Road Length

Province	Municipality	Barangay	Road Length (km)
Maguindanao	Parang	Macasandag	2.7
	Matanog	Sapad	3.3
		Kidama	7.2
Lanao Del Sur	Kapatagan	Bakikis	1.2
		Salaman	2.0
		Matimos	2.1
		Lusain	6.3
	Balabagan	Barora	1.3
		Molimoc	2.6
		Lorenzo	2.0
		Narra	0.9
		Batuan	1.4
		Budas	2.3
		Total	35.3

Source: JICA Study Team

Source: JICA Study Team

Figure 7.11.2-1 Location Map of Parang-Balabagan Road – Sub-Project 2

2) Socio-Economic Profile of the Project-affected Persons

Based on the conducted socio-economic survey, a total of eight (8) affected household heads (AHHs) and one hundred seventeen (117) affected land lot owners were interviewed as shown in **Table 7.11.2-2**.

Table 7.11.2-2 Summary of Potential Number Affected Structures and Land Lots

Loss category	Kapatagan	Parang	Balabagan	Matanog	Grand Total
Affected House Heads	4	0	4	0	8
Affected Structures	5*	0	4	0	8
Affected Land Lot Owners	62	6	31	18	117

Note: * 4 residential houses occupied and 1 house not occupied.
Source: JICA Study Team

A total of 1,009,141 sq.m of land with crops and trees will be affected by the alignment as summarized in **Table 7.11.2-3**. Majority of the cultivated crops that will be affected are corn and palay.

Table 7.11.2-3 Summary of Affected Land and Types of Cultivated Crops

Loss category	Unit	Kapatagan	Parang	Balabagan	Matanog	Total
Affected agricultural lands with corn	m2	34,500	0	5,100	72,000	111, 600
Affected agricultural lands with cassava	m2	42,900	0	0	0	42,900
Affected agricultural lands with palay	m2	0	0	0	0	0
Affected Fruit bearing trees	No.	891	62	1,451	205	2,609
Affected trees (Timber / non-fruit bearing)	No.	0	13	0	12	25
Plant/Cash Trees	No.	2	0	1,007	0	1,009
Total affected land area (sq. m.)	m2	335,041	77,954	287,523	308,623	1,009,141

Source: JICA Study Team

Loss category	Unit	Kapatagan	Parang	Balabagan	Matanog	Total
Affected agricultural lands with corn	m2	34,500	0	5,100	72,000	111, 600
Affected agricultural lands with cassava	m2	42,900	0	0	0	42,900
Total affected land area (sq. m.)	m2	335,041	77,954	287,523	308,623	1,009,141

a. Household Size

Majority or 6 (75%) of the AHHs' size ranges from 6-10 members while 1 HHs' have 1-5 and 11 – above members, respectively.

Table 7.11.2-4 No. of Affected Household Heads by Household Size

Household Size	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
1-5	1	0	0	0	1	12.5
6-10	2	0	4	0	6	75.0
11-above	1	0	0	0	1	12.5
Total	**4**	**0**	**4**	**0**	**8**	**100**

Source: JICA Study Team

Majority or 72 (62.1%) of the affected land lot owners' size ranges from 1-5 members while 31.9% have 6-10 members and 6% for 11-above members

Table 7.11.2-5 No. of Affected Land Lots by Household Size

Household Size	Affected Land / Lots					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
1-5	33	5	31	3	72	62.1
6-10	21	1	0	15	37	31.9
11-above	7	0	0	0	7	6.0
Total	**62**	**6**	**31**	**18**	**117**	**100**

Source: JICA Study Team

b. Household Structure

The common family structure that can be observed along the Parang – Balabagan Road Alignment was composed of nuclear structure (75%), a common Filipino family structure, which was made up of the parents and their children. While the remaining 25% of the affected HHs have an extended family structure where the grandparents and other close family members are staying with the family.

Table 7.11.2-6 No. of Affected Household Heads by Household Structures

Household Structure	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Single	0	0	0	0	0	0
Nuclear	2	0	4	0	6	75
Extended	2	0	0	0	2	25
Joint	0	0	0	0	0	0
Total	**4**	**0**	**4**	**0**	**8**	**100**

Source: JICA Study Team

In terms of family structure of the affected land lot owners, majority have household structure type of nuclear with 53% while 28% have joint family structure where there are two or more families are staying in one house. Ten percent (10%) of the affected HHs had a single structure where in there are only parents living without children, and the remaining 9% are extended structure.

Table 7.11.2-7 No. of Affected Land Lots by Household Structures

Household Structure	Affected Land / Lots					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Single	10	2	0	0	12	10
Nuclear	43	1	0	17	61	53
Extended	7	2	0	1	10	9
Joint	2	0	31	0	33	28
Total	**62**	**6**	**31**	**18**	**117**	**100**

Source: JICA Study Team

c. Gender Distribution

In terms of gender distribution, there are more male (63%) household heads in the affected HHs than female heads (37%).

Table 7.11.2-8 No. of Affected Household Heads by Gender

Gender	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Male	3	0	2	0	5	63
Female	1	0	2	0	3	37
Total	**4**	**0**	**4**	**0**	**8**	**100**

Source: JICA Study Team

Consequently, 82 (70%) of the affected land owners were female.

Table 7.11.2-9 No. of Affected Lands Lots Owners by Gender

Gender	Affected Land / Lots					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Male	26	2	1	6	35	30
Female	36	4	30	12	82	70
Total	**62**	**6**	**31**	**18**	**117**	**100**

Source: JICA Study Team

d. Civil Status

The civil status of most or 6 (75%) AHHs are married followed single (12.5%) and others (12.5%).

Table 7.11.2-10 No. of Affected Household by Civil Status

Civil status of affected household	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Single	1	0	0	0	1	12.5
Married	2	0	4	0	6	75
Window/er	0	0	0	0	0	0
Live-in	0	0	0	0	0	0
Others	1	0	0	0	1	12.5
No Response	0	0	0	0	0	0
Total	**4**	**0**	**4**	**0**	**8**	**100**

Source: JICA Study Team

On the other hand, majority of the land lot owner's civil status are married (98%) and widower (2%) as shown in below table.

Table 7.11.2-11 No. of Lands/Lots by Civil Status

Civil status of affected land lots owner	Affected Land / Lots					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Single	0	0	0	0	0	0
Married	60	6	31	18	115	99.13
Window/er	2	0	0	0	2	2
Live-in	0	0	0	0	0	0
Others	0	0	0	0	0	0
No Response	0	0	0	0	0	0
Total	**62**	**6**	**31**	**18**	**117**	**100**

Source: JICA Study Team

e. Age Distribution

Majority or 3 (37%) of the affected HHs' age ranges from 50-54, followed by ages ranges from 40-44 (25%) and 45-49 (25%). The remaining 13% of affected HHs' age ranges from 55-59.

Table 7.11.2-12 No. of Affected Households by Age

Age	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
15-19	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	0	0	0	0
40-44	0	0	2	0	2	25
45-49	2	0	0	0	2	25
50-54	1	0	2	0	3	37
55-59	0	0	0	0	1	13
60-64	1	0	0	0	0	0
65-69	0	0	0	0	0	0
70-74	0	0	0	0	0	0
75-79	0	0	0	0	0	0
80+	0	0	0	0	0	0
No response	0	0	0	0	0	0
Total	**4**	**0**	**4**	**0**	**8**	**100**

Source: JICA Study Team

Likewise, as observed in the age distribution of the affected land owners as shown in below table, most (20.5%) of the affected HHs' age ranges from 45 – 49. It was followed by 35 -39 years old (18.8%), 30 – 34 years old (12%), 55 – 59 years old (10.3%), 50 – 54 years old (6.8%), and the remaining have ages 20-24 and 60 and above.

Table 7.11.2-13 No. of Affected Land Lots Owners by Age

Age	Affected Land / Lots					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
15-19	0	0	0	0	0	0
20-24	5	0	0	0	5	4.3
25-29	10	1	0	0	11	9.4
30-34	2	0	12	0	14	12
35-39	10	1	6	5	22	18.8
40-44	2	1	4	0	7	6
45-49	12	0	6	6	24	20.5
50-54	2	1	2	3	8	6.8
55-59	10	0	0	2	12	10.3
60-64	2	1	1	2	6	5.1
65-69	5	0	0	0	5	4.3
70-74	0	0	0	0	0	0
75-79	2	0	0	0	2	1.7
80+	0	0	0	0	0	0
No response	0	0	0	0	0	0
Total	**62**	**6**	**31**	**18**	**117**	**100**

Source: JICA Study Team

f. Religious Affiliation

Majority or 7 (88%) of the affected HHs' are Islam followed by other religious sectors (12%).

Table 7.11.2-14 No. of Affected Household Heads by Religion

Religion	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Roman Catholic	0	0	0	0	0	0
Iglesiani Cristo	0	0	0	0	0	0
Baptist	0	0	0	0	0	0
Born Again Christian	0	0	0	0	0	0
Islam	3	0	4	0	7	88
Others	1	0	0	0	1	12
No Response	0	0	0	0	0	0
Total	**4**	**0**	**4**	**0**	**8**	**100**

Source: JICA Study Team

Majority or 106 (90.6%) of the affected HHs' are Islam followed by Roman Catholic (6.0%), and the remaining are both Born again Christian (0.9%) and other religious sectors (0.9%). Two respondents (1.7%) decided not response.

Table 7.11.2-15 No. of Affected Land Lots Owner by Religion

Religion	Affected Land / Lots					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Roman Catholic	5	2	0	0	7	6.0
Iglesiani Cristo	0	0	0	0	0	0
Baptist	0	0	0	0	0	0
Born Again Christian	0	1	0	0	1	0.9
Islam	57	0	31	18	106	90.6
Others	0	1	0	0	1	0.9
No Response	0	2	0	0	2	1.7
Total	**62**	**6**	**31**	**18**	**117**	**100**

Source: JICA Study Team

g. Educational Attainment

Half of the respondents attended high school education but were not able to finish, while 25% were able to graduate from high school. The remaining 25% were college undergrads. This indicates that remote communities were having difficulties in going to school due to access and expensive transportation.

Table 7.11.2-16 No. of Affected Household Heads by Educational Attainment

Educational Attainment of Land Lots Owners	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
No formal education	0	0	0	0	0	0
Pre-school	0	0	0	0	0	0
Elem. Grad	0	0	0	0	0	0
HS Under grad	2	0	2	0	4	50
HS grad	2	0	0	0	2	25
Vocational / Technical	0	0	0	0	0	0
Certificate Courses	0	0	0	0	0	0
College Under graduate	0	0	2	0	2	25
College grad	0	0	0	0	0	0
No response	0	0	0	0	0	0
Total	**4**	**0**	**4**	**0**	**8**	**100**

Source: JICA Study Team

As observed from **Table 7.11.2-17**, majority or 33 (28.4%) of the affected land owners were able to attend formal education followed by high school graduate (22.4%), while some completed college.

Table 7.11.2-17 No. of Affected Land Lots by Educational Attainment

Educational Attainment of Land Lots Owners	Affected Land / Lots					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
No formal education	2	0	0	0	2	1.7
Pre-school	12	0	0	1	13	11.1
Elem. Grad	12	0	0	0	12	10.3

HS Under grad	7	4	0	6	17	14.5
HS grad	17	1	0	8	26	22.4
Vocational/Technical	0	1	0	0	1	0.9
Certificate Courses	2	0	31	0	33	28.4
College Under grad	7	0	0	3	10	8.6
College grad	3	0	0	0	3	1.7
No response	0	0	0	0	0	0
Total	**62**	**6**	**31**	**18**	**117**	**100**

Source: JICA Study Team

h. Ethno-Linguistic Profile

In terms of the ethno-linguistic profile of the affected household heads, there were only two in the affected HHs in the entire Parang – Balabagan Road alignment, namely: Maranao and Iranun.

Table 7.11.2-18 No. of Affected Household Heads by Ethno-Linguistic

Ethno-Linguistic Affiliation	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Maranao	0	0	4	0	4	50
Iranun	4	0	0	0	4	50
Maguindanaon	0	0	0	0	0	0
Ilocano	0	0	0	0	0	0
Cebuano	0	0	0	0	0	0
Illonggo	0	0	0	0	0	0
Teduray	0	0	0	0	0	0
Lambangian	0	0	0	0	0	0
Dulangan Manobo	0	0	0	0	0	0
Higaonon	0	0	0	0	0	0
IP	0	0	0	0	0	0
Others	0	0	0	0	0	0
Total	**4**	**0**	**4**	**0**	**8**	**100**

Source: JICA Study Team

Consequently, majority or 64 (54.7%) of the affected land owners are Maranao followed by Iranun (32.75%), Cebuano (7.69%), Ilonggo (3.42%), and Maguindanaon (1.71%).

Table 7.11.2-19 No. of Affected Land Lots by Ethno-Linguistic

Ethno-Linguistic Affiliation	Affected Land / Lots					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Maranao	27	0	31	6	64	54.7
Iranun	26	0	0	12	38	32.75
Maguindanaon	2	0	0	0	2	1.71
Ilocano	0	0	0	0	0	0
Cebuano	5	4	0	0	9	7.69
Ilonggo	2	2	0	0	4	3.42
Teduray	0	0	0	0	0	0
Lambangian	0	0	0	0	0	0
Dulangan Manobo	0	0	0	0	0	0
Higaonon	0	0	0	0	0	0
IP	0	0	0	0	0	0
Others	0	0	0	0	0	0
Total	**62**	**6**	**31**	**18**	**117**	**100**

Source: JICA Study Team

i. Occupation

Majority or 38% of the affected HHs were farmers followed by businessman (12%) and fisherman (12%), while the remaining 38% were engaged in other works.

Table 7.11.2-20 No. of Affected Household Heads by Occupation

Occupation	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Farmer	1	0	2	0	3	38
Fisherman	1	0	0	0	1	12
Businessman	1	0	0	0	1	12
Govt. Employee	0	0	0	0	0	0
Driver	0	0	0	0	0	0
Teacher	0	0	0	0	0	0
Daycare Staff	0	0	0	0	0	0
Brgy. Official	0	0	0	0	0	0
Others	1	0	2	0	3	38
Total	**4**	**0**	**4**	**0**	**8**	**100**

Source: JICA Study Team

As observed from **Table 7.11.2-21**, 30.8% of the affected land owners were drivers, 29.9% were farmers 29.1% were engaged in other occupation, 6% were businessmen and 4.3% were teachers.

Table 7.11.2-21 No. of Affected Land Lots by Occupation

Occupation	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Farmer	28	1	0	6	35	29.9
Fisherman	0	0	0	0	0	0
Businessman	5	2	0	0	7	6.0
Govt. Employee	0	0	0	0	0	0
Driver	5	0	31	0	36	30.8
Teacher	5	0	0	0	5	4.3
Daycare Staff	0	0	0	0	0	0
Brgy. Official	0	0	0	0	0	0
Others	19	3	0	12	34	29.1
Total	**62**	**6**	**31**	**18**	**117**	**100**

Source: JICA Study Team

j. Family Income

Majority or 2 (25%) of the affected HHs' have an estimated family income ranges PhP 10,001 to 30,000. Income bracket of 1 ranges from PhP10,000, PhP30,001 to PhP 30,000, PhP 50,001 to PhP 60,000, and PhP 70,001 to PhP 80,000.

Table 7.11.2-22 No. of Affected Household Heads by Monthly Income Bracket

Monthly Income Bracket (PhP)	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
10,000 and Below	1	0	0	0	1	12.5
10,001 to 20,000	1	0	1	0	2	25.0
20,001 to 30,000	1	0	1	0	2	25.0
30,001 to 40,000	0	0	1	0	1	12.5

40,001 to 50,000	0	0	0	0	0	0
50,001 to 60,000	1	0	0	0	1	12.5
60,001 to 70,000	0	0	0	0	0	0
70,001 to 80,000	0	0	1	0	1	12.5
80,001 to 90,000	0	0	0	0	0	0
90,001 to 100,000	0	0	0	0	0	0
100,001 to 200,000	0	0	0	0	0	0
200,001 and above	0	0	0	0	0	0
No Response	0	0	0	0	0	0
Total	**4**	**0**	**4**	**0**	**8**	**100**

Source: JICA Study Team

It was commonly observed that majority of the monthly income bracket of the affected land owners ranges from 10,000 and below.

Table 7.11.2-23 No. of Affected Land Lots by Monthly Income Bracket

Monthly Income Bracket (PhP)	Affected Land Lots					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
10,000 and Below	59	3	20	18	100	85.5
10,001 to 20,000	2	2	6	0	10	8.5
20,001 to 30,000	1	1	2	0	4	3.4
30,001 to 40,000	0	0	0	0	0	0
40,001 to 50,000	0	0	3	0	3	2.6
50,001 to 60,000	0	0	0	0	0	0
60,001 to 70,000	0	0	0	0	0	0
70,001 to 80,000	0	0	0	0	0	0
80,001 to 90,000	0	0	0	0	0	0
90,001 to 100,000	0	0	0	0	0	0
100,001 to 200,000	0	0	0	0	0	0
200,001 and above	0	0	0	0	0	0
No Response	0	0	0	0	0	0
Total	**62**	**6**	**31**	**18**	**117**	**100**

Source: JICA Study Team

k. Willingness to relocate

In instances that there is a need to relocate the affected HHs, hundred percent (100%) of the households expressed their willingness to be displaced/ relocated for this project.

Table 7.11.2-24 Willingness to Relocate

Willingness to Relocate	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Yes	4	0	4	0	8	100
No, but will consider	0	0	0	0	0	0
No	0	0	0	0	0	0
Don't know	0	0	0	0	0	0
No Response	0	0	0	0	0	0
Total	**4**	**0**	**4**	**0**	**8**	**100**

Source: JICA Study Team

l. Site Preference for Relocation

Preference of affected households for site relocation is shown in **Table 7.11.2-25**. One hundred percent (100%) of affected households expressed their willingness to be relocated in the same lot areas which were not affected by the alignment.

Table 7.11.2-25 Site Preference for Relocation

Site Preference	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Same Lot	4	0	4	0	8	100
Same Barangay	0	0	0	0	0	0
Other Barangay	0	0	0	0	0	0
Other Municipality	0	0	0	0	0	0
Relocation Site	0	0	0	0	0	0
Other Site	0	0	0	0	0	0
No Response	0	0	0	0	0	0
Total	**4**	**0**	**4**	**0**	**8**	**100**

Source: JICA Study Team

m. Length of Residence

Half of the affected HHs stayed in the area for 1-5 years, while the remaining 50% did not divulge any information on their length of residence.

Table 7.11.2-26 No. of Affected Household Heads by Length of Residence

Length of Residence of Sample AH heads	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Less than 1 year	0	0	0	0	**0**	**0**
1 - 5 years	0	0	4	0	**4**	**50**
6 - 10 years	0	0	0	0	**0**	**0**
Since birth	0	0	0	0	**0**	**0**
No response	4	0	0	0	**4**	**50**
Total	**4**	**0**	**4**	**0**	**8**	**100**

Source: JICA Study Team

All (100%) of the affected land owners stayed in the proposed road alignment area since birth.

Table 7.11.2-27 No. of Affected Land Lots by Length of Residence

Length of Residence of Sample AH heads	Affected Land Lots					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Less than 1 year	0	0	0	0	0	0
1 - 5 years	0	0	0	0	0	0
6 - 10 years	0	0	0	0	0	0
Since birth	62	6	31	18	117	100
No response	0	0	0	0	0	0
Total	**62**	**6**	**31**	**18**	**117**	**100**

Source: JICA Study Team

n. Project Acceptability

In terms of project acceptability, one-hundred percent (100%) were in favor of the proposed road alignment in their area. They were able to see more potential benefits in the onset of the project than

with the negative effects. However, worries on inconvenience and displacement also surfaced in the survey.

Table 7.11.2-28 Project Acceptability

Project Acceptability	Affected House					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Yes	4	0	4	0	8	100
No	0	0	0	0	0	0
Don't know	0	0	0	0	0	0
Total	**4**	**0**	**4**	**0**	**18**	**100**

Source: JICA Study Team

Majority or 86 (74.14%) of the affected landowners agreed of the proposed project, however, 25.86% were not in favor because they were worried of being displaced.

Table 7.11.2-29 No. of Affected Land Lots by Project Acceptability

Project Acceptability	Affected Land Lots					
	Kapatagan	Parang	Balabagan	Matanog	Total	
					No.	%
Yes	32	6	31	18	87	74.35
No	30	0	0	0	30	25.65
Don't know	0	0	0	0	0	0
Total	**62**	**6**	**31**	**18**	**117**	**100**

Source: JICA Study Team

3) Barangays Affected

Table 7.11.2-30 shows the list of affected barangays and properties within the proposed 30 meters road alignment. In terms of the estimated land area per barangay, Municipality of Kapatagan recorded the highest with 335,041 sq.m constitutes an estimated of 62 lot owners, followed by Municipality of Matanog with 308,623 sq.m consists of 18 lots owners while the least is Parang which only covered Barangay Macasandag with 77,954 sq.m constitutes of 6 lot owners.

Table 7.11.2-30 Affected Properties by Barangay

Municipalities	Barangays	Estimated affected land Area	No. of Affected Properties				
			Affected Land Lots Owner	Affected Structures	Affected HH Heads	Affected PPAPs	Lot and Structures
Parang	Macasandag	77954	6	0	0	0	0
	Sub-total	**77,954**	**6**	**0**	**0**	**0**	**0**
Matanog	Sapad	96530	2	0	0	0	0
	Kidama	212093	16	0	0	0	0
	Sub-total	**308,623**	**18**	**0**	**0**	**0**	**0**
Kapatagan	Salaman	58337	14	*5	4	18	4
	Matimos	61180	7	0	0	0	0
	Bakikis	28350	14	0	0	0	0
	Lusain	187174	27	0	0	0	0
	Sub-total	**335,041**	**62**	**5**	**4**	**18**	**4**
Balabagan	Banago	21477	3	0	0	0	0
	Narra	19460	3	0	0	0	0

Municipalities	Barangays	Estimated affected land Area	No. of Affected Properties				
			Affected Land Lots Owner	Affected Structures	Affected HH Heads	Affected PPAPs	Lot and Structures
	Lorenzo	36093	1	0	0	0	0
	Molimoc	73375	6	0	0	0	0
	Barorao	33435	10	4	4	18	0
	Batuan	38328	7	0	0	0	0
	Budas	65355	1	0	0	0	0
	Sub-total	**287,523**	**31**	**4**	**4**	**18**	**0**
	TOTAL	**1,009,141**	**117**	**9**	**4**	**36**	**8**

Source: JICA Study Team

4) Land Use and Areas Affected

The land use along the proposed alignment is classified into agricultural and residential areas. Since no Comprehensive Land Use Plan (CLUP) provided by the Local Government Units (LGUs) from the Municipalities affected to properly identify the delineation of the residential land, the survey team did an estimated delineation using a GPS.

Table 7.11.2-31 Land Use (sq. m)

Municipalities	Barangays	Residential	Commercial	Agricultural	All Lands
Parang	Macasandag	0	1895	76,059	77954
	Sub-total	**0**	**1,895**	**76,059**	**77,954**
Matanog	Sapad	0	0	96,530	96530
	Kidama	0	0	212,093	212093
	Sub-total	**0**	**0**	**308,623**	**308,623**
Kapatagan	Salaman	0	0	58,337	58337
	Matimos	0	0	61,180	61180
	Bakikis	0	0	28,350	28350
	Lusain	0	0	187,174	187174
	Sub-total	**0**	**0**	**335,041**	**335,041**
*Balabagan	Banago	0	0	21,477	21477
	Narra	1669	0	17,791	19460
	Lorenzo	29403	0	6,690	36093
	Molimoc	73375	0	0	73375
	Barorao	31319	2116	0	33435
	Batuan	0	0	38,328	38328
	Budas	0	0	65,355	65355
	Sub-total	**135,766**	**2,116**	**149,641**	**287,523**
	TOTAL	**135,766**	**4,011**	**869,364**	**1,009,141**

Source: JICA Study Team

Note: * Classification is based on the Municipal Assessors.

5) Structures and Improvements Affected

The structures that will be affected by the alignment are 8 residential structures made up of concrete, semi-concrete, and shanty materials, and 1sari-sari store.

Table 7.11.2-32 Affected structures in the area

Municipalities	Barangays	No. of Structures -Residential	No. of Structures- Commercial
Parang	Macasandag	0	0
Matanog	Sapad	0	0
	Kidama	0	0
Kapatagan	Salaman	4	1
	Matimos	0	0
	Bakikis	0	0
	Lusain	0	0
Balabagan	Banago	0	0
	Narra	0	0
	Lorenzo	0	0
	Molimoc	0	0
	Barorao	4	0
	Batuan	0	0
	Budas	0	0
	TOTAL	**8**	**1**

Source: JICA Study Team

6) Crops and Trees Affected

Affected crops are summarized in **Table 7.11.2-33**. Most farmers in the area adapted the multi-storey cropping (coconut-corn) and cassava plantation. Most framers in the Municipality of Balabagan are engaged in farming cassava while corn farming is the means of livelihood among the rest of the Municipalities.

Table 7.11.2-33 Affected Area Cultivated with Crops

Municipalities	Barangays	Affected area of crops (sq.m.)		Total
		Corn	Cassava	
Parang	Macasandag	0	0	0
Matanog	Sapad	72,000	0	72,000
	Kidama	0	0	0
Kapatagan	Salaman	0	0	0
	Matimos	0	0	0
	Bakikis	0	0	0
	Lusain	34,500	0	34,500
Balabagan	Banago	0	0	0
	Narra	0	0	0
	Lorenzo	0	10,500	10,500
	Molimoc	0	0	0
	Barorao	0	12,600	12,600
	Batuan	0	11,400	11,400
	Budas	5,100	8,400	8,400
	TOTAL	**111,600**	**42,900**	**149,400**

Source: JICA Study Team

Affected trees along the proposed alignment were inventoried, most of the tree species planted are fruit bearing and harvestable timber as shown in **Table 7.11.2-34**.

Table 7.11.2-34 Affected Trees

Municipality	Affected Barangays	Trees (Fruit Bearing *)	Trees (Timber/ Non-fruit Bearing **)	Plant/ CashTrees ***	Total
Parang	Macasandag	62	13	9	84
Matanog	Sapad	128	5	0	133
	Kidama	86	7	9	102
Kapatagan	Salaman	573	0	0	573
	Matimos	183	0	0	183
	Lusain	135	2	0	137
Balabagan	Banago	212	0	0	212
	Narra	292	0	0	292
	Lorenzo	150	17	0	167
	Molimoc	87	0	0	87
	Barorao	177	990	0	1,167
	Batuan	419	0	0	419
	Budas	114	0	0	114
	Total	**2,609**	**1,034**	**18**	**3,661**

Note:
* Fruit Bearing Trees: Mango, Coconut/ Buco, Jackfruit/ Langka, Santol, Kamatchile, Duhat, Tamarind/ Sampaloc, Aratiles/ Mansanitas, Guava/ Bayabas, Macopa, Kaimito, Avocado, Atis, Casoy/ Kasuy
** Timber, Non-friut Bearing Trees: Narra, Acacia, Talisay, Bangkal, Balite, Gmelina, Falcata, Mahogany
*** Plant, Cash Trees: Banana, Papaya, Atsuete, Cassava, Cacao
Source: JICA Study Team

7) Status of Land Ownership of Affected Lots

Table 7.11.2-35 shows the status of land ownership by category and the possible mitigating/ legal remedies/ options that may help implement the Task Force responsible for Right-of-Way Acquisition of DPWH (Unified Project Management Office). Number of lots shown in the matrix was identified through local guides such as Barangay Officials that helped the RAP team during the inventory. The final list of identified lots are submitted to the Municipal Assessor's Office for verification whether the identified land claimants can be found in their records either they have title or with tax declaration.

Table 7.11.2-35 Status of Land Ownership

Type	Definition	No. of Lots (People)				Total (A)+(B)
		Lots with House			Lots without House (B)	
		Lot owned	Lot not owned	Total (A)		
Case A	Land claimant has a land titled and paying taxes	1	2	3	49	52
		(5)	(9)	(14)	(285)	(299)
Case B	Land claimant has a land title but not paying taxes	2	3	5	60	65
		(9)	(13)	(22)	(353)	(375)
Case C	Claimant has no land title but paying taxes (Tax Declaration)	0	0	0	0	0
		(0)	(0)	(0)	(0)	(0)
Case D	No land title and No Tax Declaration	0	0	0	0	0
		(0)	(0)	(0)	(0)	(0)
TOTAL		**3**	**5**	**8**	**109**	**117**
		(14)	**(22)**	**(36)**	**(638)**	**(674)**

Note:*But in case the land to be acquired for ROW is classified as public land, concerned PAF/Ps will need to provide equity contribution for the purchase of land replacement; such equity contribution for a period of time (15-25 years). In the same manner claims related to resettlement or compensation of the agrarian reform under RA 3844, RA 6389 and RA 6657, the latter is also applicable.
Source: JICA Study Team

(2) Implementation Schedule for RAP

Table 7.11.2-36 summarizes the indicative schedules of the various interrelated activities in relation to the preparation and implementation of the RAP.

Table 7.11.2-36 Resettlement Schedule

Activity	2019				2020				2021				2022				2023				2024			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
First Disclosure																								
Parcellary Survey																								
Updating of RAP																								
Formulation of MRIC																								
Disclosure of Updated RAP to PAPs																								
Notification of PAPs																								
Compensation																								
Income Restoration																								
Detailed Design																								
ROW Acquisition and RAP																								
Procurement of Contractor																								
Construction																								
Construction Supervision																								
Monitoring and Evaluation																								
Internal Monitoring																								
External Monitoring & Evaluation																								

Source: JICA Study Team

(3) Cost Estimates, Compensation and Entitlements for Sub-Project No. 2

1) Preliminary ROW Cost Estimates for Land

The current fair market values from the BIR Zonal Computation and an independent property appraiser (IPA) were compared (**Table 7.11.2-37**) to determine the Estimated ROW Cost of Land. To compute for the total ROW Cost of Land, the highest market value (which in this case was seen to be the current value by the independent property appraiser) was then multiplied by the total affected land area.

Table 7.11.2-37 Comparison of Current Market Value and BIR Zonal Value

Municipality	BIR Zonal Value			Current Market Value (IPA)		
	Residential	Commercial	Agricultural	Residential	Commercial	Agricultural
Parang	99.00	165.00	3.55	400.00	1,500.00	20.00
Matanog	99.00	165.00	3.55	400.00	750.00	25.00
Kapatagan	75.00	120.00	2.50	300.00	800.00	18.00
Balabagan	85.00	135.00	2.05	350.00	800.00	21.00

Note:* The current market value that was set by the independent property appraiser was used for the computation of the estimated market values of the affected land.

Source: JICA Study Team

Estimated market values of affected land in the assumption that all affected land owners have the complete land title is presented in **Table 7.11.2-38.**

Table 7.11.2-38 Estimated Market Values of Affected Land

Municipality	Land Classification	Affected Land (sq.m)	Unit Price (PhP)	Total Cost (PhP)
Parang	**Agricultural**	**77,954**	**20.00**	**1,559,080.00**
Matanog	Agricultural	308,623	25.00	7,715,575.00
Kapatagan	Agricultural	335,041	18.00	6,030,738.00
	Agricultural	149,641	21.00	3,142,461.00
	Commercial	2,116	800.00	1,692,800.00
Balabagan	Residential	165,766	350.00	11,982,395.00
Total		**1,009,141**		**32,123,049.00**

Note: The estimated market values of affected land were computed in the assumption that all claimants were qualified for the compensation, provided that they have the Original Certificate of Title and Tax Declarations, or any of the two.

Source: JICA Study Team

2) Preliminary ROW Replacement Cost Estimates for Structures and Improvements

The replacement cost of the affected structures, in this case were referred to the affected houses, was shown in **Table 7.11.2-39**. The computation of individual dwellings was based on the current unit price of materials and estimated for each reconstruction of building according to type of the building part and kind of materials used.

Table 7.11.2-39 Replacement Cost of Residential houses

Municipality	No. of Structures	Total
Kapatagan	4	345,250.00
Balabagan	*5	1,566,454.50
Total	**9**	**1,911,714.50**

Note: *4 residential and 1 commercial / small shop
Source: JICA Study Team

The replacement cost of the affected utilities, identified as electrical post traversing the proposed alignment site, was shown in **Table 7.11.2-40**.

The computation of the current unit price was based on the current prices incurred during the removal/transfer of the utilities in the area.

Table 7.11.2-40 Replacement Cost for Affected Utilities

Municipality	Electric Post	Unit Cost (PhP)	Total Cost (PhP)	Water System	Unit Cost (PhP)	Total Cost (PhP)	Total Cost (PhP)
Balabagan	25	35,000	875,000.00	1	15,000	15,000	890,000.00
Total	**25**	**35,000**	**875,000.00**	**1**	**15,000**	**15,000**	**890,000.00**

Source: JICA Study Team

3) Preliminary Cost Estimates for Crops and Trees

Table 7.11.2-41 Replacement Cost for crops

Municipality	Crops (sq.m)	Total Area (sq.m)	Cost/ sq.m (PhP/sq.m)	Yield (kg/sq.m)	Total Cost (PhP)
Matanog	Corn	72,000	14.00	0.21	214,536.84

Kapatagan	Corn	34,500	13.84	0.28	132,076031
Balabagan	Corn	5,100	13.84	0.28	19,524.32
	Cassava	42,900	6.53	1.53	428,609.61
Total		**154,500**			**794,747.09**

Source: JICA Study Team

Table 7.11.2-42 Replacement Cost for trees

Commodity	Municipality				Total Cost	Total Estimated Value
	Parang	Matanog	Kapatagan	Balabagan		
Fruit bearing trees	62	205	891	1,451	2,609	1,412,410
Timber / Non-fruit bearing trees	13	12	2	1,007	1,034	399,400
Plant/Cash Trees	0	0	9	9	18	1,194,500

Note:* Fruit Bearing Trees: Mango, Coconut/ Buco, Jackfruit/ Langka, Santol, Kamatchile, Duhat, Tamarind/ Sampaloc, Aratiles/ Mansanitas, Guava/ Bayabas, Macopa, Kaimito, Avocado, Atis, Casoy/ Kasuy
** Timber, Non-friut Bearing Trees: Narra, Acacia, Talisay, Bangkal, Balite, Gmelina, Falcata, Mahogany
*** Plant, Cash Trees: Banana, Papaya, Atsuete, Cassava, Cacao
Source: JICA Study Team

4) Recommended Preliminary Compensation and Entitlement Packages

The recommended budget for RAP Implementation of Sub-Project 2 is PhP **45,684,693.68** and is part of government counterpart; however, the amount is exclusive of other entitlements that are yet to be determined after the completion of the Parcellary survey of the DPWH. The indicative budget items covering land acquisition and replacement cost of structures, and cost for external monitoring. Contingencies and admin cost are also included. **Table 7.11.2-43** shows the details of the indicative budget to implement this RAP.

Table 7.11.2-43 Indicative Budget for RAP Implementation

Description	Cost Item	Amount	Remarks
Land Acquisition and Structures	Land	32,123,049.00	Estimated based on the current fair market value
	Structures	1,911,714.50	Estimated based the replacement cost
	Improvements	890,000.00	Estimated based the replacement cost
	Sub-total A	**34,924,763.50**	
Compensation	Trees and Cash crops	3,006,310.00	Estimated based on the current market values of the Maguindanao Provincial Assessor's Office and Lanao del Sur
	Damaged crops	794,747.09	Estimated based on the current market value of the Philippine Statistics Authority
	Sub-total for B	**3,801,057.09**	
External Monitoring		1,000,000.00	Estimated at PhP 1,000,000 per SP
	Sub-total for C	**1,000,000.00**	
Subtotal (A+B+C)		**39,725,820.59**	
Contingency	10%	3,972,582.06	
Admin Cost	5%	1,986,291.03	
GRAND TOTAL		**45,684,693.68**	

Source: JICA Study Team

(4) Stakeholders Meeting for RAP for Sub-Project No. 2

The affected LGUs, including municipalities and barangays, were informed on the date and venue of the public consultation meetings through a letter from the JICA Study Team. Following the protocol of the local process, a letter of invitation for public consultation meetings was handed down to the office of the Mayor for proper dissemination of information to the barangay level.

Table 7.11.2-44 Public Consultation Meetings conducted

Activity	Objective	Venue	Date	Participants	No. of participants	
					M	F
1st Round Meeting	Provide information to the possible Affected households regarding the: • project background • scope • objectives • benefits • update • basic resettlement policies (Philippines and JICA), • Cut-off-date and announcement of succeeding resettlement activities such as conduct of perception, census, socioeconomic survey and inventory of losses.	Parang municipal conference room	Dec. 7, 2017	LGU, DPWH, Project affected persons, Tourism and Barangay Officials	56	18
		Matanog municipal multi-purpose hall	Dec. 8, 2017	LGU, Project affected persons and Barangay Officials	17	95
		Balabagan, Municipal Hall Executive Building	Dec. 9, 2017	LGU, Project affected persons; farmer and fisherman; and Barangay Officials	36	18
		Kapatagan, Training Center/ Gymnasium	Dec.11, 2017	LGU, Project affected persons; farmer and fisherman; and Barangay Officials	35	39

Table 7.11.2-45 Summary of Main Opinions and Concerns raised during the First Public Consultation

Major opinions/concerns	Reflections/countermeasures
i. Parang	
Affected areas with no land titles	No land/lot title, no compensation – will be strictly followed. Required documents such as Certificate of land title and tax declaration should be secured.
Affected area that traversed military reservation and cemetery	The proposed alignment is not yet final. A copy of the results will be provided per barangay level for confirmation. Affected cultural heritage will be highly taken into consideration and recommended to the proponent for possible realignment. Affected people and area will also be considered. Information regarding this will be collected during the survey.
Affected people and areas and its compensation	A request will be made to the proponent to provide the affected people the final details of the project once the study will be done. DPWH will pay the acquisition of all affected structures. All affected land, trees, among others will be justly compensated as long as it is included in the inventory during cut offs.
Road alignment area and possible realignment	This will be considered and recommended to the proponent.
Implementation time of the project	Initial plan will be by June 2018 (as per JICA)
ii. Municipality of Matanog	
Route alignment of the project	The presented alignment for the meeting is the proposed route. There are alternatives that were also considered but this study will be conducted first to determine the best alternative that will be favorable to access of the communities.

	In the case of requesting a new route or additional road access, the barangay should submit a resolution to the LGU, particularly to mayor office, and LGU will endorse recommendation to DPWH for consideration.
Affected land areas and structures	DPWH will pay the acquisition of all affected structures. Affected people should secure the required documents such as certificate of land title and tax declaration for claims. Results of inventory will be submitted by the JICA Study Team to DPWH. The department will decide the value based on DPWH guidelines.
Affected areas with no land/lot titles	All affected owners should secure the required documents such as certificate of land title or tax declaration certified by the LGU for claims.
iii. Municipality of Balabagan	
Rerouting of road alignment	Propose rerouting of road alignment at station 4+400 – 4+900 to give way for future air strip expansion within the property of Lobregat. Travel time from Brgy. Poblacion to Parang will be shorten to 30 minutes. This will be considered and recommended to the proponent.
Plans of the Air Strip and preparation of a Municipal Resolution	Crafting the resolution will be helpful to provide information to JICA and DPWH on the plans of the municipality.
Effects of the project to the affected community	The public consultation was conducted to inform the community on the possible affected community along the alignment. This affected communities should secure documents such as the land title or declaration certificate for claims. Cooperation of the community is very important to avoid issue prior the implementation.
Compensation of affected PAPs (without land titles)	DPWH will prepare a compensation plan to compensate the affected PAPs. However, to avoid problems for compensation, the landowner should secure required documents. For military reservations like in Parang, affected properties and trees will be included in the compensation.
iv. Municipality of Kapatagan	
Affected Land properties	All affected lots will be compensated and the assessor's office will assist in the preparation of the required documents. It was emphasized by the Mayor of Kapatagan that they badly needed the project and the cooperation of the community is very important for the success of the project.
Properties without land titles	They should secure required documents to be compensated on the loss of their properties affected. DPWH is the implementing agency who will determine the true values of the properties.
On-going road project of the Mayor	It was explained that the location is different from the on-going project.
Disapproval of the barangays on the project	So far, all the barangays were very supportive on the project and some barangays were requesting to realign to pass though their barangay area.

Source: JICA Study Team

Table 7.11.2-46 Barangay Consultations Conducted

Activity	Objective	Venue	Date	Participants	No. of participants	
					PAPs	Non PAPs
2nd Round Meeting Provide information to the possible Affected households regarding the: • Proposed Projects	• To elicit further opinions from PAPs themselves about the project • To obtain the basic socioeconomic data from PAP's and to allow them to express their ideas, apprehensions, concerns and objections.	Parang Municipal Conference Room	Feb 21, 2018	Barangay Officials and PAPs	5	2
		Kapatagan Municipal Conference Room	Feb 22, 2018	Barangay Officials and PAPs	30	3
		Matanog Municipal Conference Room	Feb 23, 2018	Barangay Officials and PAPs	18	3

Table 7.11.2-47 Summary of Main Opinions and Concerns raised during Barangay Consultations

Major opinions/concerns	Reflections/countermeasures
i. Kapatagan Municipality	

Major opinions/concerns	Reflections/countermeasures
Prioritize workers for the construction.	• DPWH, D.O No. 130, series of 2016 states that: the mandatory minimum percentage of 50% of skilled unskilled labor requirement and minimum of 30% skilled labor shall be recruited and be equally accessible to both women and men.
Valid proof of ownership for entitlements.	PAP with Transfer/ Certificate of Title or tax Declaration (Tax declaration legalized to full title). The following topics are also discussed to them: • Holders of free or homesteads patens and Holders of Certificates of Land Ownership (CLOA) under CA 141. Public Lands act will be compensated on land improvements only. • Public Lands Act will be granted under Comprehensive Agrarian Reform Act shall be compensated for the land at zonal value. • If granted under Voluntary Offer to sell by the Landowner. CLOA issued under CA 141 shall be subject to the provisions of Section 112 of Public Lands Act shall receive compensation for damaged crops at market value at the time of taking.
ii. Parang Municipality	
Persons entitled for the compensation.	Specific to the project, the various types of APs are qualified, as follows: **(i) Landowners and Land Users** a. Legal owners (e.g., agricultural, residential, commercial and institutional) who have full title, tax declaration, or who are covered by customary law (e.g. possessory rights, usufruct, etc.) or other acceptable proof of ownership over the affected land. b. Users or occupants that have no land title or tax declaration over the affected land. c. Renters of the affected land. **(ii) PAPs with Structures** a. Owners of structures who have full title, tax declaration, or other acceptable proof of ownership (e.g. possessory rights, usufruct, etc.) b. Owners of structures, including shanty dwellers, who have no land title or tax declaration or other acceptable proof of ownership c. Renters **(iii) PAPs with Crops, Fruit Trees, and other Perennials** a. Owners of affected crops, fruit trees and perennials who have full title, tax declaration, or other acceptable proof of ownership (e.g. possessory rights, usufruct, etc.) b. Owners of affected crops, fruit trees and perennials who have no land title or tax declaration or other acceptable proof of ownership. **(iv) PAPs Affected by the Loss of Livelihood and Sources of Income** a. Owners of registered or unregistered shops, regardless of land tenure status, whose business operation will be interrupted temporarily or permanently due tothe project. b. Hired labor (e.g., farm worker, house help, and store helper) who will lose their work temporarily or permanently due to the project.
Payment for tree or the unit for costing of crops and the basis for compensating the properties will be affected.	• The DPWH will disclose the compensation for trees and crops after the detailed engineering and it will be discussed in the next public consultation • Section 4 of the R.A 10752 clearly states that the modes of acquiring real property are: (i) donation, (ii) negotiated sale, and (iii) expropriation. Property valuation is market-based and undertaken using Government Financial Institutions (GFIs) or Independent Property Appraisers which help promotes unbiased property valuation. The assumption by the IA of the capital gains tax also provides supplementary incentive to the lot owners to negotiate with government. All these things will be further discussed by DPWH

Major opinions/concerns	Reflections/countermeasures
	representatives and consultant in the second public consultation.
Valid proof of ownership for land and mode of payment	PAP with Transfer/ Certificate of Title or tax Declaration (Tax declaration legalized to full title). The following topics are also discussed to them: • Holders of free or homesteads patens and Holders of Certificates of Land Ownership (CLOA) under CA 141. Public Lands act will be compensated on land improvements only. • Public Lands Act will be granted under Comprehensive Agrarian Reform Act shall be compensated for the land at Zonal value. • If granted under Voluntary Offer to sell by the Landowner. CLOA issued under CA 141 shall be subject to the provisions of Section 112 of Public Lands Act shall receive compensation for damaged crops at market value at the time of taking.
iii. Matanog Municipality	
Eligible persons qualified for compensation?	Specific to the project, the various types of APs are qualified, as follows: **(i) Landowners and Land Users** a. Legal owners (e.g., agricultural, residential, commercial and institutional) who have full title, tax declaration, or who are covered by customary law (e.g. possessory rights, usufruct, etc.) or other acceptable proof of ownership over the affected land. b. Users or occupants that have no land title or tax declaration over the affected land. c. Renters of the affected land. **(ii) PAPs with Structures** a. Owners of structures who have full title, tax declaration, or other acceptable proof of ownership (e.g. possessory rights, usufruct, etc.) b. Owners of structures, including shanty dwellers, who have no land title or tax declaration or other acceptable proof of ownership c. Renters **(iii) PAPs with Crops, Fruit Trees, and other Perennials** a. Owners of affected crops, fruit trees and perennials who have full title, tax declaration, or other acceptable proof of ownership (e.g. possessory rights, usufruct, etc.) b. Owners of affected crops, fruit trees and perennials who have no land title or tax declaration or other acceptable proof of ownership. **(iv) PAPs Affected by the Loss of Livelihood and Sources of Income** a. Owners of registered or unregistered shops, regardless of land tenure status, whose business operation will be interrupted temporarily or permanently due tothe project. b. Hired labor (e.g., farm worker, house help, and store helper) who will lose their work temporarily or permanently due to the project.
Valid proof of ownership for land.	PAP with Transfer/ Certificate of Title or tax Declaration (Tax declaration legalized to full title). The following topics are also discussed to them: • Holders of free or homesteads patens and Holders of Certificates of Land Ownership (CLOA) under CA 141. Public Lands act will be compensated on land improvements only. • Public Lands Act will be granted under Comprehensive Agrarian Reform Act shall be compensated for the land at zonal value. • If granted under Voluntary Offer to sell by the Landowner. CLOA issued under CA 141 shall be subject to the provisions of Section 112 of Public Lands Act shall receive

Major opinions/concerns	Reflections/countermeasures
	compensation for damaged crops at market value at the time of taking.
PAP's without any valid proof of ownership for land.	• PAP will be entitled to cash compensation for loss of entire structure at 100% of replacement cost. • Rental subsidy for the time between the submission of complete documents and the release of payment on land. • Cash compensation for damaged crops at market value at the time of taking. • Agricultural lessors are entitled to disturbance compensation equivalent to five times the average of the gross harvest for the past 3 years but not less than PhP 15,000. For improvement, PAP will be entitled to: • Cash compensation for the affected improvements at replacement costs For crops, trees and perennial, PAP will be entitled to: • Cash compensation for the affected crops, trees, perennials at current market value as prescribed by DENR and LGUs.

*Interview was administered by the help of Barangay Officials for those PAPs who were not able to attend during the consultation meeting.

(5) Focus Group Discussions among Women and Youth

In order to ensure public involvement, through the process of resettlement planning, Notre Dame University (NDU) conducted the focus group discussions (FGDs) for the vulnerable groups or persons, such as women and youth.

The date and venue of the FGD meetings was informed to the affected LGUs such as municipalities and barangays by the official request letter from NDU. In order to gather and reflect public opinions of the affected PAFs.

1) Awareness of the Project

PARANG

More than half of the participants are not familiar with the road project in their community, however majority of the women from Pinantao have heard of the project from their barangay chairman. Most of the youth are unaware of the said project.

MATANOG

Almost half of the participants are not familiar with the road project in their community, however household heads from Kidama and Sapad said that they are familiar with an ongoing construction from Parang to Barongisan only. Most of the women and the youth participants are unaware of the said project.

KAPATAGAN

All groups in the Barangays of Bakikis, Lusain, Matimos and Salamanare not aware of the plan for road construction in their community. All house hold heads and youth are unaware of the project. While almost all participants from Bakikis, Lusain and Salaman have not heard about the project, the group of women in Barangay Matimos are aware of this plan.

BALABAGAN

The focus group discussion conducted in Balabagan covered the 8 barangays namely Banago, Narra, Lorenzo, Molimoc, Barorao, Batuan, Budas and Poblacion. There were 2 groups of participants involving representatives from the women group and youth sector. Most of the FGD participants are not aware of the Road Network Development Project in their area. Only the women participants from Lorenzo expressed that they are aware of this farm to market road construction project in their community.

Table 7.11.2-48 Awareness of Road Constructions

Mun	Barangay	Awareness on Road Construction	
		Women	Youth
Parang	Macasandag	Not aware	Not aware
	Pinantao	Aware	No answer
Matanog	Kidama	Not aware	Not aware
	Sapad	Aware=4/ Not aware=5	Not aware
Kapatagan	Bakikis	Not aware	Not aware
	Lusain	Not aware	Not aware
	Matimos	Aware	Not aware
	Salaman	Not aware	Not aware
Balabagan	Bamago	Not aware	Not aware
	Narra	Not aware	Not aware
	Lorenzo	Aware	Not aware
	Molimoc	Not aware	Not aware
	Barorao	Not aware	Not aware
	Batuan	Not aware	Not aware
	Budas	Not aware	Not aware
	Poblacion	Not aware	Not aware

Source: Social Survey of NDU

2) Impact of Poor Road

PARANG

Lack of road or poor road impact the people in the community. All barangays influenced by the road project are unanimous in saying that poor road causes problems in transporting the products from farm to the market which can be expensive, they have difficulty in accessing to basic health services, and it is hard for their children to go to school. More burdens are faced by residents in Macasandag as heavy down pour may cause accidents and landslide. They also express the difficulty to get drinking water due to poor road condition.

The residents of Pinantao on the other hand, bear the impact of poor road as horses which they use as transportation and commuters are prone to accident. Residents without horses are forced to carry their products which are heavy load.

MATANOG

Lack of road or poor road impact the people in the community. All barangays influenced by the road project are unanimous in saying that poor road causes problems in transporting the products from farm to the market for they have to cross the rivers or hire pumpboats which can be expensive, they have difficulty in accessing to basic health services, and it is hard for their children to go to school. More burdens are faced by residents in Kidama as they have to wait for longer time to go in and out their barangay.

The residents of Sapad on the other hand, bear the impact of poor road as this is difficult for their livelihood in terms of their income, they incur bigger debt due to transportation costs.

KAPATAGAN

Poor road burdens all people in the community. All barangays influenced by the road project are unanimous in saying that poor road causes problems in transporting the products from farm to the market, high risk of crossing the river, difficulty in bringing patients especially emergency cases to the nearest hospital, and the difficulty of their children in going to school and buying school needs. More burdens are faced by residents in flood-prone barangays of Bakikis and Lusain. During heavy down pour, they have to wait for the rain to stop before going to the poblacion to buy their needs or during emergency cases as the roads are not passable.

On the side of Salaman, the residents bear the impact of poor road as water level of the river can go waist high and sometimes chest level during heavy rains. There are only few vehicles that can cross the Budas River thus the difficulty of transportation.

The women in Matimos expressed that though they have an existing road project, they do not know how far it will cover, as their concern is the crossing of the river which is a burden to them. The youth on the other hand state that they have to carry their school uniform in going to school especially when the water level of the river rise beyond normal.

BALABAGAN

The residents from the different barangays in Balabagan experienced the difficulty and inconvenience brought by a poor or lack of road in their community. The mobility and transportation of people and farm products are affected by this problem. The FGD participants expressed the difficulty of farmers to transport their farm products to the market or to other places due to slow or delayed transportation and the high and expensive fare rates demanded by the "habal-habal (motorcycle) or "payong-payong" (motorcycle with a sidecar) drivers. They are usually charged P50 - P100 per individual road trip like in the case of Narra and Batuan as expressed by the women group participants.

Commuters usually have problems in going to other places within and outside the barangay especially when there is heavy rain. Roads become slippery or flooded especially in Lorenzo and Poblacion. Children/students tend to be absent from classes because of this road condition. Transportation is not also accessible during this time. The same sentiments are experienced by the people in Barorao where there is difficulty for the students to go to school and parents' access to health centers. In Molimoc, the women participants expressed their burden of fetching water from its source from a far distance.

However, they are not much affected because they have a concrete "tire path" in their barangay and farmers don't transport their products outside because these are being picked up by the owner who then sell it to the market. The household heads and women participants in Budas shared that in the absence of road, residents/farmers have to cross the Budas River where they experience the difficulty especially during rainy season.

Table 7.11.2-49 Impact of Road to the Community

Mun	Barangay	Impact of Road to Community	
		Women	Youth
Parang	Macasandag	-lower income due to expensive transport of farm products -difficulty in accessing basic health care	-products are difficult to transport going to the market -farmers experienced hardship reaching their farms

		-longer transportation time for students -hard to get drinking water -during landslide, accidents and delays can happen	-difficult for students to go to school -landslide may cause accidents
	Pinantao	-difficult for children to go to school and back home especially during heavy rains -difficult to transport farm products to the market -mothers have difficulty buying basic family and household needs, school supplies of children	-difficult for youth to go to school -difficult for parents to transport their products -school children are sent home by their teachers when their school uniform and shoes get wet by rain
Matanog	Kidama	-people from another sitio can only use horses in bringing products to their barangay, they have to hire pump boats to transport products to Parang -slow phase of life -in case of emergency, people had cross Illana bay to bring patients to Parang	-delayed delivery of products, only pump boat can reach their barangay -increase in number of out of school youth, because the only school they have is a primary school -in case of emergencies, the patient need to be transported through pump boat before reaching the hospital. There was a case where a patient died before he was transported -if there is a storm, they have difficulty evacuating because their barangay is isolated
	Sapad	-lower income/ bigger debt due to higher product transportation cost -difficult to access hospitals -difficult to start and improve business -difficult to meet relatives in remote areas	-longer time ro transport goods from farm to market -difficult to go to school because road is slippery -damaged school shoes due to bad roads -poor roads can cause accidents
Kapatagan	Bakikis	-poor road condition; mobility is hampered when water level is high difficult to reach barangay and transporting their products -risk of crossing the river as it may cause accidents	-inconvenient due to flooded, rough and muddy road products -students are always late to classes due to the dad road -difficult to transport sick relatives especially during emergency
	Lusain	-having roads would mean connection to the outside world, means of transportation is a pump boat which would take almost an hour -parents are anxious whether their children will go to school and come home safely -difficult to transport their products or buy their basic needs especially during heavy rains as the tide is high	-difficult to transport farm products to traders -difficult to buy their food and it takes time to bring emergency cases during heavy rains as they have to wait for the rain to stop
	Matimos	-difficult farm to market transportation especially during high tide -crossing the rivers is too risky -safety of children who go to school can cause anxiety to parents	-too difficult for students to go to school especially crossing the knee high river , they have to carry their school uniform -they incur absences during rainy season -they have to buy their school needs in bulk as sometimes the road is difficult to travel -difficult in transporting their products
	Salaman	-too difficult to transport products and people when river water level gets high	-transportation is difficult when river water rise, difficult for students to buy their school needs

			-students can hardly go to school due to only few vehicles can cross the river -members of the community has to home before 3pm as it is not safe to home late
Balabagan	Bamago	-Mobility is difficult	-Lower income & expensive product -Slow transportation -Communication and going to other places are difficult
	Narra	-Upper Narra residents experienced difficulty in transporting farm products to the market -Limited water for drinking and laundry	-Physically stressful when walking -Transportation is very slow -Pregnant women who are about to give birth have to go to hospitals in advanced
	Lorenzo	-Inaccessibility of transportation for the public high school students	-Difficult access to hospitals in case of emergency -Inconvenience brought by dust & dirt -Community is less beautiful -Delayed transportation
	Molimoc	-They are not much affected because they have a concrete “tire path” in their barangay and they don’t transport their products outside since these are being picked up by the owner -Women are burdened in fetching water because the source is very far from their barangay	-Inconvenient for students due to slow transportation -Lower income due to higher transportation cost -Very slow transportation of farm products
	Barorao	-Disadvantageous to the people in the community due to a road problem in going to the spring which is the source of their drinking water -it is difficult to go up and down carrying gallons of water -Difficulty for the people in the remote sitios to transport their products	-Students have difficulty in going to school -Parents have difficult access to health centers -Delay in receiving assistance for the community -Rough roads exist but transportation becomes better with concrete roads for the farmers
	Batuan	-Poor road conditions; during rainy days, roads are flooded and it’s very difficult for the people and animals to pas -Difficulty in transporting products (from farmer to owner)	-Inconvenient especially during rainy days -Difficulty in transporting farm products -Delay /slow transportation
	Budas	-Difficulty in mobility since they have to cross the Budas River which is knee deep high, current is strong and may cause accident -Children are sacrificing walking through the river carrying books and shoes and folding their pants -Not much affected in transporting products since the owner usually pick it up from the tenants	-Lower income due to higher transportation -Students have difficulty in going to school -Vehicles are easily damaged due to poor road conditions -Transportation is slow.
	Poblacion	-Difficulty in transporting farm products -Transportation of people coming from far puroks is not accessible because the number of “payong-payong” is limited	-More areas are affected by flood -Difficult to provide assistance to affected community members -The community looks unpleasant -Difficult to transport farm products to the market

		-no electricity	

Source: Social Survey of NDU

3) Main Source of Economic

In Parang, the three main sources of income in the Macasandag and Pinantao barangays are farming of corn, palay, coconut, banana, vegetables and small business such as sari-sari store, and motor vehicle servicing. While most participants engage in farm-related livelihood there were those whose economic means are remittances from OFW family members, government employee and security guard.

The three main sources of income in the Kidama and Sapad in Matanog are farming of corn,, coconut, fruits, small business such as sari-sari store, and motor vehicle servicing. While most participants engage in farm-related livelihood there were those whose economic means are remittances from OFW family members.

In case of Kapatagan, the three main sources of income in the four barangays are farming of rice, corn and coconut, fishing, and small business such as sari-sari store. While most participants engage in farm-related livelihood others like there were household heads who were into construction labor. There were women who work as tenants and in women's cooperative in the community. The youth added as other source of income, working at a barber shop.

Farming is the primary source of income or livelihood among the residents in Balabagan except in Lorenzo where most of them are private employees in the Hacienda Lobregat either as office staff, coconut caretaker, laundry woman, security guard or hacienda caretaker.

Coconut, cassava, and corn are the common and dominant products of the farmers. Some work on their own farm lot but others are tenants. In addition to farming, some are engaged into small business like sari-sari store, carenderia, loading cellphones, direct selling of RTWs, etc. The other sources of economic means of people in this area are fishing, driving and employment with the government.

Table 7.11.2-50 Main Source of Economic Means

Mun	Barangay	Main Sources of Economic Means	
		Women	Youth
Parang	Macasandag	-farming (coconut, banana and corn) -OFW remittance	-farming (corn, coconut) - government employee -sari-sari store owner
	Pinanatao	-farming (palay, coconut, corn, vegetables, fruits like marang, durian and lanzones)	-farming -motor vehicle driver -domestic helper -security guard
Matanog	Kidama	-farming (coconut, fruits and corn) -fishing -sari-sari store owner	-farming corn, upland rice, coconuts and bananas
	Sapad	-farming (coconut, corn)– sari-sari store, dried fish, rice - barangay employee -motor transportation service	-farming (copra, corn and fruits) - driver -sari-sari store -government employee -OFW
Kapatagan	Bakikis	-farming -women's cooperative worker	-farming -fishing -small time business (sari-sari store, barber shop)
	Lusain	-fishing -farming (coconut, corn and bananas)	-fishing -farming (coconut and corn)

	Matimos	- tenant/farmer	-farming(rice, corn, coconut) - fruit farmers of banana and cassava
	Salaman	-farming of coconut, corn and rice	-farming (corn, coconut and rice) - fishing -construction laborers
Balabagan	Bamago	1. Employment (8 CAFGU) 2. Barangay Officers (2 women)	1. Farming (coconut, cassava, banana, corn) 2. Service (carpentry, laborer) 3. Small business (sari-sari store, "tuba") 4. Fishing
	Narra	1. Farming (coconut, cassava, corn) 2. Sari-Sari store owner (small business) 3. Driving payong-payong	1. Employment in the barangay hall 2. Small store (sari-sari) 3. Teaching 4. Driving 5. Farming (coconut, cassava)
	Lorenzo	1. Employment in Hacienda Lobregat as Office worker, coconut caretaker, laundrywoman, security, caretakers of the hacienda	1. Private employment (Lobregat company) 2. Fishing 3. Farming 4. Government employee/company
	Molimoc	1. Tenant farming (coconut, cassava corn)	1. Farming (copra, corn, cassava) 2. Small store/sari-sari 3. Government employee 4. Water retail 5. Fishing
	Barorao	1. Coconut 2. Corn 3. Cassava	1. Farming(coconut, cassava, banana, corn) 2. Small business (Carenderia, Load, RTWs, Durul)
	Batuan	1. Coconut 2. Cassava 3. Corn 4. Making coconut roofing 5. Dressmaking	1. Farming (cassava, coconut, corn) 2. Sari-sari store 3. Service (Driving payong-payong)
	Budas	1. Tenant Farming	1. Farming (cassava, coconut, corn, banana, abaca) 2. Fishing 3. OFW 4. Cow & goat raising 5. Sari-sari store
	Poblacion	1. Farming (cassava, coconut, corn) 2. Business (sari-sari store) 3. Fish Vending 4. Government employee	1. Service (labor, driving, sewing) 2. Government employment (school, barangay hall) 3. Farming (coconut) 4. Fishing 5. Sari-sari store

Source: Social Survey of NDU

4) Negative Impact of Road Construction and Proposed Solutions

The three main negative impacts of the road construction as seen by the participants from Parang include their apprehension that the project will be left unfinished by the DPWH, that the funding may be diverted. They fear that some landowners may sacrifice their farm space/area with the construction of the road. Though there were those who expressed that there will be no negative impact as this is project is a dream come true for them.

Participants from the youth gave suggestions amid the negative effects of road construction, they recommend that people in the community assist the DPWH in the project and that the agency should be familiar with the people and the area.

On the other hand, some of the women have apprehensions because the project might bring security problems such as: the presence of military anytime and rido or clan war. They believed that establishing a Bangsamoro government and with the elders' mediation, these issues can be addressed.

The youth group expressed their concern over the road construction project like more vehicular accidents might occur and this might pave way for the terrorists to enter their barangay and more crimes might be committed. The youth from Sapad noted that DPWH had substandard projects in the past, thus their apprehension.

Among the youth from Kidama, they expressed that putting road signages, imposing speed limit and putting detachment along the road and that the barangay should intensify their patrol activities are among the proposed solutions that they can offer. Those from Sapad suggested that there should be transparency in the implementation of the project.

The respondents from Kapatagan have viewed that the three main effects of road construct encompass the apprehension that prior projects left unfinished may be experienced again, more vehicular accidents due to over speeding and there will be noise pollution.

Though some women gave no answer, those from Bakikis , Matimos and Salaman expressed that there were projects which were unfinished by DPWH , thus their apprehension.

The youth foresee more road accidents and the possibility construction of house along the road, there will be noise and air pollution. They also worry that some of their age group will be going home late.

The participants have suggestions amid the negative effects of road construction. The women believe that there should be proper fund allocation, since unfinished projects by DPWH are still evident.

Moreover, all of the youth groups propose speed limit policy, traffic signages, implement curfew and program be implemented to reduce pollution.

Six (6) barangays in Balabagan have not seen any negative impact of the road project. However, women participants from Barorao and Poblacion shared almost the same perception with regards to the negative impact of road construction. These include the possibility for the DPWH of not completing/finishing the road project based on what they experienced and the use of budget inappropriately and substandard equipment and materials in the road construction. There will be also opportunity for corruption such as using the construction materials like cement for personal needs.

As a solution, they proposed to have strict monitoring of the road project and to hire those who can be trusted. They prefer to hire private contractors in the area. The youth participants on the other side expressed about danger for more road accidents as the young people tend to engage in car or motor vehicle racing once the concrete road is completed. As a solution, they proposed the following: Provide street lights & humps, to put road signage like "slow down" and speed limit, impose policies and discipline from the barangay, and police visibility in the area.

Table 7.11.2-51 Negative Impact of Road Constructions

Mun	Brgy	Negative Impact of Road Construction and Proposed Solutions			
		Women		Youth	
		Negative Impact	Solutions	Negative Impact	Solutions
Parang	Macasandag	-landowners will sacrifice their farm space/area	consultation with farmers be done	-none	
	Pinantao	-none		-DPWH do not know the people and community, this might pose a problem to them	-the people can be asked to assist DPWH in the road construction -DPWH should know the area and people first
Matanog Kapatagan	Kidama	-none		-increase in number of vehicular accidents -terrorists might penetrate barangay -all forms of crime might happen	-put signages, impose speed limit -put detachment along the road and intensify barangay patrol activities -barangay and residents should be vigilant
	Sapad	-security issues such as: military can enter anytime, rido -more motor acquisition can lead to more road accidents	-establish Bangsamoro government, Dawah, leaders mediation	-DPWH has implemented substandard projects in the past	-there must be transparency in the implementation -hire only those people who can be trusted and willing to work without being corrupt -empower the youth so that they can be heard
	Bakikis	-none	-none	-more road accidents -outsiders will come and go -construction if delay will annoy residents -more construction of houses near the road	-impose speed limit -implement curfew hours -no corruption -signages be visible
	Lusain	-none	-none	-road accidents	-set speed limit
	Matimos	-apprehension when road project will be left unfinished	-proper fund allocation -look into several unfinished projects of DPWH; cases of unpaid local workers	-prone to vehicular accidents -youth will go home late	-set ordinance on speed limit -barangay ordinance prohibiting motor racing -implement curfew
	Salaman	apprehension on DPWH that project will not be finished	-no answer	-road accidents	-LGU should set speed limit, BPAT to have program on pollution reduction -implement curfew
Balabagan	Banago	-Corruption	-No proposed solution	-More road accidents -Racing	-Speed limit/set penalty -Give reminders
	Narra	No answer		-Road accidents -Becoming useless construc-tion	-Put lighting beside the road,slow down signage, hump construc- tion - Need for quality road suited to community problems on flood; big rocks
	Lorenzo	1. when the road	none	1.more road accidents	1. speed limit, humps,

		constructed is substandard 2. When cement are used in houses near the construction instead of the road 3. When roads are done half-way and we will wait for century before it will be finished		2.There will be racing activities	signage 2. Policy coming from the barangay prohibiting racing
	Molimoc	None		1.abuse of good roads/road accidents 2.Racing for entertainment	1. Discipline 2. Need orientation from the chairman
	Barorao	If the DPWH will not meet the standard of budget and road construction, substandard construction of the roads or bridge constructed will not be finished	none	More road accidents	Discipline among vehicle owners/ drivers Racing is already prohibited by the LGU
	Batuan	None, it is good because we can enjoy if our road is concreted		-Possibility of more road accidents	-Reminders to avoid road accidents
	Budas	1. when DPWH will construct a substandard bridge/road 2. When there is corruption, leaving the construction half-way	none	1.There will be racing in the barangay 2.More road accidents	1. humps, penalty 2. Speed limit, signage like “slow down”, discipline on parking
	Poblacion	none		1.more racings means more accidents 2.More raod accidents 3.Theft can escape faster	1. Signage like “slow down”, humps, police visibility 2. Speed limit, check points, ambulance 3. Police visibility, check points

Source: Social Survey of NDU

5) Perception towards DPWH as Road Contractor

All participants in Parang have agreed that DPWH should be the contractor for the road project for they believe that it is the role of this government agency.

In addition, the heads of the family group from Macasandag and Pinantao believe that the people will experience good life and having a farm to market road is a dream come true for them. However, the

women group favored the DPWH project as this will be useful to them especially in the accessibility of the farmers and residents in their way of life,

Among the youth they agree that DPWH can implement the project but the residents should also be involved.

In Matanog, all participants have agreed that DPWH should be the contractor for the road project for they believe that it is the role of this government agency. They are the experts in the field and are allies of the government in the development of the community.

The women from Kidama and Sapad express that the DPWH project will be advantageous for the residents. Among the youth they agree that DPWH can implement the project and this will help in their community development. More business will flourish other than fishing and farming and the youth can finish school and become successful citizens.

All participants from Kapatagan have agreed that DPWH should be the contractor for the road project for they believe that it is the role of this government agency.

In addition, the heads of the family group from Lusain and Salaman expressed that the people do not have the expertise in the project and have high hopes for the accomplishment of the DPWH project. However, the women from Matimos and Salaman favored the DPWH with the condition that they must finish the project and that the bad experience in the past will not be repeated.

Among the youth they agree that DPWH can implement the project faster, the road will improve economic means of the residents and students can have access to regular school.

On the side of FGD participants in Balabagan, all have agreed that DPWH shall take the lead in the road construction project in their community. They believe that it is the mandate of the DPWH as a government agency and they have the facilities and expertise to do road projects. However, some participants agreed but set some conditions like DPWH should allocate the budget properly; use standard measurements and equipment and has to complete or finish the road project on time.

6) Community Support to DPWH

All participants from the four municipalities from two (2) sectors have expressed full support to the DPWH as project contractor. In Parang and Matanog, they will support the basic needs of the project members such as food, water, accommodation and would volunteer in the project. They will help secure and protect the members and their equipment and materials.

On the side of the women from Pinantao in Parang and Kidama in Matanog they said that they will support the project by accompanying the team at the project site and would provide labor from local men in the community.

Meanwhile, the youth from Macasandag and Pinantao will provide security to the workers and their equipment. They expressed cooperation, assistance and would even volunteer to work. Meanwhile, the youth from Kidama and Sapad expressed their cooperation, assistance and would even volunteer in the traffic management. Aside from these, they will convince their parents to support the DPWH project.

Similarly, all participants from Kapatagan will help secure and protect the members and their equipment and materials.

On the side of the women from Bakikis and Matimos, they would provide food and water of the project team and share their kitchen utensils while the women from Lusain and Salaman would provide counterpart in labor and any support that they can afford.

Meanwhile, the youth from Bakikis and Matimos will offer food and water and resting place and provide security to the equipment. Those from Salman would follow the rules imposed and will help remove debris that fall on the road.

The participants from Balabagan Municipality assure to give support to the DPWH project team in the road construction. The household heads, women and youth participants expressed to welcome the team and provide them with food, drinks and accommodation they need. They will also ensure the safety and security of the DPWH workers and to provide help through community volunteers/laborers. In addition, they would secure and keep watch over the equipment and other materials used by the DPWH team in the road construction.

7) Summary

Generally, the focus group discussion participants from the four (4) municipalities in SP 2 are not aware of the road construction project in their community. However, they see the impact of the lack of road like there is inconvenience and difficulty in transporting farm products like coconut, corn, cassava and other crops to the market and in the mobility of people. There is a high cost of transportation and problem on accessibility due to this road problem. It becomes a concern since the main source of economic means or income of the people in this area is farming.

The implementation of the road construction project has both positive and negative impact according to the participants. The common positive impact they cited is an easier faster and better transportation for the commuters and in the delivery of farm products to the market. Consequently, it will bring better and good life to the people because of social and economic opportunities.

In terms of the negative impact, they have not seen any of these except for the apprehension on the completion of the road project on time and the tendency for the use of sub-standard equipment and materials for this project. However, the participants trust and believe in the expertise and capabilities of the DPWH team for doing this job. They only proposed for the strict monitoring and the hiring of trusted workers for this road project.

The community assures support to the DPWH team in this project by providing them with food, drinks and accommodation they need and to provide volunteers from the barangay to assist in the road construction. The safety and security of the team and their equipment are also ensured by the barangay officials in the locality.

7.11.3 Summary of Resettlement Action Plan (RAP) for Sub-Project 6

(1) Social Environment Situation of Sub-Project 6

1) Project Description

The Tapian-Lebak Coastal Road – Sub-Project 6 covers 62.6 km length and traverses the municipality of Datu Blah Sinsuat and Lebak in the provinces of Maguindanao and Sultan Kudarat, respectively. The alignment passes through barangays Penansaran, Tubuan, Nalkan, Tambak, Kinimi, Resa, Lapaken, Sedem, Meti, Sinipak, Laguitan, Tran, and Kalamongog (**Figure 7.11.3-1**). The road segment aims to increase the flexibility of the network by linking primary-intercity road (Cotabato – Gen. Santos Road) and regional primary road (Awang- Upi- Lebak Road) as well as connect coastal towns to major urban centers (Cotabato City, Koronadal City) to facilitate easier access of communities including Indigenous Peoples (IPs) and their goods. It will also provide better link to the areas with high poverty incidence to help them access social services and sell their products to urban centers with minimal transportation cost.

Table 7.11.3-1 Details of Tapian-Lebak Coastal Road Alignment and Road Length

Province	Municipality	Barangay	Road Length (Km)
Maguindanao	Datu Blah Sinsuat	Penansaran	2.7
		Tubuan	4.0
		Nalkan	4.5
		Tambak	7.2
		Kinimi	9.2
		Resa	5.8
		Lapaken	6.8
		Sedem	11.2
		Meti	3.4
		Sinipak	1.8
		Laguitan	0.7
Sultan Kudarat	Lebak	Tran	2.5
		Kalamongog	2.8
Total			**62.6**

Source: JICA Study Team

Figure 7.11.3-1 Location Map of Tapian-Lebak Coastal Road – Sub-Project 6

2) Socio-Economic Profile of the Project-affected Persons

Based on the conducted socio-economic survey, a total of twenty-one (21) affected household heads (AHHs) and One-Hundred (100) affected land lot owners were interviewed. Out of 21 AHHs, fifteen (15) are identified as IPs while fourteen (14) IPs are owners of the affected land lots as shown in **Table 7.11.3-2**.

Table 7.11.3-2 Summary of Potential Number Affected Structures and Land Lots

Loss category	Datu Blah Sinsuat		Lebak		Total		Grand Total
	Non-IP	IP	Non-IP	IP	Non-IP	IP	
Affected House Heads	1	5	5	10	6	15	21
Affected Structures *	1	5	6	10	7	15	22
Affected Land Lot Owners	63	10	23	4	86	14**	100

Note 1: * Although there are 22 residential houses and one sari-sari store, there are only 21 owners listed. This is because one household owns two houses within the alignment, during the actual field reconnaissance, this house was not occupied.

Note 2: **Although RAP them identified 14 IP households as owner of land lots, interview with Lebak LGU revealed that 10 IP households are actually care taker of a plantation and living inside the plantation hence most likely, they are not the owner. In fact, according to the concerned LGU and plantation owner, the IPs came from other areas and resettled in the plantation with the permission of the owner due to job opportunity.

Source: JICA Study Team

A total of1,898,407 sq. m of land with crops and trees will be affected by the alignment as summarized in **Table 7.11.3-3**. Majority of the cultivated crops that will be affected are corn and palay.

Table 7.11.3-3 Summary of Affected Land and Types of Cultivated Crops

Loss category	Unit	Datu Blah Sinsuat	Lebak	Total
Affected agricultural lands with corn	m^2	72,843.00	1,289.00	74,132.00
Affected agricultural lands with palay	m^2	66,868.00	13,500.00	80,368.00
Affected Fruit bearing trees	No. of trees	2,135	2,070	4,205
Affected trees (Timber / non-fruit bearing)	No. of trees	102	58	160
Plant/Cash Trees	No. of trees	148	1,151	1,299
Total affected land area (sq. m.)	m^2	1,736,892	161,515.20	1,898,407

Source: JICA Study Team

a. Household Size

Majority or 13 (61.90%) of the AHHs' size ranges from 6-10 members followed by 11-above members while only 2 HHs' have 1-5 members.

Table 7.11.3-4 No. of Affected Household Heads by Household Size

Household Size	Affected House			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
1-5	0	2	2	9.53
6-10	1	12	13	61.90
11-above	5	1	6	28.57
Total	**6**	**15**	**21**	**100**

Source: JICA Study Team

Majority or 51% of the affected land lot owners' size ranges from 1-5 members while 49% have 6-10 members.

Table 7.11.3-5 No. of Affected Land Lots by Household Size

Household Size	Affected Land Lots			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
1-5	32	19	51	51
6-10	41	8	49	49
11-above	0	0	0	0
Total	**73**	**27**	**100**	**100**

Source: JICA Study Team

b. Household Structure

The common family structure that can be observed along the Tapian- Lebak Alignment was composed of nuclear structure (100%), a common Filipino family structure, which was made up of the parents and their children.

Table 7.11.3-6 No. of Affected Household Heads by Household Structures

Household Structures	Affected House			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Single	0	0	0	0
Nuclear	6	15	21	100
Extended	0	0	0	0
Joint	0	0	0	0
Total	**6**	**15**	**21**	**100**

Source: JICA Study Team

In terms of family structure of the affected land lot owners, majority have household structure type of nuclear with 91% while 9%have an extended structure in which relatives are also leaving together with the parents and children.

Table 7.11.3-7 No. of Affected Land Lots by Household Structures

Household Structures	Affected Land Lots			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Single	0	0	0	0
Nuclear	64	27	91	91
Extended	9	0	9	9
Joint	0	0	0	0
Total	**73**	**27**	**100**	**100**

Source: JICA Study Team

c. Gender Distribution

In terms of gender distribution, majority of PAPs with affected houses and land lots are headed by male. Likewise, on the affected land lots, out of one-hundred (100) AHHs, fifteen (15) are headed by female.

Table 7.11.3-8 No. of Affected Household Heads by Gender

AHHs	Affected Household Head		
	Datu Blah Sinsuat	Lebak	Total
Male	6	15	21
Female	0	0	0
Grand Total	**6**	**15**	**21**

Source: JICA Study Team

Table 7.11.3-9 No. of Affected Lands Lots Owners by Gender

AHHs	Affected Land / Lots		
	Datu Blah Sinsuat	Lebak	Total
Male	73	12	85
Female	0	15	15
Grand Total	**73**	**27**	**100**

Source: JICA Study Team

d. Civil Status

The civil status of most or 14 (66.67%) AHHs are married followed by widowed with 6 (28.47%), while only 1 AHH is a single parent.

Table 7.11.3-10 No. of Affected Household by Civil Status

Civil status	Affected households			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Single	0	0	0	0
Married	0	14	14	66.67
Widowed	5	1	6	28.47
Live-in	0	0	0	0
Single parents	1	0	1	4.76
No Response	0	0	0	0
Total	**6**	**15**	**21**	**100**

Source: JICA Study Team

On the other hand, majority of the land lot owner's civil status are married (73) followed by widowed (15) and single parents (12) as shown in below table.

Table 7.11.3-11 No. of Lands/Lots by Civil Status

Civil status of affected land lots owner	Affected Land / Lots			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Single	0	0	0	0
Married	73	0	73	73
Widowed	0	15	15	15
Live-in	0	0	0	0
Single parents	0	12	12	12
No Response	0	0	0	0
Total	**73**	**27**	**100**	**100**

Source: JICA Study Team

e. Age Distribution

More than half or 12 of the AHHs' age ranges from 30-34 years old followed by 55-59 years old, 35-39 years old, and 40-44 years old, while only 1 AHH with age ranges 20-24 years old.

Table 7.11.3-12 No. of Affected Households by Age

Age	Affected Houses			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
15-19	0	0	0	0
20-24	0	1	1	4.76
25-29	0	0	0	0
30-34	2	10	12	57.14
35-39	1	1	2	9.52

Age	Affected Houses			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
40-44	1	1	2	9.52
45-49	0	0	0	0
50-54	0	0	0	0
55-59	2	2	4	19.06
60-64	0	0	0	0
65-69	0	0	0	0
70-74	0	0	0	0
75-79	0	0	0	0
80+	0	0	0	0
No response	0	0	0	0
Total	**6**	**15**	**21**	**100**

Source: JICA Study Team

Majority or 24% of the affected land lot owners age ranges 40-44 years old followed by 45-49 years old, 30-34 years old, 55-59 years old, and 35-39 years old. About 19% are ages range from 60- 79 years old. This indicates that most of the land lots owners have no land ownership due to the old titling of practiced.

Table 7.11.3-13 No. of Affected Land Lots Owners by Age

Age	Affected lots			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
15-19	0	0	0	0
20-24	3	0	3	3
25-29	3	0	3	3
30-34	6	4	10	10
35-39	6	0	6	6
40-44	13	11	24	24
45-49	12	4	16	16
50-54	9	0	9	9
55-59	6	4	10	10
60-64	6	0	6	6
65-69	3	0	3	3
70-74	0	4	4	4
75-79	6	0	6	6
80+	0	0	0	0
No response	0	0	0	0
Total	**73**	**27**	**100**	**100**

Source: JICA Study Team

f. Religious Affiliation

Majority or 17 (80.95%) of the affected HHs' are Islam followed by other religious sectors (9.52%), while Roman Catholic and Baptist are both 1 (4.76%).

Table 7.11.3-14 No. of Affected Household Heads by Religion

Religion	Affected House			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Roman Catholic	0	1	1	4.76
Iglesia ni Cristo	0	0	0	0
Baptist	1	0	1	4.76
Born Again Christian	0	0	0	0
Islam	4	13	17	80.95
Others	1	1	2	9.52
No Response	0	0	0	0
Grand Total	**6**	**15**	**21**	**100**

Source: JICA Study Team

Majority or 78 of the affected HHs' are Islam followed by Roman Catholic (12%), and other religious sectors (10%).

Table 7.11.3-15 No. of Affected Land Lots Owner by Religion

Religion	Affected lots			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Roman Catholic	0	12	12	12
Iglesia ni Cristo	0	0	0	0
Baptist	0	0	0	0
Born Again Christian	0	0	0	0
Islam	70	8	78	78
Others	3	7	10	10
No Response	0	0	0	0
Grand Total	**73**	**27**	**100**	**100**

Source: JICA Study Team

g. Educational Attainment

Majority or 9 (42.86%) of the affected HHs' are both high school undergrad and graduate followed by elementary graduate (4.76%), and certificate of courses (4.76%). While only 1 affected HH is no response. Conceivably, in the affected areas covered by this report, attending formal education was not given more priority by the affected household heads due to early marriages as it can be reflected on the age distribution wherein household heads fall under young age brackets. Moreover, it can also be pointed out to the situation that the families in the affected areas are having little income from their livelihood and tending the land is more prioritized than attending formal education.

Table 7.11.3-16 No. of Affected Household Heads by Educational Attainment

Educational Attainment of AHHs	Affected House			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
No formal education	0	0	0	0
Pre-school	0	0	0	0
Elem. Grad	0	1	1	4.76
HS Under grad	0	9	9	42.86
HS grad	5	4	9	42.86
Vocational/Technical	0	0	0	0
Certificate Courses	1	0	1	4.76
College Under grad	0	0	0	0
College grad	0	0	0	0
No response	0	1	1	4.76
Total	**6**	**15**	**21**	**100**

Source: JICA Study Team

Majority or 38 of the affected HHs' have no formal education followed by elementary graduate (27%), HS under graduate (20%), college under graduate (11%), while only 4 completed HS graduated.

Table 7.11.3-17 No. of Affected Land Lots by Educational Attainment

Educational Attainment of Land Lots Owners	Affected lots			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
No formal education	27	11	38	38
Pre-school	0	0	0	0
Elem. Grad	23	4	27	27
HS Under grad	20	0	20	20
HS grad	0	4	4	4
Vocational/Technical	0	0	0	0
Certificate Courses	0	0	0	0
College Under grad	3	8	11	11
College grad	0	0	0	0
No response	0	0	0	0
Total	**73**	**27**	**100**	**100**

Source: JICA Study Team

h. Ethno-Linguistic Profile

In terms of the ethno-linguistic profile of the affected household heads, majority of the affected HHs' belonged to the Teduray Tribe (42.86%) followed by Maranao (28.57%), and Maguindanaon (14.29%). The ethno-linguistic data can further support the claim that indigenous people are present within the proposed alignment, hence, special considerations should be made for the area.

Table 7.11.3-18 No. of Affected Household Heads by Ethno-Linguistic

Ethno-Linguistic Affiliation	Affected House			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Maranao	0	6	6	28.57
Iranun	1	0	1	4.76
Maguindanaon	3	0	3	14.29
Ilocano	0	0	0	0
Cebuano	0	0	0	0
Illonggo	0	0	0	0
Teduray	0	9	9	42.86
Lambangian	0	0	0	0
Dulangan Manobo	1	0	2	9.52
Higaonon	0	0	0	0
IP	0	0	0	0
Others	1	0	1	4.76
Total	**6**	**15**	**21**	**100**

Source: JICA Study Team

Table 7.11.3-19 No. of Affected Land Lots by Ethno-Linguistic

Ethno-Linguistic Affiliation	Affected Land Lots			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Maranao	0	0	0	0
Iranun	6	0	6	6
Maguindanao	41	0	41	41
Ilocano	0	0	0	0
Cebuano	0	4	4	4
Illonggo	0	0	0	0
Teduray	26	23	49	49
Lambangian	0	0	0	0
Dulangan Manobo	0	0		
Higaonon	0	0	0	0
IP	0	0	0	0
Others	0	0	0	0
Total	**73**	**27**	**100**	**100**

Source: JICA Study Team

i. Occupation

Majority or 17 (80.95%) of the affected HHs' were engaged in farming while the remaining 4 (19.05%) were engaged in other work.

Table 7.11.3-20 No. of Affected Household Heads by Occupation

Occupation	Affected House			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Farmer	4	13	17	80.95
Fisherman	0	0	0	0
Businessman	0	0	0	0
Govt. Employee	0	0	0	0
Driver	0	0	0	0
Teacher	0	0	0	0
Daycare Staff	0	0	0	0
Brgy. Official	0	0	0	0
Others	2	2	4	19.05
Total	**6**	**15**	**21**	**100**

Source: JICA Study Team

Half of the affected land lot owners were engaged in farming while the remaining half engaged in fishing, business, driving, teaching, and other works.

Table 7.11.3-21 No. of Affected Land Lots by Occupation

Occupation	Affected Land Lots Heads			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Farmer	42	8	50	50
Fisherman	6	0	6	6
Businessman	3	4	7	7
Govt. Employee	0	0	0	0
Driver	0	4	4	4
Teacher	0	0	0	0
Daycare Staff	6	0	6	6
Brgy. Official	0	0	0	0
Others	15	12	27	27
Total	**72**	**28**	**100**	**100**

Source: JICA Study Team

j. Family Income

Majority or 15 (71.43%) of the affected HHs' did not response on the estimated family income. Income bracket of 3 (14.29%) ranges from PhP10,000 and below followed by PhP20,001 to PhP 30,000 ranges 2 (9.52%), and the remaining 1 (4.76%) ranges PhP 50,001 to 60,000.

Table 7.11.3-22 No. of Affected Household Heads by Monthly Income Bracket

Monthly Income Bracket (PhP)	Affected House			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
10,000 and Below	1	2	3	14.29
10,001 to 20,000	0	0	0	0

Monthly Income Bracket (PhP)	Affected House			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
20,001 to 30,000	2	0	2	9.52
30,001 to 40,000	0	0	0	0
40,001 to 50,000	0	0	0	0
50,001 to 60,000	1	0	1	4.76
60,001 to 70,000	0	0	0	0
70,001 to 80,000	0	0	0	0
80,001 to 90,000	0	0	0	0
90,001 to 100,000	0	0	0	0
100,001 to 200,000	0	0	0	0
200,001 and above	0	0	0	0
No Response	2	13	15	71.43
Total	**6**	**15**	**21**	**100**

Source: JICA Study Team

Majority or 84 of the affected land lot owners have an estimated family income ranges PhP 10,001 to 20,000. Income bracket of 11 ranges from PhP10,000 and below followed by PhP20,001 to PhP 30,000 ranges 2, and the remaining 3did not response.

Table 7.11.3-23 No. of Affected Land Lots by Monthly Income Bracket

Income Bracket (PhP)	Affected Land Lots			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
10,000 and Below	7	4	11	11
10,001 to 20,000	84	0	84	84
20,001 to 30,000	2	0	2	2
30,001 to 40,000	0	0	0	0
40,001 to 50,000	0	0	0	0
50,001 to 60,000	0	0	0	0
60,001 to 70,000	0	0	0	0
70,001 to 80,000	0	0	0	0
80,001 to 90,000	0	0	0	0
90,001 to 100,000	0	0	0	0
100,001 to 200,000	0	0	0	0
200,001 and above	0	0	0	0
No Response	2	1	3	3
Total	**95**	**5**	**100**	**100**

Source: JICA Study Team

k. Willingness to relocate

In instances that there is a need to relocate the affected HHs, hundred percent (100%) of the households expressed their willingness to be displaced/ relocated for this project.

For the case of the 15 IP households, those 5 IP households located in Datu Blah Sinsuat, the mayor of the said municipality allocated 1 hectare each in the following barangay to be used as resettlement area:

Pinansaran, Kinimi, Lapaken, Sedem, and Sinipak. For the 10 IP households in Lebak and living inside the plantation, the NCIP, Lebak LGU, plantation owner, and the 10 IP household agreed that their houses will be just pushed back away from the alignment. The plantation has wide vacant space hence this slight (about 20 meters away) relocation of their houses won't pose a problem. To facilitate smooth transfer of their houses before construction period, the NCIP requested the LGU to commit to take responsibility in relocating the houses. If this process is followed, NCIP will not go through the long process of FPIC and will issue the CNO (Certificate of Non-Overlap). On March 1, 2018, the Mayor of Lebak submitted a letter to NCIP 12 stating that Lebak LGU commits to facilitate relocation of the IP houses. Based on this letter and based on the finding of the FBI Team of NCIP 12 which states that the IPs are not living in their ancestral domain, NCIP 12 issued the CNO to DPWH National on May 11, 2018. Parts of the finding of the FBI Team are shown below.

Base on the additional references submitted, validation team through the team leader affirms that;

- No IP names have ever appeared in the Tax Map of Barangays Kalamongog and Taguisa, both of Lebak Sultan Kudarat implicitly confirms that this is non-CADT. Hence, the two (2) Barangays is occupied by Non-IP.
- The Tax Map is supported by a Tax Declaration supporting the names indicated in the Municipal Tax Map further confirming that the parcels of land are Non IPs property.
- The Certification of the Municipal Assessor stating that the proposed area affected by the Construction of the Coastal Road Finance by JICA is never been occupied by IPs and Non-CADT is another reliable proof that the road construction has in no manner can adversely affect the life of the IPs.
- The Projection of NCIP SK Geodetic Engineer herein attached further indicated that the same proposed road construction is Non-CADT while the approved and proposed CADT is quite far to negatively affect the IPs of the locality.

In consideration therefore with the foregoing findings, the Validation Team represented by the team leader hereby recommends to the Regional Director, Sir Joey L. Bogay, MPA, Koronadal City to issue a "CERTIFICATE OF NON-OVERLAP" in the Construction of the Tapian-Lebak Coastal Road (For the Lebak affected area only) through Mr. Virgilio C. Castillo, Project Director, UPMO-Road Management Cluster 1, Department of Public Works and Highway National Office, Bonifacio Drive, Port Area, Manila.

JAIME JAMES M. RAMIREZ
Team Leader

Table 7.11.3-24 Willingness to Relocate

Willingness to Relocate	Affected House			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Yes	6	15	21	100
No, but will consider	0	0	0	0
No	0	0	0	0
Don't know	0	0	0	0
No Response	0	0	0	0
Total	**6**	**15**	**21**	**100**

Source: JICA Study Team

l. Site Preference for Relocation

Preference of affected households for site relocation is shown in **Table 7.11.3-25**. One hundred percent (100%) of affected households expressed their willingness to be relocated in the same lot areas which were not affected by the alignment.

Table 7.11.3-25 Site Preference for Relocation

Site Preference	Affected House			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Same Lot	6	15	21	100
Same Barangay	0	0	0	0
Other Barangay	0	0	0	0
Other Municipality	0	0	0	0
Relocation Site	0	0	0	0
Other Site	0	0	0	0
No Response	0	0	0	0
Total	**6**	**15**	**21**	**100**

Source: JICA Study Team

m. Length of Residence

It was commonly observed that most of the affected HHs' were staying in the area since birth as well as the affected land lot owners

Table 7.11.3-26 No. of Affected Household Heads by Length of Residence

Length of Residence of Sample AH heads	Affected House			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Less than 1 year	0	0	0	0
1 - 5 years	5	1	6	28.57
6 - 10 years	0	2	2	9.53
Since birth	1	12	13	61.90
No response	0	0	0	0
Total	**6**	**15**	**21**	100

Source: JICA Study Team

Table 7.11.3-27 No. of Affected Land Lots by Length of Residence

Length of Residence of Sample AH heads	Affected Land Lots			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Less than 1 year	0	0	0	0
1 - 5 years	0	10	10	10
6 - 10 years	32	19	51	51
Since birth	41	8	49	49
No response	0	0	0	0
Total	**73**	**27**	**100**	**100**

Source: JICA Study Team

n. Project Acceptability

In terms of project acceptability, one-hundred percent (100%) were in favor of the proposed road alignment in their area. They were able to see more potential benefits in the onset of the project than with the negative effects. However, worries on inconvenience and displacement also surfaced in the survey.

Table 7.11.3-28 Project Acceptability

Project Acceptability	Affected House			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Yes	6	15	21	100
No	0	0	0	0
Don't know	0	0	0	0
No response	0	0	0	0
Total	**6**	**15**	**21**	100

Source: JICA Study Team

Table 7.11.3-29 No. of Affected Land Lots by Project Acceptability

Project Acceptability	Affected Land Lots			
	Datu Blah Sinsuat	Lebak	Total	
			No.	%
Yes	20	0	20	20
No	0	0	0	0
Don't know	53	27	80	80
No response	0	0	0	0
Total	**73**	**27**	**100**	**100**

Source: JICA Study Team

3) Barangays Affected

Table 7.11.3-30 shows the list of affected barangays and properties within the proposed 30 meters road alignment. In terms of the estimated land area per barangay, Meti in Datu Blah Sinsuat recorded the highest with 342,404 sq.m. while the least is Laguitan in Datu Blah Sinsuat with 21,056 sq.m. Barangay Tran in Lebak recorded the highest affected land lots with 23 owners while barangay Kalamongog in Lebak has the highest recorded affected household heads with 10 owners.

Table 7.11.3-30 Affected Properties by Barangay

Municipality	Name of Barangay	Estimated Affected Land Area (sqm.)	No. of Affected Property			
			Affected Land Lots Owner	Affected Houses / Structures		
				*Affected Structures	Affected HH Heads	Affected PAPs
Datu Blah Sinsuat, Maguindanao	Penansaran	83,431	10	1	1	7
	Tubuan	119,991	6	0		
	Nalkan	136,329	16	0		
	Tambak	216,803	3	0		
	Kinimi	276,797	2	2	2	17
	Resa	175,569	3	0		
	Lapaken	206,089	8	1	1	6
	Sedem	101,930	8	1	1	5
	Meti	342,404	4	0		

	Sinipak	56,493	6	1	1	6
	Laguitan	21,056	7	0		
	Total	1,736,892				
Lebak, Suktan Kudarat	Tran	87,830.60	23	7	5	26
	Kalamongog	73,684.60	4	10	10	52
Total		**161,515.2**	**100**	**23***	**21****	**119**

Note: * 22 houses + 1 small scale store = 23 structures

** One Household Head owns two houses

Source: JICA Study Team

4) Land Use and Areas Affected

The land use along the proposed alignment is classified into agricultural and residential areas. Since no Comprehensive Land Use Plan (CLUP) provided by the Local Government Units (LGUs) from the Municipalities affected to properly identify the delineation of the residential land, the survey team did an estimated delineation using a GPS.

Table 7.11.3-31 Land Use (sq. m)

Municipalities	Barangays	Residential Area	Agricultural Area	Total
Datu Blah Sinsuat, Maguindanao	Penansaran	0	83,431	83,431
	Tubuan	0	119,991	119,991
	Nalkan	0	136,329	136,329
	Tambak	0	216,803	216,803
	Kinimi	1,727	275,070	276,797
	Resa	1,951	173,618	175,569
	Lapaken	0	206,089	206,089
	Sedem	0	101,930	101,930
	Meti	0	342,404	342,404
	Sinipak	589	55,904	56,493
	Laguitan	14,787	6,269	21,056
Lebak, Sultan Kudarat	Kalamongog	--	87,831	87,830.60
	Tran	27,582	46,103	73,684.60
TOTAL		**46,636**	**1,851,771**	**1,898,407.20**

Note: * Classification is based on the Municipal Assessors.

Source: JICA Study Team

5) Structures and Improvements Affected

The structures that will be affected by the alignment are 22 houses made up of concrete, semi-concrete, and shanty materials, and 1sari-sari store. Out of 23 affected structures, 15 are owned by Indigenous Peoples (IPs).

Table 7.11.3-32 Affected structures in the area

Municipalities	Affected Barangays	No. of House		No. of Commercial Structures		Total	
		Non-IP	IP	Non-IP	IP	Non-IP	IP
Datu Blah Sinsuat	Penansaran	0	1	0	0	0	1
	Sinipak	0	1	0	0	0	1
	Sedem	0	1	0	0	0	1
	Kinimi	1	1	0	0	1	1
	Lapaken	0	1	0	0	0	1
Lebak	Kalamongog	0	10	0	0	0	10
	Tran	6	0	1	0	7	0
Total		**7**	**15**	**1**	**0**	**8**	**15**
Grand total		**22**		**1**		**23**	

Source: JICA Study Team

6) Crops and Trees Affected

Affected crops are summarized in **Table 7.11.3-33**. Most farmers in the area adapted the multi-storey cropping (coconut-corn) and rice fields were supported by irrigation.

Table 7.11.3-33 Affected Area Cultivated with Crops

Municipalities	Barangays	Affected area of crops (sq.m.)		Total
		Corn	Palay	
Datu Blah Sinsuat	Tubuan	34,500	0	34,500
	Tambak	25,908	0	25,908
	Kinimi	12,435	0	12,435
	Meti	0	56,368	56,368
	Sinipak	0	10,500	10,500
Lebak	Kalamongog	1,289	8,400	9,689
	Tran	0	5,100	5,100
Grand Total		**74,132**	**80,368**	**154,500**

Source: JICA Study Team

Affected trees along the proposed alignment were inventoried, most of the tree species planted are fruit bearing and harvestable timber as shown in **Table 7.11.3-34**.

Table 7.11.3-34 Affected Trees

Municipality	Trees (Fruit Bearing *)	Trees (Timber/Non-fruit Bearing **)	Plant/CashTrees ***	Total
Datu Blah Sinsuat	2,135	102	148	2,385
Lebak	2,070	58	1,151	3,279
Total	**4,205**	**160**	**1,299**	**5,664**

Note:
* Fruit Bearing Trees: Mango, Coconut/ Buco, Jackfruit/ Langka, Santol, Kamatchile, Duhat, Tamarind/ Sampaloc, Aratiles/ Mansanitas, Guava/ Bayabas, Macopa, Kaimito, Avocado, Atis, Casoy/ Kasuy
** Timber, Non-friut Bearing Trees: Narra, Acacia, Talisay, Bangkal, Balite, Gmelina, Falcata, Mahogany
*** Plant, Cash Trees: Banana, Papaya, Atsuete, Cassava, Cacao
Source: JICA Study Team

7) Status of Land Ownership of Affected Lots

Table 7.11.3-35 shows the status of land ownership by category and the possible mitigating/ legal remedies/ options that may help implement the Task Force responsible for Right-of-Way Acquisition of DPWH (Unified Project Management Office). Number of lots shown in the matrix was identified through local guides such as Barangay Officials that helped the RAP team during the inventory. The final list of identified lots are submitted to the Municipal Assessor's Office for verification whether the identified land claimants can be found in their records either they have title or with tax declaration.

Table 7.11.3-35 Status of Land Ownership

Type of Status	Definition	No. of Lots (People)												Ground Total		
		Lots with House									Lots without House					
		Lot owned			Lot not owned			Total								
Non-IP / IP		Non-IP	IP	Total	Non-IP	IP	Total	Non-IP (A1)	IP (A2)	Total (A3)	Non-IP (B1)	IP (B2)	Total (B3)	Non-IP (A1)+(B1)	IP (A2)+(B2)	Total (A3)+(B3)
Case-A	Land claimant has a land titled and paying taxes	0 0	0 0	0 0	1 (5)	0 0	1 (5)	1 (5)	0 0	1 (5)	5 (31)	0 0	5 (31)	6 (36)	0 0	6 (36)
Case-B	Land claimant has a land title but not paying taxes	1 (6)	0 0	1 (6)	4 (17)	3 (21)	7 (38)	5 (23)	3 (21)	8 (44)	27 (165)	0 0	27 (165)	32 (188)	3 (21)	35 (209)
Case-C	Land claimant has no land title but paying taxes (Tax Declaration)	1 (5)	0 0	1 (5)	0 0	9 (49)	9 (49)	1 (5)	9 (49)	10 (54)	39 (237)	0 0	39 (237)	40 (242)	9 (49)	49 (291)
Case-D	No land title and No Tax Declaration	0 0	1 (5)	1 (5)	0 0	2 (11)	2 (11)	0 0	3 (16)	3 (16)	5 (31)	2 (13)	7 (44)	5 (31)	5 (29)	10 (60)
Total		***2 (11)***	***1 (5)***	***3 (16)***	***5 (22)***	***13 (81)***	***18 (103)***	***7 (33)***	***15 (86)***	***22 (119)***	***76 (464)***	***2 (13)***	***78 (477)***	***83 (497)***	***17 (99)***	***100 (596)***

Note: Upper figure is number of houses; lower figure with parenthesis is number of people

(2) Implementation Schedule for RAP

Table 7.11.3-36 summarizes the indicative schedules of the various interrelated activities in relation to the preparation and implementation of the RAP.

Table 7.11.3-36 Resettlement Schedule

Activity	2019				2020				2021				2022				2023				2024				2025			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
First Disclosure																												
Parcellary Survey																												
Updating of RAP																												
Formulation of MRIC																												
Disclosure of Updated RAP to PAPs																												
Notification of PAPs																												
Compensation																												
Income Restoration																												
Detailed Design																												
ROW Acquisition and RAP																												

Activity	2019				2020				2021				2022				2023				2024				2025			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Procurement of Contractor																												
Construction																												
Construction Supervision																												
Monitoring and Evaluation																												
Internal Monitoring																												
External Monitoring & Evaluation																												

Source: JICA Study Team

(3) Cost Estimates, Compensation and Entitlements for Sub-Project No. 6

1) Preliminary ROW Cost Estimates for Land

The current fair market values from the BIR Zonal Computation and an independent property appraiser (IPA) were compared (**Table 7.11.3-37**) to determine the Estimated ROW Cost of Land. To compute for the total ROW Cost of Land, the highest market value (which in this case was seen to be the current value by the independent property appraiser) was then multiplied by the total affected land area.

Table 7.11.3-37 Comparison of Current Market Value and BIR Zonal Value

Municipality	BIR Zonal Value (PhP)		Current Market Value by IPA (PhP)	
	Residential	Agricultural	Residential	Agricultural
Datu Blah Sinsuat	83.00	4.15	450.00*	20.00*
Lebak	180.00	22.50	550.00*	30.00*

Note: * The current market value that was set by the independent property appraiser was used for the computation of the estimated market values of the affected land.
Source: JICA Study Team

Estimated market values of affected land in the assumption that all affected land owners have the complete land title is presented in **Table 7.11.3-38.**

Table 7.11.3-38 Estimated Market Values of Affected Land

Municipality	Land Classification	Affected Land (Sq.M)	Unit Price (PhP)	Total Cost (PhP)
Datu Blah Sinsuat	Agricultural	1,717,838	20.00	34,356,760.00
	Residential	19,054	450.00	8,574,300.00
Lebak	Agricultural	133,934	30.00	4,018,020.00
	Residential	27,582	550.00	15,170,100.00
Total		**1,898,408**		**62,119,180.00**

Note: The estimated market values of affected land were computed in the assumption that all claimants were qualified for the compensation, provided that they have the Original Certificate of Title and Tax Declarations, or any of the two.

Source: JICA Study Team

2) Preliminary ROW Replacement Cost Estimates for Structures and Improvements

The replacement cost of the affected structures, in this case were referred to the affected houses, was shown in **Table 7.11.3-39**.

Table 7.11.3-39 Replacement Cost of Residential houses

Municipality	No. of Houses	Total
Datu Blah Sinsuat	6	106,914.00
Lebak	17	993,439.40
Total	**23**	**1,100,353.40**

Source: JICA Study Team

The replacement cost of the affected utilities, identified as electrical post traversing the proposed alignment site, was shown in below table.

Table 7.11.3-40 Replacement Cost for Affected Utilities

Municipality	Electric Post	Unit Cost (PhP)	Total Cost (PhP)
Datu Blah Sinsuat	0	0	0
Lebak	2	35,000	70,000.00
Total	**2**	**0**	**70,000.00**

Source: JICA Study Team

3) Preliminary Cost Estimates for Crops and Trees

Table 7.11.3-41 Replacement Cost for crops

Municipality	Crops	Area (sq. m.)	Annual Yield (kg/sq.m.)	Unit Price (PhP)	Total Cost (PhP)
Datu Blah Sinsuat	Corn	72,843.00	0.28	14.00	285,544.6
	Palay	66,868.00	0.36	10.46	251,798.1
Lebak	Corn	1,289.00	0.30	14.51	5,611.017
	Palay	13,500.00	0.36	17.96	87,285.6
Grand Total		**154,500.00**			**630,239.32**

Source: JICA Study Team

Table 7.11.3-42 Replacement Cost for trees

Commodity	Municipality				Total Estimated Value
	Datu Blah Sinsuat	Total Cost	Lebak	Total Cost	
Fruit bearing trees	2,135	1,000,060.00	2,070	2,465,950	3,466,010.00
Timber / Non-fruit bearing trees	102	38,760	58	28,280	67,040
Plant/Cash Trees	148	31,240	1,151	1,011,480	1,042,720
				Total	**4,575,770.00**

4) Recommended Preliminary Compensation and Entitlement Packages

The recommended budget for RAP Implementation of Sub-Project 6 is PhP 79,919,874.13 and is part of government counterpart, however the amount is exclusive of other entitlements that are yet to be determined after the completion of the parcellary survey of the DPWH. The indicative budget items covering land acquisition and replacement cost of structures, and cost for external monitoring. Contingencies and admin cost are also included. The below table shows the details of the indicative budget to implement this RAP.

Table 7.11.3-43 Indicative Budget for RAP Implementation

Description	Cost Item	Amount (PhP)	Remarks
Land Acquisition and Structures	Land	62,119,180.00	Estimated based on the current fair market value of Land
	Structures	1,100,353.40	Estimated based the replacement cost
	Improvements	70,000.00	Estimated based the replacement cost
	Subtotal A	**63,289,533.40**	
Compensation	Trees and Cash crops	4,575,770.00	Estimated based on the current market values of the Maguindanao Provincial Assessor's Office and Sultan Kudarat
	Damaged crops	630,239.32	Estimated based on the current market value of the Philippine Statistics Authority
	Subtotal for B	**5,206,009.32**	
External Monitoring		1,000,000.00	Estimated at PhP 1,000,000 per SP
	Subtotal for C	**1,000,000.00**	
Subtotal (A+B+C)		69,495,542.72	
Contingency	10%	6,949,554.27	
Admin Cost	5%	3,474,777.14	
GRAND TOTAL		**79,919,874.13**	

Source: JICA Study Team

(4) Stakeholders Meeting for RAP for Sub-Project 6

Table 7.11.3-44 Public Consultation Meetings conducted

Activity	Objective	Venue	Date	Participants	No. of participants	
					M	F
1st Round Meeting	Provide information to the possible Affected households regarding the: • project background • scope • objectives • benefits • update • basic resettlement policies (Philippines and JICA), • Cut-off-date and announcement of succeeding resettlement activities such as conduct of perception, census, socioeconomic survey and inventory of losses.	Datu Blah Sinsuat Municipal Conference Room	Dec. 14, 2017	LGU, DPWH, Project affected persons, Tourism and Barangay Officials	31	6
		Brgy. Covered Court of Taguisa, Lebak	Dec. 9, 2017	LGU, Project affected persons and Barangay Officials	61	12
		Brgy. Kalamongog Conference Room	Dec. 9, 2017	LGU, Project affected persons; farmer and fisherman; and Barangay Officials	61	18

The second round of public consultation will be upon the approval of DPWH ESSD on the results of the preliminary data on this RAP Report.

Table 7.11.3-45 Summary of Main Opinions and Concerns raised during the First Public Consultation

Major opinions/concerns	Reflections/countermeasures
i. Datu Blah Sinsuat Municipality	
Schedule of payment/compensation to affected population	The payment will be made before the civil work will start. It will be ensured that the affected families will be justly compensated.
Affected areas of the Indigenous People (IP)	The inclusion of the land acquisition is within the 30-meter width will be compensated with a fair market value. While the remaining land beyond the road width can still be utilized by the owner.
Affected properties without land title	The affected owner will be assisted by the LGU in acquiring the land titles.
Rerouting of initial road alignment	This will be considered and recommended to the proponent.
ii. Brgy. Taguisa, Lebak Municipality	
Request for road alignment	The concerned barangay can submit a resolution to the municipal office. The mayor will endorse this to DPWH for inclusion on their future project. This will be considered and recommended to the proponent.
Sooner implementation of the project	Currently the project is in the feasibility study stage. LGUs are encouraged to be cooperative until the implementation stage.
Compensation of affected areas	The required documents to avail the claim are Barangay certificate, certificate of land title or tax certificate. No land titles, no compensation will be strictly implemented. Affected structures and areas that belonged to public property have no equivalent compensation.
iii. Brgy. Kalamongog, Lebak Municipality	
Laborers/Workers during the project implementation	This will be recommended to the proponent considering that they are qualified for the job.
Construction of bridges	This will be included in the proposed project if necessary.
Compensation of affected areas, structures and trees	Tenants and land owners will be compensated by the DPWH.

Source: JICA Study Team

Table 7.11.3-46 Barangay Consultations Conducted

Activity	Objective	Venue	Date	Participants	No. of participants	
					PAPs	Non PAPs
2nd Round Meeting	Provide information to the possible Affected households regarding the: • Proposed Projects • To elicit further opinions from PAPs themselves about the project • To obtain the basic socioeconomic data from PAP's and to allow them to express their ideas, apprehensions, concerns and objections.	Datu Blah Sinsuat Municipal Conference Room	Feb 23, 2018	Barangay Officials and PAPs	31	6
		Brgy. Covered Court of Tran, Lebak	Feb 22, 2018	Barangay Officials and PAPs	9	2
		Brgy. Kalamongog Conference Room	Feb 22, 2018	Barangay Officials and PAPs	6	1

Table 7.11.3-47 Summary of Main Opinions and Concerns raised during Barangay Consultations

Major opinions/concerns	Reflections/countermeasures
i. Datu Blah Sinsuat Municipality	
Acquisition of the government on properties, and the conditions and circumstances involved.	Section 4 of the R.A 10752 clearly states that the modes of acquiring real property are: (i) donation, (ii) negotiated sale, and (iii) expropriation. Property valuation is market-based and undertaken using Government Financial Institutions (GFIs) or Independent Property Appraisers which help promotes unbiased property valuation. The assumption by the IA of the capital gains tax also provides supplementary incentive to the lot owners to negotiate with government. All these things will be further discussed by DPWH representatives and consultant in the second public consultation.
Valid proof of ownership for land.	PAP with Transfer/ Certificate of Title or tax Declaration (Tax declaration legalized to full title). The following topics are also discussed to them: • Holders of free or homesteads patens and Holders of Certificates of Land Ownership (CLOA) under CA 141. Public Lands act will be compensated on land improvements only. • Public Lands Act will be granted under Comprehensive Agrarian Reform Act shall be compensated for the land at Zonal value. • If granted under Voluntary Offer to sell by the Landowner. CLOA issued under CA 141 shall be subject to the provisions of Section 112 of Public Lands Act shall receive compensation for damaged crops at market value at the time of taking. • Rehabilitation assistance in the form of skills training equivalent to the amount of P15, 000.00, per family, if the present means of livelihood is no longer viable and the PAP will have to engage in a new income activity.
Concerns about those PAP's without any valid proof of ownership for land.	• PAP will be entitled to cash compensation for loss of entire structure at 100% of replacement cost. • Rental subsidy for the time between the submission of complete documents and the release of payment on land. • Cash compensation for damaged crops at market value at the time of taking. • Agricultural lessors are entitled to disturbance compensation equivalent to five times the average of the gross harvest for the past 3 years but not less than PhP 15,000. For improvement, PAP will be entitled to: • Cash compensation for the affected improvements at replacement costs For crops, trees and perennial, PAP will be entitled to: • Cash compensation for the affected crops, trees, perennials at current market value as prescribed by DENR and LGUs.
Possibility to realign some portion of road segments in their Barangay (Lapaken)	This will be considered and recommended to the proponent.
ii. Brgy. Taguisa, Lebak Municipality	
Concerns about the basis for compensating the properties will be affected.	Section 4 of the R.A 10752 clearly states that the modes of acquiring real property are: (i) donation, (ii) negotiated

Major opinions/concerns	Reflections/countermeasures
	sale, and (iii) expropriation. Property valuation is market-based and undertaken using Government Financial Institutions (GFIs) or Independent Property Appraisers which help promotes unbiased property valuation. The assumption by the IA of the capital gains tax also provides supplementary incentive to the lot owners to negotiate with government. All these things will be further discussed by DPWH representatives and consultant in the second public consultation.
Assistance from the government aside from the compensation they will receive.	Executive Order (EO) 1035. Specifically, the order specifies (i) the provision of financial assistance to displaced tenants, indigenous peoples, and settlers equivalent to the average annual gross harvest for the last 3 years and not less that PhP15, 000 per ha, (ii) disturbance compensation to agricultural lessee's equivalent to 5 times the average gross harvest during the last 5 years, and (iii) compensation for improvements on land acquired under Commonwealth Act 141.
Concerns on the mode of payment/ compensation for affected assets/ properties.	The PAPs will be paid 100% compensation prior to removal of assets and properties. The PAPs will not be displaced until after they have received in full the compensation and appropriate allowances due to them.
iii. Brgy. Kalamongog, Lebak Municipality	
Process of compensation	The DPWH representative will disclose the process of compensation in the second public consultation
Time it takes before full compensation will be released to the PAPs	The DPWH representative will disclose the process of compensation in the second public consultation
Payment for loss of crops, and trees	LARRIP, 2017 states that Cash compensation for the affected crops, trees, perennials at current market value as prescribed by DENR and LGUs.

*Interview was administered by the help of Barangay Officials for those PAPs who were not able to attend during the consultation meeting.

(5) Focus Group Discussions among Women and Youth

In order to ensure public involvement, through the process of resettlement planning, Notre Dame University (NDU) conducted the focus group discussions (FGDs) for the vulnerable groups or persons, such as women and youth.

The date and venue of the FGD meetings was informed to the affected LGUs such as municipalities and barangays by the official request letter from NDU. In order to gather and reflect public opinions of the affected PAFs.

1) Awareness of the Project

All groups in the Barangays of Taguisa, Tran, Villamonte, Datu Karonand Kalamongog in the municipality of Lebak are not aware of the plan for road construction in their community. While the groups of women and youth in Barangays Datu Karon and Kalamongog, respectively, are aware of this plan.

In DBS, all groups in the barangays of Laguitan, Meti, Sedem, Lapaken, Resa, Nalkan, and Penansaran are not aware of the proposed road construction project. In the barangays of Pura and Matuber, except for the youth group, few in the women's group are at least aware of it. In the barangays of Kinimi

and Tubuan, only a few in the women and youth groups combined have at least some have knowledge. While in Barangays Sinipak and Tambak, only their youth group is aware of the road project.

In the overall, majority among the groups in both towns are not aware of the road construction plan in their respective communities.

Table 7.11.3-48 Awareness of Road Constructions

Mun	Barangay	Awareness on Road Construction	
		Women	Youth
Lebak	Taguisa	Not aware	Not aware
	DatuKaron	Aware	Not aware
	Kalamongog	Not aware	Aware
	Tran	Not aware	Not aware
	Villamonte	Not aware	Not aware
DBS	Laguitan	Not aware	Not aware
	Sinipak	Not aware	Aware
	Meti	Not aware	Not aware
	Sedem	Not aware	Not aware
	Lapaken	Not aware	Not aware
	Resa	Not aware	Not aware
	Kinimi	A few	Only one is aware
	Tambak	Not aware	Aware
	Nalkan	Not aware	Not aware
	Tubuan	Aware	Only one is aware
	Penansaran	Not aware	Not aware
	Matuber	Only one is aware	Not aware
	Pura	A few	Not aware

Source: Social Survey of NDU

2) Impact of Poor Road

The main opinions and views of the participants are summarized in **Table 7.11.3-49**, together with how this concern were reflected in the RAP report. The participants expressed their concerns that bringing of their sick patients and expectant mothers would take time to get to the nearest towns and hospitals. When sea waves are high or when there is bad weather, no boats dare to sail the sea. Majority of the barangay have cases that sick patients did not reach the hospital on time and / or just died. On the other hand, the youth in Barangay Taguisa said that the poor road condition make them suffer from respiratory problems caused by dusty road.

Another health impact is on the communities' nutrition needs due to bad weather. They could not buy rice and other basic necessities because going out is impossible. The women of Barangay Tubuan and Sedem experienced that they have starvation because the waves are high and the current of water is strong. Moreover, travelling during weather bear getting wet and later experienced illness. Further, Barangay Meti also experienced starvation as travelling by foot to Lebak during bad weather is risky as the trail are dangerous.

In times of calamities, the lack of road and poor road condition also an issues since entry to barangays is difficult, the rescuers could not easily get to them. During this times, most often they are prevented from getting any assistance from the outside which puts the people to vulnerable state.

Poor road conditions also humpers the schooling of the children. The difficulty of the children's going to school during bad weathers and high waves, as most of them go to school by foot traversing the risky trail and some of the roads, rivers or streams gets easily flooded. Most of this children's have no

choice but to stay home or absent from their classes. This was also experienced were some of the barangays the only means of transport is by riding pump boats, particularly in Barangay Resa, their teachers who resides in Cotabato City would only report to school once a month. Some of the coastal barangays used the barangay hall as classrooms because assistance from outside is difficult.

In terms of economic impact, almost all the participants expressed their concerned with difficulty of moving their products from their farms to nearest markets. Due to costly transportation and during bad weather. Participants from coastal barangays stated that this much worsen for them since their mode of transportation is by boat.

Overall, almost all of the groups in all barangays mentioned concern over the mobility of the people. Youth groups in the barangays of Penansaran, Matuber, and Pura even said that travelling is inconvenient, time-consuming, and perilous.

Table 7.11.3-49 Impact of Road to the Community

Mun	Barangay	Impact of Road to Community	
		Women	Youth
Lebak	Taguisa	Difficult to transport due to rough road; high transportation cost; due to high fare charged by public utility vehicle (PUV), students are forced to walk the long distance in going to school; too difficult to bring patients especially emergency cases to the hospital	Slow progress in the local business; too difficult for farmers to deliver their products; Students suffer from respiratory problem due to the dust brought by the rough road; low income in farming due to high transportation cost
	DatuKaron	Too difficult to travel particularly during rainy days and flooding; road is flooded with contaminated water; flooded road disrupts economic activities and hinders residents in going to the town proper; no transportation during flood since only habalhabal is the only mode of transportation; students do not go to school during flood; too difficult to travel due to rough road	Too difficult in going to school especially during rainy season,often absent in school during rainy days because no habal-habal; too difficult to transport farm products to traders; it takes time to bring emergency cases to the hospital; too risky to travel on a rough road particularly at night
	Kalamongog	Difficulty in farm to market transportation; too difficult for students to cross rough and muddy road; too difficult to go to Lebak especially when the river overflow	Rough road is a burden to commuters for it takes much time in travelling; high transportation cost; poor road reflects the lives of the community
	Tran	Difficult farm to market transportation especially during high tide; rough and muddy road is too difficult for students to go to school; too risky for students to cross the river particularly during high tide and flooding; flood hinders people to move to nearby barangays and go to the market; too difficult for PWD and senior citizen to commute; patients die along the way before reaching the nearest hospital.	Too difficult to travel because of rough road and sometimes flooded during rainy season; heavy rains often erode the road which becomes muddy and slippery; dusty road during dry season; too difficult to bring patients to the nearest hospital
	Villamonte	Too difficult to transport products; accident always happen because of the hazardous road; too difficult to bring patients to the nearest hospital; too risky and uncomfortable to travel; vehicles malfunction easily	Transportation is expensive due rough road; students can hardly go to school; difficult farm to market transportation; accident happens all the time
DBS	Laguitan	Difficult to get the farm and fish products out of the barangay; difficult to purchase rice; difficult for us to get out of the barangay when it is raining hard because the waves get bigger and the water level rises; difficult for	Present road is not properly elevated and it easily gets flooded and become muddy everytime there is rain; difficult for motorcycles to traverse the muddied road and this often leads to accidents; the road

Mun	Barangay	Impact of Road to Community	
		Women	Youth
		rescuers to penetrate if there is no road and that the water is high; difficult to bring the sick to the hospital especially when there is emergency; 4Ps beneficiaries have difficulty getting their allowances as they have to go to another barangay	gets easily flooded and can no longer be traversed everytime it rains; children can no longer go to school because when the road gets flooded
	Sinipak	People could not cross the Tran River when there is a typhoon as it becomes flooded; the present road becomes slippery, muddy, and gets flooded everytime it rains or during the rainy season; landslides occur and some get injured from falling rocks; farm products could not get through to the town; children have difficulty in going to school; travel to Lebak becomes sluggish everytime it rains because the road is muddy	Difficult to bring products out of the barangay; difficult for children to go to school because of the road condition (muddy, dusty, flooded); Perilous to cross the river when there is rain as it causes flooding
	Meti	We cannot buy food from Lebak if it rains as it is difficult or impossible to travel by land or sea; students have difficulty in going to school when it rains; some donot have boats to cross the sea and therefore could not buy things they need; most of the people get sick when only riding pumpboats as they get wet when it rains because they need to buy their necessities elsewhere; people could not engage in business if there is no road	Burden to the community; too far to reach the nearest barangay by walking; expensive transportation fare; unfortunate for the students because teachers are not available due to inaccessible area
	Sedem	Difficult for children to go to school during rainy season; difficult to procure rice from Lebak and buy other provisions because the only means to travel is by sea; difficult to engage in livelihood; difficult to transport fish products out of the barangay if it rains as the tide and waves get high	Difficult to bring products out; difficult to go to other places we desire; high fare when going to Lebak; patients could not be moved out when there is heavy rain
	Lapaken	We cannot deliver our products to Lebak or Cotabato if the weather is not good; our food supply gets all used up and we have nothing more left to eat if there is a storm and the waves are high; the sick could not be brought to the hospital if the waves are high	Difficult to bring things if there is no road; difficult to travel by walking over the mountains if waves in the sea are high; difficult to go to Lebak if there is no transport vehicle; difficult to go to school
	Resa	Transport cost becomes high when boarding pumpboats; difficult to go to Cotabato City during emergencies; difficult to bring copra products to Cotabato if one has no pumpboat of his own; we cannot get out of the barangay during times when the waves are high	Difficult to go to the city (to attend classes/to buy things) if the waves are big; we could not attend classes at times; difficult to bring products to Cotabato City to sell because the waves are big and there is no road to traverse; difficult to bring patients to the hospital during emergencies if the waves are big
	Kinimi	Difficult to bring the sick to the hospital in the city especially when the waves are big ; food gets all used up when there are no trips for pumpboats; difficult to go to the city during bad weather; difficult to conduct livelihood activities such as bringing out products to the main trading areas if the weather is not good; Difficult for students to go to school if the weather is not good	Difficult to bring out products and conduct livelihood activities everytime the waves get bigger; difficult for people to go to the city and hospital in case of emergencies when the waves are high; difficult to go to the city to study and buy our necessities everytime the waves are big

Mun	Barangay	Impact of Road to Community	
		Women	Youth
	Tambak	Difficult for people to engage in livelihood activities; children have difficulty in going to school; barangay residents have difficulty in going to other barangays if there is a typhoon as the water at the stream is high; difficult to easily attend to those who are sick or to those who are to give birth to a child as they could not be easily brought to the hospital in the city by sea if there is a typhoon	Difficult to travel by foot if there is no road; difficult to go to the city if the waves are big; difficult to go to school as there is no choice but to go on foot for lack of road and pumpboat; difficult to get products out as the fare is doubled; difficult to bring patients out if the waves are big
	Nalkan	We have difficulty to bring patients to the hospital in the city; difficult because products could not be transported easily; difficult for us to buy groceries from the city; students have difficulty to go to school if the waves are big	Difficult to travel if the waves are big; transport cost is high and doubled (pumpboat and jeep); could not bring patients to the hospital easily during emergency; difficult to walk for there is lack of road; difficult and way too long before one gets to school; difficult to bring products out and so they just get stored; difficult to buy food and other necessities; difficult to go to school by sea
	Tubuan	Difficult for children to go to school; difficult to bring farm and fish products out; difficult for us to bring our patients because the sea is the only way out; difficult for business; difficult as our food gets all used up and we get to starve when there is a typhoon; we cannot go to other barangays because the water gets high the waves become bigger	Difficult to travel if the waves are high and there is no other way out but through crossing the sea; difficult to go to school by just walking; difficult to travel and bring products out especially when there is typhoon as the road gets slippery and there is flooding; the road condition is accident-prone; difficult to go to the city during a typhoon because there is no rood to traverse; our schooling has already been affected for we cannot board on pumpboats due to high waves
	Penansaran	Difficult to go to other barangays (and to find signal for network connection); difficult to cross the sea and to get to the city if the waves are strong; difficult to harvest vegetables and other farm products, collect firewood and make charcoal; difficult to conduct business when there is a typhoon	Can damage transport vehicles and time-consuming; difficult to traverse the area when there is no proper road (up and down); difficult if the road is not cemented; one can have body pain when travelling within and through the barangay; difficult to go the city
	Matuber	Difficult for students to go to school; difficult to bring patients to the hospital; patients could die before reaching the hospital; our products and livelihood are affected because we have difficulty in bringing out our farm and fish products; difficult to go to the city especially when you are sick; fare is doubled and therefore high	Waste of time because if there's an emergency (including sick patients), one needs to wait for availability of pumpboats in going to the city; difficult to go to the city if the waves are big; slow development due to inefficiencies brought about by poor transportation; one gets wet when going to the city via pumpboats
	Pura	Difficult to bring or transport products to the market (in the city) and buy merchandise for our sari-sari stores if there is a storm; difficult to get assistance from others in times of calamities; no transportation is possible if the waves are high	Difficult to get to places you would want to go; travelling is tiresome and damaging to vehicles as the road is bumpy and difficult

Source: Social Survey of NDU

3) Main Source of Economic

In both towns, the two main sources of income are farming and fishing, some engaged into other farm related activities, livelihood activities such as sari-sari stores, driving habal-habal, and pump boats. Summarized below **Table 7.11.3-50** the main source of women and youth.

Table 7.11.3-50 Main Source of Economic Means

Mun	Barangay	Main Sources of Economic Means	
		Women	Youth
Lebak	Taguisa	• farming • fishing • small time business	• farming • fishing • small time business • reflexology
	DatuKaron	• fishing • farming (coconut and rice) • vending • gardening (vegetables) • charcoal making • laborer (planting and harvesting) • nipa weaving • carpentry	• fishing • farming (coconut) • nipa weaving • habalhabal (motorcycle) driving
	Kalamongog	• farming • fishing • vending	• farming (rice, corn, coconut) • laborer • fishing • Habalhabal (motorcycle) driving
	Tran	• fishing • farming • laborer (fishing, planting, harvesting of rice and coconut) • gardening • vending (rice cake and fish)	• farming • laborer (planting rice, corn, coconutand banana)
	Villamonte	• farming • small time business • livestock raising	• farming (corn, rice, coconut) • laborer • teaching • Habalhabal (motorcycle) driving
DBS	Laguitan	• Farming; fishing; selling rice and vending vegetables; selling “kakanin”	• Farming (copra, palay, corn, banana) and fishing; getting paid as barangay official; and driving motorcycle (Habal-habal) for hire
	Sinipak	• Half of the residents are engaged into fishing; farming (copra, palay, corn, garden vegetables, root crops); poultry, livestock, piggery, nipa weaving; basket (native products); coco sugar and vinegar	• Fishing; farming vegetables and farm crops; livestock and poultry-raising; vending vegetables and fruits; catching crabs
	Meti	• Farming (copra, basakan, mais, and vegetables); fishing (sap-sap, bolinao, tamban); selling “kakanin” and vegetables	• Farming; fishing; hired labor; food vending
	Sedem	• Fishing; farming; selling “kakanin” and street foods; fish vending	• Fishing; farming, habal-habal driving, operating a sari-sari store
	Lapaken	• Fishing, farming, operating a sari-sari store; hired as farm laborer	• Fishing, farming, selling dried fish; operating a pumpboat
	Resa	• Fishing, engaged in buy and sell business (fish and farm products); farming; hired labor (daily copra worker); working in tenanted farms	• Fishing; farming (copra, corn,palay, and vegetables) ; operating a sari-sari store; cultivating vegetables; charcoal-making
	Kinimi	• Fishing (dilis, tulingan, sari-sari, pusit); farming (copra, mais, mani, monggo, palay, gulay, saging, ube, camote, cassava, sari-sari);	• Fishing; farming (copra, mais, and vegetables); operating a sari-sari store

Mun	Barangay	Main Sources of Economic Means	
		Women	Youth
		cooking and selling "kakanin"; operating a sari-sari store	
	Tambak	• Fishing (tulingan, pusit, matambaka, katambak, tambilawan, at sari-sari); selling vegetables; operating a sari-sari store; selling "kakanin"	• Farming (vegetables, palay, coconut, legumes, as well as other temporary crops); fishing
	Nalkan	• Fishing (dilis, tulingan, pusit, at sari-sari); farming (copra, mais, monggo, palay, gulay, saging, ube, camote, cassava, etc.)	• Farming (copra, corn, peanut, palay, banana, cassava, vegetables); selling vegetable in the city; charcoal-making; operating a sari-sari store; doing laundry for pay; hired labor (utility); fruit, vegetable and fish vending
	Tubuan	• Farming (corn, copra, peanut, banana, cassava, and others); fishing daily; vegetable and "*kakanin"* vending; operating a sari-sari store	• Farming (copra, corn, banana, vegetables, charcoal); fishing
	Penansaran	• fishing; farming (copra, palay); cooking "*kakanin*"; selling vegetables and viands; operating a sari-sari store	• Farming (copra, cassava, vegetables, banana, and mango); doing laundry for pay; weaving
	Matuber	• Farming (copra, corn); fishing; selling dried fish; nipa-weaving; copra meat processing; selling vegetables and "*kakanin*"; livestock and poultry-raising (quail); charcoal-making	• Cropping; operating a small business (store); farming; getting paid as government worker; fishing; working abroad (OFW); charcoal-making; nipa-weaving
	Pura	• Farming (copra, corn, cassava, banana, palay, vegetables); fishing (isdasabato, tuna); livestock (chicken, goat); • Cooking and selling "*kakanin*" and street foods	• Fishing; vegetable vending; working as construction worker; farming (corn, palay, peanut); selling "pandesal", working as private security

Source: Social Survey of NDU

4) Negative Impact of Road Construction and Proposed Solutions

The participants expressed their concerns on safety and security, as well as, possible setbacks in their local community. Majority apprehension of the youth in many barangays fear that the road will cause easy entry of criminals and armed groups. While women in some of the barangays has actual similar sentiments. To prevent the entry of lawless elements in the area, majority of the groups recommended that there must be checkpoints or detachments that shall be manned by either the police or military, and barangay peacekeeping action team (BPAT).

In terms of accident due to road, many youth and women in different barangay are much concerns on their safety and their properties. Moreover, some youth groups and women's groups also worry about the occurrence of landslides and this is also a shared sentiment by several household heads and women's groups in the barangays. To prevent incidents of vehicular accidents, several groups strongly suggested that barangays should firm up some traffic rules (e.g. sinage/signboard). While in the case of landslides, planting trees along the road or least cutting them, and safety barriers. Summarized below **Table 7.11.3-51**.

Table 7.11.3-51 Negative Impact of Road Constructions

Mun.	Brgy.	Negative Impact of Road Construction and Proposed Solutions			
		Women		Youth	
		Negative Impact	Solutions	Negative Impact	Solutions
Lebak	Taguisa	• presence of lawless elements	• arrest the suspicious looking individuals	• terrorism in the barangay • drug addiction • destruction of the source of water • demolition of houses	• put up check point in the community • sports festival • JICA/DPWH/

Mun.	Brgy.	Negative Impact of Road Construction and Proposed Solutions			
		Women		Youth	
		Negative Impact	Solutions	Negative Impact	Solutions
					• CTI Engineers must plan well the construction to prevent any damage
	Datu Karon	• none	• none	• road accidents due to over-speeding • over-loading of public utility vehicles	• provide safety signage • set speed limit • conduct seminar for drivers
	Kalamo-ngog	• entry of lawless elements • illegal collection of toll fee • presence of rebels and armed group	• put up Phil. Marine check points • ensure safe driving	• prone to vehicular accidents • children will be up until midnight • insurgents will pass by our barangay	• put signage in accident prone areas • implement curfew • put up barangay police station
	Tran	• sub-standard road construction • prone to vehicular accident	• close monitoring on the road construction and audit the budget in order to prevent corruption by government agency	• vehicular accident due to over-speeding	• conduct seminar for drivers on road rules and regulations and safe driving • put up road signage and set speed limit
	Villa-monte	• presence of thieves and other bad elements • presence of rebels since they can already pass our barangay • lack of control of entry and exit of people	• need to put up check point	• drug addiction • threats of terrorism • over population • air pollution	• put up PNP and Army check points • plant trees along the road
DBS	Laguitan	• None	• NAP	• Lawless elements (thieves, drug peddlers, hooligans) and even the army with their tanks can easily gain access; it would be dusty; the road would become accident-prone for motorcycle riders	• Put up a checkpoint; there must be police, military, and *barangay tanod* visibility; people should cooperate in preventing entry of lawless elements; put up signage like "No ID, No Entry"
	Sinipak	• Air can become polluted which could cause sickness (cough) to people; reckless driving	• Avoid the use of old vehicles and consider regular maintenance check (change oil); passage of a barangay ordinance prohibiting the use of old or	• Accident-prone to children; we could easily get sick due to air pollution ; noisy	• Explain and make parents understand that the road is only for vehicles and not a children's playground • ; plant many trees to make the air clean

Mun.	Brgy.	Negative Impact of Road Construction and Proposed Solutions			
		Women		Youth	
		Negative Impact	Solutions	Negative Impact	Solutions
			dilapidated vehicles; require a 20KPH- speed limit		
	Meti	• Accidents; entry of lawless elements; entry of drug addiction; private lands could be reduced when portions of it would be used as part of the road	• Avoid over speeding; lawless elements should be reported immediately to the police so they could be apprehended; there should be unity; a drainage canal should be put in order to prevent flooding	• Easy for bad people to do unlawful activities	• Put up a checkpoint
	Sedem	• The army can already gain access and we do not want armed violence; easy for lawless elements like the Maute group to gain entry	• Put up a checkpoint for the public's safety	• There would be more motorcycle accidents; landslide; children would be prone to accidents; entry of people with bad intentions	• Put up a sign; • Plant trees along the road; put up checkpoints; accompany the children and guard them closely
	Lapaken	• NONE	• NAP-	• Accident-prone; easy entry for lawless elements; landslide; influx of people	• Put up a signage (e.g., Slowdown); put up a checkpoint and put the unlawful individuals behind bars; plant trees; monitor the entry of non-residents
	Resa	• Landslide during typhoons	• The road must be cemented in order for it to be built properly	• Hazardous for children crossing the road; landslide; there must be traffic management; the road could be difficult to traverse because it would be slippery when raining	• Avoid cutting trees; put up signboards
	Kinimi	• Hazardous for children	• Parents should safeguard their children from vehicles	• Air pollution; landslide; road accidents	• Do not cut trees especially those along the highway; • Slowdown and always be careful when driving to avoid any accident;
	Tambak	• NONE	• -NAP-	• Road accidents; entry of unlawful individuals; landslide	• Be careful in driving; do not drive when drunk; put up signage (e.g., Slowdown); put up humps especially along the bends; put up a checkpoint; do not cut

Mun.	Brgy.	Negative Impact of Road Construction and Proposed Solutions			
		Women		Youth	
		Negative Impact	Solutions	Negative Impact	Solutions
					trees; put up road barriers
	Nalkan	• NONE	• -NAP-	• The number of trees like coconut could be reduced; landslide; could cause accidents for children who would be playing along the road; more people would be congregating along the road even during the curfew period; street fights which can be perpetuated by entry of strangers; easy entry for unlawful individuals or strangers	• Put up checkpoints, signage, and CCTV cameras; plant trees; avoid cutting large/fully- grown trees; observance of curfew period to avoid untoward incidents
	Tubuan	• NONE	• -NAP-	• Prone to accidents for motorists especially when it is raining as the road becomes slippery; coconut trees will be cut; occurrence of landslide; accident-prone for those children playing along the road	• Put up a sign or signage; slowdown when driving; plant trees to avoid landslide; parents should closely guard their small children especially those residing along the roadside
	Penansa-ran	• Possibility of having landslides	• DPWH should construct the road properly and find means to prevent occurrence of landslides	• Road/ • vehicular accident; landslide; trees could be cut	• Institute rules; everyone must work together to prevent the occurrence of landslides
	Matuber	• NONE	• NAP-	• Many strangers will gain access; the barangay could be a potential venue for conflict especially among youth groups from different areas; motorcycle and other vehicular accidents due to over speeding; corruption from projects that have not been implemented and remain as promise; the youth have no voice to speak out against corruption; landslide or soil erosion	• Close and constant monitoring of BPATS, Marines, CAFGU, *Lupon*; prevent the spilling-out of armed groups; conduct seminars to the drivers on road signage; traffic enforcers; ordinance on open-pipes; putting up of safety wall/barriers/ borders to prevent soil erosion
	Pura	• There should be a road built in Barangay Tapian and all the way to BarangayPura and Lebak	• Proceed building the road	• Road/vehicular accidents and injuries; landslides; incidents of trees falling along the roadside; children can be hit by passing vehicles; entry of unknown individuals	• Put up a signage like “slowdown”; bring the victims to hospital; slowdown when driving; careful when crossing; give due attention to children to prevent accidents from happening; seek assistance from authorities; there must be checkpoints

Source: Social Survey of NDU

5) Perception towards DPWH as Road Contractor

All respondents in both towns expressed their approval that DPWH must take responsibility of the road construction project. This affirmative stance among the participants is anchored on several positive perceptions they have towards the DPWH. According to the youth group of Barangay Laguitan, if such project is not given to the government, there is a possibility that the construction will not be finished.

DPWH has a consent in the condition that the agency hires the men in their barangays as construction workers. While the women from Barangay Tran said that DPWH should use standard equipment and materials and must finish the project on time. But for the women in Barangay Pura mentioned that does not matter to them whoever gets to do the work as long as there will be a road constructed for them

6) Community Support to DPWH

Overall, the group had expressed their readiness to offer their support in the following forms; (1) provide water and foods; (2) home as shelters; (3) borrow utensils; (4) cook for their food; (5) give protections and assistance; and (6) help them transport construction materials.

7) Summary

Most of the group are not aware of the proposed road constructions, however, majority of them have long been anticipating for this facility in their area. Majority of them has limited the mobility of people, products, and technology that could uplifted their standards of living.

In both municipalities of Lebak and DBS, majority are mainly into farming and fishing as their main source of income. However, some of them engaged in other livelihood activities such as small business, driving habal-habal (single motorcycle), and pump boat particularly coastal barangays.

Some of the group perceived that the road will cause in negative impact such as their security and safety to terrorist, selling of drugs to their youth, and prone to accident. However, the group forseen the positive impact of the road such improve the living conditions of the community (e.g. health, economy, education) and additional development in their barangays.

To show their support to the project and the implementing agency, the group show their support; (1) provide water and foods; (2) home as shelters; (3) borrow utensils; (4) cook for their food; (5) give protections and assistance; and (6) help them transport construction materials.

7.11.4 Summary of Resettlement Action Plan (RAP) for Sub-Project 7

(1) Social Environment Situation of Sub-Project 7

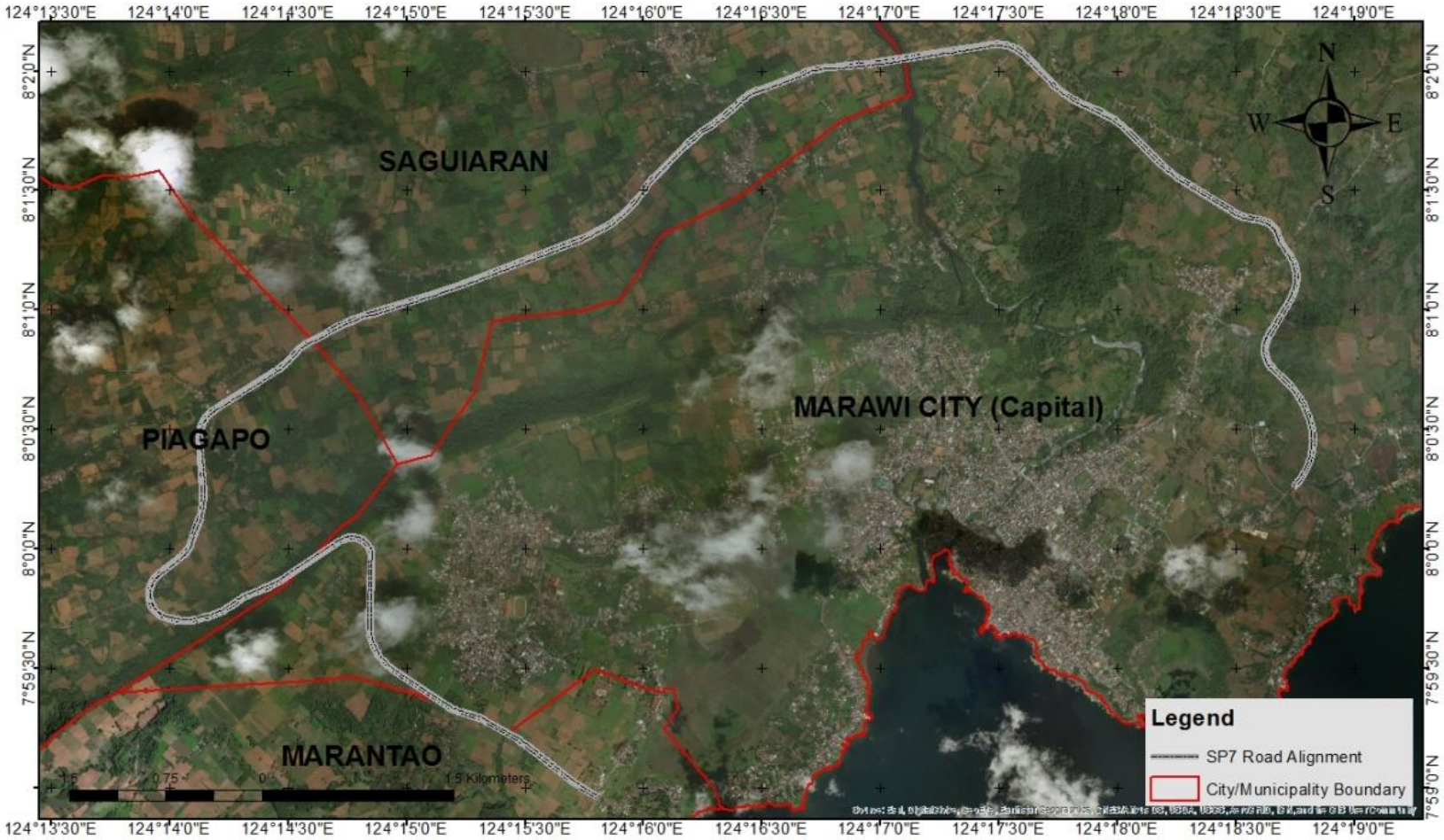
1) Project Description

The Marawi City Ring Road –Sub-Project 7 covers 19.8 km length (**Table 7.11.4-1**) and traverses the municipality of Marantao, Piagapo, Saguiran and Marawi Sity in the province of Lanao del Sur. The alignment will pass through barangays Daanaingod, Matampay, and Palao in Marantao Municipality; Paling, Rantian and Bubo in Piagapo Municipality; Bagoingod, Lumbaca Toros, Pagalamatan, Bubong and Mipaga in Saguiran Municipality; and Banga, Cabasaran, Guimba, Dulay West, Kilala in Marawi City (**Figure 7.11.4-1**). The road segment aims to firm up the formation of the city's road network by providing a trunk road which would expand capacity of the network that would result to improved flow of traffic. It will also help improve traffic flow and urban amenities by separating through traffic from local traffic and access to social services by providing trunk road at the edge of the built-up area. It will also guide sound urbanization of Marawi City by providing trunk road at the edge of the city which would result to efficient utilization of urban space and contribute to early recovery of Marawi City by providing temporary jobs during construction stage.

Table 7.11.4-1 Details of Marawi City Ring Road and Road Length

Province	Municipality	Barangay	Road Length (Km)
Lanao del Sur	Marantao	Daanaingud	1.1
		Matampay	1.2
		Palao	0.6
	Piagapo	Paling	1.5
		Rantian	0.6
		Bubo	1.9
	Saguiran	Bagoingod	1.1
		Lumbaca Toros	0.8
		Pagalamatan	1.4
		Bubong	0.8
		Mipaga	1.3
	Marawi	Banga	1.8
		Cabasaran	1.1
		Guimba	2.0
		Dulay West	1.5
		Kilala	1.1
Total			**19.8**

Source: JICA Study Team



SP7 MARAWI CITY RING ROAD
LOCATION MAP

Source: JICA Study Team

Figure 7.11.4-1 Marawi City Ring Road

2) Socio-Economic Profile of the Project-affected Persons

Based on the conducted socio-economic survey, **a total of ten (10) affected household heads (AHHs) and one-hundred eight (108) affected land lot owners were interviewed** as shown in **Table 7.11.4-2**.

Table 7.11.4-2 Summary of Potential Number Affected Structures and Land Lots

Loss category	Marantao	Piagapo	Saguiran	Marawi	Total
Affected House Heads	0	1	5	4	10
Affected Structures	0	1	7	4	12
Affected Land Lot Owners	9	32	40	27	108

Note: * There are 10 residential houses and 2 sari-sari stores
Source: JICA Study Team

A total of 364,953.80 sq. m of land with crops and trees will be affected by the alignment as summarized in **Table 7.11.4-3**. Majority of the cultivated crops that will be affected are corn and cassava.

Table 7.11.4-3 Summary of Affected Land and Types of Cultivated Crops

Loss category	Unit	Marantao	Piagapo	Saguiran	Marawi	Total
Affected agricultural lands with corn	m^2	42,000	65,400	29,100	23,850	160,350
Affected agricultural lands with cassava	m^2		3,600	19,200	5,400	28,200
Affected Fruit bearing trees	No. of trees	70	100	1,008	126	1,304
Affected trees (Timber / non-fruit bearing)	No. of trees	11	138	1,029	1,066	2,244
Plant/Cash Trees	No. of trees		61	1,501	71	1,633
Total affected land area (sq. m.)	m^2	43,405.56	69,652.65	103,671.31	148,224.28	364,953.80

Source: JICA Study Team

a. Household Size

Majority or 6 (60%) of the AHHs' size ranges from 6-10 members followed by 11-above (30%) members while only 2 (20%) HHs' have 1-5 members.

Table 7.11.4-4 No. of Affected Household Heads by Household Size

Household Size	Total Affected Houses					
	Barira	Matanog	Buldon	Marawi	Total	
					No.	%
1-5	0	1	1	1	3	30
6-10	0	0	4	2	6	60
11-above	0	0	0	1	2	20
Total	**0**	**1**	**5**	**4**	**10**	**100**

Source: JICA Study Team

Majority or 45.11% of the affected land lot owners' household size ranges from 11-above members, while 29.32% have 6-10 members. The remaining percentage (25.57%) have household size of 1-5 members.

Table 7.11.4-5 No. of Affected Land Lots by Household Size

Household Size	Total Affected Land/Lots					
	Barira	Matanog	Buldon	Marawi	Total	
					No.	%
1-5	2	5	13	8	28	25.57
6-10	2	11	7	12	32	29.32
11-above	5	16	20	8	49	45.11
Total	**9**	**32**	**40**	**27**	**108**	**100**

Source: JICA Study Team

b. Household Structure

The common family structure that can be observed along the Marawi Ring Road Alignment was composed of nuclear structure (70%), a common Filipino family structure, which was made up of the parents and their children.

Table 7.11.4-6 No. of Affected Household Heads by Household Structures

Household Structure	Affected House					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Single	0	0	0	0	0	0
Nuclear	0	1	3	3	7	70
Extended	0	0	2	1	3	30
Joint	0	0	0	0	0	0
Total	**0**	**1**	**5**	**4**	**10**	**100**

Source: JICA Study Team

In terms of family structure of the affected land lot owners, majority have household structure type of extended with 56.48% while 37.96% have a nuclear in which relatives are also leaving together with the parents and children. The remaining 5.55% are joint household structure.

Table 7.11.4-7 No. of Affected Land Lots by Household Structures

Household Structure	Affected Lots					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Single	0	0	0	0	0	0.00
Nuclear	1	14	7	19	41	37.96
Extended	8	16	29	8	61	56.48
Joint	0	2	3	0	6	5.55
Total	**9**	**32**	**40**	**27**	**108**	**100**

Source: JICA Study Team

c. Gender Distribution

In terms of gender distribution, majority of PAPs with affected houses and land lots are headed by male. Likewise, on the affected land lots, out of 108 AHHs, 29 (27.20%) are headed by female as well.

Table 7.11.4-8 No. of Affected Household Heads by Gender

Gender	Affected Household Head					
	Marantao	Piagapo	Saguiaran	Marawi	Total No.	%
Male	0	0	3	3	6	60
Female	0	1	2	1	4	40
Total	**0**	**1**	**5**	**4**	**10**	**100**

Source: JICA Study Team

Consequently, 79 (72.80%) of the affected land owners were male while 27.20% are female.

Table 7.11.4-9 No. of Affected Lands Lots Owners by Gender

Gender	Affected Land / Lots					
	Marantao	Piagapo	Saguiaran	Marawi	Total No.	%
Male	5	21	34	18	79	72.80
Female	4	11	6	9	29	27.20
Total	**9**	**32**	**40**	**27**	**108**	**100.00**

Source: JICA Study Team

d. Civil Status

The civil status of all AHHs is married (**Table 7.11.4-10)**.

Table 7.11.4-10 No. of Affected Household by Civil Status

Civil status	Affected households					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Single	0	0	0	0	0	0
Married	0	1	5	4	10	100
Widowed	0	0	0	0	0	0
Live-in	0	0	0	0	0	0
Single parents	0	0	0	0	0	0
No Response	0	0	0	0	0	0
Total	**0**	**1**	**5**	**4**	**10**	**100**

Source: JICA Study Team

On the other hand, majority of the land lot owner's civil status are married (99.07%) and one (0.93%) is widowed as shown in **Table** 7.11.4-11.

Table 7.11.4-11 No. of Lands/Lots by Civil Status

Civil status of affected land lots owner	Affected Land / Lots					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Single	0	0	0	0	0	0.00
Married	8	32	40	27	107	99.07
Widowed	1	0	0	0	1	0.93
Live-in	0	0	0	0	0	0.00
Single parents	0	0	0	0	0	0.00
No Response	0	0	0	0	0	0.00
Total	**9**	**32**	**40**	**27**	**108**	**100**

Source: JICA Study Team

e. Age Distribution

Three (30%) of the AHHs' age ranges from 55-59 years old followed by 50-54 years old (20%), 25-29 years old (20%), and 40-44 years old (10%), while only 1 (AHH with age ranges 35-39 years old (20%).

Table 7.11.4-12 No. of Affected Households by Age

Age	Affected Houses					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
15-19	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	2	0	2	20
30-34	0	0	0	0	0	0
35-39	0	0	0	1	2	20
40-44	0	0	1	0	1	10
45-49	0	0	0	0	0	0
50-54	0	0	2	0	2	20
55-59	0	0	0	3	3	30
60-64	0	0	0	0	0	0
65-69	0	0	0	0	0	0
70-74	0	0	0	0	0	0
75-79	0	0	0	0	0	0
80+	0	0	0	0	0	0
No response	0	0	0	0	0	0
Total	**0**	**1**	**5**	**4**	**10**	**100**

Source: JICA Study Team

Majority or 21.83% of the affected land lot owners age ranges 55-59 years old followed by 45-49 years old (13.62%). This indicates that most of the land lots owners have no land ownership due to the old titling of practiced.

Table 7.11.4-13 No. of Affected Land Lots Owners by Age

Age	Affected lots					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
15-19	0	0	0	0	0	0.00
20-24	0	0	6	0	6	5.29
25-29	0	0	6	0	6	5.29
30-34	1	0	6	0	7	6.22
35-39	1	2	0	4	7	6.61
40-44	1	5	6	0	11	10.45
45-49	1	2	11	0	15	13.62
50-54	1	9	0	0	10	9.39
55-59	1	9	6	8	24	21.83
60-64	1	2	0	12	15	13.76

Age	Affected lots					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
65-69	1	2	0	0	3	3.04
70-74	0	0	0	4	4	3.57
75-79	1	0	0	0	1	0.93
80+	0	0	0	0	0	0.00
No response	0	0	0	0	0	0.00
Total	**9**	**32**	**40**	**27**	**108**	**100**

Source: JICA Study Team

f. Religious Affiliation

All of the affected HHs' are Islam as shown in **Table 7.11.4-14**.

Table 7.11.4-14 No. of Affected Household Heads by Religion

Religion	Affected House					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Roman Catholic	0	0	0	0	0	0
Iglesiani Cristo	0	0	0	0	0	0
Baptist	0	0	0	0	0	0
Born Again Christian	0	0	0	0	0	0
Islam	0	1	5	4	10	100
Others	0	0	0	0	0	0
No Response	0	0	0	0	0	0
Total	**0**	**1**	**5**	**4**	**10**	**100**

Source: JICA Study Team

All of the affected HHs' are Islam, shown in **Table 7.11.4-15**.

Table 7.11.4-15 No. of Affected Land Lots Owner by Religion

Religion	Affected lots					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Roman Catholic	0	0	0	0	0	0
Iglesiani Cristo	0	0	0	0	0	0
Baptist	0	0	0	0	0	0
Born Again Christian	0	0	0	0	0	0
Islam	9	32	40	27	108	100
Others	0	0	0	0	0	0
No Response	0	0	0	0	0	0
Total	**9**	**32**	**40**	**27**	**216**	**200**

Source: JICA Study Team

g. Educational Attainment

Majority of the affected HHs' are both high school graduate and elementary graduate followed by elementary graduate and certificate of courses. While only 1 (10%) affected HH are high school undergraduate, college undergraduate and graduate and no response.

Table 7.11.4-16 No. of Affected Household Heads by Educational Attainment

Educational Attainment of AHHs	Affected House					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
No formal education	0	0	0	0	0	0
Pre-school	0	0	0	0	0	0
Elem. Grad	0	0	1	1	3	30
HS Under grad	0	0	1	0	1	10
HS grad	0	0	2	1	3	30
Vocational/Technical	0	0	0	0	0	0
Certificate Courses	0	0	0	0	0	0
College Under grad	0	0	1	0	1	10
College grad	0	0	0	1	1	10
No response	0	0	0	1	1	10
Total	**0**	**1**	**5**	**4**	**10**	**100**

Source: JICA Study Team

Majority or 32 of the affected HHs' have attained college (29.74%) followed by high school (25.44%) and Elementary (26.37%).

Table 7.11.4-17 No. of Affected Land Lots by Educational Attainment

Educational Attainment of Land Lots Owners	Affected lots					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
No formal education	0	0	0	0	0	0
Pre-school	0	0	0	0	0	0
Elem. Grad	3	7	11	8	28	26.37
HS Under grad	0	2	0	0	2	2.12
HS grad	2	7	11	8	27	25.44
Vocational/Technical	0	5	0	0	5	4.23
Certificate Courses	0	0	0	0	0	0
College Under grad	1	5	4	0	9	8.53
College grad	3	7	15	8	32	29.74
No response	0	0	0	4	4	3.57
Total	**9**	**32**	**40**	**27**	**108**	**100**

Source: JICA Study Team

h. Ethno-Linguistic Profile

In terms of the ethno-linguistic profile of the affected household heads and land lot owners, all of the affected households are Maranao, as shown in **Table 7.11.4-18**.

Table 7.11.4-18 No. of Affected Household Heads by Ethno-Linguistic

Ethno-Linguistic Affiliation	Affected House					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Maranao	0	1	5	4	10	100
Iranun	0	0	0	0	0	0
Maguindanao	0	0	0	0	0	0
Ilocano	0	0	0	0	0	0
Cebuano	0	0	0	0	0	0
Illonggo	0	0	0	0	0	0
Teduray	0	0	0	0	0	0
Lambangian	0	0	0	0	0	0
Dulangan Manobo	0	0	0	0	0	0
Higaonon	0	0	0	0	0	0
IP	0	0	0	0	0	0
Others	0	0	0	0	0	0
Total	**0**	**1**	**5**	**4**	**10**	**100**

Source: JICA Study Team

Table 7.11.4-19 No. of Affected Land Lots by Ethno-Linguistic

Ethno-Linguistic Affiliation	Affected Land Lots Owners					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Maranao	9	32	40	27	108	100
Iranun	0	0	0	0	0	0
Maguindanaon	0	0	0	0	0	0
Ilocano	0	0	0	0	0	0
Cebuano	0	0	0	0	0	0
Illonggo	0	0	0	0	0	0
Teduray	0	0	0	0	0	0
Lambangian	0	0	0	0	0	0
Dulangan Manobo	0	0	0	0	0	0
Higaonon	0	0	0	0	0	0
IP	0	0	0	0	0	0
Others	0	0	0	0	0	0
Total	**9**	**32**	**40**	**27**	**108**	**100**

Source: JICA Study Team

i. Occupation

Majority or 6(60%) of the affected HHs' were engaged in farming while the remaining 4 (40%) were engaged in other work.

Table 7.11.4-20 No. of Affected Household Heads by Occupation

Occupation	Affected House					
	Marantao	Piagapo	Saguiaran	Marawi City	Total	
					No.	%
Farmer	0	1	3	1	4	40
Fisherman	0	0	0	0	0	0
Businessman	0	0	0	0	0	0
Govt. Employee	0	0	0	0	0	0
Driver	0	0	0	0	0	0
Teacher	0	0	0	0	0	0
Daycare Staff	0	0	0	0	0	0
Brgy. Official	0	0	0	0	0	0
Others	0	0	3	3	6	60
Total	**0**	**1**	**5**	**4**	**10**	**100**

Source: JICA Study Team

Aside from farming, almost half (51) of the affected land lot owners were engaged small enterprises while the remaining half engaged in fishing, business, driving, teaching, and other works.

Table 7.11.4-21 No. of Affected Land Lots by Occupation

Occupation	Affected Land Lots Heads					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Farmer	1	20	3	0	24	22.25
Fisherman	0	0	0	0	0	0.00
Businessman	1	0	20	0	21	19.44
Govt. Employee	1	0	3	0	4	4.01
Driver	0	0	0	0	0	0.00
Teacher	0	2	0	0	2	2.28
Daycare Staff	0	0	0	0	0	0.00
Brgy. Official	1	0	0	4	5	4.50
*Others	5	10	13	23	51	47.52
Total	**9**	**32**	**40**	**27**	**108**	**100**

Source: JICA Study Team

j. Family Income

Majority or 6 (60%) of the affected HHs' declared an estimated family income from 80,000 to 90,000. Income bracket of ranges from PhP10,000 were 4 (40%), shown in **Table 7.11.4-22.**

Table 7.11.4-22 No. of Affected Household Heads by Monthly Income Bracket

Monthly Income Bracket (PhP)	Affected House					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
10,000 and Below	0	1	3	1	4	40
10,001 to 20,000	0	0	0	0	0	0
20,001 to 30,000	0	0	0	0	0	0
30,001 to 40,000	0	0	0	0	0	0
40,001 to 50,000	0	0	0	0	0	0
50,001 to 60,000	0	0	0	0	0	0
60,001 to 70,000	0	0	0	0	0	0
70,001 to 80,000	0	0	0	0	0	0
80,001 to 90,000	0	0	3	3	6	60
90,001 to 100,000	0	0	0	0	0	0
100,001 to 200,000	0	0	0	0	0	0
200,001 and above	0	0	0	0	0	0
No Response	0	0	0	0	0	0
Total	0	1	5	4	10	100

Source: JICA Study Team

Majority or 61 of the affected land lot owners have an estimated family income ranges PhP 10,001 and below.

Table 7.11.4-23 No. of Affected Land Lots by Monthly Income Bracket

Income Bracket (PhP)	Affected Land Lots					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
10,000 and Below	5	29	9	18	61	56.17
10,001 to 20,000	1	3	0	5	9	8.48
20,001 to 30,000	3	0	4	5	12	10.66
30,001 to 40,000	0	0	18	0	18	16.46
40,001 to 50,000	0	0	4	0	4	4.12
50,001 to 60,000	0	0	0	0	0	0
60,001 to 70,000	0	0	0	0	0	0
70,001 to 80,000	0	0	0	0	0	0
80,001 to 90,000	0	0	0	0	0	0
90,001 to 100,000	0	0	4	0	4	4.12
100,001 to 200,000	0	0	0	0	0	0
200,001 and above	0	0	0	0	0	0
No Response	0	0	0	0	0	0
Total	**9**	**32**	**40**	**27**	**108**	**100**

Source: JICA Study Team

k. Willingness to relocate

In instances that there is a need to relocate the affected HHs, 100% of the households expressed their willingness to be displaced/ relocated for this project.

Table 7.11.4-24 Willingness to Relocate

Willingness to Relocate	Affected House					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Yes	0	**1**	**5**	**4**	10	100
No, but will consider	0	0	10	0	10	0
No	0	0	0	0	0	0
Don't know	0	0	0	0	0	0
No Response	0	0	0	0	0	0
Total	**0**	**1**	**5**	**4**	**10**	**100**

Source: JICA Study Team

l. Site Preference for Relocation

Preference of affected households for site relocation is shown in **Table 7.11.4-25**.

Majority or 70% percent of affected households expressed their willingness to be relocated in the same lot areas which were not affected by the alignment.

Table 7.11.4-25 Site Preference for Relocation

Site Preference	Affected House					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Same Lot	0	1	4	3	7	70
Same Barangay	0	0	0	1	1	10
Other Barangay	0	0	0	1	1	10
Other Municipality	0	0	0	0	0	0
Relocation Site	0	0	1	0	1	10
Other Site	0	0	0	0	0	0
No Response	0	0	0	0	0	0
Total	**0**	**1**	**5**	**4**	**10**	**100**

Source: JICA Study Team

m. Length of Residence

It is observed that most of the affected HHs' were staying in the area for 1-5 years while the affected land lot owner's majority have been living in the area since birth, as shown in **Table 7.11.4-26** and **Table 7.11.4-27** respectively.

Table 7.11.4-26 No. of Affected Household Heads by Length of Residence

Length of Residence of Sample AH heads	Affected House					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Less than 1 year	0	0	0	0	0	0
1 - 5 years	0	1	5	4	10	100
6 - 10 years	0	0	0	0	0	0
Since birth	0	0	0	0	0	0
No response	0	0	0	0	0	0
Total	**0**	**1**	**5**	**4**	**10**	**100**

Source: JICA Study Team

Table 7.11.4-27 No. of Affected Land Lots by Length of Residence

Length of Residence of Sample AH heads	Affected Land Lots					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Less than 1 year	0	0	0	0	0	0
1 - 5 years	0	0	0	0	0	0
6 - 10 years	0	0	0	0	0	0
Since birth	9	32	33	27	101	93.83
No response	0	0	7	0	7	6.17
Total	**9**	**32**	**40**	**27**	**108**	**100**

Source: JICA Study Team

n. Project Acceptability

In terms of project acceptability, one-hundred percent (100%) of the affected houses did not give their response; peoples from the proposed affected area were still not decided because of the armed conflict that happened in Marawi.

Table 7.11.4-28 Project Acceptability

Project Acceptability	Affected House					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Yes	0	0	0	0	0	0
No	0	0	0	0	0	0
Don't know	0	0	0	0	0	0
No response	0	1	5	4	10	100
Total	**0**	**1**	**5**	**4**	**10**	**100**

Source: JICA Study Team

Consequently, 90.74% of the affected land owners were in favor of the proposed project. They said that the project can help them in their rehabilitation from the Marawi siege.

Table 7.11.4-29 No. of Affected Land Lots by Project Acceptability

Project Acceptability	Affected Land Lots					
	Marantao	Piagapo	Saguiaran	Marawi	Total	
					No.	%
Yes	9	32	30	27	98	90.74
No	0	0	10	0	10	9.26
Don't know	0	0	0	0	0	0
No response	0	0	0	0	0	0
Total	**9**	**32**	**40**	**27**	108	100

Source: JICA Study Team

3) Barangays Affected

Table 7.11.4-30 shows the list of affected barangays and properties within the proposed 30 meters road alignment. In terms of the estimated land area per barangay, Guimba in Marawi City recorded the highest with 39,769.99 sq.m. while the least is Palao in Marantao with 5,423.14 sq.m..

Barangay Bubo in Lebak recorded the highest affected land lots with 23 owners while barangay Kalamongog in Lebak has the highest recorded affected household heads with 10 owners.

Table 7.11.4-30 Affected Properties by Barangay

Municipality	Name of Barangay	Estimated Affected Land Area (sqm.)	No. of Affected Property			
			Affected Land Lots Owner	Affected Houses / Structures		
				*Affected Structures	Affected HH Heads	Affected PAPs
Marantao	Daanaingud	16,937.32	4	0	0	0
	Matampay	21,045.10	5	0	0	0
	Palao	5,423.14		0	0	0
Sub-Total		**43,405.56**	**9**	0	0	0
Piagapo	Paling	29,728.13	10	1	1	12
	Rantian	5,712.07	4	0	0	0
	Bubo	34,212.45	18	0	0	0
Sub-Total		**69,652.65**	**32**	**1**	**1**	**12**
Saguiran	Bagoingod	21,346.93	2	3	1	4
	Lumbaca Toros	12,782.26	5	0	0	0
	Pagalamatan	28,140.92	14	0	0	0
	Bubong	16,163.82	10	0	0	0
	Mipaga	25,237.38	9	4	4	21
Sub-Total		**103,671.31**	**40**	**7**	**5**	**25**
Marawi	Banga	35,738.10	6			
	Cabasaran	21,826.02	7	1	1	6
	Guimba	39,769.99	10	1	1	6
	Dulay West	29,564.98	3	2	2	12
	Kilala	21,325.19	1	0	0	0
Sub-Total		**148,224.28**	**27**	**4**	**4**	**24**
Grand Total		**364,953.80**	**108**	**12***	**10**	**61**

Note: *10 houses + 2 small scale store = 12 structures
Source: JICA Study Team

4) Land Use and Areas Affected

The land use along the proposed alignment is classified into agricultural and residential areas. Since no Comprehensive Land Use Plan (CLUP) provided by the Local Government Units (LGUs) from the Municipalities affected to properly identify the delineation of the residential land, the survey team did an estimated delineation using a GPS.

Table 7.11.4-31 Land Use (sq. m)

Municipalities	Barangays	Residential Area	Agricultural Area	Total
Marantao	Daanaingud	3,120	13,817.32	16,937.32
	Matampay	0	21,045.10	21,045.10
	Palao	0	5,423.14	5,423.14
Piagapo	Paling	0	29,728.13	29,728.13
	Rantian	0	5,712.07	5,712.07
	Bubo	5,250	28,962.45	34,212.45
Saguiran	Bagoingod	0	21,346.93	21,346.93
	Lumbaca Toros	0	12,782.26	12,782.26
	Pagalamatan	0	28,140.92	28,140.92
	Bubong	0	16,163.82	16,163.82
	Mipaga	0	25,237.38	25,237.38
Marawi	Banga	0	35,738.10	35,738.10
	Cabasaran	17,250	4,576.02	21,826.02
	Guimba	0	39,769.99	39,769.99
	Dulay West	0	29,564.98	29,564.98
	Kilala	0	21,325.19	21,325.19
Total		**25,620**	**339,333.80**	**364,953.80**

Source: JICA Study Team

5) Structures and Improvements Affected

The structures that will be affected by the alignment are 10 houses made up of concrete, semi-concrete, and shanty materials, and 2 sari-sari stores.

Table 7.11.4-32 Affected structures in the area

Municipalities	Affected Barangays	No. of House	No. of Commercial Structures	Total
Piagapo	Paling	1	0	1
Saguiran	Bagoingod	1	2	3
	Mipaga	4	0	4
Marawi	Cabasaran	1	0	1
	Guimba	1	0	1
	Dulay West	2	0	2
Total		**10**	**2**	**12**

Source: JICA Study Team

6) Crops and Trees Affected

Affected crops are summarized in **Table 7.11.4-33**. Most farmers in the area adapted the multi-storey cropping (coconut-corn) and cassava fields were supported by irrigation.

Table 7.11.4-33 Affected Area Cultivated with Crops

Municipalities	Barangays	Affected area of crops (sq.m.)		Total
		Corn	Cassava	
Marantao	Daanaingud	19,200	0	19,200
	Matampay	22,800	0	22,800
Piagapo	Paling	23,100	0	23,100
	Rantian	17,700	0	17,700
	Bubo	24,600	3,600	28,200
Saguiran	Pagalamatan	23,700	9,600	33,300
	Mipaga	5,400	9,600	15,000
Marawi	Banga	20,100	600	20,700
	Cabasaran	2,400		2,400
	Guimba	1,350	4,800	6,150
Total		**895,350**	**28,200**	**196,050**

Source: JICA Study Team

Affected trees along the proposed alignment were inventoried, most of the tree species planted are fruit bearing and harvestable timber as shown in **Table 7.11.4-34**.

Table 7.11.4-34 Affected Trees

Municipality	Trees (Fruit Bearing *)	Trees (Timber/Non-fruit Bearing **)	Plant/CashTrees ***	Total
Marantao	70	11	8	89
Piagapo	100	138	61	299
Saguiran	1,008	1,029	1,501	3,538
Marawi	126	1,066	71	1,263
Total	**1,304**	**2,244**	**1,641**	**5,189**

Note:
* Fruit Bearing Trees: Mango, Coconut/ Buco, Jackfruit/ Langka, Santol, Kamatchile, Duhat, Tamarind/ Sampaloc, Aratiles/ Mansanitas, Guava/ Bayabas, Macopa, Kaimito, Avocado, Atis, Casoy/ Kasuy
** Timber, Non-friut Bearing Trees: Narra, Acacia, Talisay, Bangkal, Balite, Gmelina, Falcata, Mahogany
*** Plant, Cash Trees: Banana, Papaya, Atsuete, Cassava, Cacao
Source: JICA Study Team

7) Status of Land Ownership of Affected Lots

Shown in **Table 7.11.4-35** is the status of land ownership by category and the possible mitigating/ legal remedies/ options that may help implement the Task Force responsible for Right-of-Way Acquisition of DPWH (Unified Project Management Office). Number of lots shown in the matrix was identified through local guides such as Barangay Officials that helped the RAP team during the inventory. The final list of identified lots are submitted to the Municipal Assessor's Office for verification whether the identified land claimants can be found in their records either they have title or with tax declaration.

Table 7.11.4-35 Status of Land Ownership

Type	Definition	No. of Lots (People)				Total (A)+(B)
		Lots with House			Lots without House (B)	
		Lot owned	Lot not owned	Total (A)		
Case A	Land claimant has a land titled and paying taxes	0	0	0	0	0
		(0)	(0)	(0)	(0)	(0)
Case B	Land claimant has a land title but not paying taxes	0	0	0	0	0
		(0)	(0)	(0)	(0)	(0)
Case C	Claimant has no land title but paying taxes (Tax Declaration)	0	0	0	0	0
		(0)	(0)	(0)	(0)	(0)
Case D1	Claimant within the military reservation (no title) with no Tax Declaration	0	10	10	94	104
		(0)	(61)	(61)	(840)	(901)
Case D2	No land title and No Tax Declaration	0	0	0	4	4
		(0)	(0)	(0)	(35)	(35)
TOTAL		**0**	**10**	**10**	**98**	**108**
		(0)	**(61)**	**(61)**	**(875)**	**(936)**

Note: *But in case the land to be acquired for ROW is classified as public land, concerned PAP/Ps will need to provide equity contribution for the purchase of land replacement; such equity contribution for a period of time (15-25 years). In the same manner claims related to resettlement or compensation of the agrarian reform under RA 3844, RA 6389 and RA 6657, the latter is also applicable.

Source: JICA Study Team

(2) Implementation Schedule for RAP for Sub-Project No. 7

Table 7.11.4-36 summarizes the indicative schedules of the various interrelated activities in relation to the preparation and implementation of the RAP.

Table 7.11.4-36 Resettlement Schedule

Activity	2019				2020				2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
First Disclosure																				
Parcellary Survey																				
Updating of RAP																				
Formulation of MRIC																				
Disclosure of Updated RAP to PAPs																				
Notification of PAPs																				
Compensation																				
Income Restoration																				
Detailed Design																				
ROW Acquisition and RAP																				
Procurement of Contractor																				
Construction																				
Construction Supervision																				
Monitoring and Evaluation																				
Internal Monitoring																				
External Monitoring & Evaluation																				

Source: JICA Study Team

(3) Cost Estimates, Compensation and Entitlements for Sub-Project No. 7

1) Preliminary ROW Cost Estimates for Land

The current fair market values from the BIR Zonal Computation and an independent property appraiser (IPA) were compared (**Table 7.11.4-37**) to determine the Estimated ROW Cost of Land. To compute for the total ROW Cost of Land, the highest market value (which in this case was seen to be the current value by the independent property appraiser) was then multiplied by the total affected land area.

Table 7.11.4-37 Comparison of Current Market Value and BIR Zonal Value

Municipality	BIR Zonal Value (PhP)		Current Market Value by IPA (PhP)	
	Residential	Agricultural	Residential	Agricultural
Marantao	55.00	2.45	300.00	15.00
Piagapo	50.00	2.45	250.00	15.00
Saguiran	55.00	2.45	300.00	15.00
Marawi	175.00	5.00	600.00	25.00

Note: * The current market value that was set by the independent property appraiser was used for the computation of the estimated market values of the affected land.
Source: JICA Study Team

Estimated market values of affected land in the assumption that all affected land owners have the complete land title is presented in **Table 7.11.4-38.**

Table 7.11.4-38 Estimated Market Values of Affected Land

Municipality	Land Classification	Affected Land (Sq.M)	Unit Price (PhP)	Total Cost (PhP)
Marantao	Agricultural	40,285.56	15.00	604,283.40
	Residential	3,120	300.00	936,000.00
Piagapo	Agricultural	64,402.65	15.00	966,039.75
	Residential	5,250	250.00	1,312,500.00
Saguiran	Agricultural	103,671.31	15.00	1,555,069.65
Marawi	Agricultural	130,974.28	25.00	3,274,357.00
	Residential	17,250	600.00	10,350,000.00
Total		**364,953.80**		**18,998,249.80**

Note: The estimated market values of affected land were computed in the assumption that all claimants were qualified for the compensation, provided that they have the Original Certificate of Title and Tax Declarations, or any of the two.
Source: JICA Study Team

2) Preliminary ROW Replacement Cost Estimates for Structures and Improvements

The replacement cost of the affected structures, in this case were referred to the affected houses, was shown in **Table 7.11.4-39**.

The computation of individual dwellings was based on the current unit price of materials and estimated for each reconstruction of building according to type of the building part and kind of materials used.

Table 7.11.4-39 Replacement Cost of Residential houses

Municipality	No. Of Houses	Total
Piagapo	1	17,840.00
Saguiran	7	463,175.00
Marawi	4	171,595.00
Total	**12**	**652,610.00**

Source: JICA Study Team

The replacement cost of the affected utilities, identified as electrical post traversing the proposed alignment site, was shown in **Table 7.11.4-40.** The computation of the current unit price was based on the current prices incurred during the removal/transfer of the utilities in the area.

Table 7.11.4-40 Replacement Cost for Affected Utilities

Municipality	Electric Post	Unit Cost (PhP)	Total Cost (PhP)
Marantao	1	35,000.00	35,000.00
Piagapo	1	35,000.00	35,000.00
Marawi	3	35,000.00	105,000.00
Total			**175,000.00**

Source: JICA Study Team

3) Preliminary Cost Estimates for Crops and Trees

Table 7.11.4-41 Replacement Cost for Crops

Municipality	Crops	Area (sq. m.)	Annual Yield (kg/sq.m.)	Unit Price (PhP)	Total Cost (PhP)
Marantao	Corn	42,000	0.28	13.84	160,788.55
Piagapo	Corn	65,400	0.28	13.84	250,370.74
	Cassava	3,600	1.53	6.53	35,967.24
Saguiran	Corn	29,100	0.28	13.84	111,403.49
	Cassava	19,200	1.53	6.53	191,825.28
Marawi	Corn	23,850	0.28	13.84	91,304.93
	Cassava	5,400	1.53	6.53	53,950.86
Grand Total		**196,050**	**-**	**-**	**895,611.09**

Source: JICA Study Team

Table 7.11.4-42 Replacement Cost for Trees

Municipality	Trees (Fruit Bearing *)	Total Cost (PhP)	Trees (Timber, Non-Fruit Bearing **)	Total Cost (PhP)	Plant/ Cash Trees ***	Total Cost (PhP)	Grand Total (PhP)
Marantao	70	37,450	11	4,100	8	41,550	83,100.00
Piagapo	100	51,750	138	52,000	61	61	207,500.00
Saguiaran	1,008	427,650	1,029	363,500	1,501	791,150	1,582,300.00
Marawi City	126	62,600	1,066	418,300	71	21,300	502,200.00
Total	**1,304**	**355,505.00**	**1,244**	**164,540.00**	**1,641**	**3,570.00**	**2,375,100**

Note: * Fruit Bearing Trees: Mango, Coconut/ Buco, Jackfruit/ Langka, Santol, Kamatchile, Duhat, Tamarind/ Sampaloc, Aratiles/ Mansanitas, Guava/ Bayabas, Macopa, Kaimito, Avocado, Atis, Casoy/ Kasuy
** Timber, Non-friut Bearing Trees: Narra, Acacia, Talisay, Bangkal, Balite, Gmelina, Falcata, Mahogany
*** Plant, Cash Trees: Banana, Papaya, Atsuete, Cassava, Cacao

4) Recommended Preliminary Compensation and Entitlement Packages

The recommended budget for RAP Implementation of Sub-Project 7 is **PhP 27,711,056.52** and is part of government counterpart, however the amount is exclusive of other entitlements that are yet to be

determined after the completion of the Parcellary Survey of the DPWH. The indicative budget items covering land acquisition and replacement cost of structures, and cost for external monitoring. Contingencies and admin cost are also included. **Table 7.11.4-43** shows the details of the indicative budget to implement this RAP.

Table 7.11.4-43 Indicative Budget for RAP Implementation

Description	Cost Item	Amount	Remarks
Land Acquisition and Structures	Land	18,998,249.80	Estimated based on the current fair market value of Land
	Structures	652,610.00	Estimated based the replacement cost
	Improvements	175,000.00	Estimated based the replacement cost
	Subtotal A	**19,825,859.80**	
Compensation	Trees and Cash crops	2,375,100.00	Estimated based on the current market values of the Maguindanao Provincial Assessor's Office and Sultan Kudarat
	Damaged crops	895,611.09	Estimated based on the current market value of the Philippine Statistics Authority
	Subtotal for B	**3,270,711.09**	
External Monitoring		1,000,000.00	Estimated at PhP 1,000,000 per SP
	Subtotal for C	**1,000,000.00**	
	Subtotal (A+B+C)	**24,096,570.89**	
Contingency	10%	2,409,657.089	
Admin Cost	5%	1,204,828.54	
GRAND TOTAL		**27,711,056.519**	

Source: JICA Study Team

(4) Stakeholders Meeting for RAP for Sub-Project 7

Table 7.11.4-44 Public Consultation Meetings conducted

Activity	Objective	Venue	Date	Participants	No. of participants	
					Male	Female
1st Round Meeting	Provide information to the possible Affected households regarding the: • project background • scope • objectives • benefits • update • basic resettlement policies (Philippines and JICA), • Cut-off-date and announcement of succeeding resettlement activities such as conduct of perception, census, socioeconomic survey and inventory of losses.	Marantao Municipal Conference Room	Jan. 17, 2018	LGU, DPWH, Project affected persons, Barangay Officials, MSU Marawi, Iligan City LGU	57	31
		Piagapo ABC Hall	Jan. 16, 2018	LGU, DPWH, Project affected persons and Barangay Officials	40	21
		Saguiran Session Hall	Jan. 15, 2018	LGU, DPWH, Project affected persons and Barangay Officials	60	25
		Marawi City Session Hall	Jan. 15, 2018	LGU, DPWH, NDU Cotabato, Project affected persons and Barangay Officials	53	19

The second round of public consultation will be upon the approval of DPWH ESSD on the results of the preliminary data on this RAP Report.

Table 7.11.4-45 Summary of Main Opinions and Concerns raised during the First Public Consultation

Major opinions/concerns	Reflections/countermeasures
i. Marantao Municipality	
Compensation on affected land without land titles	Request for a barangay certification to be certified by the Mayor to be used as basis in applying for a tax declaration in the Municipal's Assessor's Office. In addition, only 30% of the lands in Lanao del Sur have tax declaration. This will be an opportunity for them to secure records in their municipality. The land owners were encouraged to apply for tax declaration. The affected owner will be assisted by the LGU in acquiring the land titles.
Consideration of the existing provincial road	The recommendation was well noted and will be included in the report.
Compensation for land	The highest prevailing market value will be considered in computing for the land compensation.
ii. Piagapo Municipality	
Hiring of locals during construction	Locals will be given first priority in the project; as long as it will fit their skills and will pass the minimum age requirement. All residents will benefit from the project
iii. Saguiran Municipality	
Establishment affected by the road alignment like NPC compound near Somrorang	The inventory team will check if it will be affected
Inaccuracy in the barangay boundaries	The concern will be validated. All barangays near the road alignment even not traversed will still benefit because they can still use the road to transport products easily from farm to market.
Payment for lot without land title	Data from different government agencies will be gathered and the prevailing market value will be considered.
Unpaid land claims by previous road projects	The results will be submitted to the DPWH National and they will be the one to validate the results
Schedule of payments	The compensation will start before the start of the civil works It is DPWH who is the proponent of the project and the expenses for implementation will be loaned from JICA. If problems will arise the PAPs were advised to file complaints to the Mayor's office being part of the steering committee.
Assistance to land surveys of the affected lots without land title	Framework will be based on PD29 - since birth or more than 30 years of residences and will be certified by barangay officials thru barangay resolutions. Cadastral maps from DENR can also be used in validating the results of the inventory since land surveys is not part of the TOR.
iv. Marawi City	
Missing barangays	There will be ocular and field work to determine the affected land, properties and barangays.
Coordination with the MPDC before the conduct of scoping	Barangays will still be validated. Data from different agencies will be used to validate the data. The team will coordinate with the affected barangays and ask for assistance from the barangay officials during the inventory.

Source: JICA Study Team

Table 7.11.4-46 Barangay Consultations Conducted

Activity	Objective	Venue	Date	Participants	No. of participants	
					PAPs	Non PAPs
2nd Round Meeting Provide information to the possible Affected households regarding the: • Proposed Projects	• To elicit further opinions from PAPs themselves about the project • To obtain the basic socioeconomic data from PAP's and to allow them to express their ideas, apprehensions, concerns and objections.	Guimba & Kilala Brgy. Hall	Mar 22, 2018	Barangay Officials and PAPs	12	7
		Bubong, Mipaga, Pagalamatan & Lumbaca Brgy. Hall	Mar 23, 2018	Barangay Officials and PAPs	14	8
		Bubo Brgy. Hall	Mar 24, 2018	Barangay Officials and PAPs	12	5
		Matampay & Daanaingud Brgy. Hall	Mar 25, 2018	Barangay Officials and PAPs	9	2

Table 7.11.4-47 Summary of Main Opinions and Concerns raised during Barangay Consultations

Major opinions/concerns	Reflections/countermeasures
i. Marawi City	
PAPs without land claimants without any valid proof of ownership.	• The DPWH will discuss this matter in the second public consultation as to how PAPs will receive the compensation
Process of compensation.	• The DPWH will disclose the process of compensation after the detailed engineering and it will be discussed in the next public consultation • Section 4 of the R.A 10752 clearly states that the modes of acquiring real property are: (i) donation, (ii) negotiated sale, and (iii) expropriation. Property valuation is market-based and undertaken using Government Financial Institutions (GFIs) or Independent Property Appraisers which help promotes unbiased property valuation. The assumption by the IA of the capital gains tax also provides supplementary incentive to the lot owners to negotiate with government. All these things will be further discussed by DPWH representatives and consultant in the second public consultation.
Valid proof of ownership for land and mode of payment.	• PAP with Transfer/ Certificate of Title or tax Declaration (Tax declaration legalized to full title). The following topics are also discussed to them: • Holders of free or homesteads patens and Holders of Certificates of Land Ownership (CLOA) under CA 141. Public Lands act will be compensated on land improvements only. • Public Lands Act will be granted under Comprehensive Agrarian Reform Act shall be compensated for the land at Zonal value. • If granted under Voluntary Offer to sell by the Landowner. CLOA issued under CA 141 shall be subject to the provisions of Section 112 of Public Lands Act shall receive compensation for damaged crops at market value at the time of taking.
ii. Saguiran Municipality	
Acceptable proof of ownership.	• PAP with Transfer/ Certificate of Title or tax Declaration (Tax declaration legalized to full title). The following topics are also discussed to them:

Major opinions/concerns	Reflections/countermeasures
	• Holders of free or homesteads patens and Holders of Certificates of Land Ownership (CLOA) under CA 141. Public Lands act will be compensated on land improvements only. • Public Lands Act will be granted under Comprehensive Agrarian Reform Act shall be compensated for the land at Zonal value. • If granted under Voluntary Offer to sell by the Landowner. CLOA issued under CA 141 shall be subject to the provisions of Section 112 of Public Lands Act shall receive compensation for damaged crops at market value at the time of taking.
iii. Piagapo Municipality	
Concerns on PAPs without valid proof of ownership.	• There are several forms of land ownership as provided by our existing laws such as with Orginal/Transfer Cert. of Title (TCT) or Tax Declaration(TD) • Holders of free or homesteads patens and Holders of Certificates of Land Ownership (CLOA) under CA 141. Public Lands act will be compensated on land improvements only. • Public Lands Act will be granted under Comprehensive Agrarian Reform Act shall be compensated for the land at Zonal value. • or Predecessors-in-interest have been in open, continuous, exclusive and notorious possession and occupation of alienable and disposable lands of the public domain under a bona fide claim of ownership since June 12, 1945, or earlier, or by virtue of inheritance Provided by P.D 1529 • This will be further discussed in the next public consultation with DPWH.

*Interview was administered by the help of Barangay Officials for those PAPs who were not able to attend during the consultation meeting.

(5) Focus Group Discussions among Women and Youth

In order to ensure public involvement, through the process of resettlement planning, Notre Dame University (NDU) conducted the focus group discussions (FGDs) for the vulnerable groups or persons, such as women and youth.

The date and venue of the FGD meetings was informed to the affected LGUs such as municipalities and barangays by the official request letter from NDU. In order to gather and reflect public opinions of the affected PAFs.

1) Awareness of the Project

Data in **Table 7.11.4-48** clearly says that awareness of the project is evident among the household heads, especially to those coming from Saguiaran municipality. Only one of the women – participants was aware of the project; while most of the youth were unaware of the project as most of the women do.

Table 7.11.4-48 Awareness of Road Constructions

Mun	Barangay	Awareness on Road Construction	
		Women	Youth
Marantao	Bacong	Not Aware	Not Aware
	Daanaingud	Not Aware	Not Aware
	Matampay	Not Aware	Not Aware
	Palao	Aware	Not Aware
Piagapo	Bobo	Not Aware	Not Aware
	Ilian Poblacion	Not Aware	Not Aware
	Paling	Not Aware	Not Aware
	Rantian	Not Aware	Not Aware
Saguiaran	Alinun	Not Aware	Not Aware
	Bagoinged	Not Aware	Not Aware
	Bubong	Not Aware	Aware
	Linao	Not Aware	Aware
	Lumbacaturos	Not Aware	Aware
	Lumbayanague	Not Aware	Not Aware
	Mipaga	Not Aware	Aware
	Pagalamatan	Not Aware	Aware
	Pamacutan	Not Aware	Not Aware
Marawi	Banga	Not Aware	Not Aware
	Boganga	Not aware	Not Aware
	Dulay West	Not aware	Not Aware
	Guimba	Not Aware	Not Aware
	Kilala	Not aware	Not Aware
	Pantaon	Not aware	Not Aware
	Papandayan	Not Aware	Not Aware
	Rorogagus	Not Aware	Not Aware

Source: Social Survey of NDU

2) Impact of Poor Road

Displeasures due to the lack of roads and the poor condition of the existing roads are presented in **Table 7.11.4-49**. Most of their distressful accounts are socio – economic in nature.

Accordingly, school age children are adversely affected by poor road conditions. Given the natural rainy weather, roads are terribly muddy and slippery, making it hazardous for motorized and non-motorized vehicles to pass through. In fact, the roads are impassable after a heavy rain, said the participants. Children who walk on foot through the roads get dirty with mud as they reach the school. Burdened by this condition, some children are discouraged to go out and were thus often absent from school.

The participants were unanimous in saying that poor roads impede immediate access to health services. Whenever there are emergencies especially pregnant women who are to deliver their babies, they find it difficult to take them and other ill persons to the hospital for the appropriate medical attention. There were also instance when patients have died along the way due to grave delay in transport because the roads were hardly if not at all passable.

Farmers also attested to be encountering problems in transporting their harvests to the market location due to delays in travel and the high cost of fare. Fishermen likewise have the same share of difficulty as they deliver their daily catch to the market. Due the poor road, lesser motor vehicles contract services to and for the barangays, and when they do, the cost of fare is very high. Regular transportation charges for people and products are likewise very costly borne by poor road access.

Women – participants articulated certain difficulties in doing household chores like fetching water and doing the laundry because water sources are far from their residences. The long walk to the water source, manually carrying the load of laundry and/or water containers, is harder due to rough roads which are very slippery and muddy when it rains; and it rains frequently in Marawi. A lot of times, flooding and flashflood occur after a heavy downpour, particularly causing damage to low lying barangays. The lack of road is coupled with the lack of a proper drainage system.

Economic opportunities are dampened by lack of roads and poor condition of the existing roads, said the participants. To them, minimal economic activity and low income opportunities are a result of poor road access. According to the participants, government services can hardly reach their barangays because of inaccessibility.

Table 7.11.4-49 Impact of Road to the Community

Mun	Barangay	Impact of Road to Community	
		Women	Youth
Marantao	Bacong	• Slippery and muddy roads • Trucks and motors cannot reach the barangay • It's difficult to transport our products going to market • The barangay is hardly passable during rainy season • It's hard to go to market and other barangays • Business will be affected • Our children having difficulty in going to school • It's hard when there's an emergency; difficult to transport our patient to the hospital.	• Road is not passable when there is heavy rain • No business opportunities for the barangay
	Daanaingud	• Difficult to go to other barangays • Children and their things get dirty with mud when going to school. • Children have difficulty in going to school especially during rainy season • Difficult to transport products in the market • Hard to deliver fish catch to the market • When there is emergency we have difficulty in sending our patient to nearest hospital	• It's very hard if we don't have road • Slippery and muddy during rainy season • Difficulty in going to schools and market
	Matampay	• Difficulty of children going to school • Less opportunity for business • Difficulty for our products to transport going to market • Have difficulty to reach the nearest hospital in Amay Pakpak in case of emergency (giving birth, checkup and when there is sick)	• Difficulty of children going to school • Difficulty in reaching hospital especially during emergency • No vehicle will the barangay • During rainy season, farmers have difficulty in transporting their products

		• Slippery and muddy during rainy season • Trucks and motorcycle have difficulty in reaching our barangay	
	Palao	• The barangay is hardly passable during rainy days • It's difficult with there is emergency; it's hard to go to hospital • We only walked when we go to Municipal Hall especially during payout in 4Ps • Transporting our products like cassava, eggplant, tomatoes, etc is not easy • No vehicle transporting in our barangay especially during rainy season because of the muddy road	• Difficulty on Transporting the products from the farm to the market • Difficult to dispose product • Children always late when going to school because they only walk • Slippery and muddy when rainy season • Difficult to go outside especially at night
Piagapo	Bobo	• Road too narrow • Difficulty of transporting products	• Have difficulty in going to school because we only walk • Have difficulty in transporting products to market • Slippery and muddy during rainy season
	Ilian Poblacion	• Difficulty in transporting and selling our products to market • Transportation cost is expensive • Slow development of barangay • Difficult to reach hospital or clinic when in case of emergency • Transportation cost for horse is too expensive	• Have difficulty in reaching school especially during rainy days • Have difficulty in fetching water and many times we became late in the class
	Paling	• Difficulty in reaching hospital when there's an emergency (for pregnant and sick) • Difficulty in going to town during rainy season/days • Road is not passable when rainy season • Children have difficulty in going to school • Difficult to transport products going to market because the only way to transport products is horse	• We have difficulty in going to school because our way going to school is slippery and muddy when it rains • Transportation cost is too expensive • Difficulty in reaching hospital when there's an emergency (for pregnant and sick)
	Ratian	• Rough road • Children have difficulty in going to school, many times they became late • Road is slippery and muddy • Difficult to reach the hospital in case of emergency • Difficult to transport products in the market	• So difficult, trucks will stuck in muddy road • There were times that we can't go to school because of muddy way • No vehicle can reach the barangay when rainy days
Saguiaran	Alinun	• Children have difficulty in going to school • Difficulty to reach town and market • Farmers have difficulty to transport and sell their products • Students are often late in school • Difficult in bringing patients and pregnant mothers to the hospital	• Students are often late in school • Walking to school is very hard • Delayed delivery of products in the market
	Bagoinged	• Road is narrow • Difficulty in going to school • Transportation too expensive	• Delayed transporting of products to market • Motor parts/car parts are easily damaged due to rough roads

		• difficult in bringing patients and pregnant women to the hospital (there was an accident before that the pregnant woman died while giving birth because they were not allowed to go out to their barangay-due to curfew)		• Traffic during flood
	Bubong	• Slippery and muddy • Difficult to transport products • Our children are often late in school		• Caused of accidents due to slippery roads • Cannot perform daily activities due to poor road • Difficult to transport products of farmers
	Linao	• Less opportunity for work • Expensive transportation • Our children have difficulty in going to school when it rains • Difficult to reach hospital during emergency cases		• Slippery road during rainy days • Farmers have difficulty in transporting their products • Students can't go to school during rainy days • Motor and trucks easily damaged of the rough and slippery road
	Lumbacaturos	• No available farm to market road. • Non Passable of road when their heavy rain • Worst mud during rainy days • Minimal Livelihood opportunities	• When rainy days the roads are muddy and slippery • Difficult to go to other barangays and town • Business will stop • Patients, pregnant mothers struggle due to poor road condition	• Cause low income • Government assistance cannot reach the barangay
	Lumbayanague	• Difficulty on Transporting the products from the farm to the market • Less income for the community • Always delayed delivery of products	• Non passable road when rainy days • Rough road • Slippery and muddy • difficult for students to cross rough and muddy road • no vehicle can reach the barangay when rainy season • Difficulty in transporting the products from the farm to the market • Transportation is expensive	• Difficulty in transporting the products from the farm to the market • Difficult to reach the hospital in case of emergency
	Mipaga	• Difficulty on Transporting the products from the farm to the market • We only walk going to market • No vehicle reach our area	• Difficulty in going to other barangay • Difficulty in transporting our products like corn, camote, and vegetables	• Access to farm land is difficult • Poor economic development • Delayed delivery of products to market
	Pagalamatan	• Difficulty on Transporting the products from the farm to the market • High cost of fare • Lack of barrio road and muddy during rainy season	• Rough, slippery and muddy road is too difficult for students to go to school • No vehicles can reach the barangay especially during rainy days • Too difficult in bringing patients and pregnant	• Delayed delivery of products in the market • Caused of absent of students in the class during rainy days

		• Minimal Opportunity for employment • Slow development in terms of livelihood because of inaccessibility of our place	women to the nearest hospital at Amay pakpak	
	Pamacutan	• We have a single lane or one way street and it does not really help us at all because it can cause some accidents • During rainy season flood usually takes place. • Mud during rainy days • Difficulty to reach establishments and commercial places	• We only walked going to proper Pamacutan • No vehicle reach our area because of the rough way • Difficult to go market and school • Transportation is expensive	• Caused flood when rainy season • Government projects and assistance cannot reach the barangay • Slippery and muddy during rainy season • Unproductive community
Marawi	Banga	• Lack of Barrio Road • Single and Minimal Lanes of the road • Difficulty to reach the health center when there's an emergency • Slow development in terms of livelihood because of inaccessibility of our place	• Difficulty of children going to school; children only walk going to school and its slippery and muddy • Less opportunity for business • Difficulty of transporting our products to market • Trucks and motor cannot travel in our barangay • Less opportunity for business • Difficulty of carrying sick and pregnant mothers to hospital • Difficulty in fetching water	• Difficulty of transporting our products to market • Road is not passable when it heavy rain • Difficult to reach the hospital in case of emergency
	Boganga	• Lack of barangay road • Flood during rainy days because of low lands and it's beside Agus River • Minimal Livelihood opportunities	• Discomfort while travelling (muddy) • High transportation cost • Difficult to transport farm crops • Difficult to transport patient in emergency cases • Children have the difficulty in going to school	• Transportation problem • No other livelihood aside from farming • Children have the difficulty in going to school • Difficult to transport patient in emergency cases
	Dulay West	• Difficulty to reach the market, commercial places, schools and other establishments • High cost of fare • Steep Road • Mud during rainy days • Minimal Livelihood opportunities	• Discomfort while travelling (muddy) • High transportation cost, • Difficult to transport farm crops • Difficult to transport patient in emergency cases • Children have the difficulty in going to school	• Transportation problem • Difficulty in transporting farm produce • High transportation cost • Discomfort while travelling (rough, narrow, muddy)which causes accidents

			• Greatest Problem: Water system	
	Guimba	• Difficulty to reach the market, commercial places, schools and other establishments • High cost of fare • Steep Road • Mud during rainy days • Minimal Livelihood opportunities	• Difficulty in walking or traveling to other barangay and town • Trucks and motors have difficulty in reaching the barangay • Have difficulty in fetching water	• Have difficulty in fetching water • Difficulty to reach the market, school and hospital
	Kilala	• Lack of barrio road • Flood during rainy days because of low lands and it's beside Agus River • Minimal Livelihood opportunities	• Marketing difficulty • High transportation cost • Uncomfortable while travelling • Difficulty in doing household chores	• High transportation cost • Children have the difficulty in going to school • Discomfort while travelling • (muddy) causes vehicle failure • Marketing difficulty
	Pantaon	• Steep and Narrow Road that makes the residents be even afraid of transportation • Lack of barrio road • Flood during rainy days because of low lands and it's beside Agus River • Minimal Livelihood opportunities	• Difficulty in transporting farm produce • Difficulty in doing the laundry because source of water is far from their houses (Oftentimes women have to fetch water) • Marketing difficulty • Greater Problem: • Water system	• Transportation problem • Difficulty in transporting farm produce • High transportation cost • Difficulty in doing the laundry because source of water is far from their houses (Oftentimes women have to fetch water)
	Papandayan	• Lack of Barrio Road • Lack of Proper Drainage • Difficulty to reach the health center when there's an emergency • Slow development in terms of livelihood because of inaccessibility of our place	• Marketing difficulty • High transportation cost • Uncomfortable while travelling • Difficulty in doing household chores	• -Difficult to transport patient in emergency cases • Children have the difficulty in going to school • Discomfort while travelling (muddy) which causes accidents • Delays schedules meetings/activities
	Rorogagus	• Steep and Narrow Road that makes the residents be even afraid of transportation • Lack of barrio road • Flood during rainy days because of low lands and it's beside Agus River • Minimal Livelihood opportunities	• Farmers have difficulty in transporting their products (corn, palay, banana, ube, papaya) to market • Children only walk going to school • Flood when rainy season	• Caused of absent of students in the class during rainy days • Difficulty of transporting our products to market • Slippery and muddy roads when it rains • Less opportunity for business

Source: Social Survey of NDU

3) Main Source of Economic

Table 7.11.4-50 presents the main sources of income in the barangays according to the participants:

On-Farm Sources. These are income sources that directly involve actual tilling of farm lands. In the influence area, on-farm sources include farming, which is the main source of income. Farming involves basically corn and palay. They also grow other crops such as coconut, cassava, camote, abaca, fruits, banana, and various types of vegetables.

Off-farm Sources. These are income-generating activities which are agriculture-related but does not necessitate actual tilling of one's own farm land. The following off-farm sources surfaced from the participants' responses: fishing, agri-business, livestock raising, small-scale logging, charcoal making, vegetable vending and providing farm labor services (hired labor) during planting and harvesting in nearby barangays or in other municipalities.

Non-farm Sources. Participants have identified non-farm related sources such as: dressmaking, driving, carpentry, operating a variety store, working in the market as vendors, welding, automotive and government employment.

Currently however, economic activity in Marawi City is on a standstill after the destruction brought about by the military operations against the terrorists who attempted to occupy the city. Majority of its residents have just returned from the evacuation centers and temporary shelters. There is no farming activity for almost a year now. The residents are yet relying greatly on the relief goods and assistance provided by the DSWD and many other organizations.

Table 7.11.4-50 Main Source of Economic Means

Mun	Barangay	Main Sources of Economic Means		
		First	Second	Third
Marantao	Bacong	• Farming	• Dressmaking • Fishing	•
	Daanaingud	• Farming • Fishing	• Dressmaking • carpentry	• driving
	Matampay	• Farming (corn, palay, cassava, peanut and coconut) •	• Driving of tricycle, trucks • Carpentry • Vegetable gardening and vending	• Agri-business and sari-sari store • Dressmaking •
	Palao	• Farming (corn, palay and rootcrops)	• Vegetable gardening and vending • Carpentry • Farm labor	• Driving (tricycle) • Small Sari-Sari Store •
Piagapo	Bobo	• Farming (corn, palay, abaca and coconut) •	• Vegetable gardening and selling • Tricycle driving • Carpentry	• Sari Sari Store •
	Ilian Poblacion	• Farming (corn and palay)	• Vegetable gardening and selling • Carpentry • Tricycle drivers	• Sari Sari Store •
	Paling	• Farming (corn) • Driving (Motorcycle)	• Vegetable gardening • Tricycle driving	• Carpentry • Small Sari Sari Store

	Rantian	• Farming (corn, peanut, water melon, banana and coffee)	• Vegetable gardening (eggplant, okra, camote tops, atsal, luya, sili labuyo) • Carpentry	• Motorcycle drivers
Saguiaran	Alinun	• Farming	• Sari-sari store • Construction workers/Carpentry	• Charcoal making • Motorcycle driving • Logging
	Bagoinged	• Farmers (corn and cassava) •	• Tricycle and multicab drivers • Vegetable gardening and selling	• Carpentry • Small Sari Sari Store
	Bubong	• Farming	• Farmers labor • Vegetable gardening	• Motorcycle driving
	Linao	• Farming (corn, cassava, coconut, and banana)	• Farm labor • Vegetable gardening • Driving (Motorcycle)	• Logging • Carpentry • Small Sari Sari Store
	Lumbacaturos	• Farming (corn and coconut)	• Vegetable gardening • Farm laborer	• Driving • Carpentry • Motorcycle drivers
	Lumbayanague	• Farming (corn, cassava and peanut)	• Motorcycle drivers	• Sari-sari store • Vegetable gardening
	Mipaga	• Farming (corn and palay)	• Fishing (tilapia, haluan, katulong and suso)	• Tricycle driving
	Pagalamatan	• Farming (corn, cassava and camote)	• Tricycle drivers • Farm labor • Sari Sari Store	• Vegetable gardening (tomatoes, eggplant, cucumber, squash, stringbeans and upo) • Carpentry
	Pamacutan	• Farming (corn, palay, cassava and ube)	• Vegetable gardening • Sari Sari Store • Tricycle driving	• Charcoal making • Working in market/vendor
Marawi	Banga	• Farming (corn and palay)	• Vegetable gardening and vending (pechay, tomatoes, squash, okra, rootcrops) • Carpentry	• Livestock raising • Logging
	Boganga	• Currently no available livelihood because they just came back 2 weeks ago; rely on the relief goods from DSWD and other groups who caters the evacuees.	• (Before the crisis) Doing business in Marawi market • (After the crisis) No work; dependent on the assistance	• Driver • Business • Government Employee • Fishing • Farming
	Dulay West	• Farming • Driving	• Before the Crisis: • Dressmaking, • Doing business(sari-sari store in Marawi main market), fish and chicken vendors • After the crisis: • No work, dependent on the assistance	• Farming • Driving
	Guimba	• Farming (corn, cassava, camote)	• Vegetable gardening and vending • Carpentry • Motorcycle driving	• Welding/Automotive

	Kilala	• Currently No available livelihood because we just came back 2 weeks ago. We just rely on the relief goods from DSWD and other groups who caters the evacuees.	• Before the crisis: • Vendor; sari-sari store, • After the crisis: No IGP work	• Farming • Business • Fishing • Driver
	Pantaon	• Farming • Carpentry • Fishing • Driving	• Sari-sari store • *After the crisis: they have no work including their husband; just dependent on the assistance: relief goods and cash)*	• Labor
	Papandayan	• Before the Crisis: business- sari-sari store • Present- no means of livelihood	•	• Farming • Driver • Carpentry • Welding
	Rorogagus	• Farming (corn, banana, ube, and palay)	• Vegetable gardening (ginger, stringbeans, avocado, pineapple and durian) • Fishing	• Carpentry • Driver

Source: Social Survey of NDU

4) Negative Impact of Road Construction and Proposed Solutions

Along with the perceived benefits from the proposed road project are apprehensions that certain problems and threats to the community might emerge from it. **Table 7.11.4-51** below is a matrix that shows these perceived negative effects.

Easy entry of people with ill-intentions such as thieves and terrorists, as well as avengers in cases of rido (or family feuds) might come along with the constructed road. The participants also presented practical solutions to prevent these from occurring. Accordingly, community should be extra vigilant and help monitor whatever is happening on ground. And since it is typical in a rural barangay that everybody knows everybody, it is easier to spot unfamiliar faces and report immediately to the authorities. Whereas in the case of ridos, they said that it would help if the local government can initiate a peaceful dialogue between conflicting families and resolve whatever problems these families have had.

Existence of main roads will most likely increase the incidence of noise pollution, air pollution, and vehicular accidents particularly involving children due to reckless driving and overspeeding. However, these may also be presented especially when mothers or parent will be extra watchful of their children. Road signs, humps and safety reminders should be place to prevent accidents from occurring.

According to the participants, it would be generally helpful if military/police/BPAT checkpoints are established for road security. Their presence will already address concerns regarding possibilities of vehicular mishaps and security issues in the barangays involved.

Finally, the participants also saw possibilities of conflict between the road project management and the private landowners for lands/areas that may be affected by the road construction. These however may be resolved by peaceful negotiation and just compensation, said the participants.

Table 7.11.4-51 Negative Impact of Road Constructions

Mun.	Barangay.	Negative Impact of Road Construction and Proposed Solutions			
		Women		Youth	
		Negative Impact	Solutions	Negative Impact	Solutions
Marantao	Bacong	• Traffic • Thieves	• Parents should take care and watch their children	• None	• None
	Daanaingud	• Accident prone especially for children • Might create problems with owners of lands that will be affected by the road construction	• Parents should watch their children • Relocation • There must be an agreement first between DPWH and the owner of the house or land	• Accident prone especially for children	• Put up signage
	Matampay	• None	• None	• None	• None
	Palao	• In case of rido, they can reach/hide easily in the barangay • Bad people can easily enter the barangay	• Put up check point • Barangay chairman should settle rido	• None	• None
Piagapo	Bobo	• Prone to accident • Over speeding	• Put up signage • Discipline the drivers	• None	• None
	Ilian Poblacion	• There might be properties like houses and farm lots that might be affected in the road construction	• There should be settlement and agreement between the government and the owner of the properties •	• None	• None
	Paling	• None	• None	• None	• None
	Rantian	• Prone to accident	• Signage especially in curves	• Prone to accident and over speeding	• Keep safe always and discipline drivers •
Saguiaran	Alinun	• Noise • Air pollution • Prone to accident	• Remove muffler • Use mobile car/no gasoline • Put up hump and signage	• None	• None
	Bagoinged	• Prone to accident • Properties that might be damaged during the construction • Over speeding	• Put signage • Agreement between government and the owner of the properties • With speed limit to all vehicles	• Prone to accident especially for children	• Families should be responsible for their children

	Bubong	• None	• None	• Lessen area of farm land • Accident prone in school	• Give proper compensation to the land owners • Put up hump in school vicinity
	Linao	• None	• None	• Prone to accident	• Observe road regulations/policy
	Lumbacaturos	• Properties that might be affected during the construction	• Agreement between DPWH and the owner of properties	• Properties that might be affected during the construction • Prone to accident	• Agreement between DPWH and the owner of properties • Put up signage
	Lumbayanague	• Prone to accident • Over speeding	• Put up signage • Speed limit	• None	• None
	Mipaga	• There might be properties that will affected for the road construction	• There must be settlement or agreement	• Prone to accident	• Put up signage
	Pagalamatan	• Our worry is that our source of water will be affected of this road construction	• DPWH find solution	• Bad people will be given easy access to their targets • Unsafe especially for children playing outside	• Be vigilant • Parents should be responsible for their children • Secure family members
	Pamacutan	• None	• None	• None	• None
Marawi	Banga	• Prone to accident • There might be properties (house and farm land) damaged	• Construct barangay health center so that if there's an emergency they could respond • DPWH and the property owners will have an agreement	• Traffic • Prone to accident • There might be properties (house and farm land) damaged	• Observe traffic rules and discipline drivers • Put up humps • DPWH and property owners will have agreement
	Boganga	• Prone to accident • Area becomes accessible by everyone particularly the criminals	• Place warning signage in danger areas • Assign checkpoint/BPAT	• Prone to accident • Lessen farmland	• road policies should be implemented and observed • give land owners proper compensation
	Dulay West	• Accident prone • Presence of bad elements in the society	• Install road humps • Place pedestrian • Place signage or warning signs • Assign BPAT • Community to support and report to LGU any presence of suspicious persons	• Prone to accident •	• road policies should be implemented and observed
	Guimba	• Prone to accident	• Put up check point, hump and signage	• None	• None
	Kilala	• Prone to accident • Area becomes accessible by everyone	• Place warning signage in danger areas	• Prone to accident	• there should be pedestrian lanes

		particularly the criminals	• -Assign checkpoint/ BPAT		• road policies should be implemented and observed
	Pantaon	• Prone to accident • Area becomes accessible by everyone particularly the criminals	• Prone to accident • Area becomes accessible by everyone particularly the criminals	• Lessen farmland • Stop farmers from farming	• give land owners proper compensation • Encourage residents to continue farming
	Papandayan	• Accident prone • Easy entry of lawless element	• Warning, signage • Provide checkpoint, everyone should be vigilant	• Traffic • Prone to accident • Area becomes accessible by everyone particularly the criminals	• Cross roads should have traffic lights • -Strict patronage of police officers
	Rorogagus	• Prone to accident especially to children • Flood when it rains	• Parents should be responsible for their children • Road with drainage in both sides	• Prone to accident • There might be properties (house and farm land) damaged • Air pollution	• Discipline drivers and put up signage • DPWH and the property owners will have an agreement

Source: Social Survey of NDU

5) Perception towards DPWH as Road Contractor

There is a general agreement in having DPWH as the road contractor, as reflected in Table 56. However, there were few household heads who articulated that their agreement is premised by a belief that a monitoring team from JICA should be there to supervise DPWH and ensure that the project is implemented well.

There were also few from the youth – participants who expressed disagreement because according to them, it should be handled by the LGU because the construction is one opportunity for the local community to earn. It was unclear as to how they can earn from the construction. But one household head pronounced that it was alright if DPWH becomes the contractor for as long as the local labor are hired for work.

Although many of those who agreed to DPWH's involvement did not give reason, those given by others are already sufficient enough to justify the general agreement. Accordingly, DPWH can be trusted and have the necessary materials, equipment and expertise in road construction. Moreover, they are the agency mandated by the government to spearhead physical infrastructure development. Therefore, they cannot afford to default and fall short of their function as the fast and reliable builders of road systems.

6) Community Support to DPWH

Prior to this section, participants already mentioned that they will be supportive to DPWH should the construction already commences. They had long been waiting for the grace of a road network and now that the probability is at hand, they are committed to assisting the DPWH contractors in the following ways:

The household heads are willing to work as construction workers for dual purposes. First, the wage earnings would be a big help for family sustenance especially now that economic activity is disrupted by

the Marawi siege. Second, no other person can provide the best labor services but the locals because they have a higher sense of belonging to the project. Thus, quality work is assured.

Moreover, they are also willing to offer volunteer work for the construction particularly in the aspect of securing the construction materials and equipment day in and day out. Also in providing assistance in road clearing and directions. Most importantly, they committed to securing the life of the DPWH team from perpetrators of crime and unrest. This will be done with the help of the local authorities through the barangay chairmen.

Women professed to allow their husbands and abled sons to offer paid labor services in the construction. Children will be kept away from playing in the construction site for their own safety and to ensure that they cannot cause any damage to work. Some plans of putting up a small store to cater to the commodity needs of the construction workers. Most importantly, majority proclaimed willingness to offer free food, water, coffee, snacks and even cooking services to the DPWH team.

The youth in general saw worth in assisting the DPWH team in directions and road clearing. They were also willing to supervise the newly-cemented roads until these are dried. This is to ensure that newly cemented roads are not damaged by playful children and even stray animals. Securing the materials and equipment; as well as offering food, water and cooking services were also committed by them.

In general, the entire community articulated support to the DPWH team should the road construction project materializes.

7) Summary

Awareness of the project is evident particularly among the household heads; women and youth are generally unaware of the proposed road construction project. Since road and transport problems are major drawbacks to agricultural development and socio-economic welfare of the influence area, the participants were delighted by the probability of finally having better and wider roads. Based on their perceptions, better and wider roads will promote income potentials as it would facilitate and lessen cost of agri-transport, particularly in corn farming which is their main source income. It will likewise enhance peoples' access to basic social services. Moreover, the proposed road would indeed complement the rehabilitation of Marawi after having been devastated by the long months of fighting between the government military forces and a terrorist groups which attempted to occupy the city.

However, along with the perceived benefits from the proposed road project are apprehensions that certain problems and threats to the community might emerge from it. These emergent problems are mostly on security, safety of children, heightened rido or family feuds, and conflict with owners of lands that might be affected by the road construction. Interestingly, the participants were also able to identify practical solutions to these emergent problems. Solutions that primarily require community vigilance, commitment, discipline and close coordination with the local government authorities.

Finally, there is a general agreement in having DPWH as the road contractor as they are the agency mandated by the government to pursue physical infrastructure projects. The presumption that a monitoring team from JICA will be there to supervise the implementation of the project is noteworthy. The entire community however are willing to cooperate with DPWH and committed to support he construction team in several ways that their capacities will enable and allow them to do.

7.11.5 Summary of Resettlement Action Plan (RAP) for Sub-Project 8

(1) Social Environment Situation of Sub-Project 8

1) Project Description

The **Parang East Diversion Road -Sub-Project 8** is one of top priority road segments under this project which it covers 7.0 km road length (**Table 7.11.5-1**) and traverses in the municipality of Parang, Maguindanao covering the barangays of Nituan, Manion, Gumagadong, Calawag and Making (**Figure 7.11.5-1**). This road segment aims to increase connectivity by linking three primary inter-city roads of Cotabato-Marawi Road, Cotabato-Davao Road, Cotabato-Gen. Santos Road. As such can support/ enhance economic productivity along these areas with high agri-industrial activities and quarrying industry as the primary source of income among the people.

Table 7.11.5-1 Details of Parang East Diversion Road Alignment and Road Length

Province	Municipality	Barangay	Road Length (km)
Maguindanao	Parang	Nituan	2.6
		Manion	1.0
		GumagadongCalawag	0.9
		Making	2.5
Total			**7.0**

Source: JICA Study Team

Source: JICA Study Team

Figure 7.11.5-1 Location Map of Parang East Diversion Road– Sub-Project 8

2) Socio-Economic Profile of the Project-affected Persons

Based on the conducted socio-economic survey, a total of nineteen (19) affected household heads (AHHs) and fifteen (15) affected land lot owners were interviewed as shown in **Table 7.11.5-2**.

Table 7.11.5-2 Summary of Potential Number Affected Structures and Land Lots

Loss category	Grand Total
Affected House Heads	19
Affected Structures	23
Affected Land Lot Owners	15

Note: * 4 residential houses occupied and 1 house not occupied.
Source: JICA Study Team

A total of 178,236.13 sq.m of land with crops and trees will be affected by the alignment as summarized in **Table 7.11.5-3**. Majority of the cultivated crops that will be affected are corn and palay.

Table 7.11.5-3 Summary of Affected Land and Types of Cultivated Crops

Loss category	Unit	Total
Affected agricultural lands with corn	m2	5,889
Affected agricultural lands with palay	m2	4,420
Affected Fruit bearing trees	No. of trees	772
Affected trees (Timber / non-fruit bearing)	No. of trees	433
Plant/Cash Trees	No. of trees	17
Total affected land area (sq. m.)	m2	178,236.13

Source: JICA Study Team

a. Household Size

Majority or 14 (73.68%) of the AHHs' size ranges from 6-10 members while 5 (26.32%) HHs' have 1-5 members.

Table 7.11.5-4 No. of Affected Household Heads by Household Size

Household Size	Total Affected Hous	
	Total	
	No.	%
1-5	5	26.32
6-10	14	73.68
11-above	0	0
Total	**19**	**100**

Source: JICA Study Team

Majority or 73.33% of the affected land lot owners' size ranges from 1-5 members while 26.67% have 6-10 members.

Table 7.11.5-5 No. of Affected Land Lots by Household Size

Household Size	Total Affected Hous	
	Total	
	No.	%
1-5	11	73.33
6-10	4	26.67
11-above	0	0
Total	**15**	**100**

Source: JICA Study Team

b. Household Structure

The common family structures that can be observed along Parang East Diversion Road are composed of nuclear structure (78.95%), a common Filipino family structure, which was made up of the parents and their children. There are 15.79% of the households that were comprised of a single structure. The remaining 5.26% have an extended family structure where the grandparents and other close family members are staying with the family.

Table 7.11.5-6 No. of Affected Household Heads by Household Structures

Household Size	Total Affected Hous	
	Total	
	No.	%
Single	3	15.79
Nuclear	15	78.95
Extended	1	5.26
Joint	0	0
Total	**19**	**100**

Source: JICA Study Team

In terms of family structure of the affected land lot owners, majority have household structure type of nuclear with 60%, 20% had a single composition and the remaining 20% had an extended structure.

Table 7.11.5-7 No. of Affected Land Lots by Household Structures

Household Structure	Total Affected Hous	
	Total	
	No.	%
Single	3	20
Nuclear	9	60
Extended	3	20
Joint	0	0
Total	**15**	**100**

Source: JICA Study Team

c. Gender Distribution

In terms of gender distribution, there are more male (63.16%) household heads in the affected HHs than female heads (36.84%).

Table 7.11.5-8 No. of Affected Household Heads by Gender

Gender	Total Affected Hous	
	Total	
	No.	%
Male	12	63.16
Female	7	36.84
Total	**19**	**100**

Source: JICA Study Team

Consequently, 73.33% of the affected land owners were male and 26.67% were female heads.

Table 7.11.5-9 No. of Affected Lands Lots Owners by Gender

Gender	Total Affected Hous	
	Total	
	No.	%
Male	11	73.33
Female	4	26.67
Total	**15**	**100**

Source: JICA Study Team

d. Civil Status

All (100%) of the affected household had married heads.

Table 7.11.5-10 No. of Affected Household by Civil Status

Civil status of affected household	Affected House	
	Total	
	No.	%
Single	0	0
Married	19	100
Window/er	0	0
Live-in	0	0
Others	0	0
No Response	0	0
Total	**19**	**100**

Source: JICA Study Team

On the other hand, 100% of the affected landowners were married as shown in below table.

Table 7.11.5-11 No. of Lands/Lots by Civil Status

Civil status of affected land lots owner	Affected Land / Lots	
	Total	
	No.	%
Single	0	0
Married	15	100
Window/er	0	0
Live-in	0	0
Others	0	0
No Response	0	0
Total	**15**	**100**

Source: JICA Study Team

e. Age Distribution

It was observed that the most common age bracket of the affected household heads is between 35-39 (26.31%), 25-29 (15.79%), 40-44 (15.79%), 30-34 (15.79%), 60-64 (21.05%) and 50-54 (5.26%).

Table 7.11.5-12 No. of Affected Households by Age

Age	Affected House	
	Total	
	No.	%
15-19	0	0
20-24	0	0
25-29	3	15.79
30-34	3	15.79
35-39	5	26.31
40-44	3	15.79
45-49	0	0
50-54	1	5.26
55-59	0	0
60-64	4	21.05
65-69	0	0
70-74	0	0
75-79	0	0
80+	0	0
No response	0	0
Total	**19**	**100**

Source: JICA Study Team

Likewise, as observed in the age distribution of the affected land owners as shown in below table, that there was an equal age distribution on brackets, 30-34, 35-39, 40-44, 50-54, and 60-64 at 20%.

Table 7.11.5-13 No. of Affected Land Lots Owners by Age

Age	Affected Land / Lots	
	Total	
	No.	%
15-19	0	0
20-24	0	0
25-29	0	0
30-34	3	20
35-39	3	20
40-44	3	20
45-49	0	0
50-54	3	20
55-59	0	0
60-64	3	20
65-69	0	0
70-74	0	0
75-79	0	0
80+	0	0
No response	0	0
Total	**15**	**100**

Source: JICA Study Team

f. Religious Affiliation

Roman Catholic was the most common (52.63%) religion practiced by the affected household heads; it was followed with Born Again Christian (36.84%) and others (10.53%).

Table 7.11.5-14 No. of Affected Household Heads by Religion

Religion	Affected House	
	Total	
	No.	%
Roman Catholic	10	52.63
Iglesiani Cristo	0	0
Baptist	0	0
Born Again Christian	7	36.84
Islam	0	0
Others	2	10.53
No Response	0	0
Total	**19**	**100**

Source: JICA Study Team

As shown in below table, 46.67% of the affected landowners were Roman Catholics, 26.67% were Born Again Christians and 26.67% were practicing other religions.

Table 7.11.5-15 No. of Affected Land Lots Owner by Religion

Religion	Affected lots	
	Total	
	No.	%
Roman Catholic	7	46.67
Iglesiani Cristo	0	0
Baptist	0	0
Born Again Christian	4	26.67
Islam	0	0
Others	4	26.67
No Response	0	0
Total	**15**	**100**

Source: JICA Study Team

g. Educational Attainment

All of the affected household heads within the Parang East Diversion Road had attended form education. Sixty three percent (63.16%) were High School Undergrads, 10.53% had attended vocational / technical education and 26.32% were high school graduates.

Table 7.11.5-16 No. of Affected Household Heads by Educational Attainment

Educational Attainment of Land Lots Owners	Affected House	
	Total	
	No.	%
No formal education	0	**0**
Pre-school	0	0
Elem. Grad	0	0
HS Under grad	12	63.16
HS grad	2	10.53
Vocational/Technical	5	26.32
Certificate Courses	0	0
College Under grad	0	0
College grad	0	0
No response	0	0
Total	**19**	**100**

Source: JICA Study Team

As observed from **Table 7.11.5-17**, majority (60%) of the affected land owners were high school undergraduates and 40% were high school graduates.

Table 7.11.5-17 No. of Affected Land Lots by Educational Attainment

Educational Attainment of Land Lots Owners	Affected lots	
	Total	
	No.	%
No formal education	0	0
Pre-school	0	0
Elem. Grad	0	0
HS Under grad	9	60
HS grad	6	40
Vocational/Technical	0	0
Certificate Courses	0	0
College Under grad	0	0
College grad	0	0
No response	0	0
Total	**15**	**100**

Source: JICA Study Team

h. Ethno-Linguistic Profile

As observed in below table, there were only two ethno-linguistic affiliations in the affected HH in the entire Parang East Diversion Road, namely: Cebuano 63.16) and Ilonggo (36.84).

Table 7.11.5-18 No. of Affected Household Heads by Ethno-Linguistic

Ethno-Linguistic Affiliation	Affected House	
	Total	
	No.	%
Maranao	0	0
Iranun	0	0
Maguindanao	0	0
Ilocano	0	0
Cebuano	12	63.16
Illonggo	7	36.84
Teduray	0	0
Lambangian	0	0
Dulangan Manobo	0	0
Higaonon	0	0
IP	0	0
Others	0	0
Total	**19**	**100**

Source: JICA Study Team

Consequently, most of the affected land owners (73.33%) were Cebuano and 26.67% and Ilonggo.

Table 7.11.5-19 No. of Affected Land Lots by Ethno-Linguistic

Ethno-Linguistic Affiliation	Total of Affected lots	
	Total	
	No.	%
Maranao	0	0
Iranun	0	0
Maguindanao	0	0
Ilocano	0	0
Cebuano	11	73.33
Illonggo	4	26.67
Teduray	0	0
Lambangian	0	0
Dulangan Manobo	0	0
Higaonon	0	0
IP	0	0
Others	0	0
Total	**15**	**100**

Source: JICA Study Team

i. Occupation

As shown in below table, 36.84% of the affected HHs were both farmers, and doing business, 21.05% had other occupation and 5% were drivers.

Table 7.11.5-20 No. of Affected Household Heads by Occupation

Occupation	Affected House	
	Total	
	No.	%
Farmer	7	36.84
Fisherman	0	0
Businessman	7	36.84
Govt. Employee	0	0
Driver	1	5.26
Teacher	0	0
Daycare Staff	0	0
Brgy. Official	0	0
Others	4	21.05
Total	**19**	**100**

Source: JICA Study Team

As observed from **Table 7.11.5-21**, 40% of the affected land owners were doing other occupation, 33.33% were businessmen and 26.67% were farmers.

Table 7.11.5-21 No. of Affected Land Lots by Occupation

Occupation	Affected House Affected Land Lots	
	Total	
	No.	%
Farmer	4	26.67
Fisherman	0	0
Businessman	5	33.33
Govt. Employee	0	0
Driver	0	0
Teacher	0	0
Daycare Staff	0	0
Brgy. Official	0	0
Others	6	40
Total	**15**	**100**

Source: JICA Study Team

j. Family Income

As shown in below table, 52.63% of the HHs' monthly income ranges from 10,000 and below and the remaining 47.37% ranges from 10,001 to 20,000.00

Table 7.11.5-22 No. of Affected Household Heads by Monthly Income Bracket

Monthly Income Bracket (PhP)	Affected House	
	Total	
	No.	%
10,000 and Below	10	52.63
10,001 to 20,000	9	47.37
20,001 to 30,000	0	0
30,001 to 40,000	0	0
40,001 to 50,000	0	0
50,001 to 60,000	0	0
60,001 to 70,000	0	0
70,001 to 80,000	0	0
80,001 to 90,000	0	0
90,001 to 100,000	0	0
100,001 to 200,000	0	0
200,001 and above	0	0
No Response	0	0
Total	**19**	**100**

Source: JICA Study Team

As shown in below table it was commonly observed that majority of the monthly income bracket of the affected land owners ranges from 10,000 and below (86.67%).

Table 7.11.5-23 No. of Affected Land Lots by Monthly Income Bracket

Monthly Income Bracket (PhP)	Affected Land Lots	
	Total	
	No.	%
10,000 and Below	13	86.67
10,001 to 20,000	2	13.33
20,001 to 30,000	0	0
30,001 to 40,000	0	0
40,001 to 50,000	0	0
50,001 to 60,000	0	0
60,001 to 70,000	0	0
70,001 to 80,000	0	0
80,001 to 90,000	0	0
90,001 to 100,000	0	0
100,001 to 200,000	0	0
200,001 and above	0	0
No Response	0	0
Total	**15**	**100**

Source: JICA Study Team

k. Willingness to relocate

In instances that there is a need to relocate the affected HHs, hundred percent (100%) of the households expressed their willingness to be displaced/ relocated for this project.

Table 7.11.5-24 Willingness to Relocate

Willingness to Relocate	Affected House	
	Total	
	No.	%
Yes	19	100
No, but will consider	0	0
No	0	0
Don't know	0	0
No Response	0	0
Total	**19**	**100**

Source: JICA Study Team

l. Site Preference for Relocation

Preference of affected households for site relocation is shown in **Table 7.11.5-25**. Eighty-nine percent (89.47%) of affected households expressed their willingness to be relocated in the same lot areas which were not affected by the alignment and the remaining 10.53% preferred to be relocated to the same barangay.

Table 7.11.5-25 Site Preference for Relocation

Site Preference	Affected House	
	Total	
	No.	%
Same Lot	17	89.47
Same Barangay	2	10.53
Other Barangay	0	0
Other Municipality	0	0
Relocation Site	0	0
Other Site	0	0
No Response	0	0
Total	**19**	**100**

Source: JICA Study Team

m. Length of Residence

All of the affected HHs' stayed in the area since birth.

Table 7.11.5-26 No. of Affected Household Heads by Length of Residence

Length of Residence of Sample AH heads	Affected House	
	Total	
	No.	%
Less than 1 year	0	0
1 - 5 years	0	0
6 - 10 years	0	0
Since birth	19	100
No response	0	0
Total	**19**	**100**

Source: JICA Study Team

All (100%) of the affected land owners stayed in the proposed road alignment area since birth.

Table 7.11.5-27 No. of Affected Land Lots by Length of Residence

Length of Residence of Sample AH heads	Affected Land Lots	
	Total	
	No.	%
Less than 1 year	0	0
1 - 5 years	0	0
6 - 10 years	0	0
Since birth	15	100
No response	0	0
Total	**15**	**100**

Source: JICA Study Team

n. Project Acceptability

In terms of project acceptability, one-hundred percent (100%) were in favor of the proposed road alignment in their area. They were able to see more potential benefits in the onset of the project than with the negative effects. However, worries on inconvenience and displacement also surfaced in the survey.

Table 7.11.5-28 Project Acceptability

Project Acceptability	Affected House	
	Total	
	No.	%
Yes	19	100
No	0	0
Don't know	0	0
Total	**19**	**100**

Source: JICA Study Team

In below table, it was observed that most of the affected land owners (86.67%) opposed the Proposed Parang East Diversion Road. They pointed out that the project could potentially displace their livelihood and disrupt their source of living.

Table 7.11.5-29 No. of Affected Land Lots by Project Acceptability

Project Acceptability	Affected Land Lots	
	Total	
	No.	%
Yes	2	13.33
No	13	86.67
Don't know	0	0
Total	**15**	**100**

Source: JICA Study Team

3) Barangays Affected

Table 7.11.5-30 shows the list of affected barangays and properties within the proposed 30 meters road alignment. In terms of the estimated land area per barangay, Making and Nituan recorded the highest land affected privately owned (13 lot owners), followed by Barangay Gumagadong Calawag with 20,174.91sq.m with 2 identified owners while in Barangay Manion affected lands are all inside the Military Reserved Areas which constitutes 22,143.35 sq.m.

Table 7.11.5-30 Affected Properties by Barangay

Municipalities	Barangays	Estimated affected land Area	No. of Affected Properties				
			Affected Land Lots Owner	Affected Structures	Affected HH Heads	Affected PAPs	Lot and Structure
Parang	Nituan	68,725.99	2	0	0	0	0
	Manion	***22,143.35	0	0	0	0	0
	Gumagandong Calawag	20,174.91	2	5	4	31	4
	Making	67,191.868	11	18	15	70	15
TOTAL		**178,236.13**	**15**	***23**	**19**	**101**	****19**

Note: * 19residential houses, 3 waiting sheds and 1 military detachment,
** 19affected households owned both residential structure and lot affected. ,*** Military reserved areas.
Source: JICA Study Team

4) Land Use and Areas Affected

The land use along the proposed alignment is classified into agricultural and residential areas. Since no Comprehensive Land Use Plan (CLUP) provided by the Local Government Units (LGUs) from the Municipalities affected to properly identify the delineation of the residential land, the survey team did an estimated delineation using a GPS.

Table 7.11.5-31 Land Use (sq. m)

Municipalities	Barangays	Residential	Military Reserve	Agricultural	All Lands
		Total Area Affected (sq.m)	Total Area Affected (sq.m)	Total Area Affected (sq.m)	Total Area Affected (sq.m)
Parang	Nituan	4,552.04	24,513.15	39,660.80	68,725.99
	Manion	0	22,143.30	0	22,143.35
	Gumagadong Calawag	411.44	0	14,592.92	20,174.91
	Making	3,285.66	50,832.97	13,073.25	67,191.868
Total		**8,249.14**	**102,660.02**	**67,326.97**	**178,236.13**

Note: Classification is based on the Municipal Assessors
Source: JICA Study Team

5) Structures and Improvements Affected

The structures that will be affected by the alignment are 20 residential structures made up of concrete, semi-concrete, and shanty materials, and 3 structures (non-residential).

Table 7.11.5-32 Affected structures in the area

Municipalities	Affected Barangays	No. of Structures (Residential)	No. of Structures (non-residential)	Total
Parang	Making	16	2	18
	Gumagandong Calawag	4	1	5
Total		**20**	**3**	**23**

Source: JICA Study Team

6) Crops and Trees Affected

Affected crops are summarized in **Table 7.11.5-33**. Most farmers in the area adapted the planting scheme of multi-storey cropping (coconut-corn) and rice production.

Table 7.11.5-33 Affected Area Cultivated with Crops

Municipalities	Barangays	Affected area of crops (sq.m.)		Total
		Palay	Corn	
Parang	Manion	2,212	5,889	8,101
	Nituan	2,208	0	2,208
TOTAL		**4,420**	**5,889**	**10,309**

Source: JICA Study Team

Affected trees along the proposed alignment were inventoried, most of the tree species planted are fruit bearing and harvestable timber as shown in **Table 7.11.5-34**.

Table 7.11.5-34 Affected Trees

Municipality	Affected Barangays	Trees (Fruit Bearing *)	Trees (Timber, Non-Fruit Bearing **)	Plant/ Cash Trees ***
Parang	Making	336	84	0
	Gumagadong Calawag	79	36	0
	Manion	157	122	4
	Nituan	200	191	13
Grand Total		**772**	**433**	**17**

Note:
* Fruit Bearing Trees: Mango, Coconut/ Buco, Jackfruit/ Langka, Santol, Kamatchile, Duhat, Tamarind/ Sampaloc, Aratiles/ Mansanitas, Guava/ Bayabas, Macopa, Kaimito, Avocado, Atis, Casoy/ Kasuy
** Timber, Non-friut Bearing Trees: Narra, Acacia, Talisay, Bangkal, Balite, Gmelina, Falcata, Mahogany
*** Plant, Cash Trees: Banana, Papaya, Atsuete, Cassava, Cacao
Source: JICA Study Team

7) Status of Land Ownership of Affected Lots

Table 7.11.5-35 shows the status of land ownership by category and the possible mitigating/ legal remedies/ options that may help implement the Task Force responsible for Right-of-Way Acquisition of DPWH (Unified Project Management Office). Number of lots shown in the matrix was identified through local guides such as Barangay Officials that helped the RAP team during the inventory. The final list of identified lots are submitted to the Municipal Assessor's Office for verification whether the identified land claimants can be found in their records either they have title or with tax declaration.

Table 7.11.5-35 Status of Land Ownership

Type	Definition	No. of Lots (People)				Total (A)+(B)
		Lots with House			Lots without House (B)	
		Lot owned	Lot not owned	Total (A)		
Case A	Land claimant has a land titled and paying taxes	1	0	1	1	2
		(5)	(0)	(5)	(5)	(10)
Case B	Land claimant has a land title but not paying taxes	0	1	1	1	2
		(0)	(5)	(5)	(5)	(10)
Case C	Claimant has no land title but paying taxes (Tax Declaration)	10	8	18	13	31
		(61)	(49)	(110)	(47)	(157)
Case D	No land title and No Tax Declaration	0	0	0	0	0
		(0)	(0)	(0)	(0)	(0)
TOTAL		**11**	**9**	**20**	**15**	**35**
		(66)	**(54)**	**(120)**	**(57)**	**(177)**

Note:*But in case the land to be acquired for ROW is classified as public land, concerned PAF/Ps will need to provide equity contribution for the purchase of land replacement; such equity contribution for a period of time (15-25 years). In the same manner claims related to resettlement or compensation of the agrarian reform under RA 3844, RA 6389 and RA 6657, the latter is also applicable.
Source: JICA Study Team

(2) Implementation Schedule for RAP

Table 7.11.5-36 summarizes the indicative schedules of the various interrelated activities in relation to the preparation and implementation of the RAP.

Table 7.11.5-36 Resettlement Schedule

Activity	2019				2020				2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
First Disclosure																				
Parcellary Survey																				
Updating of RAP																				
Formulation of MRIC																				
Disclosure of Updated RAP to PAPs																				
Notification of PAPs																				
Compensation																				
Income Restoration																				
Detailed Design																				
ROW Acquisition and RAP																				

Activity	2019				2020				2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Procurement of Contractor																				
Construction																				
Construction Supervision																				
Monitoring and Evaluation																				
Internal Monitoring																				
External Monitoring & Evaluation																				

Source: JICA Study Team

(3) Cost Estimates, Compensation and Entitlements

1) Preliminary ROW Cost Estimates for Land

The current fair market values from the BIR Zonal Computation and an independent property appraiser (IPA) were compared to determine the Estimated ROW Cost of Land. To compute for the total ROW Cost of Land, the highest market value (which in this case was seen to be the current value by the independent property appraiser) was then multiplied by the total affected land area.

Table 7.11.5-37 Comparison of Current Market Value and BIR Zonal Value

Municipality	BIR Zonal Value			Current Market Value (IPA)		
	Residential	Commercial	Agricultural	Residential	Commercial	Agricultural
Parang	99.00	165.00	3.55	400.00	1,500.00	20.00

Note:* The current market value that was set by the independent property appraiser was used for the computation of the estimated market values of the affected land.
Source: JICA Study Team

Estimated market values of affected land in the assumption that all affected land owners have the complete land title is presented in below table**.**

Table 7.11.5-38 Estimated Market Values of Affected Land

Municipality	Land Classification	Affected Land (sq.m)	Unit Price (PhP)	Total Cost (PhP)
Parang	Agricultural	67,326.97	20.00	1,346,539.32
	Residential	8,249.14	400.00	3,299,657.64
Total		**75,576.11**		**4,646,196.95**

Note: The estimated market values of affected land were computed in the assumption that all claimants were qualified for the compensation, provided that they have the Original Certificate of Title and Tax Declarations, or any of the two.
Source: JICA Study Team

2) Preliminary ROW Replacement Cost Estimates for Structures and Improvements

Table 7.11.5-39 Replacement Cost of Residential houses

Barangay	No. of Structures	Total
Gumagandong Calawag	*5	361,550.00
Making	18	2,952,424.50
Total	**23**	**3,313,974.50**

Source: JICA Study Team

3) Preliminary Cost Estimates for Crops and Trees

Table 7.11.5-40 Replacement Cost for crops

Municipality	Crops (sq.m)	Total Area (sq.m)	Cost/ sq.m (PhP/sq.m)	Yield (kg/sq.m)	Total Cost (PhP)
Parang	Corn	5,899	14.00	0.28	23,303.09
	Palay	4,420	16.01	0.36	25,443.49
Total					**48,746.57**

Source: JICA Study Team

Table 7.11.5-41 Replacement Cost for trees

Municipality	Trees (Fruit Bearing *)	Total Cost	Trees (Timber, Non-Fruit Bearing **)	Total Cost	Plant/ Cash Trees ***	Total Cost	Grand Total
Parang	772	355,505.00	433	164,540.00	17	3,570.00	523,615.00
Total	**772**	**355,505.00**	**433**	**164,540.00**	**17**	**3,570.00**	**523,615.00**

Note:
* Fruit Bearing Trees: Mango, Coconut/ Buco, Jackfruit/ Langka, Santol, Kamatchile, Duhat, Tamarind/ Sampaloc, Aratiles/ Mansanitas, Guava/ Bayabas, Macopa, Kaimito, Avocado, Atis, Casoy/ Kasuy
** Timber, Non-friut Bearing Trees: Narra, Acacia, Talisay, Bangkal, Balite, Gmelina, Falcata, Mahogany
*** Plant, Cash Trees: Banana, Papaya, Atsuete, Cassava, Cacao

4) Recommended Preliminary Compensation and Entitlement Packages

The recommended budget for RAP Implementation of Sub-Project 8 is PhP 10,962,412.98 and is part of government counterpart, however the amount is exclusive of other entitlements that are yet to be determined after the completion of the Parcellary Survey of the DPWH. The indicative budget items covering land acquisition and replacement cost of structures, and cost for external monitoring. Contingencies and admin cost are also included. The below table shows the details of the indicative budget to implement this RAP.

Table 7.11.5-42 Indicative Budget for RAP Implementation

Description	Cost Item	Amount	Remarks
Land Acquisition and Structures	Land	4,646,196.95	Estimated based on the current fair market value of Land
	Structures	3,313,974.50	Estimated based the replacement cost
	Subtotal A	**7,960,171.45**	
Compensation	Trees and Cash crops	523,615.00	Estimated based on the current market values of the Maguindanao Provincial Assessor's Office
	Damaged crops	48,746.57	Estimated based on the current market value of the Philippine Statistics Authority
	Subtotal for B	**572,361.57**	
External Monitoring		1,000,000.00	Estimated at PhP 1,000,000 per SP
	Subtotal for C	**1,000,000.00**	
Subtotal (A+B+C)		**9,532,533.03**	
Contingency	10%	953,253.30	
Admin Cost	5%	476,626.65	
GRAND TOTAL		**10,962,412.98**	

Source: JICA Study Team

(4) Stakeholders Meeting for RAP for Sub-Project 8

Table 7.11.5-43 Public Consultation Meetings conducted

Activity	Objective	Venue	Date	Participants	No. of participants	
					M	F
1st Round Meeting	Provide information to the possible Affected households regarding the: • project background • scope • objectives • benefits • update • basic resettlement policies (Philippines and JICA), • cut-off-date and announcement of succeeding resettlement activities such as conduct of perception, census, socioeconomic survey and inventory of losses.	Parang municipal conference room	December 7, 2017	LGU, DPWH, Project affected persons, Tourism and Barangay Officials	56	18

Table 7.11.5-44 Summary of Main Opinions and Concerns raised during the First Public Consultation

Major opinions/concerns	Reflections/countermeasures
Parang	
Affected areas with no land titles	No land/lot title, no compensation – will be strictly followed. Required documents such as Certificate of land title and tax declaration should be secured.
Affected area that traversed military reservation and cemetery	The proposed alignment is not yet final. A copy of the results will be provided per barangay level for confirmation. Cultural heritage will be highly taken into consideration. Affected people and area will also be considered. Information regarding this will be collected during the survey.
Affected people and areas and its compensation	A request will be made to the proponent to provide the affected people the final details of the project once the study will be done. DPWH will pay the acquisition of all affected structures after the conduct of RAP. All affected land area will be justly compensated. All affected trees will be compensated as long as it is included in the inventory during cut offs.
Road alignment area and possible realignment	The proposed road alignment will be the basis of all studies to be conducted by JICA and DPWH. There are alternative routes which are considered as options.
Implementation time of the project	Initial plan will be by June 2018 (as per JICA)

Source: JICA Study Team

Table 7.11.5-45 Barangay Consultation Conducted

Activity	Objective	Venue	Date	Participants	No. of participants	
					PAPs	Non PAPs
2nd Round Meeting	Provide information to the possible Affected households regarding the: • project background • scope • objectives	Parang municipal conference room	Feb 21, 2018	Barangay Officials and PAPs	25	4

	• benefits • update • basic resettlement policies (Philippines and JICA), • cut-off-date and announcement of succeeding resettlement activities such as conduct of perception, census, socioeconomic survey and inventory of losses.					

Table 7.11.5-46 Summary of Main Opinions and Concerns raised during the Barangay Consultation

Major opinions/concerns	Reflections/countermeasures
Parang	
PAPs who are entitled for the compensation	• The DPWH will disclose the compensation for trees and crops after the detailed engineering and it will be discussed in the next public consultation • Section 4 of the R.A 10752 clearly states that the modes of acquiring real property are: (i) donation, (ii) negotiated sale, and (iii) expropriation. Property valuation is market-based and undertaken using Government Financial Institutions (GFIs) or Independent Property Appraisers which help promotes unbiased property valuation. The assumption by the IA of the capital gains tax also provides supplementary incentive to the lot owners to negotiate with government. All these things will be further discussed by DPWH representatives and consultant in the second public consultation.
Payment for tree or the unit for costing of crops and the basis for compensating the properties will be affected.	The proposed alignment is not yet final. A copy of the results will be provided per barangay level for confirmation. Cultural heritage will be highly taken into consideration. Affected people and area will also be considered. Information regarding this will be collected during the survey.
Valid proof of ownership for land and how they will be paid.	PAP with Transfer/ Certificate of Title or tax Declaration (Tax declaration legalized to full title). The following topics are also discussed to them: • Holders of free or homesteads patens and Holders of Certificates of Land Ownership (CLOA) under CA 141. Public Lands act will be compensated on land improvements only. • Public Lands Act will be granted under Comprehensive Agrarian Reform Act shall be compensated for the land at Zonal value. • If granted under Voluntary Offer to sell by the Landowner. CLOA issued under CA 141 shall be subject to the provisions of Section 112 of Public Lands Act shall receive compensation for damaged crops at market value at the time of taking.

*Interview was administered by the help of Barangay Officials for those PAPs who were not able to attend during the consultation meeting.

(5) Focus Group Discussions among Women and Youth

In order to ensure public involvement, through the process of resettlement planning, Notre Dame University (NDU) conducted the focus group discussions (FGDs) for the vulnerable groups or persons, such as women and youth.

The date and venue of the FGD meetings was informed to the affected LGUs such as municipalities and barangays by the official request letter from NDU. In order to gather and reflect public opinions of the affected PAFs.

1) Awareness of the Project

The FGD respondents noted that they are not aware of the road project proposed in their barangays. This is noted among all the respondents—household heads, women and youth groups.

Table 7.11.5-47 Awareness of Road Constructions

Mun	Barangay	Groups	
		Women	Youth
Parang	Nituan	Not aware	Not aware
	Gumagadong Calawag	Not aware	Not aware
	Making	Not aware	Not aware
	Manion	Not aware	Not aware

Source: Social Survey of NDU

2) Impact of Poor Road

When asked about the impact of lack of road to the community, five major areas were raised. First is the difficulty, expensive and high cost incurred in the transport of farm products to the highway/ market due to double handling, with only the laborers or horses carrying the products/goods despite the thick mud, slippage, dirt waters and heavy floods they have to endure in barefoot. In the long run, some farm products get spoiled and damaged before they can be brought to the market. Second is in dealing with emergency cases especially on health concerns of the sick to go to hospitals. Third is the experience of the children hurdling the mud, floods, and longer time to walk to attend school or even get absent because of lack of roads. Another difficulty is the sourcing out of drinking water for the households. Others have noted the hazard of criminality as the criminals are hard to track down hiding is easy without road patterns.

Table 7.11.5-48 Impact of Road to the Community

Mun	Barangay	Impact of Lack of Road to Community	
		Women	Youth
Parang	Nituan	• supply of drinking water tankers difficult to enter the barangay • drivers charge double pay to transport from homes to nearest road, from road to poblacion/ market. • difficult during emergencies going to hospitals • children find difficult to go to school • community suffers from mud and dirt waters during heavy rains	• roads are slippery during rains and paying-payong tre scarce • transport cannot reach the upper areas • prone to floods, the students are absent from class • accidents become a problem
	Gumagadong Calawag	• expensive transport cost of farm products • farm products get damaged before reaching the market • additional worry for families with children going to school • hassle for the family during rainy season	• slippery road when raining • students from the upper areas are discouraged to go to school • difficult to transport farm products • caused to delayed transactions
	Making	• expensive farm transport cost lowers farm income for the family	• puroks far from the center are hard to reach, people only hike

		• likely health ill-effects of walking in the rough road • financial effect of higher fare due to rough road	• difficult to go to school with rough and slippery roads • difficulty during times of emergencies like going to hospital • few habal habal transport route the area • students experience damaged shoes and dirty uniforms when it rain
	Manion	• difficulty of transport of farm products from the sitios • only paying-payong or single motor vehicles are available • people from farther sitios take long walks to reach the main road	• the roads get stocked up during rains and vehicles cannot readily pass the road • delay the delivery of products from farm to nearest municipality • students wait for hours to get paying-payong transport to go to school

Source: Social Survey of NDU

3) Main Source of Economic

The major source of income of households is farming with corn, coconut and rice in most barangays. Others farm with fruit trees and vegetables to generate income.

Table 7.11.5-49 Main Source of Economic Means

Mun	Brgy	Main Source of economic Means/ Income			
		First	Second	Third	Fourth
Parang	Nituan	Coconut	Charcoal making	Corn	Fruits
	Gumagadong Calawag	Corn	Fruits	Rice	Coconut
	Making	Coconut	Corn	Rice	Vegetables
	Manion	Corn	Rice	Coconut	Banana

Source: Social Survey of NDU

4) Negative Impact of Road Construction and Proposed Solutions

When the road is constructed, many respondents said that there are no negative impacts of road construction. However, other respondents mentioned some negative impact. Respondents mentioned that some families living near the site of the road maybe displaced because of road construction. Road accidents can also happen when vehicles pass the road with speed. Security of the families can be a concern as more people can come and go in the community with good road.

Table 7.11.5-50 Negative Impact of Road Constructions

Municipality	Barangay	Negative Impact of Road Project			
		Women		Youth	
		Negative Impact	Solutions	Negative Impact	Solutions
Parang	Nituan	• none	• none	• there might be corruption: implement the road project in partnership with NGOs or other agencies	• implement the road project in partnership with NGOs or other agencies
	Gumagadong Calawag	• competitions with paying-payong transport service	• not a big problem anyhow so no solutions were cited	• substandard materials: follow the required standards • problem of corruption: they must work with honesty	• follow the required standards • they must work with honesty

	Making	• road accidents may happen as vehicles will pass the road with speed • security of the people may be a concern as more people can come and go	• provide sign boards and make proper coordination with officials of affected barangays	• in government, corruption is rampant: as youth leaders, we have to be vigilant and be educated: hire people who are honest: projects must be monitored	• as youth leaders, we have to be vigilant and be educated: hire people who are honest: projects must be monitored
	Manion		• none	• increase road accident: the barangay should implement an ordinance covering speed limit and place warning signs • possible increase in crimes: establish barangay outposts or BPAT along the road and intensify the barangay patrol activities	• the barangay should implement an ordinance covering speed limit and place warning signs • establish barangay outposts or BPAT along the road and intensify the barangay patrol activities

Source: Social Survey of NDU

5) Perception towards DPWH as Road Contractor

The respondents agree with DPWH as the road constructor in their community. They said that DPWH is the government agency responsible, tasked and authorized for such construction. The community cannot afford to construct roads.

6) Negative Impact of Road Construction and Proposed Solutions

When asked what support the community can give to the DPWH Project Team, the respondents said they can provide food, snacks, water, accommodation and security to the project workers. Others said they can also volunteer to work like bayanihan with or without pay, build temporary shelters for them in the area, secure the safety of the construction materials, explain to community members who are affected or displaced by the project, assist and serve as guide for the team to fast tract the project.

7) Summary

The survey respondents comprising household heads, women and youth are not aware of the road project proposed in Parang East Diverssion road.

When asked about the impact of lack of road to their community, they reported the high cost of transport of farm products to the highway/ market due to double handling; the struggle of laborers or horses to transport the products/goods through the thick mud, slippage, dirt waters and heavy floods; less access to basic services especially with emergency cases like health; the children's difficulty in attending school; inaccessibility of securing safe drinking water for the family; and the risk of criminality in the area.

The respondents reported the main sources of economic means in the barangay to include farming with corn, coconut and rice as the major crop in farming. Other sources include farming with fruit trees and vegetables, fishing, vending and small business.

With the road construction, the respondents gave positive impact to the barangays-- transportation benefits for farm products, children, and commuters; increase income for reduced transportation costs and fare for farming and fishing; increase income for reduced transportation costs and fare for farming and fishing; promotion of business ventures; increase the flow of transport facilities to access to hospitals, church, markets and many other daily activities; and promote clean surroundings without the flood rubbles and wastes scattering around.

Respondents said there are no negative impacts of road construction. However, families living near the site of the road may be displaced. They mentioned road accidents for speed driving and barangay security as negative impact.

The respondents agree that DPWH is the government agency responsible, tasked and authorized for road construction. To support the road project, they mentioned that the barangay community can provide food, snacks, water, accommodation, and guide and security to the project workers and construction materials.

7.11.6 Summary of Resettlement Action Plan (RAP) for Sub-Project 9

(1) Social Environment Situation of Sub-Project 9

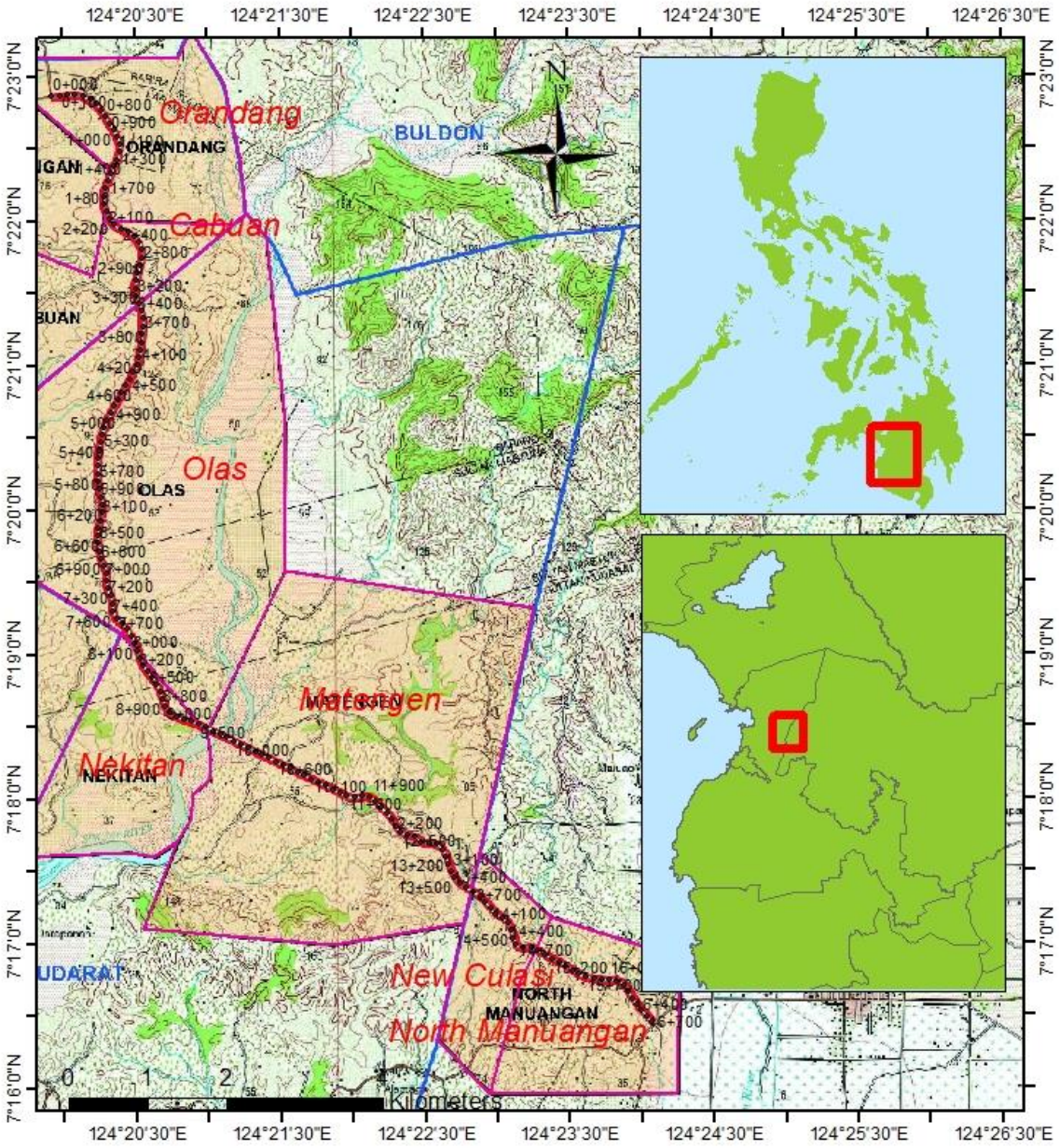
1) Project Description

The **Manuangan – Parang Road**–Sub-Project 9 covers 16.8 km length and traverses the municipality of Parang, Sultan Kudarat, and Pigcawayan in the provinces of Maguindanao and North Cotabato, respectively. The alignment passes through barangays Gadungan, Orandang, Cabuan, Olas, Nekitan, Matengen, North Manuangan, andNew Culasi (**Figure 7.11.6-1**). This road segment aims to increase connectivity by linking three primary inter-city roads of Cotabato-Marawi Road, Cotabato-Davao Road, Cotabato-Gen. Santos Road. As such it will support/ enhance economic productivity along these areas with high agri-industrial activities and quarrying industry as the primary source of income among the people. Furthermore, the construction of this road will support by providing better access to the markets.

Table 7.11.6-1 Details of Manuangan - Parang Road Alignment and Road Length

Province	Municipality	Barangay	Road Length (km)
Maguindanao	Parang	Gadungan	0.3
		Orandang	1.9
		Cabuan	1.3
	Sultan Kudarat	Olas	1.3
		Nekitan	4.8
		Matengen	4.2
North Cotabato	Pigcawayan	North Manuangan	1.8
		New Culasi	1.2
Total			**16.8**

Source: JICA Study Team



Source: JICA Study Team

Figure 7.11.6-1 Location Map of Manuangan- Parang Road – Sub-Project 9

2) Socio-Economic Profile of the Project-affected Persons

Based on the conducted socio-economic survey, a total of eleven (11) affected household heads (AHHs) and Thirty-two (32) affected land lot owners were interviewed as shown in **Table 7.11.6-2**.

Table 7.11.6-2 Summary of Potential Number Affected Structures and Land Lots

Loss category	Parang	SultangKudarat	Pigcawayan	Grand Total
Affected House Heads	8	3	0	11
Affected Structures	8	3	0	11
Affected Land Lot Owners	4	20	8	32

Note: * 4 residential houses occupied and 1 house not occupied.
Source: JICA Study Team

A total of 504,343 sq.m of land with crops and trees will be affected by the alignment as summarized in **Table 7.11.6-3**. Majority of the cultivated crops that will be affected are corn and palay.

Table 7.11.6-3 Summary of Affected Land and Types of Cultivated Crops

Loss category	Unit	Parang	Sultan Kudarat	Pigcawayan	Total
Affected agricultural lands with corn	m2	8,092	34,582	16,929	74,132.00
Affected agricultural lands with palay	m2	24,524	16,152	5,282	80,368.00
Affected Fruit bearing trees	No. of trees	408	197	54	659
Affected trees (Timber / non-fruit bearing)	No. of trees	151	21	18	190
Plant/Cash Trees	No. of trees	2	9	121	132
Total affected land area (sq. m.)	m2	105,209	307,642	91,492	504,343

Source: JICA Study Team

a. Household Size

Majority or 8 (72.73%) of the AHHs' size ranges from 1-5 members followed by 6-10 members while there are no HHs' in 11-above.

Table 7.11.6-4 No. of Affected Household Heads by Household Size

Household Size	Total Affected Houses				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
1-5	7	1	0	8	72.73
6-10	1	2	0	3	27.27
11-above	0	0	0	0	0
Total	**8**	**3**	**0**	**11**	**100**

Source: JICA Study Team

Majority or 14 (43.75%) of the affected land lot owners' size ranges from 6-10 members while 11 (34.38%) and 7 (21.88%) for 1-5 members.

Table 7.11.6-5 No. of Affected Land Lots by Household Size

Household Size	Total Affected Land/Lots				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
1-5	3	8	0	11	34.38
6-10	1	5	8	14	43.75
11-above	0	7	0	7	21.88
Total	**4**	**20**	**8**	**32**	**100**

Source: JICA Study Team

b. Household Structure

The common family structure that can be observed along the Manuangan-Parang Alignment was composed of extended family structure (63.64%) followed by nuclear structure (27.27%). The remaining 9.09% of the affected HHs have a single structure.

Table 7.11.6-6 No. of Affected Household Heads by Household Structures

Household Structure	Total Affected Houses				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Single	1	0	0	1	9.09
Nuclear	1	2	0	3	27.27
Extended	1	6	0	7	63.64
Joint	0	0	0	0	0
Total	**3**	**8**	**0**	**11**	**100**

Source: JICA Study Team

In terms of family structure of the affected land lot owners, majority have household structure type of nuclear with 59.38% while 18.18%have an extended structure in which relatives are also leaving together with the parents and children.

Table 7.11.6-7 No. of Affected Land Lots by Household Structures

Household Structure	Total Affected Land/Lots				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Single	2	3	0	5	15.63
Nuclear	1	10	8	19	59.38
Extended	1	5	0	6	18.75
Joint	0	2	0	2	6.25
Total	**4**	**20**	**8**	**32**	**100**

Source: JICA Study Team

c. Gender Distribution

In terms of gender distribution, majority of PAPs with affected houses and land lots are headed by female 18 (56.25%). Likewise, on the affected land lots, out of 32 AHHs, 18 (56.25%) are headed by female.

Table 7.11.6-8 No. of Affected Household Heads by Gender

Gender	Total Affected Houses				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Male	2	9	3	14	43.75
Female	2	11	5	18	56.25
Total	**4**	**20**	**8**	**32**	**100**

Source: JICA Study Team

Table 7.11.6-9 No. of Affected Lands Lots Owners by Gender

Gender	Total Affected Land/Lots				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Male	2	9	3	14	43.75
Female	2	11	5	18	56.25
Total	**4**	**20**	**8**	**32**	**100**

Source: JICA Study Team

d. Civil Status

The civil status of most or 10 (90.91%) AHHs are married followed by widowed with 1 (9.09%) as shown in below table.

Table 7.11.6-10 No. of Affected Household by Civil Status

Civil Status	Total Affected Houses				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Single	0	0	0	0	0
Married	8	2	0	10	90.91
Window/er	0	0	0	0	0
Live-in	0	1	0	1	9.09
Single Parent	0	0	0	0	0
No Response	0	0	0	0	0
Total	**8**	**3**	**0**	**11**	**100**

Source: JICA Study Team

On the other hand, majority of the land lot owner's civil status are married 27 (84.38%) followed by Live-in with 5 (15.63%) as shown in below table.

Table 7.11.6-11 No. of Lands/Lots by Civil Status

Civil Status	Total Affected Land/Lots				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Single	0	0	0	0	0
Married	4	15	8	27	84.38
Window/er	0	0	0	0	0
Live-in	0	5	0	5	15.63
Single Parent	0	0	0	0	0
No Response	0	0	0	0	0
Total	**4**	**20**	**8**	**32**	**100**

Source: JICA Study Team

e. Age Distribution

Majority of the AHHs' age ranges from 25-29 years old followed by 40-44 years old, 45-49 years old, and 50-54 years old, while only 1 AHH with age ranges35-39 years old and 60-61 years old.

Table 7.11.6-12 No. of Affected Households by Age

Age	Total Affected Houses				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
15-19	0	0	0	0	0
20-24	0	0	0	0	0
25-29	3	0	0	3	27.27
30-34	0	0	0	0	0
35-39	1	0	0	1	9.09
40-44	1	1	0	2	18.18
45-49	1	1	0	2	18.18
50-54	1	1	0	2	18.18
55-59	0	0	0	0	0
60-64	1	0	0	1	9.09
65-69	0	0	0	0	0
70-74	0	0	0	0	0
75-79	0	0	0	0	0
80+	0	0	0	0	0
No response	0	0	0	0	0
Total	**8**	**3**	**0**	**11**	**100**

Source: JICA Study Team

Majority or 25% of the affected land lot owners age ranges 50-54 years old followed by 35-39 years old (21.38%), 45-49 years old (15.63%), 30-34 years old (12.50%), 60-64 years old (9.38%) and 40-44 years old (6.25%), and the remaining have ages 55-59, 65- 69 and 70-74 years old. This indicates that most of the land lots owners have no land ownership due to the old titling of practiced.

Table 7.11.6-13 No. of Affected Land Lots Owners by Age

Age	Total Affected Land/Lots				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
15-19	0	0	0	0	0
20-24	0	0	0	0	0
25-29	0	0	0	0	0

Age	Total Affected Land/Lots				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
30-34	0	1	3	4	12.50
35-39	1	1	5	7	21.88
40-44	1	1	0	2	6.25
45-49	0	5	0	5	15.63
50-54	1	7	0	8	25.00
55-59	0	1	0	1	3.13
60-64	1	2	0	3	9.38
65-69	0	1	0	1	3.13
70-74	0	1	0	2	3.13
75-79	0	0	0	0	0
80+	0	0	0	0	0
No response	0	0	0	0	0
Total	**4**	**20**	**8**	**32**	**100**

Source: JICA Study Team

f. Religious Affiliation

Majority or 4 (36.4%) of the affected HHs' are Roman Catholic followed by Born Again Christian and Islam (27.3%), while other religious sector has only 1 (9.09%).

Table 7.11.6-14 No. of Affected Household Heads by Religion

Religion	Total Affected Houses				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Roman Catholic	4	0	0	4	36.36
Iglesia ni Cristo	0	0	0	0	0
Baptist	0	0	0	0	0
Born Again Christian	3	0	0	3	27.27
Islam	0	3	0	3	27.27
Others	1	0	0	1	9.09
No Response	0	0	0	0	0
Total	**8**	**3**	**0**	**11**	**100**

Source: JICA Study Team

Majority or 25 (78.13) of the affected HHs' are Islam followed by Roman Catholic (15.63%), and other religious sectors (3.13%).

Table 7.11.6-15 No. of Affected Land Lots Owner by Religion

Religion	Total Affected Land/Lots				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Roman Catholic	2	0	3	5	2
Iglesiani Cristo	0	0	0	0	0
Baptist	0	0	0	0	0
Born Again Christian	1	0	0	1	1
Islam	0	20	5	25	0
Others	1	0	0	1	1
No Response	0	0	0	0	0
Total	**4**	**20**	**8**	**32**	**4**

Source: JICA Study Team

g. Educational Attainment

Majority or 5 (45.45%) of the respondents attended high school education but were not able to finish, both high school graduate and vocational/technical with 18.18%, and certificate of courses and college undergrad with both 9.09%. This indicates that remote communities were having difficulties in going to school due to access and expensive transportation.

Table 7.11.6-16 No. of Affected Household Heads by Educational Attainment

Education	Total Affected Houses				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
No formal education	0	0	0	0	0
Elem. level	0	0	0	0	0
Elem. Grad	0	0	0	0	0
HS Under grad	5	0	0	5	45.45
HS grad	1	1	0	2	18.18
Vocational/Technical	2	0	0	2	18.18
Certificate Courses	0	1	0	1	9.09
College Under grad	0	1	0	1	9.09
College grad	0	0	0	0	0
No response	0	0	0	0	0
Total	**8**	**3**	**0**	**11**	**100**

Source: JICA Study Team

Majority or 14 (43.75%) of the affected HHs' have attained the highest educational degree of high school graduate only followed by high school under grad (21.88%), elementary graduate (18.75%), college graduate (6.25%), while both no formal education and pre-school has only 3.13%.

Table 7.11.6-17 No. of Affected Land Lots by Educational Attainment

Education	Total Affected Lands/Lot				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
No formal education	0	1	0	1	3.13
Elem. level	0	1	0	1	3.13
Elem. Grad	1	5	0	6	18.75
HS Under grad	1	3	3	7	21.88
HS grad	1	8	5	14	43.75
Vocational/Technical	1	0	0	1	3.13
Certificate Courses	0	0	0	0	0
College Under grad	0	0	0	0	0
College grad	0	2	0	2	6.25
No response	0	0	0	0	0
Total	**4**	**20**	**8**	**32**	**100**

Source: JICA Study Team

h. Ethno-Linguistic Profile

In terms of the ethno-linguistic profile of the affected household heads, majority of the affected HHs' belonged to the Cebuano Tribe (45.45%) followed by Ilonggo (27.27%), and Iranun (18.18%). The ethno-linguistic data can further support the claim that there are no indigenous people present within the proposed alignment.

Table 7.11.6-18 No. of Affected Household Heads by Ethno-Linguistic

Ethno-Linguistic	Total Affected Houses				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Maranao	0	0	0	0	0
Iranun	0	2	0	2	18.18
Maguindanao	0	1	0	1	9.09
Ilocano	0	0	0	0	0
Cebuano	5	0	0	5	45.45
Illonggo	3	0	0	3	27.27
Teduray	0	0	0	0	0
Lambangian	0	0	0	0	0
Dulangan Manobo	0	0	0	0	0
Higaonon	0	0	0	0	0
IP	0	0	0	0	0
Others	0	0	0	0	0
Total	**8**	**3**	**0**	**11**	**100**

Source: JICA Study Team

Majority or 19 (59.38%) of the affected land owners are Iranun followed by Maguindanaon (25.00%), Cebuano (9.38%) and the remaining are Ilonggo and others with both 3.13%.

Table 7.11.6-19 No. of Affected Land Lots by Ethno-Linguistic

Ethno-Linguistic	Total Affected Land/Lots				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Maranao	0	0	0	0	0
Iranun	0	16	3	19	59.38
Maguindanao	0	3	5	8	25.00
Ilocano	0	0	0	0	0
Cebuano	3	0	0	3	9.38
Illonggo	1	0	0	1	3.13
Teduray	0	0	0	0	0
Lambangian	0	0	0	0	0
Dulangan Manobo	0	0	0	0	0
Higaonon	0	0	0	0	0
IP	0	0	0	0	0
Others	0	1	0	1	3.13
Total	**4**	**19**	**8**	**32**	**100**

Source: JICA Study Team

i. Occupation

Majority or 4 (36.36%) of the affected HHs' were engaged in business while others were engaged in other work such as farming (18.2%), driving and day care staff with both 9.09%.

Table 7.11.6-20 No. of Affected Household Heads by Occupation

Occupation	Total Affected Houses				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Farmer	1	0	1	2	18.18
Fisherman	0	0	0	0	0
Businessman	3	1	0	4	36.36
Govt. Employee	0	0	0	0	0
Driver	1	0	0	1	9.09
Teacher	0	0	0	0	0
Daycare Staff	0	1	0	1	9.09
Brgy. Official	0	0	0	0	0
Others	3	1	0	4	36.36
Total	**8**	**2**	**1**	**11**	**100**

Source: JICA Study Team

Majority or 17 (53.13%)of the affected land lot owners were engaged in farming followed by others occupation of the affected land owners with 7 (21.88%)while the remaining lot owners engaged in business, government, driving, day care staff, barangay officials and other works.

Table 7.11.6-21 No. of Affected Land Lots by Occupation

Occupation	Total Affected Land/Lots				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Farmer	1	11	5	17	53.13
Fisherman	0	0	0	0	0
Businessman	1	2	0	3	9.38
Govt. Employee	0	2	0	2	6.25
Driver	0	1	0	1	3.13
Teacher	0	0	0	0	0
Daycare Staff	0	1	0	1	3.13
Brgy. Official	0	1	0	1	3.13
Others	2	2	3	7	21.88
Total	**4**	**20**	**8**	**32**	**100**

Source: JICA Study Team

j. Family Income

Majority or 4 (36.36%) of the affected HHs' have an estimated family income ranges PhP 10,001 to 20,000. Income bracket of 3 ranges from PhP20,001 to 30,000 and the remaining are with family income of 10,000 and below, 30,001 to 40,000, 50,001 to 60,000 and 70,001 to 80,000.

Table 7.11.6-22 No. of Affected Household Heads by Monthly Income Bracket

Monthly Income Bracket (PhP)	Total Affected Houses				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
10,000 and below	1	0	0	1	9.09
10,001 to 20,000	3	1	0	4	36.36

Monthly Income Bracket (PhP)	Total Affected Houses				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
20,0001 to 30,000	2	1	0	3	27.27
30,001 to 40,000	0	1	0	1	9.09
40,001 to 50,000	0	0	0	0	0.00
50,001 to 60,000	1	0	0	1	9.09
60,001 to 70,000	0	0	0	0	0.00
70.001 to 80,000	1	0	0	1	9.09
80,001 to 90,000	0	0	0	0	0.00
90,001 to 100,000	0	0	0	0	0.00
100,001 to 200,000	0	0	0	0	0.00
200,001 and above	0	0	0	0	0.00
Total	8	3	0	11	100.00

Source: JICA Study Team

Majority or 19 of the affected land lot owners have an estimated family income ranges PhP 10,000 and below. Income bracket of 4 ranges from PhP10,000 to 20,000 and 40,001 to 50,000followed by PhP20,001 to PhP 30,000 ranges 360,001 to 70,000 ranges 2, while bracket ranges 1 are 30,001 to 40,000, 50,001 to 60,000, and 70,001 to 80,000.

Table 7.11.6-23 No. of Affected Land Lots by Monthly Income Bracket

Monthly Income Bracket (PhP)	Total Affected Land/Lots				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
10,000 and below	1	13	5	19	54.29
10,001 to 20,000	2	2	0	4	11.43
20,0001 to 30,000	1	2	0	3	8.57
30,001 to 40,000	0	1	0	1	2.86
40,001 to 50,000	0	1	3	4	11.43
50,001 to 60,000	0	1	0	1	2.86
60,001 to 70,000	0	2	0	2	5.71
70.001 to 80,000	0	1	0	1	2.86
80,001 to 90,000	0	2	0	0	0.00
90,001 to 100,000	0	0	0	0	0.00
100,001 to 200,000	0	0	0	0	0.00
200,001 and above	0	0	0	0	0.00
Total	4	25	8	35	100.0

Source: JICA Study Team

k. Willingness to relocate

In instances that there is a need to relocate the affected HHs, hundred percent (100%) of the households expressed their willingness to be displaced/ relocated for this project.

Table 7.11.6-24 Willingness to Relocate

Willingness to relocate	Affected Houses				
	Parang	Sultan Kudarat	Pigkawayan	Total	
				No.	%
Yes	8	3	0	11	100
No, but will consider	0	0	0	0	0
No	0	0	0	0	0
Don't know	0	0	0	0	0
No Response	0	0	0	0	0
Yes	**8**	**3**	**0**	**11**	**100**
Total	8	3	0	11	100

Source: JICA Study Team

l. Site Preference for Relocation

Preference of affected households for site relocation is shown in below table. One hundred percent (100%) of affected households expressed their willingness to be relocated in the same lot areas which were not affected by the alignment.

Table 7.11.6-25 Site Preference for Relocation

Preferred Relocation Site of AHs	Affected Houses				
	Parang	Sultan Kudarat	Pigkawayan	Total	
				No.	%
Same Lot	8	3	0	11	100
Same Barangay	0	0	0	0	0
Other Barangay	0	0	0	0	0
Other Municipality	0	0	0	0	0
Relocation Site	0	0	0	0	0
Other Site	0	0	0	0	0
No Response	0	0	0	0	0
Total	**8**	**3**	**0**	**11**	**100**

Source: JICA Study Team

m. Length of Residence

It was commonly observed that most of the affected HHs' were staying in the area since birth as well as the affected land lot owners as shown in below table.

Table 7.11.6-26 No. of Affected Household Heads by Length of Residence

Length of Residence of Sample AH heads	Affected House				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Less than 1 year	0	0	0	0	0
1 - 5 years	0	0	0	0	0.00

6 - 10 years	1	0	0	1	9.09
Since birth	7	3	0	10	90.91
No response	0	0	0	0	0.00
Total	**8**	**3**	**0**	**11**	**100**

Source: JICA Study Team

Table 7.11.6-27 No. of Affected Land Lots by Length of Residence

Length of Residence	Affected Land/Lots				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Less than 1 year	0	0	0	0	0.00
1 - 5 years	0	1	0	1	3.13
6 - 10 years	0	1	0	1	3.13
Since birth	4	18	8	30	68.75
No response	0	0	0	0	0.00
Total	**4**	**20**	**8**	**32**	100

Source: JICA Study Team

n. Project Acceptability

In terms of project acceptability, one-hundred percent (100%) were in favor of the proposed road alignment in their area. They were able to see more potential benefits in the onset of the project than with the negative effects. However, worries on inconvenience and displacement also surfaced in the survey.

Table 7.11.6-28 Project Acceptability

Project Acceptability	Affected Houses				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Yes	8	3	0	11	100
No	0	0	0	0	0
Don't know	0	0	0	0	0
No response	0	0	0	0	0
Total	**8**	**3**	**0**	**11**	**100**

Source: JICA Study Team

Table 7.11.6-29 No. of Affected Land Lots by Project Acceptability

Project Acceptability	Affected Land/Lots				
	Parang	Sultan Kudarat	Pigcawayan	Total	
				No.	%
Yes	4	20	7	31	97.0
No	0	0	1	1	3.0
Don't know	0	0	0	0	0
No response	0	0	0	0	0
Total	**4**	**20**	**8**	**32**	**100**

Source: JICA Study Team

3) Barangays Affected

Table 7.11.6-30 shows the list of affected barangays and properties within the proposed 30 meters road alignment. In terms of the estimated land area per barangay, Orandang, Cabuan, Olas, Nekitan, and Matengen of Maguindanao and North Manuangan, and New Culasi, North Cotabato with 504,343 sq.m.

Barangay Matengen in Sultan Kudarat recorded the highest affected land lots with 11 owners while barangay Orandang and Cabuan has the highest recorded affected household heads with a total of 8 owners.

Table 7.11.6-30 Affected Properties by Barangay

Municipalities	Barangays	Estimated affected land Area	No. of Affected Properties			
			Affected Land Lots Owner	Affected Houses / Structures		
				Affected Structures	Affected HH Heads	Affected PPAPs
Parang, Maguindanao	Gadungan	8,365				
	Orandang	58,841	2	4	4	32
	Cabuan	38,003	2	4	4	22
	Sub-total	**105,209.00**	**4**	**8**	**8**	**54**
Sultan Kudarat, Maguindanao	Olas	144,614	9	0	0	0
	Nekitan	39,433	0	0	0	0
	Matengen	123,595	11	2	2	7
	Sub-total	**307,642.00**	**19**	**2**	**2**	**7**
Pigcawayan, North Cotabato	North Manuangan	55,352	7	0	0	0
	New Culasi	36,140	1	0	0	0
	Sub-total	**91,492.00**	**8**	**0**	**0**	**0**
TOTAL		504,343.00	**32**	**11**	**11**	**76**

Source: JICA Study Team

4) Land Use and Areas Affected

The land uses along the proposed alignment are classified into agricultural and residential areas. The estimation and delineation of land areas was based on the Comprehensive Land Use Plan (CLUP) provided by the Local Government Units (LGUs) of Parang, Sultan Kudarat, and Pigcawayan.

Table 7.11.6-31 Land Use (sq. m)

Municipalities	Barangays	Residential	Agricultural	All Lands
Parang, Maguindanao	Gadungan	0	8,365	8,365
	Orandang	2,522	56,319	58,841
	Cabuan	774	37,229	38,003
	Sub-total	**3,296**	**101,913**	**105,209**
Sultan Kudarat, Maguindanao	Olas	659	143,955	144,614
	Nekitan	0	39,433	39,433
	Matengen	0	123,595	123,595
	Sub-total	**659**	**306,983**	**307,642**
Pigcawayan, North Cotabato	North Manuangan	0	55,352	55,352
	New Culasi	0	36,140	36,140
	Sub-total	**0**	**91,492**	**91,492**
TOTAL		**3,955.00**	**500,388.00**	**504,343.00**

Source: JICA Study Team

5) Structures and Improvements Affected

The structures that will be affected by the alignment are 11 houses made up of concrete, semi-concrete, and shanty materials.

Table 7.11.6-32 Affected structures in the area

Municipalities	Barangays	No. of House	No. of Commercial Structures	Total
Parang	Orandang	4	0	4
	Cabuan	4	0	4
Sultan Kudarat	Olas	1	0	1
	Nekitan	0	0	0
	Matengen	2	0	2
Pigcawayan	North Manuangan	0	0	0
	New Culasi	0	0	0
TOTAL		**11**	**0**	**11**

Source: JICA Study Team

6) Crops and Trees Affected

Affected crops are summarized in **Table 7.11.6-33**. Most farmers in the area adapted the multi-storey cropping (coconut-corn) and rice fields were supported by irrigation.

Table 7.11.6-33 Affected Area Cultivated with Crops

Municipalities	Barangays	Affected area of crops (sq.m.)		Total
		Corn	Palay	
Parang	Orandang	8,092	0	8,092
	Cabuan	0	24,524	24,524
Sultan Kudarat	Olas	0	14,990	14,990
	Nekitan	2,503	0	2,503
	Matengen	32,079	1,162	33,241
Pigcawayan	North Manuangan	0	0	0
	New Culasi	16,929	5,282	22,211
TOTAL		**111,600**	**42,900**	**149,400**

Source: JICA Study Team

Affected trees along the proposed alignment were inventoried; most of the tree species planted are fruit bearing and harvestable timber as shown in **Table 7.11.6-34**.

Table 7.11.6-34 Affected Trees

Municipality	Trees (Fruit Bearing *)	Trees (Timber/ Non-fruit Bearing **)	Plant/ CashTrees ***	Total
Parang	408	151	2	561
Sultan Kudarat	197	21	9	227
Pigcawayan	54	18	121	193
Total	**659**	**190**	**132**	**981**

Note:
* Fruit Bearing Trees: Mango, Coconut/ Buco, Jackfruit/ Langka, Santol, Kamatchile, Duhat, Tamarind/ Sampaloc, Aratiles/ Mansanitas, Guava/ Bayabas, Macopa, Kaimito, Avocado, Atis, Casoy/ Kasuy
** Timber, Non-friut Bearing Trees: Narra, Acacia, Talisay, Bangkal, Balite, Gmelina, Falcata, Mahogany
*** Plant, Cash Trees: Banana, Papaya, Atsuete, Cassava, Cacao
Source: JICA Study Team

7) Status of Land Ownership of Affected Lots

Table 7.11.6-35 shows the status of land ownership by category and the possible mitigating/ legal remedies/ options that may help implement the Task Force responsible for Right-of-Way Acquisition of DPWH (Unified Project Management Office). Number of lots shown in the matrix was identified through local guides such as Barangay Officials that helped the RAP team during the inventory. The final list of identified lots are submitted to the Municipal Assessor's Office for verification whether the identified land claimants can be found in their records either they have title or with tax declaration

Table 7.11.6-35 Status of Land Ownership

Type	Definition	No. of Lots (People)				Total (A)+(B)
		Lots with House			Lots without House (B)	
		Lot owned	Lot not owned	Total (A)		
Case A	Land claimant has a land titled and paying taxes	0	5	5	9	14
		(0)	(35)	(35)	(70)	(105)
Case B	Land claimant has a land title but not paying taxes	0	2	2	4	6
		(0)	(14)	(14)	(31)	(45)
Case C	Claimant has no land title but paying taxes (Tax Declaration)	0	4	4	8	12
		(0)	(27)	(27)	(63)	(90)
Case D	No land title and No Tax Declaration	0	0	0	0	0
		(0)	(0)	(0)	(0)	(0)
TOTAL		**0**	**11**	**11**	**21**	**32**
		(0)	**(76)**	**(76)**	**(164)**	**(240)**

Note:*But in case the land to be acquired for ROW is classified as public land, concerned PAF/Ps will need to provide equity contribution for the purchase of land replacement; such equity contribution for a period of time (15-25 years). In the same manner claims related to resettlement or compensation of the agrarian reform under RA 3844, RA 6389 and RA 6657, the latter is also applicable.
Source: JICA Study Team

(2) Implementation Schedule for RAP

Table 7.11.6-36 summarizes the indicative schedules of the various interrelated activities in relation to the preparation and implementation of the RAP.

Table 7.11.6-36 Resettlement Schedule

Activity	2019				2020				2021				2022				2023				2024			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
First Disclosure																								
Parcellary Survey																								
Updating of RAP																								
Formulation of MRIC																								
Disclosure of Updated RAP to PAPs																								
Notification of PAPs																								
Compensation																								
Income Restoration																								

Activity	2019				2020				2021				2022				2023				2024			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Detailed Design																								
ROW Acquisition and RAP																								
Procurement of Contractor																								
Construction																								
Construction Supervision																								
Monitoring and Evaluation																								
Internal Monitoring																								
External Monitoring & Evaluation																								

Source: JICA Study Team

(3) Cost Estimates, Compensation and Entitlements for Sub-Project No. 9

1) Preliminary ROW Cost Estimates for Land

The current fair market values from the BIR Zonal Computation and an independent property appraiser (IPA) were compared to determine the Estimated ROW Cost of Land. To compute for the total ROW Cost of Land, the highest market value (which in this case was seen to be the current value by the independent property appraiser) was then multiplied by the total affected land area.

Table 7.11.6-37 Comparison of Current Market Value and BIR Zonal Value

Municipality	BIR Zonal Value		Current Market Value (IPA)	
	Residential	Agricultural	Residential	Agricultural
Matanog	83.00	4.55	450.00*	20.00*
Barira	83.00	4.55	450.00*	30.00*
Buldon	350.00	21.00	500.00*	30.00*

Note:* The current market value that was set by the independent property appraiser was used for the computation of the estimated market values of the affected land.
Source: JICA Study Team

Estimated market values of affected land in the assumption that all affected land owners have the complete land title is presented in below table.

Table 7.11.6-38 Estimated Market Values of Affected Land

Municipality	Land Classification	Affected Land (sq.m)	Unit Price (PhP)	Total Cost (PhP)
Parang	Agricultural	101,913.00	20.00	2,038,260.00
	Residential	3,296.00	450.00	1,483,200.00
Sultan Kudarat	Agricultural	306,983.00	20.00	6,139,660.00
	Residential	659.00	450.00	296,550.00
Pigcawayan	Agricultural	91,492.00	30.00	2,744,760.00
	Residential	0	0	0
Total		**504,343.00**		**12,702,430.00**

Note: The estimated market values of affected land were computed in the assumption that all claimants were qualified for the compensation, provided that they have the Original Certificate of Title and Tax Declarations, or any of the two.
Source: JICA Study Team

2) Preliminary ROW Replacement Cost Estimates for Structures and Improvements

Table 7.11.6-39 Replacement Cost of Residential houses

Municipality	No. Of Houses	Total
Parang	8	823,241.00
Sultan Kudarat	3	408,083.00
Pigcawayan	0	0
Total	**11**	**1,231,324.00**

Source: JICA Study Team

3) Preliminary Cost Estimates for Crops and Trees

Table 7.11.6-40 Replacement Cost for crops

Municipality	Crops (sq.m)	Total Area (sq.m)	Cost/ sq.m (PhP/sq.m)	Yield (kg/sq.m)	Total Cost (PhP)
Parang	Corn	8,092.00	0.28	14.00	31,720.64
	Palay	24,524.00	0.36	16.01	141,346.53
Sultan Kudarat	Corn	34,582.00	0.28	14.00	135,561.44
	Palay	1,162.00	0.36	16.01	6,697.30
Pigcawayan	Corn	16,929.00	0.29	18.26	89,645.83
	Palay	5,282.00	0.42	18.42	40,863.66
Total		**90,571.00**			**445,835.40**

Source: JICA Study Team

Table 7.11.6-41 Replacement Cost for trees

Commodity	Municipality						Total Estimated Value
	Parang	Total Cost	SK	Total Cost	Pigcawayan	Total Cost	
Fruit bearing trees	408	191,760	197	92,590	54	25,380	309,730.00
Timber / Non-fruit bearing trees	151	57,380	21	7,980	18	6,840	72,200.00
Plant/Cash Trees	2	420	9	1,890	121	25,410	27,720
Total							**409,650.00**

4) Recommended Preliminary Compensation and Entitlement Packages

The recommended budget for RAP Implementation of Sub-Project 9 is **PhP 18,157,625.31** and is part of government counterpart, however the amount is exclusive of other entitlements that are yet to be determined after the completion of the Parcellary Survey of the DPWH. The indicative budget items covering land acquisition and replacement cost of structures, and cost for external monitoring. Contingencies and admin cost are also included. The below table shows the details of the indicative budget to implement this RAP.

Table 7.11.6-42 Indicative Budget for RAP Implementation

Description	Cost Item	Amount	Remarks
Land Acquisition and Structures	Land	**12,702,430.00**	Estimated based on the current fair market value of Land
	Structures	**1,231,324.00**	Estimated based the replacement cost
	Subtotal A	**13,933,754.00**	

Description	Cost Item	Amount	Remarks
Compensation	Trees and Cash crops	**409,650.00**	Estimated based on the current market values of the Maguindanao Provincial Assessor's Office and Lanao del Sur
	Damaged crops	**445,835.40**	Estimated based on the current market value of the Philippine Statistics Authority
	Subtotal for B	**855,485.40**	
External Monitoring		1,000,000.00	Estimated at PhP 1,000,000 per SP
	Subtotal for C	**1,000,000.00**	
Subtotal (A+B+C)		**15,789,239.40**	
Contingency	10%	1,578,923.94	
Admin Cost	5%	789,461.97	
GRAND TOTAL		**18,157,625.31**	

Source: JICA Study Team

(4) Stakeholders Meeting for RAP for Sub-Project No. 9

Table 7.11.6-43 Public Consultation Meetings conducted

Activity	Objective	Venue	Date	Participants	No. of participants	
					M	F
1st Round Meeting	Provide information to the possible Affected households regarding the: • project background • scope • objectives • benefits • update • basic resettlement policies (Philippines and JICA), • Cut-off-date and announcement of succeeding resettlement activities such as conduct of perception, census, socioeconomic survey and inventory of losses.	Parang Municipal Hall	Dec.7, 2017	LGU, DPWH, Project affected persons, Tourism and Barangay Officials	66	8
		Sultan Kudarat Conference Room	Dec.12, 2017	LGU, Project affected persons and Barangay Officials	23	14
		Pigcawayan Municipal Gym	Dec.13, 2017	LGU, Project affected persons; farmer and fisherman; and Barangay Officials	18	12

Table 7.11.6-44 Summary of Main Opinions and Concerns raised during the First Public Consultation

Major Opinions/Concerns	Reflections/Countermeasures
i. Parang Municipality	
Compensation for land owners who don't have land title.	DPWH will compensate the affected land owner but for those who don't have land/lot title or other supporting documents to prove their ownership, no payment or compensation from DPWH will be made Land owners were reminded to secure their documents.
Compensation for trees	All affected trees within the project will be paid or compensated as long as it is included in the inventory within the cut-off date.
Compensation for structures	DPWH will pay the acquisition of all affected structures.
Road alignment and PWD friendly	The road is for everyone, designed for vehicles. It has signage and will always consider the needs of PWD but with limitations as compared to other countries.

Major Opinions/Concerns	Reflections/Countermeasures
Shifting of road alignment	For areas with Muslim cemetery, shifting of road alignment will be considered. Respect for cultural heritage The PAPs were asked to provide right information for smooth implementation of the project.
ii. Sultan Kudarat Municipality	
Affected areas are mostly agricultural land	The issue can be controlled and negotiated. Request will be made to all barangay officials to help since this project is for the development and may attract business investors.
Rerouting road alignment instead of relocating the affected households	The initial road alignment is still subject for evaluation and assessment together with the gathered data of affected features (i.e. cost estimates, transportation costs). Thus, could still be changed depending on the implementing agency.
Landslide-prone barangays	Landslide will be included in the study. Mine and Geo-Sciences Bureau (MGB) maps are gathered for assessment of the hazard. Engineering measures will be done before the construction stage to prevent future damages.
Forester policies to protect perennial trees and areas with wild animals	A comprehensive study is being done such as flora and fauna. This will be included in the EIA study.
Affected owner will fail to issue clearance	Hopefully this will not happen to avoid complications regarding the RROW.
Support of barangay captains for the project	The barangay captains of Matengen, Olas and Nekitan expressed their full support and participation for the road project.
iii. Pigcawayan Municipality	
Compensation for private property	All affected properties will be included in the inventory and cost will be estimated. Data will be gathered from the assessor's office (regional and municipal level). DPWH will make a compensation plan and validate in the barangay level. They will determine the true cost.
Local laborers	As per requirement of DENR, local laborers will be from the barangay and will help the community while the project in the area is on-going.
Temporary canteens during construction	This is possible since the workers/laborers will need this the most.

Source: JICA Study Team

Table 7.11.6-45 Barangay Consultations Conducted

Activity	Objective	Venue	Date	Participants	No. of participants	
					PAPs	Non PAPs
2nd Round Meeting Provide information to the possible Affected households regarding the:	• To elicit further opinions from PAPs themselves about the project • To obtain the basic socioeconomic data from PAP's and to allow them to	Parang Municipal Conference Room	Feb 21, 2018	Barangay Officials and PAPs	8	2
		Pigcawayan Municipal Conference Room	Feb 22, 2018	Barangay Officials and PAPs	5	1

• Proposed Projects	express their ideas, apprehensions, concerns and objections.	Sultan Kudarat Municipal Conference Room	Feb 25, 2018	Barangay Officials and PAPs	21	3

Table 7.11.6-46 Summary of Main Opinions and Concerns raised during Barangay Consultations

Major opinions/concerns	Reflections/countermeasures
i. Parang Municipality	
PAPs who are entitled for the compensation	Specific to the project, the various types of PAPs are qualified, as follows: **(i)Landowners and Land Users** a. Legal owners (e.g., agricultural, residential, commercial and institutional) who have full title, tax declaration, or who are covered by customary law (e.g. possessory rights, usufruct, etc.) or other acceptable proof of ownership over the affected land. b. Users or occupants that have no land title or tax declaration over the affected land. c. Renters of the affected land. **(ii) PAPs with Structures** a. Owners of structures who have full title, tax declaration, or other acceptable proof of ownership (e.g. possessory rights, usufruct, etc.) b. Owners of structures, including shanty dwellers, who have no land title or tax declaration or other acceptable proof of ownership c. Renters **(iii) PAPs with Crops, Fruit Trees, and other Perennials** a. Owners of affected crops, fruit trees and perennials who have full title, tax declaration, or other acceptable proof of ownership (e.g. possessory rights, usufruct, etc.) b. Owners of affected crops, fruit trees and perennials who have no land title or tax declaration or other acceptable proof of ownership. **(iv) PAPs Affected by the Loss of Livelihood and Sources of Income** a. Owners of registered or unregistered shops, regardless of land tenure status, whose business operation will be interrupted temporarily or permanently due tothe project. b. Hired labor (e.g., farm worker, house help, and store helper) who will lose their work temporarily or permanently due to the project.

Major opinions/concerns	Reflections/countermeasures
Payment for tree or the unit for costing of crops and the basis for compensating the properties which will be affected.	• The DPWH will disclose the compensation for trees and crops after the detailed engineering and it will be discussed in the next public consultation • Section 4 of the R.A 10752 clearly states that the modes of acquiring real property are: (i) donation, (ii) negotiated sale, and (iii) expropriation. Property valuation is market-based and undertaken using Government Financial Institutions (GFIs) or Independent Property Appraisers which help promotes unbiased property valuation. The assumption by the IA of the capital gains tax also provides supplementary incentive to the lot owners to negotiate with government. All these things will be further discussed by DPWH representatives and consultant in the second public consultation.
Valid proof of ownership for land and how they will be paid.	PAP with Transfer/ Certificate of Title or tax Declaration (Tax declaration legalized to full title). The following topics are also discussed to them: • Holders of free or homesteads patens and Holders of Certificates of Land Ownership (CLOA) under CA 141. Public Lands act will be compensated on land improvements only. • Public Lands Act will be granted under Comprehensive Agrarian Reform Act shall be compensated for the land at Zonal value. • If granted under Voluntary Offer to sell by the Landowner. CLOA issued under CA 141 shall be subject to the provisions of Section 112 of Public Lands Act shall receive compensation for damaged crops at market value at the time of taking.
ii. Pigcawayan Municipality	
The process of compensation if is it directly given to the beneficiary or through LGU.	• The DPWH will discuss this matter in the second public consultation as to how PAPs will receive the compensation
iii. Sultan Kudarat Municipality	
Concerns if the lot owners are not paying taxes.	If requested by the property owner, the implementing agency shall remit to the LGU concerned the amount corresponding to any unpaid real property tax, subject to deduction of this amount from the total negotiated price: provided that the said amount is not more than the negotiated sale. This will be further discussed in the next public consultation.

*Interview was administered by the help of Barangay Officials for those PAPs who were not able to attend during the consultation meeting.

(5) Focus Group Discussions among Women and Youth

In order to ensure public involvement, through the process of resettlement planning, Notre Dame University (NDU) conducted the focus group discussions (FGDs) for the vulnerable groups or persons, such as women and youth.

The date and venue of the FGD meetings was informed to the affected LGUs such as municipalities and barangays by the official request letter from NDU. In order to gather and reflect public opinions of the affected PAFs.

1) Awareness of the Project

It is apparent in **Table 7.11.6-47** that majority of the participants are not aware of the road project. Accordingly, few road construction surveys were done in the past yet no rad was ever constructed.

Table 7.11.6-47 Awareness of Road Constructions

Municipality	Barangay	Groups	
		Women	Youth
Parang	Orandang	Aware=3/ Not aware=7	Not aware
	Gadungan	Not aware	Not aware
	Cabuan	Not aware	Not aware
Sultan Mastura	Bungabong	Not Aware	Not Aware
Sultan Kudarat	Nekitan	Aware	Not Aware
	Matengen	Not aware	Not aware
Pigcawayan	Olas	Not aware	Not aware
	North Manuangan	Nit isot aware	Aware

Source: Social Survey of NDU

2) Impact of Poor Road

Lack of road and the deplorable condition of the existing roads are causing various discomfort to the communities in the project area. These unfavorable realities are laid out in **Table 7.11.6-48** and are summed up into the following categories:

In socio-economic aspect, the most common responses center on the difficulty in transporting farm produce from farm to identified market locations. The present road situation negatively affects farm income because of exorbitant transport and labor costs that are attributable to poor access to transport facilities and very distant farm lots. This also leads to slow movement or delays in the delivery of harvested crops. Albeit the lack of post-harvest facilities, harvested crops are spoiled by bad weather conditions. Provision of post-harvest facilities are close to becoming impossible because local governments are incapacitated by the lack of road that leads access to the barangays. Farm income is also adversely affected by the very rough roads because spillage during transport is higher.

Family members are likewise separated because some school children are forced to stay in boarding houses in the Poblacion area or at Parang, Maguindanao. Rental payments and living allowances in this arrangement also adds to the costs incurred by families.

Access to social services is also dampened by lack and/or poor road. People are having a hard time in manually carrying to nearest hospitals the sick persons, pregnant women, mothers who are about to deliver their babies (especially the high-risk cases) and the elderly needing medical attention.

In the aspect of education, many children are discouraged to attend school because of the physical stress that they had to endure to going to and from school. In addition, the existing few school buildings in the areas already need major repair yet cannot be materialized because of difficulty in transporting construction materials.

In terms of health, there are no good sources for drinking water for the greater majority of people in the communities. Water sources are quite hard to build due to poor road access. Moreover, private sellers of water (water tankers) sometimes refuse to go to the barangay fearing that the rough roads will damage the trucks.

Aside from the foregoing, skin diseases are frequent in adults and children because to microbial infections borne to walking in knee-deep muddy roads especially during rainy season. And in the summer season, the excessive heat and dust are causing respiratory problems such as asthma, rhinitis and other allergies.

Table 7.11.6-48 Impact of Road to the Community

Municipality	Barangay	Groups	
		Women	Youth
Parang	Orandang	• Difficulty in transporting agricultural products to market; increase spillage • Spoilage of products due to delays brought about by poor transport • Slippery and muddy roads cause itchiness and skin diseases • Difficulty in bringing sick family members to nearby clinic/hospital • Children gets late in going to school • Mechanized vehicles such as motorcycles are often damaged due to bad road conditions	• Difficulty in product transport • Hardly passable during rainy days • Even with horses and carabaos, road transport is still hard
	Gadungan	• Lower (net) income from farm and livelihood activities • Poor access to basic services such as hospitals, school,etc. • Increased number of accidents due to bad physical condition of the road as well as landslides	• Difficulty in transporting goods to market • Slow movement in production (planting and harvesting) • Students are discouraged to go to school • Cause of skin diseases, accidents. Road is slippery and muddy and prone to landslide during rainy days. While on sunny days, road dusts triggers asthma
	Cabuan	• Physical stress in manual carrying of product packages; or even with horseback ride • Difficulties encountered particularly during emergency situations • Delay in product movement especially during rainy days	• Longer travel time; very unproductive • Reluctance of public motorized vehicles to serve the transport needs of the community • Most sick persons can't go to the nearest health facility at the earliest time for treatment • Product spoilage
Sultan Mastura	Bungabong	• Triple handling of farm products before it reaches the market • Difficulty in accessing buyers for agricultural products	• Low productivity due to delays in transactions/transportation • Expensive transport services • Difficulty going to hospitals during health emergencies • Only few engage in transportation service business.

Sultan Kudarat	Nekitan	• Roads are muddy and flooded during rainy days; hardly passable • Poor access to drinking water supply • Late in coming to community activities • Difficult to transport products	• Difficult to go to school • (Their) parents are having a hard time to transport farm products to the market • Expensive/costly fare • Low income opportunities and possibilities
	Matengen	• Emergency response is slow • Unsafe water sources • High cost of available transport • Difficulty in bringing products to the market	• Difficulty in transporting products to market • Increased hassle during emergency situations • Late/ delay in attending community meetings and functions • Walking on foot during rainy days is hard
Pigcawayan	Olas	• Very expensive transport fare • Difficult route in transporting products via crossing the river to Darapanan then to the public market in Pigcawayan Poblacion • Accident prone • Poor water source	• Vehicle damage • Very high cost of fare • Community don't go out of the barangay during rainy days because travel even by foot is so inconvenient
	North Manuangan	• Difficult to transport goods to market • Difficult for children to go to school	• Uneasy to travel to main barangay for particular transactions • Difficult to transport products • Hesitation to establish business activities • Burden for students going to school

Source: Social Survey of NDU

3) Main Source of Economic

The main sources of income of the people in the barangays can be categorized into the following sets:

The first set of income source are on-farm activities. On farm sources refer to livelihood activities that directly involves actual tilling of farmlands. In the project area, on-farm activities are identified as follows: corn farming, palay farming, coconut farming, banana production, vegetable farming as well as growing fruit trees and other minor crops.

There are also off-farm income sources. The identified off-farm activities are copra processing, vegetable selling, fish vending, renting-out uncultivated lands to private companies, as well as providing farm labor services (hired labor) during planting and harvest seasons in other municipalities.

Lastly, the non-farm sources. The participants have income sources such as driving, sari-sari store (home-based variety stores), construction work, carpentry, quarrying, carenderias (food stalls) and employment either in the government or private sector.

Details of these income sources per barangays can be seen in **Table 7.11.6-49**.

Table 7.11.6-49 Main Source of Economic Means

Municipality	Barangay	Main Source of Income		
		women	youth	Fourth
Parang	Orandang	Farm Labor during planting and harvest season	Coconut farming	Sari-sari Store (Small-scale variety stores)
	Gadungan	Employment in government or private service	Buying and selling of agricultural products	Growing vegetables and milkfruit
	Cabuan	Upland rice farming	Vegetable farming	Growing peanuts and other rootcrops
Sultan Mastura	Bungabong	Corn farming	Rice farming	Small-scale quarrying; driving; sari-sari store
Sultan Kudarat	Nekitan	Farm Labor during planting and harvesting	Driving and carpentry	Wage labor; sari-sari store
	Matengen		Paid Manual and farm labor	Construction work; driving; sari-sari store
Pigcawayan	Olas	Coconut farming	Land for lease (rental income from Lamsan Trading) which rented their lands for sugarcane plantation	Growing and selling banana, sugarcane and cassava
	North Manuangan	Farm labor	Fish vending and sari-sari store	Carpentry and Carenderia

Source: Social Survey of NDU

4) Negative Impact of Road Construction and Proposed Solutions

Table 7.11.6-50 shows that women and youth are apprehensive that the road construction might generate negative effects. The utmost concerns are the possible occurrence of drag racing, vehicular accidents particularly involving children, corruption during the construction phase and increased military access which might instigate resistance from anti-government groups and lawless element. This might undermine peace and stability in the area.

However, the participants also mentioned particular solutions to these perceived negative eventualities. According to them, these may be resolved by immediately reporting to the proper authorities any suspicious activities that happen in the area; moreover, for matters over which the community seem powerless, the participants just lobby on trust that the LGU will do their jobs well.

As to the perceived occurrence of vehicular accidents, the participants are quick to specify placing road signs and warnings; not to allow drag racing and most importantly, not to allow children to play alongside the road.

Despite the mention of these perceived negative impacts, the participants still hope that the road project will push through.

Table 7.11.6-50 Negative Impact of Road Constructions

Municipality	Barangay	Negative Impact of Road Construction and Proposed Solutions			
		Women		Youth	
		Negative Impact	Solution	Negative Impact	Solution
Parang	Orandang	• motor racing/drag racing may occur • vehicular accidents involving children	• increase community vigilance	• none	• report to barangay authorities any incidence of drag racing
	Gadungan	• more vehicular accidents • military access to the barangay	• place reminder and warning signs	• corruption • disturbance in the smooth flow of traffic when road construction is not finished on time	• corruption cannot be addressed at their level • possible traffic disturbance can be tolerated in exchange of convenience in the immediate future
	Cabuan	• vehicular accidents may occur	• parents should be more watchful of their children	• road/vehicular accidents may increase • noise pollution	• keep watch
Sultan Mastura	Bungabong	• None		• expect more road accidents • increase competition among motor drivers; lower income from driving	• warning signals must be placed
Sultan Kudarat	Nekitan	• none		• increase barangay population • drag racing may occur • terrorism	• report to barangay drag racing
	Matengen	• outlaws or fugitives can easily enter the barangay to hide • accidents due to reckless driving	• be watchful and report to authorities	• vehicular accidents involving children and animals • bad elements who are threats to the society can easily enter the barangay	• place road signs • be more vigilant
Pigcawayan	Olas	• None		• road accidents • military forces can easily enter the barangay	
	North Manuangan	• vehicular accident • noise	• road signs and warning signs	• barangay population growth • road accidents • lawless elements will use the road as exit point	• trust authorities that they will do their jobs

Source: Social Survey of NDU

5) Perception towards DPWH as Road Contractor

In general, the entire community affirms having DPWH as the contractor for the road project. To them, having it handled by DPWH is more appropriate because it is the government agency tasked to develop roads and by that, they are seen as experts in road construction projects.

6) Community Support to DPWH

Most women in all barangays highly prefer involving their husbands in paid labor. According to them, hiring locals for paid labor would be better. Women participants were generally willing to offer food and water services; some are even willing to offer extra spaces in their homes as sleeping quarters for the construction team.

Youth in general see worthy support in the form of fetching water, offering food and water, help locate areas, attend to errands and help out in watching over equipment and construction materials.

7) Summary

The major source of income, according to the participants, is farming. This conforms to the results in the survey. They also said that the major cash crops are indeed the yellow and white corn, irrigated and upland palay, as well as coconut. Other crops mentioned are banana and coconut.

It transpired in the FGD that the greatest majority of the participants are not aware of the current plan for a road development project. Some are quite apprehensive because accordingly, a number of surveys were done in the past but no road ever materialized. People since then have long endured the disheartening roads which are either too muddy or too dusty depending on the day's weather. The major struggle encountered by people relative to the existing poor road condition is the difficulty in product transport. Bad roads lead to delays in transport, increased spillage and spoilage particularly in bad weather conditions, and most importantly the high cost of transportation via horseback and mechanized vehicles. Manual labor is likewise expensive. Transportation costs, purely shouldered by the farmers, dampens the profitability of their farming activity.

In addition, basic social services are also dampened by the lack of road. Children's education is affected due to difficulty in travel. According to the participants, they encounter difficulties in taking the sick people and other needing immediate medical attention to nearest healthcare facilities mainly due to lack of road. Moreover, post-harvest facilities are not adequate and cannot accommodate the volume of harvest that is why farmers are forced to sell their harvest fresh, unable to dry or semi-process it. Dried and semi-processed crops would have commanded greater market price and are a value-added to the profits of the farmers.

This conforms to the survey findings as that which suggests that the greatest manifestation of the benefit or positive impact of the road development project is when transportation costs are lowered with better roads, access to transportation services increases thereby lowering labor costs, and opening avenues for increased market options. This will all promote farm profits. This positive impact will feedback on others, encouraging more farmer to engage in farming and the same time moving existing tillers to intensify farm activity, higher agricultural productivity will be achieved in the influence area. A positive economic indicator for the province of Maguindanao.

Access to basic social service is likewise seen as a positive impact of the road development project. FGD participants said that foremost, access to safe drinking water might improve. This will greatly

benefit the community. There might be more teachers in the barrio in the same way that health workers wil finally conduct frequent visits to the influence area if a concrete road is developed in the influence area. In general, the participants are seeing better lives with better roads.

Indeed, some participants see unfavorable consequences when a road is developed. They foresee corruption, road extortion by the enemies of the state, vehicular accidents involving children and incidence of drag racing. However, these consequences cannot outweigh the aforementioned benefits that the road development project will bring to agriculture and social services. And to address the foreseen unlikely consequences, the community had identified, and vowed to implement, community measures to suppress these negative expectancies.

Finally, the participants are one in proclaiming support to DPWH as the contractor for the road project. The participants are willing to assist the DPWH team in terms of labor, food and water provision, errands, directions, and most importantly assuring security and safety for the team and the equipment. There was even one participant who specifically mentioned that it no longer matters who implements the road construction project, what truly matters is a road will be provided so that their lives will improve and agricultural potential will be promoted.