

**NATIONAL ELECTRIFICATION ADMINISTRATION (NEA)
DEPARTMENT OF ENERGY (DOE)
THE REPUBLIC OF THE PHILIPPINES**

**PREPARATORY SURVEY REPORT
ON
THE PROJECT FOR IMPROVEMENT OF
EQUIPMENT FOR POWER DISTRIBUTION
IN BANGSAMORO AREA
IN
THE REPUBLIC OF THE PHILIPPINES

FINAL REPORT**

JANUARY 2017

**JAPAN INTERNATIONAL COOPERATION AGENCY
ORIENTAL CONSULTANTS GLOBAL CO., LTD.**

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PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey and entrust the survey to ORIENTAL CONSULTANTS GLOBAL CO., LTD.

The survey team held a series of discussions with the officials concerned of the Government of the Republic of Philippines, and conducted a field investigation. As a result of further studies in Japan, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Philippines for their close cooperation extended to the survey team.

January, 2017

Akira NAKAMURA
Director General,
Infrastructure and Peacebuilding Department
Japan International Cooperation Agency

SUMMARY

1. Outline of the Country

(1) Country

The Republic of the Philippines (hereinafter “the Philippines”) is a republic located in Southeast Asia. It is an island country separated from Japan by the Philippine Sea, Taiwan by the Luzon Straits, Malaysia by the Sulu Sea, Indonesia by the Celebes Sea, and China & Vietnam by the South China Sea. The Philippine Sea lies to the East of the Philippines, the South China Sea to the West, and the Celebes Sea to the South. The capital city is Manila and the most populous city is Quezon City. The total area of the country is as large as 299,404km².

(2) Natural environment

The project area includes the middle-western part of the main island of Mindanao and the Sulu islands including Basilan Island. As these areas are located in the tropical zone, the climate of each area is tropical rainforest climate and the temperature is high all year round with only a small annual amplitude of temperature change. In addition, as typhoons formed in the Northwest Pacific Ocean head for Luzon Island or Visayan Islands located to the North of Mindanao, they rarely hit the shore of the Mindanao Island.

(3) Social environment

The poverty rate of the mid-western part of Mindanao (46.9% for the area, which is anticipated to become Bangsamoro by referendum in the future, compared with the national average of 22.3%) is the highest in the Philippines partly due to the impact of the conflict that has lasted for over forty (40) years. This area is facing such challenges as social services and aging/shortage of infrastructure. The electrification rate of the project area is low as it is approximately 35% compared with the national average of 74%, making it one of the factors preventing the improvement of living standard, improvement of social services, and development of industries from occurring.

2. Background, History and Outline of the Project

Since the “Framework Agreement” concerning the Mindanao peace process was signed by both the Philippine Government and the MILF in October 2012 and it was agreed to establish the ‘Bangsamoro Autonomous Government (hereinafter, “new autonomous government”)', JICA has been engaging in necessary cooperation with BTC, BDA that is the development agency of MILF, and ARMM government as a counterpart (hereinafter, “C/P”) so that the NAG consisting of ARMM government and personnel from the MILF side, as is anticipated, could provide appropriate administrative services. In the key components of “Comprehensive Capacity Development Project

for the Bangsamoro Development Plan for the Bangsamoro” implemented as a part of the program, improvement in transport/electricity infrastructure necessary for rejuvenation of economic activities in a comprehensive and fair manner was considered to be very important; and, appropriate improvement/rehabilitation of equipment for power distribution was positioned as a priority project being an urgent task in the mid- to long-term plan (assumed to be from 2016 to 2022) that was formulated for the development of the project area. Having been constructed in the 1970s, most of the equipment for power distribution is in a state of significant degradation that has progressed over time; and the high rate of power distribution loss, low electrification rate, and so on is hindering the stable supply of power, making it one of the factors which have been slowing down the development in the project area. Against such background, the project aims to improve ECs’ capacity to operate and maintain their power distribution line and improve the power quality in the project area by providing the respective ECs with on-site vehicles for the construction work required for the rehabilitation of equipment for power distribution together with materials and equipment which constitute the power distribution line through which power is supplied to the important parts of the project area, and with this ‘Peace Dividends’, the project also aims to contribute to promoting conflict prevention and development in the area.

3. Outline of the Survey Result and the Content of the Project

(1) Outline of the survey result

Because the Bangsamoro region, which is the project area, is one of the conflict-affected areas, no Japanese are allowed to visit most of the areas. Therefore, we collected the information concerning the EC through interviews by inviting the responsible officers from the respective ECs. In addition, between the first survey and the second survey, we dispatched the local consultant (DEVCON) to the site (EC) as a part of the supplementary information gathering. In the third survey, we explained the details of MOD and decided the components temporarily. In the fourth survey, we confirmed the details of the project and made an agreement concerning the items to be borne by the Philippines. The dispatch period is detailed as follows:

- The first dispatch period: 9 February - 3 March 2016
Information gathering by inviting “NEA”, the Implementing Agency, and ECs to Manila
- The second dispatch period: 24 July - 16 August 2016
Information gathering from the ECs in Davao. We visited MAGELCO in Cotabato to see the current status of the equipment for power distribution and carry out interviews with experts there.
- The third dispatch period: 23 - 29 October 2016
There was no plan for the third survey initially; nevertheless, we had discussions with DOE, NEA and ECs to reconfirm the details of the project

- The fourth dispatch period: 4 - 10 December 2016
Explanation of draft outlined design

(2) Contents of the project

It is considered that one of the critical issues for Bangsamoro region, in addition to the low electrification rate, is the fact that, as most of the existing facilities were constructed in the 1970s, the technical losses of the distribution line are high due to degradation over time. In addition, the fact that the capacity of the distribution line is also small and not sufficient to cope with the increased power demand required for the future development is a huge challenge as well. Therefore, the purpose of the project is to try to renew the equipment for power distribution line with an eye to coping with the anticipated increase of the power demand and to reduce the technical losses of the distribution line with an eye to improving the power quality. We will provide necessary equipment and materials (power poles, power lines, and pole transformers) required for rehabilitation of the power distribution line by its distribution unit (hereinafter referred to as ‘feeder’) (each power distribution line is composed of several feeders) which is considered to be important and prioritized to be rehabilitated in the area of jurisdiction of the six ECs engaging in power distribution business in Bangsamoro region. In addition, as either heavy equipment (on-site vehicles) required for construction work has degraded significantly over time or they don’t have any, it has been decided that, for the purpose of implementing distribution line upgrading work and improving equipment maintenance capacity, boom trucks with buckets and with diggers which are essential for maintenance/repair/construction work of the equipment for power distribution should be included in the list of equipment and materials to be provided.

The summary of boom trucks and equipment/materials for power distribution to be provided to the ECs in the project is shown in Table 1.

Table 1 On-site Vehicles and Equipment/Materials for Power Distribution to be Provided to ECs

Classification	Boom Truck (Japan)		Feeder Name	Pole Mount Transformer (Local Procurement)							
	Boom Truck with Buckt	Boom Truck with Digger		Transformer 10kVA	Transformer 15kVA	Transformer 25kVA	Transformer 37.5kVA	Transformer 50kVA	Transformer 75kVA	Transformer 100kVA	Transformer 167kVA
Name of Equipment	No.	No.		No.	No.	No.	No.	No.	No.	No.	No.
Unit	No.	No.		No.	No.	No.	No.	No.	No.	No.	No.
	8	8		13	99	194	64	35	11	7	2
MAGELCO	2	2	DOS Feeder			37					
			Landasan Feeder								
			Upi Feeder								
			Parang Feeder			35					
LASURECO	2	2	40 Feeder 2		16	22	3	2			
			5 Tugaya Feeder		14	32	32	6			
BASELCO	1	1	Lamitan Feeder		5	15	7	7	1		
SULECO	1	1	Feeder 4	3	3	5	8	8	5	5	2
			Feeder 6	10	15	3	2	2	2	2	
TAWELCO	1	1	Feeder 1		6	20	12	10	3		
SIASELCO	1	1	Feeder 3		40	25					

Classification	Name of Equipment	Name of Feeders	Poles (Local Procurement)						Distribution Conductor (Local Procurement)				
			Concrete Pole 40 Ft.	Concrete Pole 45 Ft.	Concrete Pole 60 Ft.	Steel Pole 35 Ft.	Steel Pole 40 Ft.	Steel Pole 50 Ft.	Steel Pole 60 Ft.	ACSR #3/0	Insulated ACSR #4/0	ACSR #4/0	Grounding, Galvanized 3 Strand, 5/16" Dia
Unit	No.	No.	No.	No.	No.	No.	No.	No.	m	m	m	feet	
Qty	No.	No.	No.	No.	No.	No.	No.	No.	m	m	m	feet	
	743	1,463	85	780	730	120	150	264,270	522,847	343,447	150,537		
MAGELCO	DOS Feeder	667						46,000	69,000	69,000	26,680		
	Landasan Feeder	83	85					11,500	27,600	6,900	8,017		
	Upi Feeder	500						34,500	82,800	20,700	20,000		
	Parang Feeder	160		230				34,500	51,750	51,750	12,500		
LASURECO	40 Feeder 2	426						24,495	73,485	73,485	17,040		
	5 Tugaya Feeder	370						21,275	31,912	31,912	14,800		
BASELCO	Lamitan Feeder			50	230	120	150	34,500	103,500	0	19,000		
SULECO	Feeder 4			70	70			8,050	0	24,150	4,550		
	Feeder 6			230	230			26,450	62,100	17,250	14,950		
TAWELCO	Feeder 1				200			11,500	20,700	13,800	7,000		
SIASELCO	Feeder 3			200				11,500	0	34,500	6,000		

Source: Created by JICA Study Team

4. Project Schedule

With respect to the time frame required for the project, it is assumed that it would take approximately six (6) months from execution of design to tendering and contractor agreement after the conclusion of the consultant agreement and 14 months from the contractor agreement to procurement of equipment & materials and delivery of them, making the total project period be approximately 20 months.

5. Evaluation of the Project

(1) Appropriateness of the project

The power distribution equipment of the EC targeted in the project is decrepit (constructed in the 1970s) and facing such challenges as high power distribution loss rate and many power outage incidents. As the power distribution loss and power outage incidents are factors contributing to the tight financial situation of the EC, the rehabilitation of the equipment and materials for power distribution is highly urgent. In addition, because of the provision of pole transformers, the project fits into the electrification program of the NEA which oversees the power distribution area.

(2) Quantitative evaluation of the project

1) Quantitative evaluation for the rehabilitation of equipment for power distribution

After the implementation of the project, loss reduction of power distribution and increase of the power transmission capacity can be expected by upgrading the wire size and upgrading of the power supply mode from the existing single-phase system to a three-phase system. In addition, improvement in electrification rate for future increase in power demand with improved power quality can be expected by provision of pole transformers, and the provision of insulated wires would contribute to the reduction of ground-faults and short-circuit faults in forest area, which lead to the realization of the duration of shortening of power outage caused by a tree touching.

2) Quantitative evaluation by boom trucks

In terms of maintenance work capacity and pole-erecting capacity concerning the equipment for power distribution, it is expected that, by providing boom trucks with buckets and with diggers, there will be approximately two to three times improvement in operational efficiency compared to manual construction.

(3) Qualitative evaluation of the project

The project aims to contribute to promoting conflict prevention and development in the project area through improving power distribution stability by enhancing the respective ECs' capacity to operate and maintain their power distribution line with renewed equipment provided by the project. The detail of the qualitative evaluation of the project is as follows.

By rehabilitating the aged equipment and materials for power distribution, it is expected that the power distribution loss could be reduced and the number of incidents of power outage would also be reduced. It is considered that that will also contribute to improvement in the EC's financial situation. Further, with respect to pole-erecting, the safety and efficiency of pole-removal and pole-erecting operations will be improved by the use of the boom trucks with diggers. The extremely difficult and inefficient manner of operation currently being done manually will be improved dramatically which, as a result, would not only lead to reduction of construction cost, but contribute to the improvement in EC's financial situation as well. In addition, by using the boom truck with bucket, it will become possible to carry out power line installation work and/or power line maintenance & repair work in an efficient and safe manner. Furthermore, by eliminating the climbing by the operator through the introduction of high reach working vehicles, it is expected that the number of accidents involving electrocution or falling will be reduced dramatically. On top of that, in relation to power outages caused by grounding faults and short circuit faults involving a power distribution line contacting with trees, it is expected that the duration of power outages will be reduced because, by the use of a boom truck with bucket, tree pruning operations will become easier and the maintenance work for the power distribution line be implemented in an appropriate manner.

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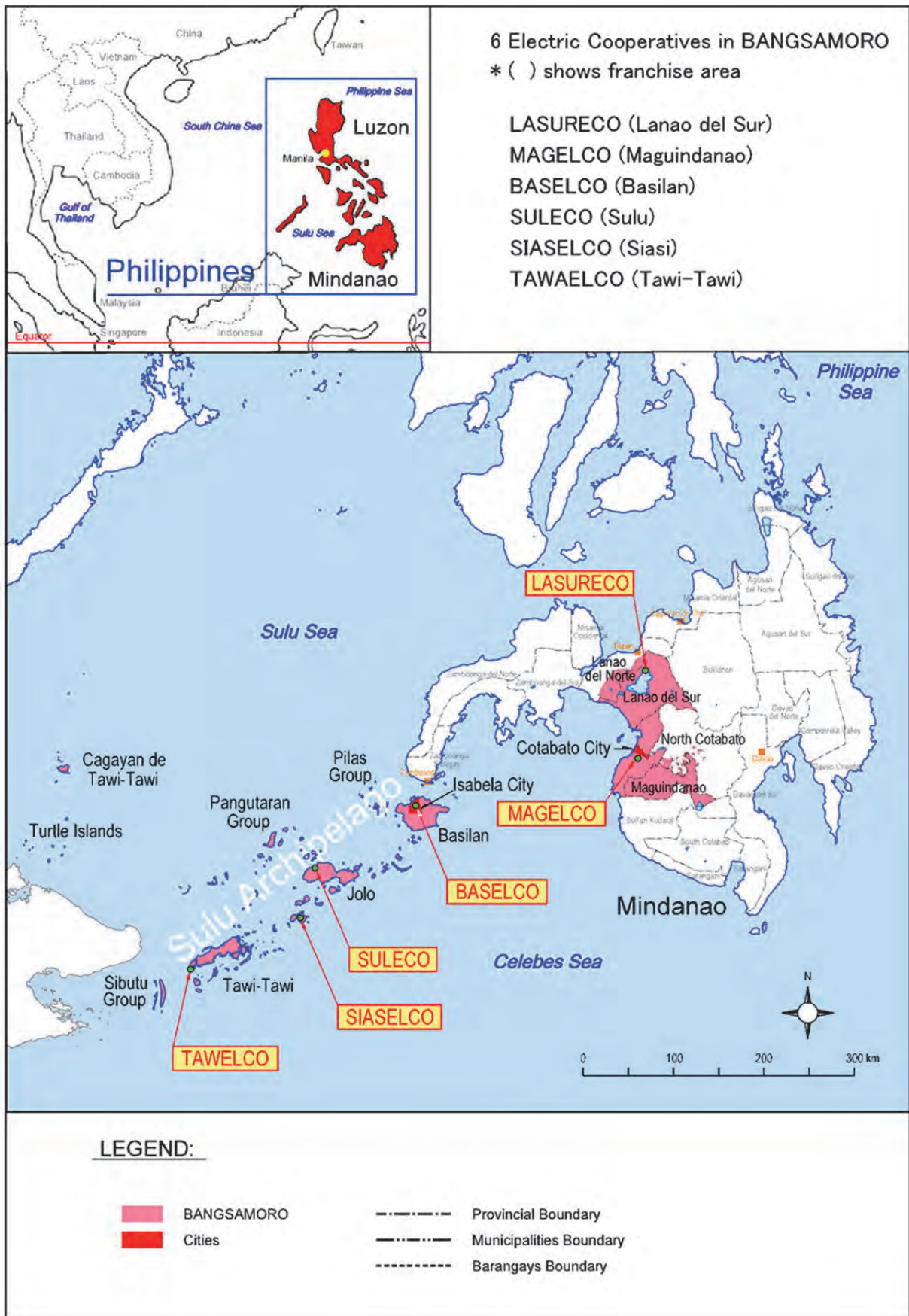
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Abbreviations

Abbreviation	Full Name
ACSR	Aluminum Conductor Steel Reinforced
ADB	Asian Development Bank
ARMM	Autonomous Region in Muslim Mindanao
ARMM RBI	ARMM Regional Board of Investment
AWG	American Wire Gauge
BBL	Bangsamoro Basic Law
BDA	Bangamoro Development Agency
BIFF	Bansamoro Islam Freedom Fighter
Bgy.	Barangay
BTC	Bangsamoro Transitional Commission
cct	Circuit
CIIP	Comprehensive and Integrated Infrastructure Program
CLPC	Cotabato Light and Power Company
C/P	Counterpart
DDP	Distribution Development Plan
DEVCON	Development Consultants Inc.
DOE	Department of Energy
EC	Electric Cooperative
EPIRA	Electric Power Industry Reform Act
HQ	Headquarters
IMT	International Monitoring Team
IP	Indigenous People
IPP	Independent Power Producer
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
JPY	Japanese Yen
LGU	Local Government Unit
MEP	Mindanao Energy Plan
MHPP	Mini-hydro Power Plant
MILF	Moro Islamic Liberation Front
MinDA	Mindanao Development Authority
MNLF	Moro National Liberation Front
MRCC	Mindanao Regional Control Center
NPC	National Power Corporation
NEA	National Electrification Administration
NEDA	National Economic and Development Authority
NGCP	National Grid Corporation of the Philippines
NPC	National Power Corporation
NPC-SPUG	National Power Corporation - Small Power Utilities Group
OPAPP	Office of the Presidential Adviser on Peace Process
PhP	Philippine Peso
PPA	Power Purchase Agreement

Abbreviation	Full Name
PSALM	Power Sector Assets and Liability Management
T/L	Transmission Line
TDP	Transmission Development Plan
TFL	Task Force LASURECO
UNDP	United Nations Development Program
UNHCR	United Nations High Commissioner for Refugees
USAID	United States Agency for International Development
VAT	Value Added Tax
MAGELCO	Maguindanao Electric Cooperative, Inc.
LASURECO	Lanao del Sur Electric Cooperative, Inc.
BASELCO	Basilan Electric Cooperative, Inc.
SULECO	Sulu Electric Cooperative, Inc.
SIASELCO	Siasi Electric Cooperative, Inc.
TAWELCO	Tawi-Tawi Electric Cooperative, Inc.
CASELCO	Cagayan De Sulu Electric Cooperative, Inc.
Units	
km	Kilometer
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt-hour
MVA	Mega Volt-Ampere
MW	Megawatt
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index

Chapter 1 Background of the Project

Chapter 1 Background of the Project

1-1 Background of the Project

1-1-1 Current Status and Challenges

The current status of the Philippines power sector and the current status & challenges of the power distribution sector in Bangsamoro region are detailed as follows:

1-1-1-1 The Current Status of Power Sector in the Philippines

With respect to the power sector in the Republic of the Philippines (hereinafter, referred to as “the Philippines”), in a situation where the National Power Corporation (hereinafter, referred to as “NPC”), which was in charge of power generation and transmission, was heavily indebted and the government debt was increasing, the section responsible for electrical power production was separated from the section responsible for power transmission when the Electric Power Industry Reform Act (EPIRA) was put in force in 2001. In the power generation area, the government actively encouraged Independent Power Producers (hereinafter, referred to as “IPP”) to come forward and the power plants which were once owned by the NPC were gradually privatized. In addition, the power transmission sector was also privatized and, at the moment, the National Grid Corporation of the Philippines (hereinafter, referred to as “NGCP”) is running the power distribution business.

On the other hand, with respect to the power distribution sector, unlike the power transmission sector, there are mixture of private power distribution companies such as Manila Electric Company (MERALCO) and small power distribution business operators called Electric Cooperatives (hereinafter, referred to as “EC”) which are publicly owned non-profit organizations (121 operating companies as of January 2016), engaging in the community-based power distribution business.

1-1-1-2 The Current Status & Challenges of the Power Distribution Sector in the Bangsamoro Region

(1) The details of EC’s Business and Service Area

With respect to the power distribution operation in the Philippines, the EC, which is a power business operator in the respective area, operates and administers the power distribution network while engaging in maintenance and repair of equipment starting from construction of power distribution lines under the supervision of the National Electrification Administration (hereinafter, referred to as “NEA”) which are positioned under the Department of Energy (hereinafter, referred to as “DOE”) which is the supervisory authority in charge of general energy policies in the Philippines. In Bangsamoro region, there are 7 ECs as shown in Table 1-1.1, engaging in power distribution business in their respective areas. The number of households potentially requiring electricity is extracted from the 2015 data which are publicly available on the NEA official website.

Table 1-1.1 ECs in the Bangsamoro Region

No.	Name of EC	Address	Covered Area	Potential Customers (Household)
1	MAGELCO	Awang, Datu Odin Sinsuat, Maguindanao	Maguindano (exclude Cotabato City)	116,200
2	LASURECO	Maliwanag, Marawi City Lanao del Sur	Lanao del Sur	139,500
3	BASELCO	Isabela City, Basilan	Basilian	76,200
4	SULECO	Busbus St., Jolo, Sulu	Sulu (Bgy.* except for Siasi)	85,800
5	SIASELCO	Poblacion, Siasi, Sulu	Sule (Siasi)	13,500
6	TAWELCO	Bongao, Tawi-Tawi	Tawi Tawil	42,700
7	CASELCO	Mapun, Tawi-Tawi	Tawi Tawi (Mapun)	5,200

* Bgy: Barangay - The smallest administrative division in the Philippines

Source: NEA Website

The rated voltage of power distribution systems operated by the EC in the Bangsamoro region, is 13.2kV (three-phase)/7.62kV (single-phase) for the high voltage systems and 240V for low voltage systems. With respect to the power supply to the consumers, the respective EC enters into a Power Purchase Agreement (PPA) with NGCP, NPC or Power Sector Assets and Liability Management (PSALM) and sells the electricity it purchased to the power consumers/households. The areas of jurisdiction of ECs in the Bangsamoro region are shown in Figure 1-1.1

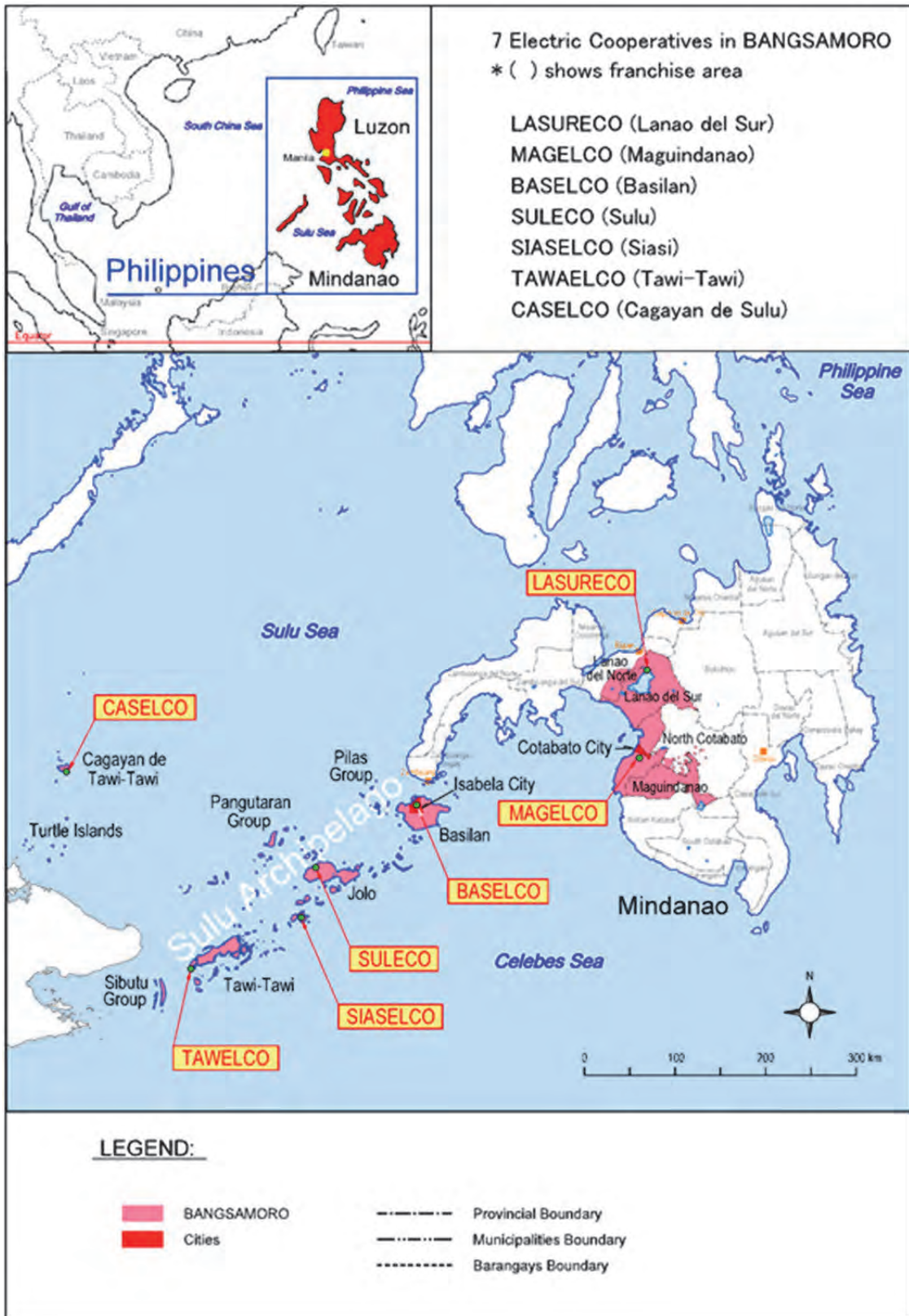


Figure 1-1.1 ECs in the Bangsamoro Region

(2) Challenges ECs are facing

Because the Bangsamoro region, the project area, is one of the conflict-affected areas, no Japanese are allowed to visit most of the areas where ECs are located. Therefore, the JICA Study Team (herein after the Team) collected the information concerning the EC through interviews by inviting the responsible officers from the respective ECs to meetings. In addition, between the first survey and the second survey, the Team dispatched the local consultant (DEVCON) to the site (EC) as a part of supplementary information gathering. Based on interviews with EC and the information obtained from the local consultant, the Team identified the following items as common challenges all the ECs are facing:

- Low electrification rate
- Decrepit facilities
- Frequent power outages
- High rate of power distribution loss
- Inefficient maintenance/construction work being done manually

1) Electrification Rate

In respective states over which ECs have jurisdiction, non-electrified areas account for a large percentage. Particularly in sparsely-populated areas, the electrification rate is low due to shortage of equipment and materials for power distribution. The electrification rate of the respective ECs is shown in Table 1-1.2

Table 1-1.2 The respective ECs Electrification Rate (as of September 2016)

	Name of ECs	Electrification Rate
1	MAGELCO	24%
2	LASURECO	40%
3	BASELCO	57%
4	SULECO	31%
5	SIASELCO	31%
6	TAWELCO	28%
7	CASELCO	37%
Mindanao Area		74%
Whole of the Philippines		87%

Source: NEA Website

2) Aged Distribution Facilities

As most of the equipment for power distribution in the Bangsamoro region was constructed in the 1970s and, as with all the ECs, the equipment under its jurisdiction is showing significant degradation over time and requires urgent upgrading.

3) Power Outage Situation (Excluding Planned Outage)

MAGELCO

The record of the System Average Interruption Duration Index (SAIDI), which shows the average annual power outage time per household, was 2,292 minutes in 2015. In addition, the System Average Interruption Frequency Index (SAIFI), which shows the frequency of power outage per year per household, is approximately 30 times. Power outage occurred across the supply area; and, with respect to the main reasons for the outage, breaking of wire (the reason why it was broken is unclear) accounts for 49%, contact with a tree 27%, and breakdown of equipment 10%.

LASURECO

SAIDI was approximately 47 minutes and SAIFI approximately 850 times in 2015, indicating that power outage has become an everyday affair. The figures quoted above do not include the areas of which power is supplied through Tugaya substation, Ganassi substation, or Malabang substation as these areas are currently out of power due to the power distribution line bombing accident that occurred in January 2016.

BASELCO

SAIDI was approximately 99,500 minutes and SAIFI approximately 380 times in 2015, indicating that power outage is occurring over once a day. Power outage occurred across the supply area; and, with respect to the main reasons for the outage, it is reported that breakdown of equipment accounts for 45% and troubles at the power source side 40%.

SULECO

SAIFI and SAIDI is not known because only the actual data for March 2016 was provided; however, it is reported that power outage time is 4,512 minutes and power outage occurred 51 times for the whole power distribution system. Out of the main reasons for the outage, planned outage accounts for 49% and contact with a tree 27%.

SIASELCO

Based on the recent actual data from January to September 2016, it is worked out that SAIDI was 2,838 minutes and SAIFI 10 times in 2016. With respect to the main reasons for the outage, breakdown of the equipment accounts for 43% and contact with a tree 27%.

TAWELCO

SAIDI caused by power distribution equipment was approximately 474,282 minutes (approximately 7,905 hours) and SAIFI 159 times in 2015, indicating that power outage has become chronic. As for the main reasons for the outage, contact with a tree comes at the top accounting for 20%. Please note that it is also reported that outage caused by unknown reasons accounts for 40%.

CASELCO

Unknown, since no data has been given from CASLCO concerning power outage.

Table 1-1.3 SAIDI and SAIFI for the respective ECs

No.	EC	Interruption Status			Note	
		SAIDI	SAIFI	Affected Area		
		(Minutes)	(Times)			Cause
1	MAGELCO	2,292	26.98	Datu Odin Sinsuat, Parang, etc.	Disconnection fault 49%, touch to trees 27%, malfunction of equipment 10%.	Data from Jan, 2015 to December
2	LASURECO	47.47	848.7	Marawi City, Dansalan, etc.	Earth leakage due to aged equipment and Scheduled Power Outage	Data from Jan, 2015 to December • Data from Dansalan S.S. Except Tugaya S.S, Ganassi S.S and Malabang S.S since no power due to bonbed-out Transmission line.
3	BASELCO	99,584	379.3	Total Area of Isabela, Lamitan, Tipo-Tipo, Tuburan, Lantaw	Malfunction of equipment 45 % and Malfunction of primary side (power station side) 40%	Data from Jan, 2015 to December
4	SULECO	4,512	51.0	Jolo, Indanan, Maimbug etc.	Scheduled Power Outage 49% and touch to trees 27%	Data of March, 2016 only.
5	SIASELCO	2,838	10	Kuntan, Sipanding,	Malfunction of equipment 43 % and touch to tree 27%	Date from March to September, 2015
6	TAWELCO	474,282	159	Bongao, Tubig Mampallum etc.	20% of Interruption were caused by touch to tree,	Data from Jan, 2015 to December. Interruption data excluding data of malfunction of Power Station
Mindanao		762	14.99	Data for 2015		
The Philippines		1,347	15.92	Data for 2015		

SAIDI: System Average Interruption Duration Index
SAIFI: System Average Interruption Frequency Index

4) Rate of Power Distribution Loss

According to the 2015 data published by the NEA, the power distribution loss of the respective ECs is as shown in the table below. As the power distribution loss is worked out as the difference between the amount of electricity the respective ECs purchased from the National Power Corporation (NPC) and the amount of electricity actually sold to consumers, the power distribution loss shown in Table 1-1.4 is a total of technical loss (heat loss from power distribution lines etc.) and non-technical loss (electricity stealing and electricity charges that have not been paid, etc.). Power distribution loss of SIASELCO is 11% which is relatively small compared to the other ECs, those of other ECs are 20-40%, in particular, that of LASURECO is 39% which is three times as high as SIASELCO.

<Reference> In the case of Tokyo Electric Power Co., the rate of power transmission/distribution loss (power transmission loss plus power distribution loss) is 5% or so.

Table 1-1.4 Amount of Electricity Purchased/Sold by the respective ECs and the Power Distribution Loss

No.	Name of EC	Buying	Selling	Distribution Loss Rate (%)
		A (kWh)	B (kWh)	$C=(A-B)/A$
1	MAGELCO	41,022,332	29,582,612	28%
2	LASURECO	87,342,522	53,155,144	39%
3	BASELCO	27,172,739	18,751,926	31%
4	SULECO	35,065,756	24,126,676	31%
5	SIASELCO	2,171,400	1,926,569	11%
6	TAWELCO	15,862,913	12,216,126	23%
7	CASELCO	—	—	—

Source: NEA Website

- 5) **It is the major factor of non-technical loss that kWh meters are often broken and electricity stealing is widespread. ECs are willing to rehabilitate kWh meters, but ECs are in difficult situation because of the fact that financial status of ECs is not healthy. Inefficient maintenance/construction work being done manually**

Currently, with respect to all the ECs subject to this study, it takes a lot of time and manpower for them to carry out the maintenance work and/or new construction work, therefore, the efficiency of the work is not very good due to the fact that either they don't have adequate heavy equipment for maintenance and construction work or, even if they do, they cannot use it because the equipment is in a decrepit condition. Those ECs that do not have any boom trucks with diggers (TAWELCO etc.) are doing pole-erecting work manually.



Manual Pole Installation Work



Manual Digging for Poles Since there is No Boom Truck with Digger.

Figure 1-1.2 Workers Who Are Engaging in Pole-erecting Work Manually (TAWELCO)

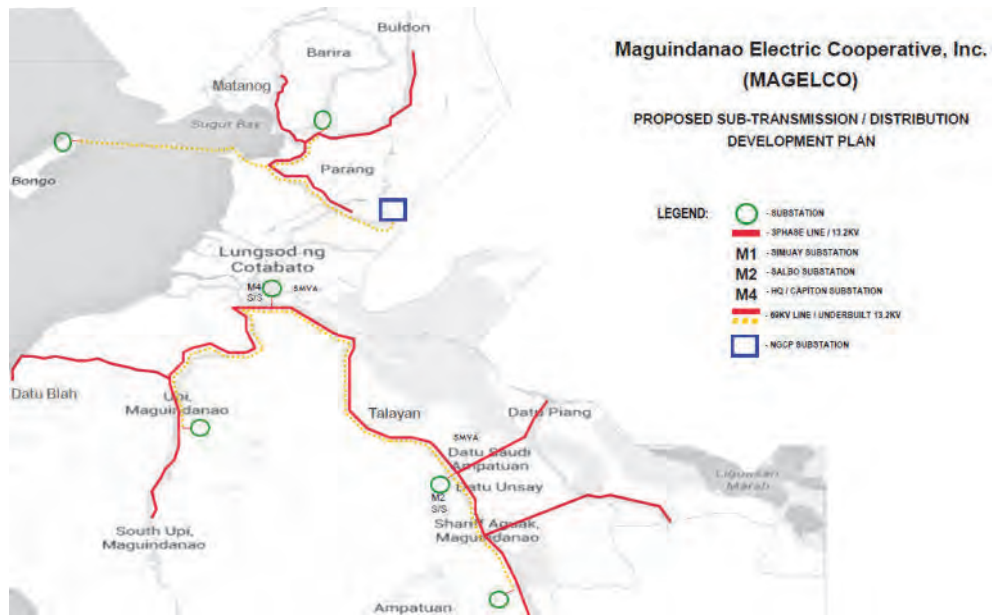
1-1-2 Development Plan

Subject ECs have formulated a development plan for equipment for power distribution called the “Distribution Development Plan” in order to address the issues detailed in “1-1-1-2, (2) Challenges ECs are Facing”. The development plan of the respective ECs is detailed as follows (in the Development Plan, with technical view, the power distribution development plan is designed by its distribution unit (hereinafter referred to as ‘feeder’) (each power distribution line is composed of several feeders)):

(1) MAGELCO

1) Power distribution line new-installation/upgrading plan

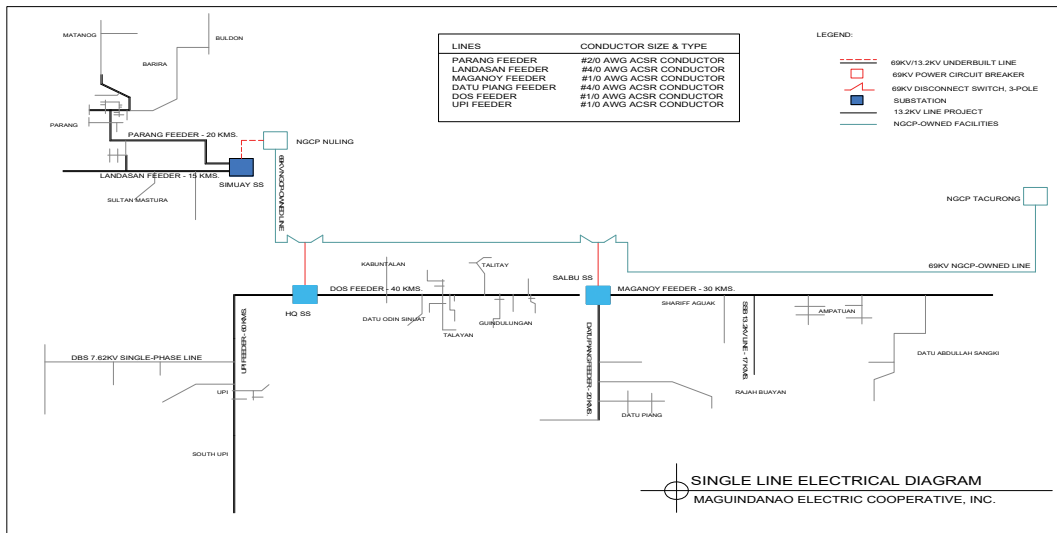
The 13.2kV high voltage feeder operated by MAGELCO radiates in all directions from the secondary side of three substations, namely HQ substation (with one transformer for power distribution of 5MVA capacity), SALBU substation (with one transformer for power distribution of 5MVA capacity), and SIMUAY substation (with one transformer for power distribution of 10MVA capacity) which receives electricity through the 69kV power transmission line operated by NGCP. Although electricity in the Cotabato city is distributed & supplied by Cotabato Light and Power Co., a private power distribution business operator, electricity in the Parang, Sultan Mastura areas located to the Northern side of the city is distributed & supplied by the SIMUAY substation and electricity in the Datu Odin Sinsuat and Upi areas located to the South of Cotabato city is distributed & supplied by the HQ substation and SALBU substation through 13.2kV high voltagefeeder. The power distribution line (feeders) of MAGELCO is shown in Figure 1-1.3.



Source: Provided by MAGELCO

Figure 1-1.3 MAGELCO’s Power Distribution Line (Feeders) Diagram

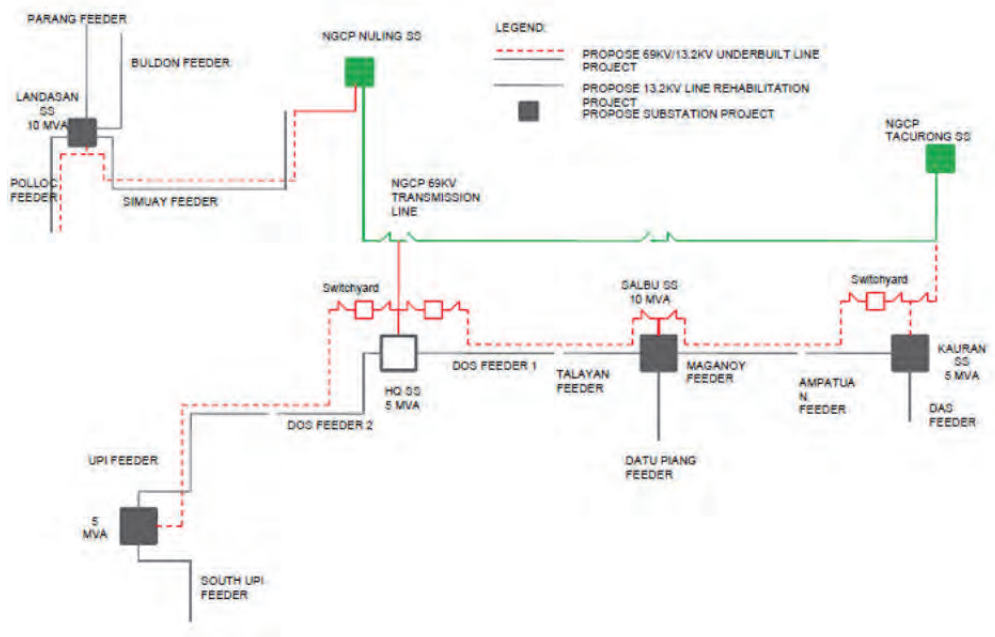
The single-line diagram showing the existing 13.2kV feeder is shown in Figure 1-1.4.



Source: Provided by MAGELCO

Figure 1-1.4 The Single-line Diagram to Show the Existing Feeder

Although no target year is indicated, there is a need to upgrade the existing feeders in the near future. The single-line diagram of the upgraded feeder representing the future plan is shown in Figure 1-1.5.



Source: Provided by MAGELCO

Figure 1-1.5 Single-line Diagram for Future 13.2kV Feeder

This future plan will be achieved by upgrading/replacing the existing feeders. Existing feeders will be divided into blocks and the source substation will be changed. New names attached to all feeders are shown in Table 1-1.5.

Table 1-1.5 Feeder Upgrading Plan

Original Feeder Name	Original Substation	New Feeder Name	New Substation
DOS Feeder	HQ Substation	DOS Feeder 1	HQ Substation
		Talayan Feeder	Salbu Substation
Maganoy Feeder	Salbu Substation	Maganoy Feeder	Salbu Substation
		Ampatuan Feeder	Ampatuan (Kauran) SS
		DAS Feeder	Ampatuan (Kauran) SS
Upi Feeder	HQ Substation	DOS Feeder 2	HQ Substation
		Upi Feeder	Nuro Substation
		South Upi Feeder	Nuro Substation
Landasan Feeder	Simuay Substation	Simuay Feeder	Landasan Substation
		Polloc Feeder	Landasan Substation
		Parang Feeder	Landasan Substation
		Buldon Feeder	Landasan Substation
Parang Feeder	Simuay Substation	(the portion from Simuay will be eliminated)	

Source: Site Survey Report by DEVCON

In addition, the new-installation/upgrading plan for respective feeders in consideration of priority from MAGELCO's technical point of view in implementing the new-installation/upgrading plan for respective feeders to achieve the plan mentioned above is shown in Table 1-1.6.

Table 1-1.6 Feeder new-installation/upgrading plan in consideration of priority

Name of Feeders	Priority	Section	Length (km)	Consumer Numbers (Households)	Reasons of Priority
Maganoy (Ampatuan) Feeder	1	From Ampatuan to Shariff Aguak	12	4,667	Installation of new Substation
DAS Feeder	1	From Ampatuan to DAS	13	2,510	Installation of new SubStation
Simuay Feeder	1	From Landasan to Simuay	9	1,197	Significantly aged
Parang Feeder	1	From Landasan gto Matanog	33	4,358	Significantly aged
Buldon Feeder	1	From Landasan to Buldon	30	769	Significantly aged
Polloc Feeder	1	From Landasan to Polloc Port	6	2,221	Significantly aged
Talayan Feeder	2	From Salbu to Talayan	15	2,272	Significantly aged
DOS Feeder 1	2	From HQ to Poblacion DOS	25	3,571	Significantly aged
DOS Feeder 2	3	From HQ to Labungan	12	651	Significantly aged
Name of Feeders	Priority	Section	Length (km)	Consumer Numbers (Households)	Reasons of Priority
Upi Feeder	3	From Nuro, Upi to Labungan	18	4,306	Significantly aged
South Upi Feeder	3	From Nuro to Timanan	25	1,846	For new Substation

Source: Site Survey Report by DEVCON

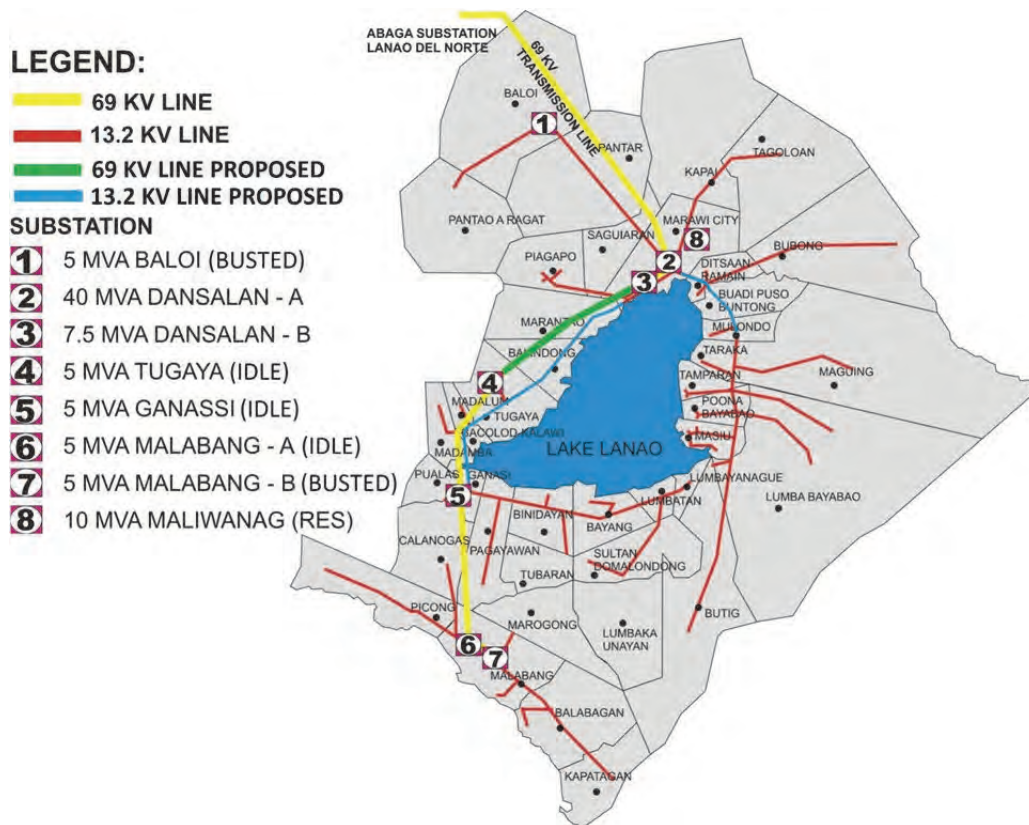
2) The referential document was provided by MAGELCO, the following items are listed as requires “Immediate Assistance from the People of Japan”

- 30,000 pcs. of kWh meters
- Rehabilitation of Distribution Lines
- 2 units of Boom Truck
- 5 units of Utility Vehicles
- Construction of Submarine Cable, Substation and Distribution Lines at Bongao Island

(2) LASURECO

1) New-installation/upgrading plan of Feeders

The feeders operated by LASURECO is the 13.2kV high voltage feeder built to the secondary side of respective substations i.e. Dansalan substation (there are two substations, one with one transformer of 40MVA capacity and the other with one transformer of 7.5MVA capacity), Tugaya substation, Ganassi substation and Malabang substation which receive electricity through the 69kV power transmission line operated by NGCP. While electricity is supplied to each area from respective substations through the feeders built radially surrounding the Lake Lanao, as those substations located down the river i.e. Ganassi substation and Malabang substation including Tugaya substation are, as they say, currently out of order (confirmed in February 2016) due to the power transmission tower bombing incident between Dansalan substation and Tugaya substation, they are engaging in recovery work as of June 2016. Diagram of the power distribution line (feeders) reflecting the new power distribution lines to be installed is shown in Figure 1-1.6.



Source: Provided by LASURECO

Figure 1-1.6 LASURECO's Power Distribution Line (Feeders) Diagram

In addition to the recovery plan for the power transmission facilities that were destroyed in the 69kV transmission tower bombing incident, a new construction plan has been formulated to build a 13.2kV Feeder to supply electricity to the 40-Feeder 2 and Guanassi substation, Tugaya substation system etc. which are located on the east side of Marawi city. The list of new-installation/upgrade plans which have been formulated most recently is shown in Table 1-1.7.

Table 1-1.7 Most Recent Plans to Rehabilitate the Power Distribution Line (Feeders)

No.	Name of Feeders	Voltage [kV]	Nos. of Circuits	Section	Length [km]
1	40-Feeder 2	13.2	2	Marawi City to Mun. Mulondo, L.D.S	21.3
2	7.5-Feeder 1	13.2	1	Marawi City to Mun. Tugaya, L.D.S	15.2
3	5-Tugaya	13.2	1	Mun. Tugaya to Mun. Ganassi, L.D.S	18.5

Source: Provided by LASURECO

As all the existing distribution lines/facilities were constructed in the 1970s and are showing considerable aged deterioration, urgent repair is required. For your information, with respect to “No.2” shown in the above Table1-1.7, equipment and materials for power distribution required for upgrading have been purchased by LASURECO, it is anticipated that upgrade work will commence by the end of this year.

2) 2016 Action Plan

LASURECO is implementing administrative reform by setting up a taskforce. The “2016 Action Plan” is one of the reform plans formulated in the course of the process, which consists of the following major items:

Area 1: Efficient and Effective Service Delivery

- Current Status
 - 37,000 kWh meters were installed to 16 out of 22 LGUs that were disconnected in the past few months, and the remaining uninstalled kWh meters will be installed to the remaining 6 un-energized LGUs as soon as NGCP 69kV transmission lines are restored.
 - Restoration of the trust and confidence of the LGU leaders and consumers by the meeting and reform campaign drive.
 - Improvement of tariff collection implemented by mobile toll collection and massive collection campaign.
 - Replacement of wires to prevent pilferage of electricity.

Area 2: Rehabilitation/Upgrading/Development of Facilities and System Loss Reduction

- Current Status
 - Replacement of damaged and dilapidated poles and wirings, and defective kWh meters
 - Completion of energization of 69kV substation (Baloi, Tugaya, Ghanasi, and Malabang) that had been under outage due to the troubles of NGCP transmission lines

Area 3: Financial Viability

- Current Status
 - Tariff collection is still poor situation. However, since DOE, undersecretary, Mr. Benito L. Ranque, was designated as a chairman of the TFL and the acting general manager, it has been starting to normalize.

Organizational Development

- Current Status
 - Conducted strategic planning seminar workshop to improve the managerial performance
 - Another round of workshop will be held to tackle on the organizational goals, objectives, and performance target of every departments, divisions, and individual personnel. The number of department will be reduced from 12 departments to 4 only.

(3) BASELCO

1) Power Distribution Line (Feeders) new-installation/upgrading plan

The power distribution line (feeders) operated by BASELCO is built in such a manner that the high voltage power distribution line called the backbone line goes to the circuit of Basilan Island. The number of feeders is only two lines which is either a 13.2kV three-phase or a 7.62kV single-phase power distribution line. The power distribution line built clockwise starting Isabela located in the northern part of Basilan Island is Lamitan Feeder and the power distribution line built counterclockwise is Isabela Feeder. The diagram of BASELCO's high voltage power distribution line (feeders) is shown in Figure 1-1.7.



Source: Provided by BASELCO

Figure 1-1.7 BASELCO's Power Distribution Line (Feeders) Diagram

In addition, BASELCO's new-installation/upgrade plans which have been formulated most recently are shown in Table 1-1.8.

Table 1-1.8 Most Recent Plans to Rehabilitate the Power Distribution Lines (Feeders)

No.	Name of Feeder	Voltage [kV]	Nos. of Feeder	Section	Length [km]	Note
1	Lamitan Feeder	13.2	2	Bgy.Limook to Sayugan	1	New
2	Lamitan Feeder	13.2	1	Isabela City to Lamitan City	30	Upgrade
3	Isabela Feeder	13.2	1	Binuangan to Port Area	4	Upgrade
4	Sumiship Section	13.2	1	Maluso to Tumahubong	45	Upgrade

Source: Provided by BASELCO

While is a new construction work for the purpose of improvement of the reliability of power supply, through to is a refurbishment plan for the purpose of upgrading the relevant feeders which are showing considerable aged deterioration because they were constructed in the 1970s.

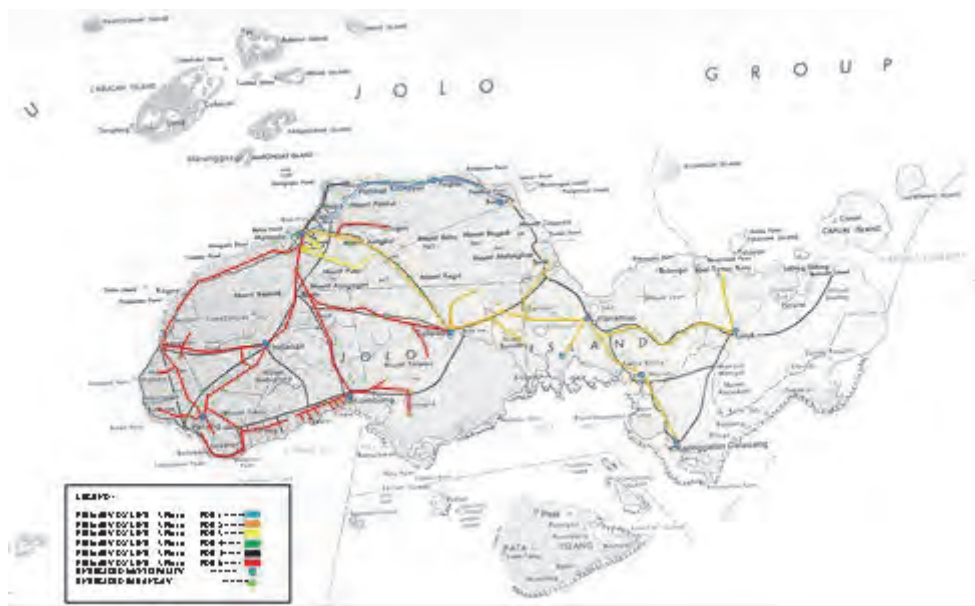
2) Feeder construction plan across the middle of the island

As there is a plan to construct a road across the middle of the island and there is a plan to install high voltage feeders along this road. As this plan is at the concept level, technical consideration will be given in the future.

(4) SULECO

1) Power Distribution Line (feeders) new-installation/upgrading plan

SULECO operates six feeder circuits. It is located in the northwestern part of the Sulu Island: and, respective 13.2kV high voltage feeders stretch out radially from Jolo, the center. SULECO’s high voltage power distribution line (feeders) is shown in Figure 1-1.8.



Source: Provided by SULECO

Figure 1-1.8 SULECO’s Power Distribution Line (Feeders) Diagram

Among the other six feeders, the “Feeder 4” from Jolo substation to Alat shows significant deterioration and this feeder is considered to be the one that needs an upgrade most urgently. The number of customer households of which electricity is supplied through Feeder 4 is 3,438. The next feeder which is considered to be requiring an urgent upgrade is Feeder 6, of which they say that it is necessary to upgrade it from 7.6 kV single-phase high voltage feeder to 13.2kV three-phase high voltage feeder. The power distribution line (feeders) new-installation/upgrade plans which have been formulated most recently are shown in Table 1-1.9.

Table 1-1.9 Most Recent Plans to Rehabilitate the Power Distribution Lines (Feeders)

No.	Name of Feeder	Voltage [kV]	Nos. of Circuits	Section	Length [km]	Note
1	Feeder 4	13.2	1	From Substation to Alat	7	Upgrade
2	Feeder 6	13.2	1	From Km 2.5 Indanan to Maimbung Sulu	23	Upgrade

Source: Provided by SULECO

(5) SIASELCO

1) Power Distribution Line (Feeders) new-installation/upgrading plan

The high voltage power distribution lines (feeders) operated by SIASELCO are built in such a manner that 13.2kV three-phase and 7.62kV single-phase high voltage power distribution lines go to the circuit of Siasi Island. It consists of two feeders coming from the NPC-SPUG power station/substation located in the mid-western part of the Siasi Island. In addition, electricity is supplied to Tara Island located to the North of Siasi Island through a single-phase high voltage power distribution line. The diagram of SIASELCO's high voltage power distribution system (feeders) is shown in Figure 1-1.9.



Source: Provided by SIASELCO

Figure 1-1.9 SIASELCO's Power Distribution Line (Feeders) Diagram

The most recent SIASELCO's upgrading plan is shown in Table 1-1.10.

Table 1-1.10 Most Recent Plans to Rehabilitate the Power Distribution Line

Name of Feeder	Voltage [kV]	Nos. of Circuits	Length [km]	Note
Feeder 3	7.6kV (Single Phase)	1	16	Upgrade

Source: Provided by SIASELCO

With regard to Feeder 3, the need to increase the capacity of the power line became an urgent issue because, for one thing, power distribution loss is high because electricity is supplied via a single-phase 7.6kV high voltage power line, and for another, it is anticipated that the system will not be able to cope with the increased demand in the near future due to the fact that the size of the power line being used is #1/0 which is smaller than the standard size stipulated by NEA. While the number of households supplied by Feeder 3 was 800 as of August 2016, it is anticipated that the number will increase to 1,400 in a short span of time. As for the upgrading plan, they have formulated a plan to upgrade the power line so that single-phase will be upgraded to three-phase and the power line size will be upgraded to #4/0. After this upgrading, it is anticipated that the power distribution loss will be reduced to be one sixth of the current level.

(6) TAWELCO

1) Plan for laying new power distribution line (Feeders) or rehabilitating existing ones

TAWELCO's power distribution line (feeders) is established mainly on Bongao Island. Figure 1-1.10 is the power distribution line (feeders) diagram for TAWELCO. The red power distribution line rated at three phase and 13.2 kV is called Feeder 1, which runs around the whole island. Meanwhile, Feeder 2 (green power distribution line) rated at a single phase and 7.62 kV covers most parts of Sanga-Sanga Island and extends radially.



Source: Provided by TAWELCO

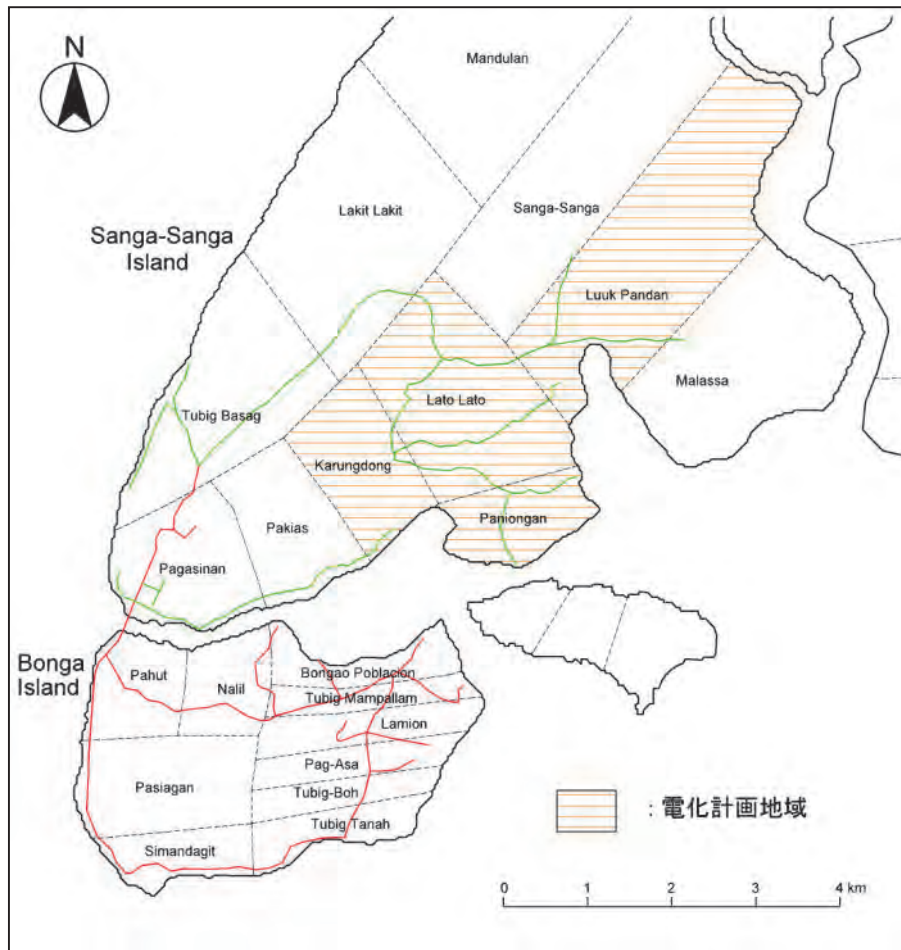
Figure 1-1.10 TAWELCO's Power Distribution Line (Feeders) Diagram

Most of the feeders are degraded significantly because they were laid in 1975, and there are many wooden poles that are likely to collapse. Accordingly, it is essential to urgently rehabilitate Feeder 1 that supplies power for many consumers.

When the 1st mission was implemented, the Team received the information on an electrification plan for the following barangays (Feeder 2). According to TAWELCO, the final commissioning was completed in September 2016, and the targeted barangays were already energized.

- Karungdung and Luuk Pandan (Completed and energized in March 2016)
- Lato-Lato and Panyungan (Completed and energized in September 2016)

After the plan is implemented, electric power will be supplied to about 180 houses. Figure 1-1.11 shows the barangays in question.



Source: Provided by SIASELCO

Figure 1-1.11 Plan for Electrifying Barangays

(7) CASELCO

Although the Team frequently asked NEA to collect information about development plans, the Team could get nothing because of lack of contact with CASELCO.

1-1-3 Social and Economic States

The southwestern part of Mindanao Island has the highest poverty rate in the Philippines due to a conflict persisting for more than forty (40) years. The National Statistics in FY 2012 indicated that the national mean poverty rate is 22.3 percent but that area, which is expected to be called Bangsamoro after a local referendum, has 46.9 percent. Accordingly, Bangsamoro suffers from many issues, such as insufficient social services, aging infrastructures, and lack of infrastructures. The electrification rate of the area is about 35 percent, which is much lower than the nationwide average of 74 percent and is an obstacle to the improvement of living conditions and social services as well as to the development of industries.

1-2 Background, History, and Outline of the Grant Aid

In October 2012, peace negotiating teams sent by both the Philippine government and MILF signed the framework agreement on peaceful Mindanao and agreed to establish the Bangsamoro autonomous political entity. Since that time, JICA has granted necessary aid to BTC, BDA that is the development agency of MILF, and the ARMM government as the counterpart so that the new political entity can offer administrative services properly. The members of the Comprehensive Capacity Development Project for the Bangsamoro (development planning), part of the grant aid, thought that the overall and fair construction of transport and electric infrastructures was very important to the activation of economic activities and drew up a middle- to long-term plan (from 2016 to 2022) for developing the area in question to give priority to the proper and urgent construction or rehabilitation of power distribution facilities. As a result, the Team made a preparatory survey for the plan for installing power distribution equipment and material in the Bangsamoro area to be implemented in the project. As mentioned in “1-1-1 Current Status and Challenges,” most of the power distribution facilities in the area are degraded significantly because they were built in the 1970s, resulting in the high power distribution loss and low electrification rate, both being obstacles to stable power supply and local development. Therefore, the purpose of this project is to improve the power distribution line of the local area in question by providing the local electric companies (hereinafter called the ECs) with the vehicles necessary to facilitate rehabilitation as well as with equipment and material composing the power distribution line for supplying more qualified power to important parts of the area, and with this ‘Peace Dividends’, the project also aims to promoting conflict prevention and development in the area.

1-3 Natural Conditions

The targeted area in the project is located in the southern-west region of Mindanao main Island and Sulu Islands including Basilan Island in the southern part of the Philippines. Since the climate for each region is tropical rainforest climate, the temperature tends to be high through the year and there is only a small yearly difference in temperature. Also, the typhoons occurring in the Northwest Pacific seldom land in the Mindanao region. Table 1-3.1 shows the temperature and precipitation for main points of typical provinces in the area targeted in the project. The headquarters of the ECs that the equipment is provided for are situated in the points shown in the typical areas below.

Table 1-3.1 Climate Conditions of Typical Recipient Areas

Item	Maguindano State (Awang)	Lanao del Sur State (Maliwang)	Basilan State (Isabela)
Monthly Mean Max. Temp.(Highest Month)	32.8°C(Mar.)	29.4°C(Apr.)	32.3°C(Apr.)
Monthly Mean Max. Temp (Lowest Month)	22.0°C (Jan., Feb.)	17.8°C (Jan., Feb.)	21.7°C (Jan., Feb.)
Precipitation (Yearly Ave.)	2,184mm	2,791mm	1,726mm
Precipitation (Highest Month)	280mm(Oct.)	357mm(Jul.)	233mm(Oct.)
Item	Sulu State (Jolo)	Sulu State (Siasi)	Tawi-Tawi State (Bongao)
Monthly Mean Max. Temp.(Highest Month)	31.7°C(May.)	31.2°C(May.)	31.7°C(Aug.)
Monthly Mean Max. Temp (Lowest Month)	22.4°C (Mar.)	22.0°C (Jan., Oct.)	22.7°C (Mar, Jul, Oct)
Precipitation (Yearly Ave.)	2,093mm	1,592mm	1,879mm
Precipitation (Highest Month)	255mm(Oct.)	199mm(Jun.)	197mm(Nov.)

Source: CLIMATE-DATA ORG (Website)

1-4 Environmental and Social Considerations

The project is classified as a JICA social and environmental category “C”. It is considered that the unfavorable impact against the environment is minimized because the project is the rehabilitation of the distribution lines and it would give a minimum impact on the environment. It is also considered that its environmental impact would be minimized because the diesel engine mounted on the boom trucks provided through the project, shall satisfy the regulations of exhausted gas emissions.

Chapter 2 Contents of the Project

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Supreme Objective

As of June 2016, the current ARMM area, which is expected to be under the control of the Bangsamoro autonomous political entity, has an electrification rate of 36 percent, which is much lower than the mean rate of 74 percent in the whole Mindanao area. Moreover, other regions in the Philippines have higher electrification rates, for example, the Luzon and Visayas areas have 92 and 91 percent of electrification rate, respectively. Also from the viewpoint of regional gap correction, it is necessary for the ARMM area to increase the electrification rate urgently. NEA, an agency for supervising the power distribution sector, set forth a management vision of increasing the electrification rate to 100 percent in the whole service area by 2020 and has just started the electrification promotion program with DOE in the ARMM area that includes sitios (this program is designed to supply the power for the twenty-one (21) sitios existing in the ARMM region by expanding the distribution lines) as of October 2016. Therefore, the supreme objective is to contribute to the development of the Bangsamoro area by updating the power distribution facilities to increase the nationwide electrification rate of the Philippines.

2-1-2 Objectives of the Project

In addition to a low electrification rate, the Bangsamoro area has issues, such as the existing degraded feeders and the high technical loss since most of them were installed in the 1970s. Another problem is the small feeder capacity, which will not cope with the growth in power demand for future development. Accordingly, the project has two objectives: one is to respond to an expected growth in power demand and the other is to improve the power quality by reducing the technical loss of the existing feeders.

2-1-3 Outline of the Project

To provide the six ECs that conduct power supply services in the Bangsamoro area with equipment and material (utility poles, electric wires, and pole transformers) necessary to the rehabilitation of feeders regarded as important in the conflict-affected region. The existing heavy machines (vehicles) which are owned by ECs are degraded significantly, or some ECs have no Heavy machinery at all. Accordingly, in order for the ECs to rehabilitate the power distribution line (feeders) efficiently and to improve the maintenance capability of it, this equipment is indispensable.

2-2 Outline Design of the Japanese Assistance

2-2-1 Design Policy

Most of the power distribution line (feeders) owned by ECs in the Bangsamoro area were constructed in the 1970s, and they have not been maintained appropriately due to a lack of equipment and material during the conflict. Therefore, the feeders are already degraded, and the region suffers from many issues, such as huge distribution losses and frequent power outages. The basic design policy is to mitigate the issues mentioned above by supplying equipment and material for the feeders and boom trucks to be used for maintenance work and pole erection work which are expected to improve the efficiency of feeder installation and maintenance.

2-2-2 Basic Plan (Equipment Plan)

(1) Power Distribution Equipment

1) Basic specifications of the equipment and material

Provision of pole transformers, utility poles, and electric wires are planned. The specifications of the above equipment are as follows:

(a) Pole Transformers

The transformers shall have a variety of standard capacities defined by NEA: 10 kVA, 15 kVA, 25 kVA, 37.5 kVA, 50 kVA, 75 kVA, 100 kVA, and 167 kVA. Each transformer is a general-purpose product that has a silicon steel plate core filled with oil. The rated voltage of the transformer is shown below,

- Primary side: 13.2 kV/7.6 kV
- Secondary side: 240 V/120 V

In consideration of the natural conditions of the local area, the casing (outer box) shall be coated with zinc paint featuring high resistance to salt or with its equivalent, and the transformer shall meet the technical standards defined by NEA.



Figure 2-2.1 Pole Transformer

(b) Utility Poles

The poles shall consist of two types: one is made from concrete and the other is a steel type. Compared with the former, the latter has various advantages: light weight, easy handling, and low transportation cost. Therefore, mainly, the steel poles will be provided to the ECs located on

the islands. As the result of discussions with the ECs, ECs proposed the following poles with the following heights.

- Concrete pole: 40 feet, 45 feet, and 60 feet
- Steel pole: 35 feet, 40 feet, 50 feet, and 60 feet.



Concrete Pole



Steel Pole

Source: Provided by Dura-Pole, INGAL Corp..

Figure 2-2.2 Utility Poles

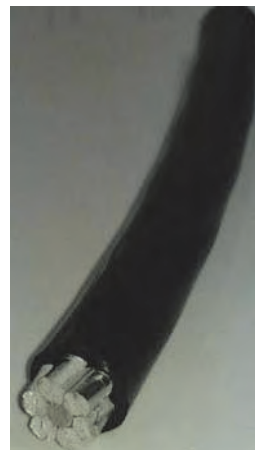
(c) Electric Wires

The electric wires to be supplied shall consist of two types: one is aluminum conductor steel reinforced and the other is insulated aluminum conductor steel reinforced. The former will be laid in urban areas, while the latter will be installed in regions having many trees. The insulated aluminum wire could prevent ground faults or short-circuit faults when it touches a tree for a short time due to rain or wind because the conductor is covered (insulated).



ACSR

(Aluminum Conductor Steel Reinforced)



Insulated ACSR

(Insulated Aluminum Conductor Steel Reinforced)

Source: Provided by AC Harris

Figure 2-2.3 Wires Used for Distribution Lines

2) Allocation of the equipment and material

The ECs provide a power supply service to conflict affected regions, so it is important to set up fair criteria for supplying the equipment and material to ECs. Accordingly, an allocation index based on two (2) parameters are adopted: the total length of feeders and the number of potential households (customers), information regarding both being provided by the respective ECs, to specify the priority and quantity of the equipment and material so that an equipment budget can be properly allocated to the respective ECs. Table 2-2.1 shows the allocation indices given on an EC basis.

Table 2-2.1 Allocation Indices for the respective ECs

	MAGELCO	LASURECO	BASELCO	SULECO	TAWELCO	SIASELCO
Potential Connections (As of Sep. 2015)	116,200	139,500	76,200	85,800	47,200	13,500
Allocation Index A	0.243	0.292	0.159	0.179	0.099	0.028
Circuit kms. Of Line	3,468	2,692	1,407	1,100	295	168
Allocation Index B	0.380	0.295	0.154	0.120	0.032	0.018
Allocation Index C(=A+B)	0.623	0.586	0.313	0.300	0.131	0.047
	1	2	3	4	5	6
Budget Allocatin Ratio (Target)	31.1%	29.3%	15.7%	15.0%	6.5%	2.3%

Source: Created by JICA Study Team

In addition to this process, with technical viewpoint, considering the respective ECs' Development Plan (mentioned in 1-1-2) and in terms of promoting conflict prevention, the project targeting power distribution line of the respective ECs' are selected by its feeder unit in accordance with the allocation indices above. The components of equipment and material for power distribution line consist of hundreds of types if the above equipment and materials include pole accessories. The field survey results carried out by the local consultant shows that the ECs have sufficient stock of incidental equipment and materials. Moreover, allocating as many key components as possible contributes to the improvement of wide-area, therefore, three types of components, Pole Transformer, Utility Pole and Electric Wire are selected and will be procured. Table 2-2.2 is a list of the equipment and material for the selected power distribution line by its feeder unit to be procured for the ECs.

Table 2-2.2 Quantities of Equipment and Material to be Procured for the respective ECs

Classification	Boom Truck (Japan)		Feeder Name	Pole Mount Transformer (Local Procurement)							
	Boom Truck with Buckt	Boom Truck with Digger		Transformer 10kVA	Transformer 15kVA	Transformer 25kVA	Transformer 37.5kVA	Transformer 50kVA	Transformer 75kVA	Transformer 100kVA	Transformer 167kVA
Name of Equipment	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Unit	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Q'ty	8	8		13	99	194	64	35	11	7	2
MAGELCO	2	2	DOS Feeder			37					
			Landasan Feeder								
			Upi Feeder								
			Parang Feeder			35					
LASURECO	2	2	40 Feeder 2		16	22	3	2			
			5 Tugaya Feeder		14	32	32	6			
BASELCO	1	1	Lamitan Feeder		5	15	7	7	1		
SULECO	1	1	Feeder 4	3	3	5	8	8	5	5	2
			Feeder 6	10	15	3	2	2	2	2	
TAWELCO	1	1	Feeder 1		6	20	12	10	3		
SIASELCO	1	1	Feeder 3		40	25					

Classification	Name of Equipment	Name of Feeders	Poles (Local Procurement)					Distribution Conductor (Local Procurement)				
			Concrete Pole 40 Ft.	Concrete Pole 45 Ft.	Concrete Pole 60 Ft.	Steel Pole 35 Ft.	Steel Pole 40 Ft.	Steel Pole 50 Ft.	Steel Pole 60 Ft.	ACSR #3/0	Insulated ACSR #4/0	ACSR #4/0
Unit	No.	No.	No.	No.	No.	No.	No.	No.	m	m	m	feet
Q'ty	743	1,463	85	780	730	120	150	264,270	522,847	343,447	150,537	
MAGELCO	DOS Feeder		667					46,000	69,000	69,000	26,680	
	Landasan Feeder	83		85				11,500	27,600	6,900	8,017	
	Upi Feeder	500						34,500	82,800	20,700	20,000	
	Parang Feeder	160			230			34,500	51,750	51,750	12,500	
LASURECO	40 Feeder 2		426					24,495	73,485	73,485	17,040	
	5 Tugaya Feeder		370					21,275	31,912	31,912	14,800	
BASELCO	Lamitan Feeder				50	230	120	150	34,500	103,500	0	19,000
SULECO	Feeder 4				70	70			8,050	0	24,150	4,550
	Feeder 6				230	230			26,450	62,100	17,250	14,950
TAWELCO	Feeder 1					200			11,500	20,700	13,800	7,000
SIASELCO	Feeder 3				200				11,500	0	34,500	6,000

Source: Created by JICA Study Team

(1) Vehicles for Maintenance/Construction Work (Boom Trucks)

The boom trucks (with Bucket / with Digger), which meet the local environments including the road width, are to be procured for the maintenance/construction work of the power distribution line. These vehicles will contribute to increasing the efficiency of the ECs. The allocation of the vehicles is determined according to the scale of the ECs' franchise area and power distribution line, the number of existing vehicles, and the operating status. Table 2-2.3 shows the number of boom trucks to be procured in accordance with "2-2-2 Basic Plan."

Table 2-2.3 Number of Boom Trucks to be Procured

Name of EC	Boom Truck/Bucket [Unit(s)]	Boom Truck/Digger [Unit(s)]	Reasons
MAGELCO	2	2	MAGELCO owns one old boom truck made by Altec, however no spare parts are available due to them being old type vehicles (more than 20 years old). MAGELCO operates in the province of Maguindanao on Mindanao Island and covers a broader area compared to the other ECs on nearby islands. Therefore, requesting four (4) boom trucks is reasonable.
LASURECO	2	2	LASURECO purchased two used Boom Trucks in 1999, one boom truck has been working however, no spare parts are available and the other one is broken down. However, LASURECO has no boom trucks with diggers. LASURECO has almost the same scale of coverage area as MAGELCO. Therefore, requesting four (4) boom trucks is reasonable.
BASELCO	1	1	At present, BASELCO owns one boom truck (Altec made) manufactured in 2000. However, the vehicle body itself has been damaged, and the operator could not operate the boom truck safely. Considering safe operation and the works, requesting two (2) boom trucks is considered reasonable and proper.
SULECO	1	1	SULECO used to own a second-hand boom truck with bucket and digger that was procured in 2000. After four (4) years of operation, it was disposed of in 2004 due to serious troubles with the hydraulic system. Accordingly, SULECO does not own either type of boom truck at present. SULECO has the same scale of coverage area as BASELCO. Therefore, requesting two (2) boom trucks is considered reasonable and proper.
TAWELCO	1	1	At present, TAWELCO owns one boom truck (Telct made) manufactured in 2000. However, the windshield and bucket have been broken, and these affect the operation and maintenance. Since TAWELCO has no boom truck with Digger, requesting two (2) boom trucks is considered reasonable and proper.
SIASELCO	1	1	SIASELCO has never owned a boom truck before, and for that reason, all work related to power distribution has to be carried out by human power. The coverage area of SIASELCO is not as large as the other ECs Considering future development of SIASELCO requesting two (2) boom trucks is considered reasonable and proper.
CASELCO	0	0	No information has been given.
Total	8	8	

Source: Created by JICA Study Team

2-2-3 Outline Design Drawing

The following shows the rough design drawings of the boom truck with bucket and with digger.

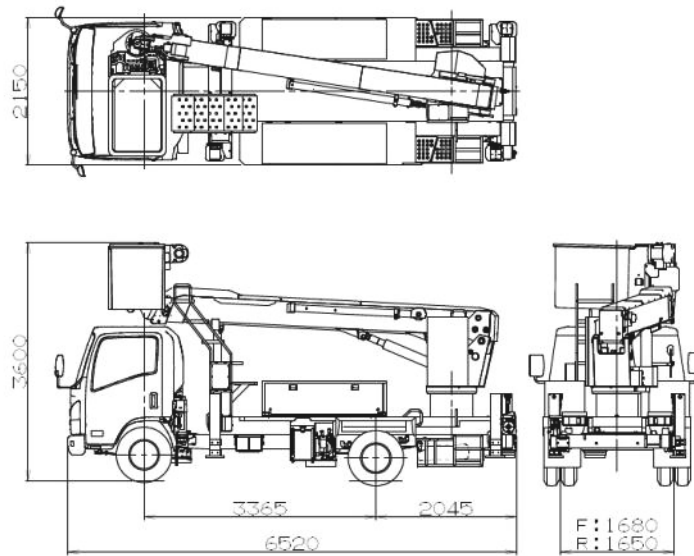


Figure 2-2.4 Rough Design Drawing of the Boom Truck with Bucket

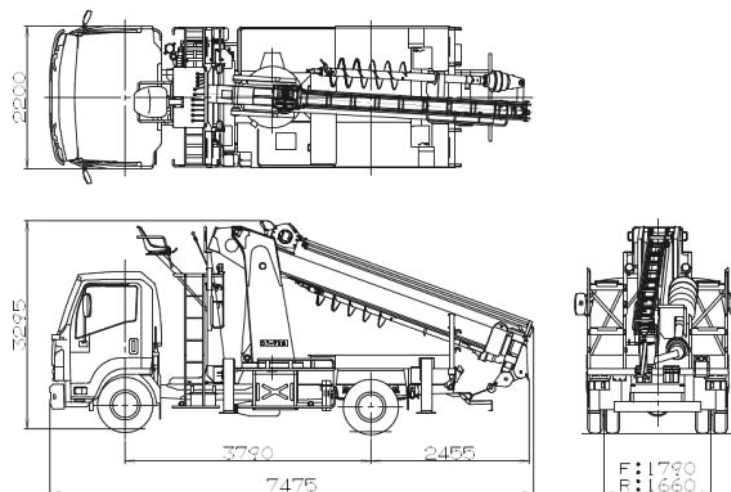


Figure 2-2.5 Rough Design Drawing of the Boom Truck with Digger

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

The boom trucks with bucket and with digger to be procured for the project are not made in the Philippines. Therefore, those trucks are to be procured from a Japanese manufacturer. The equipment and material for power distribution are made in the Philippines and the ECs are familiar with handling them, so those equipment and materials are to be procured from manufacturers in the Philippines. Japanese people are banned from visiting the regions in which the ECs are based except for the HQ of MAGELCO and its surrounding area. From the viewpoints of making

Japanese control possible and ensuring Japanese safety, three unloading ports are selected, namely, the Port of Cagayan de Oro for LASURECO, the Port of General Santos for MAGELCO, and the Port of Zamboanga for the remaining ECs (BASELCO, SULECO, SIASELCO and TAWELCO) located on the islands. Japanese people are not allowed to land at the Port of Zamboanga. Instead, a local consultant will carry out the incoming inspection before handing over the equipment and material to the ECs. In order to study the inspection procedures, the consultant will attend the first incoming inspection together with the local consultant (which will be carried out at the Port of General Santos).

2-2-4-2 Implementation Conditions

Concerning the equipment and material procured from the local area, standardized products are to be procured since about 2,300 concrete poles are necessary for the project. Monthly manufacturing capacity of the manufactures was considered.

2-2-4-3 Scope of Works

The scope of the project is only to provide the vehicles for maintenance / construction work and the equipment and material for the power distribution line. Japanese people are banned from going to the Bangsamoro area, therefore, the equipment and materials provided have to be installed by the ECs. As mentioned in “2-2-4-1 Implementation Policy,” Japanese people are prohibited from going to the areas in which the ECs are based except for the HQ of MAGELCO. Accordingly, the above vehicles and equipment and materials shall be handed over at the designated unloading ports (the Port of Cagayan de Oro, the Port of General Santos and the Port of Zamboanga) mentioned in 2-2-4-1. The ECs are responsible for transportation from the designated unloading ports to their sites. The four (4) ECs located on islands (BASELCO, SULECO, TAWELCO and SIASELCO) have to receive the vehicles and the equipment and materials at the Port of Zamboanga and then deliver them to their sites by sea along with by land.

2-2-4-4 Consultant Supervision

(1) Production of the equipment

Before the production of the equipment at a factory, the inspection engineer of the consultant checks the drawings to be submitted by the manufacturer. After the approval of the drawings, the manufacturer starts to produce the equipment.

(2) On-site inspection

It is required to carry out an inspection of the boom trucks made in Japan at the manufacturer’s factory in order to check for conformance to the specifications and to test for performance. The manufacturer takes the initiative for the factory inspection, while the inspection engineer of the consultant attends the test to make technical checks. Concerning the equipment and material for

power distribution made in the Philippines, the consultant does not carry out factory inspections because they are general-purpose products with no special specifications.

(3) Transportation of the equipment (checking for correctness before shipping)

Before shipping from Japan, all vehicles have to be inspected by a third party inspector commissioned by the consultant. The inspection shall take place at the warehouse of each shipping port.

(4) Incoming inspection and handover

Concerning the boom truck, it is necessary to carry out an incoming inspection and handover the boom truck to the ECs at each unloading port and to move the boom truck to the parking space of the nearest EC to make final adjustments including the positional alignment of the boom. After the adjustment is complete, the ECs transport the boom trucks to ECs respectively through land/marine transportation. After all the boom trucks have been handed over to the ECs, training for initial machine operation, pole construction, and pole removal will be carried out for the operators and engineers of the companies at the site of MAGELCO. The consultant will supervise the training courses.

In terms of the equipment and materials (pole transformers, utility poles, and electric wires) to be procured locally, after completion of the incoming inspection at each unloading port, all the equipment and materials will be handed over to the respective ECs, and the ECs shall transport them to the EC's own warehouse.

2-2-4-5 Quality Control Plan

Since the boom trucks are procured from Japan, the consultant will carry out factory inspections before transporting them from the factory. Concerning the pole transformers, utility poles, and electric wire to be procured in the Philippines, no factory inspection is made because they are standard products available in the market. Before the equipment and materials are handed over to the respective ECs at the unloading port, it is required to carry out the incoming inspection to check the specifications of the equipment and materials and quantity.

2-2-4-6 Procurement Plan

(1) Country of Origin

Equipment and material to be procured in the project are shown below.

- Boom Truck with Bucket
- Boom Truck with Digger
- Equipment and material for power distribution (pole transformers, utility poles, and electric wire)

The equipment and materials are to be procured locally because they are manufactured in the Philippines and their quality meets the requirements of the standards presented by NEA. On the other hand, the boom truck with bucket and boom truck with digger are to be procured from Japan because they are not manufactured in the Philippines. Table 2-2.4 indicates the countries from which the equipment and materials are procured.

Table 2-2.4 Countries from which the equipment and material are procured

Equipment Name	Country of Origin	
	Philippines	Japan
Boom Trucks with Diggers		○
Boom Trucks with Buckets		○
Poles (Concrete and Steel)	○	
Pole Mounted Transformers	○	
Distribution Wire (ACSR)	○	
Insulated Distribution Wire (Insulated ACSR)	○	

(2) Transportation by ECs

In the project, as shown in “2-2-4-3 Scope of Works” the ECs are responsible for land and marine transportation from the unloading port. After the equipment and materials arrive at the unloading port and an incoming inspection is complete, the ECs shall prepare vessels and trucks within several days to transport them to the EC’s own storage areas. If the storage period exceeds more than a certain number of days at the port, additional port charges will be charged to the ECs. Therefore, ECs are required not only to coordinate closely with the contractor of the project to make schedule adjustments carefully but also to make perfect preparations.

2-2-4-7 Operational Guidance Plan

After all the boom trucks have been handed over to ECS, initial operation guidance regarding the boom trucks will be held at the site of MAGELCO where a visit ban is in effect for Japanese people. Japanese trainers will teach workers sent from all the ECs about how to operate the boom trucks. The trainers will use the boom trucks owned by MAGELCO. The trainers are to be dispatched from the manufacturer and the training period is for a total of two weeks (how to use the boom trucks in the first week and how to place and remove poles in the second week). The respective ECs will send two or four trainees. During the meeting with the ECs, the ECs agreed to pay expenses necessary for their trainees, such as the fare to MAGELCO and the accommodation cost. Moreover, applying insulated cables to actual facilities in the project is the first attempt for the ECs. Therefore, the Team plans to deliver training in good skills for laying such cables after the initial training in machine operation to improve their technical competence. The period is one week and the lecturers are to be dispatched from NEA, and BENELCO (Baguio Electric Cooperative) that has insulated cables as plant assets, or MERALCO, a private company. Also in this training, the respective ECs are allowed to send two or four trainees. Note that the consultants will attend both training courses to check their contents.

2-3 Obligation of Recipient Country

(1) Domestic Marine and Inland Transportation of Equipment from Unloading Port to ECs

As mentioned in “2-2-4-3 Scope of Works”, the Philippine side shall pay the entire marine and land transport costs for the equipment and material from the unloading port to the respective ECs.

(2) Expense for Inspection and Taking-over of Equipment at Zamboanga Port For ECs on islands

The Philippine side shall pay the travel and accommodation costs necessary for the officials in charge of the respective ECs who attend the inspection and handover.

(3) Additional Charge for Storage at Unloading Port

When the storage period of the equipment and material exceeds normally allowable days at the unloading port, the Philippine side shall pay the additional cost.

(4) Arrangement of Place for Inspection and Taking Over

As a rule, the equipment and materials are inspected and handed over to the EC at the unloading port. If this is difficult due to the quantity of equipment and material or the necessary period, the Philippine side shall make preparations at its own expense to make an inspection and handover at a site that is near to the port and that is owned by the EC.

(5) Expense for Operational Guidance

The Philippine side shall pay the travel costs, accommodation fees, and daily allowances necessary for the members of the ECs who participate in the training in initial operation in Cotabato City.

(6) Registration of Boom Trucks

The Philippine side shall pay the cost for registering the vehicles to be procured.

(7) Commissions to Bank for Payments

The Philippine side shall pay the commissions necessary for payment to the Japanese bank according to the banking arrangement.

(8) Tax Procedure

1) Boom Trucks

In general, Value Added Tax (VAT (12%)) and Import Tax are applied to Boom Trucks to be imported from Japan. In the project, without using the Grant, and without cost to Japanese nationals et al. (‘Japanese nationals’ in the present understanding means Japanese physical persons or Japanese juridical persons controlled by Japanese physical persons, and Japanese subcontractors in

the contractual relationship with Japanese nationals), NEA shall take necessary measures for Value Added Tax (VAT (12%)) and Import Tax in accordance with the Philippine's relevant laws and regulations.

2) Equipment and Material for the Power Distribution Line

In general, Value Added Tax (VAT (12%)) is applied to the equipment and material for the power distribution line to be procured in the Philippines. In the project, without using the Grant, and without cost to Japanese nationals et al. ('Japanese nationals' in the present understanding means Japanese physical persons or Japanese juridical persons controlled by Japanese physical persons, and Japanese subcontractors in the contractual relationship with Japanese nationals), NEA shall take necessary measures for Value Added Tax (VAT (12%)) in accordance with the Philippine's relevant laws and regulations. Others

It is necessary to hold a meeting at a place (Davao City is planned) where the Japanese can visit just before the equipment and materials are delivered, so the ECs shall let their staff participate in the meeting. The Philippine side needs to pay the travel and accommodation costs for the participants. If a ceremony is held, necessary expenses will be borne by the Philippine side.

2-4 Project Operation Plan

2-4-1 Structures and of Operation and Maintenance

In the Philippines, the ECs operate and maintain power distribution line under the control of NEA. The respective ECs shall maintain the boom trucks that were procured in the project. The ECs plan to temporarily keep the equipment and material for power distribution in their warehouses and to use them according to the progress of feeder rehabilitation. Table 2-4.1 shows the number of workers involved in the maintenance and operation of the machinery, equipment, and materials for the respective EC.

Table 2-4.1 Number of Workers Involved in Maintenance and Operation

Name of EC	Total Employees	Division in Charge	Number of Employees for Distribution Maintenance	Number of Boom Truck Operators	Number of Mechanics
MAGELCO	111	Boom Truck: Materials Management & Fleet Services Dept. Distribution Equipment: Operation & Maintenance Dept.	48	2	2
LASURECO	230	Boom Truck: Motor pool & Equipment Maintenance Div. Distribution Equipment: Operation Maintenance Div.	35	9	4
BASELCO	32	Boom Truck: Technical Services Div. Distribution Equipment: Technical Services Div.	25	1	1
Name of EC	Total Employees	Division in Charge	Number of Employees for Distribution Maintenance	Number of Boom Truck Operators	Number of Mechanics
SULECO	65	Boom Truck: Line & O/M Div. Distribution Equipment: Line & O/M Div.	28	3	1
SIASELCO	28	Boom Truck: Administrative Services Section Head Distribution Equipment: Technical Services Sec.	14	3	2
TAWELCO	86	Boom Truck: General Services Div. Distribution Equipment: Operation Maintenance Div.	18	2	2

Source: ECs Fact Sheet (as of June 2016), Provided by ECs

For the boom truck operation, one driver who has boom operation skill and one (1) to two (2) linemen are required. As shown in Table 2-4.1, five (5) ECs aside from BASELCO have two or more operators and linemen who belong to the distribution maintenance sections/department, are sufficient. Accordingly, it is considered that there is no operational concern as long as the initial operation and maintenance training is conducted. On the other hand, since BASELCO has only one (1) operator, it is required that BASELCO additionally employs one more operator in preparation for simultaneously carrying out both pole-erection work and maintenance work. Regarding the mechanics, it would be desirable to secure two or more for the respective ECs. However, it is considered that there is no concern in operation and maintenance control because the Japanese boom trucks do not break down frequently as far as they are normally operated. All the ECs have their own warehouses and parking lots for keeping material, and the site area is wide enough to keep the equipment and material to be procured. Figure 2-4.1 to Figure 2-4.3 show parking spaces for the respective ECs, while Figure 2-4.4 to Figure 2-4.6 indicate their material yards.



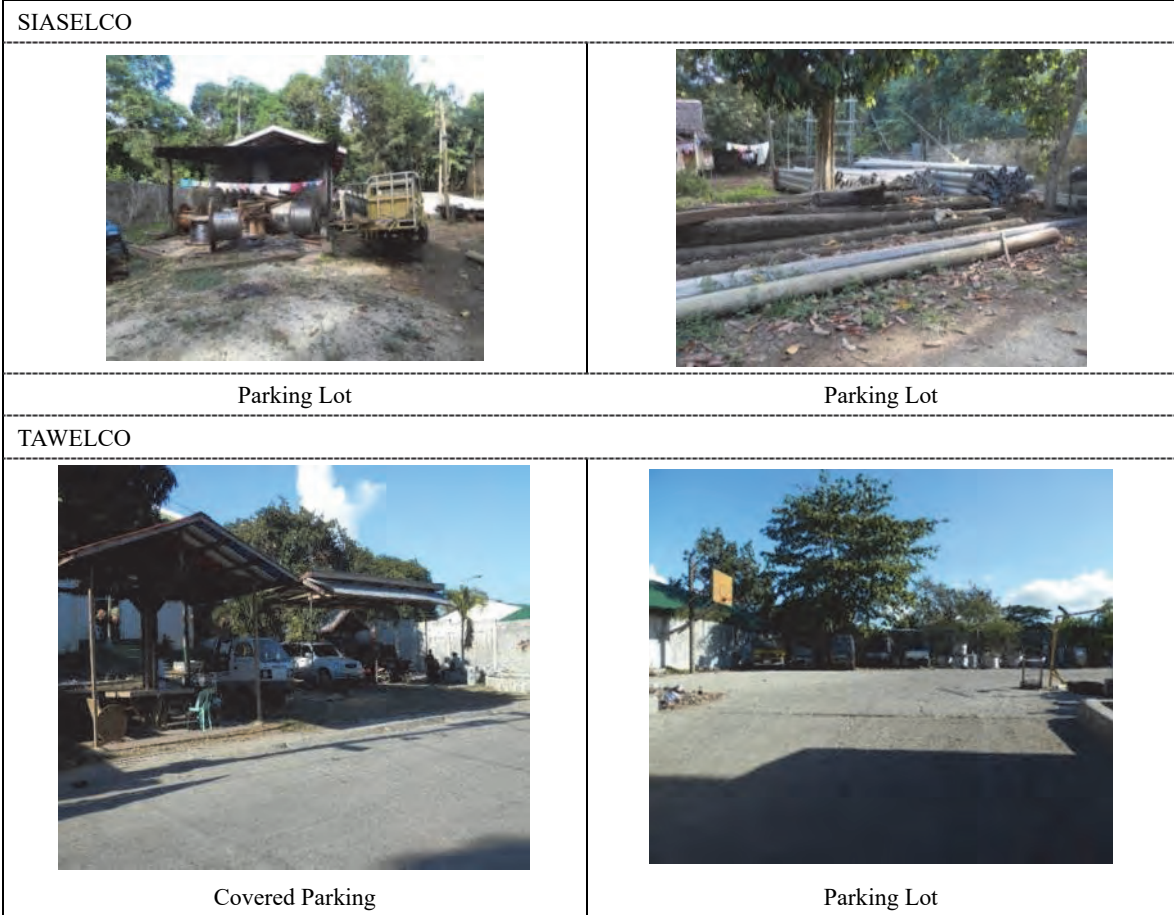
Source: Provided by ECs

Figure 2-4.1 Parking Spaces for MAGELCO



Source: Provided by ECs

Figure 2-4.2 Parking Spaces for LASURECO, BASELCO, and SULECO

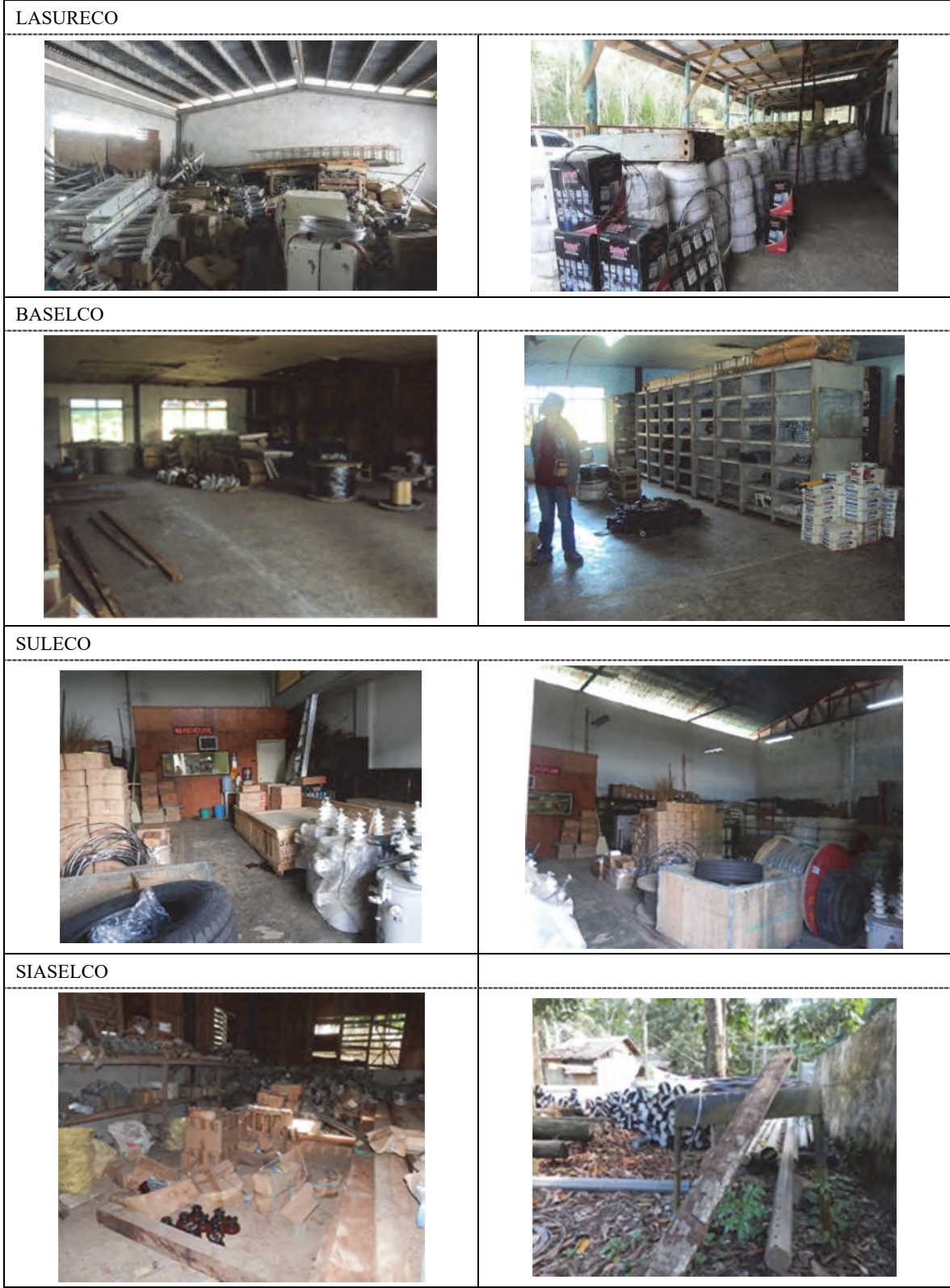


Source: Provided by ECs

Figure 2-4.3 Parking Spaces for SIASELCO and TAWELCO



Figure 2-4.4 Material Stock Yard for MAGELCO and LASURECO



Source: Provided by ECs

Figure 2-4.5 Material Stock Yard for LASURECO, BASELCO, SULECO, and SIASELCO



Source: Provided by ECs

Figure 2-4.6 Material Stock Yard for TAWELCO

2-4-2 Education and Training for Human Resources

As shown in “2-2-4-7 Operational Guidance Plan”, skill improvement for operating boom trucks is required for the current operators working at the respective ECs because the introduction of Japanese boom trucks is the first experience for the ECs. However, they already have experience with operating existing boom trucks. Accordingly, it is considered that it is enough for them to have a chance to be trained only in the initial operational guidance.

2-4-3 Details of Maintenance Works

The distribution equipment is temporarily stocked at the stock yards of the ECs and is to be utilized in the feeder rehabilitation work. According to the respective ECs, the conditions of distribution facilities are periodically checked by monitoring done by walking or motorecycling every two (2) months to ensure that it is properly maintained. The concerns, trouble and relevant information identified through the monitoring are recorded in the log book and monthly report, and feed back to the maintenance work such as tree pruning or trimming. Accordingly, it is considered that the newly rehabilitated distribution lines will be adequately maintained even after the rehabilitation work using the equipment provided through the project. On the other hand, since the boom trucks are maintained with many kinds of special tools for maintenance work owned and used for the existing boom trucks, it is also considered that they are maintained without concerns and problems.



Source: Provided by SIASELCO

Figure 2-4.7 Special tools for Maintenance Work

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

(1) Cost to be shouldered by the Recipient Country

Total cost shouldered by the Philippine side is estimated to be around 209 million pesos. Details are shown in Table 2-5.2.

Table 2-5.1 Cost Shouldered by the Philippine Side

Items	Million Peso	Million Yen *1
Value Added Tax (VAT (12%))	68.0	165.24
Inland and Marine Transportation cost from Unloading Ports (the Port of Cagayan de Oro, the Port of General Santos and the Port of Zamboanga)	13.3	32.32
ECs Inspector's Travel Cost, Accommodation Fee and Allowance for Hand-over Inspection held at the port of Zamboanga.	0.32	0.78
Additional Port Charge (if any) *2	0.49	1.19
Trainee's Travel Cost, Accommodation Fee and Allowance for Initial Operation	0.62	1.51
Boom Truck Registration Fee	0.72	1.75
Cost for Installation of Distribution Equipment	123.69	300.57
Total	207.14	503.36

*1: Exchange rate (JPY/PHP) = 2.43

*2: This is an additional cost charged in the case that the equipment is stocked at the yard of ports in the Philippines for one (1) week beyond the "Free-storage period". The free-storage period for domestic equipment is two (2) calendar days after the day that the last item of cargo is unloaded from the carrying vessel. On the other hand, the free-storage period for imported equipment is five (5) calendar days after the day that the last item of cargo is unloaded from the carrying vessel. (Source: Philippine Ports Authority)

(2) Estimation conditions

The following shows the estimation conditions.

- 1) Estimation time: August 2016 (in which the second field survey is complete)
- 2) Exchange rate: 1 US dollar = 107.12 yen
1 Philippine peso = 2.43 yen

2-5-2 Operation and Maintenance Cost

(1) Boom Trucks for Distribution Maintenance and Construction Work

These boom trucks require no maintenance cost for one (1) year because the ECs can use the presented spare parts for one year after handover. If any boom trucks fail to work within one (1) year after handover, the supplier is responsible for repairing it because of the one-year warranty. After one year passes after handover, the maintenance cost is borne by the ECs. Table 2-5.2 shows the maintenance costs provided by the respective ECs.

Table 2-5.2 Maintenance Costs for the Boom Trucks (in pesos)

EC	Annual Cost In 2015	Annual Budget In 2015
MAGELCO	436,838	600,000
LASURECO	1,000,000	1,100,000
BASELCO	2,231,319	2,254,950
SULECO	1,160,112	948,864
SIASELCO	650,000	670,000
TAWELCO	750,000	800,000

Source: Provided by ECs

(2) Power Distribution Equipment

After power distribution facilities are rehabilitated, it will be necessary to secure the budget for the operation and maintenance work to properly maintain the power facilities. The maintenance cost includes the cost for patrolling, tree pruning, etc. Table 2-5.3 shows the operation and maintenance costs and budget for the power distribution facilities.

Table 2-5.3 Operation and Maintenance Costs and Budgets (in pesos)

EC	Annual Cost In 2015	Annual Budget In 2015
MAGELCO	1,068,000	1,500,000
LASURECO	500,000	550,000
BASELCO	8,461,517	14,769,082
SULECO	9,600,000	17,000,000
SIASELCO	950,000	1,200,000
TAWELCO	1,000,000	1,150,000

Source: Provided by ECs

The rehabilitation schedule for each feeder is planned as shown in Table 2-5.4.

Chapter 3 Project Evaluation

Chapter 3 Project Evaluation

3-1 Preconditions

For the project implementation, it is essential to execute the items shouldered by the Philippines in the agreement without delay, and it is important for ECs to secure the budget for those matters, and to realize safe inland transportation without accidents or troubles after receiving the equipment at the port for handing-over in a timely manner.

3-2 Necessary Inputs by the Recipient Country

In order to accomplish and sustain the effectiveness of the project, the ECs are to ensure the following issues:

- Capable staff allocation for operation, maintenance, and administration
- Budgetary appropriation required for operation and maintenance

It is indispensable for organizations relative to Bangsamoro development, such as not only DOE and NEA but also BDA, and OPAPP, to be involved and to mutually associate with each other because the project site is included in the conflict-affected area and the coordination with local government is needed in order to smoothly implement the project.

3-3 Important Assumptions

ECs are required to concentrate their effort on collecting the electric tariff and improve their financial status to accomplish and sustain the effectiveness of the project.

3-4 Project Evaluation

3-4-1 Relevance

(1) Beneficiary of the Project

The power consumers which are supplied with the power through the distribution feeders targeted of the project shall be beneficiaries. Simultaneously, the ECs in the ARMM region would be beneficial as well in terms of the improvement of the distribution feeders that they stably supply the power through and the fact that they can maintain their distribution lines better than before.

(2) Objective of the Project

The project goal is to enable the ECs to supply more and stable power for the power consumers by rehabilitating the aging distribution feeders.

(3) Consistency with the Middle and Long Term Development Plans

As shown in “2-2-2 Basic Plan (Equipment Plan)”, the targeted feeders in the project were properly selected in consideration of not only necessity and priority of rehabilitation from a technical point of view, but also realization of fair benefit among a wide range of various organizations, residential people, and religious groups, referring to the “Distribution Development Plan” established by the ECs.

(4) Consistency with the Japanese Government Strategy and Policy

The Japanese grant aid policy for the Philippines is aiming at peace building and development in Mindanao and assistance for regional development through the infrastructure improvement of infrastructure and industry development in order to reduce poverty and to ensure peace through promotion of the peace process. While the improvement of public security remains, the project accords with these policies because it is essential to the establishment of an attractive investment environment and industrial development to supply the stable power and to improve the critical infrastructure.

3-4-2 Effectiveness

The following quantitative and qualitative effects are expected as outputs of the Project.

3-4-2-1 Quantitative Effects

(1) Quantitative Effects by the Rehabilitation of Distribution Facilities

It is expected that the distribution loss rate can be reduced and the capability of transmitting the power can be increased due to the upgrade of wire size and change from existing single phase system to three (3) phase system supply after the project implementation. Furthermore, the provision of the pole transformers enables more power supply to the power consumers and contributes to the improvement of the electrification rate. The quantitative evaluation indices, which were submitted by the respective ECs, are shown in the Table 3-4.1.

Table 3-4.1 Distribution Losses, Electrification Rate and Beneficiaries

EC	Name of Feeder	Present (Oct. 2016)		Expected Future Value (After Upgrading)		
		Distribution Loss (%)	Electrification Rate (%)	Distribution Loss (%)	Electrification Rate (%)	Beneficiaries (Households)
MAGELCO *1	DOS Feeder	12.3	53.7	3.0	80.0	4,094
	Landasan Feeder	12.6	40.0	9.2	80.0	6,107
	Upi Feeder	8.0	60.9	2.0	90.0	2,375
	Parang Feeder	9.5	20.9	5.8	80.0	13,029
LASRECO	40 Feeder 2	33.98	65.0	13.0	85	11,671
	5 Tugaya Feeder	34.15	60.0	14.0	80	17,387
BASELCO	Lamitan Feeder	24.73	49.08	21.73	56.38	9,529
SULECO	Feeder 4	37.10	100	29.0	100	1,000
	Feeder 6	60.27	72.5	46.0	80	1,500
TAWELCO	Feeder 1	28.0	14.6	18.0	18.0	3,000
SIASELCO	Feeder 3	10.28	37.43	7.0	42.5	820

*1: The distribution loss rate for MAGELCO was calculated by using system analysis software, “Power World” and it means the technical loss rate. It does not include non-technical loss rate. On the other hand, the distribution loss rate for the other ECs means the total loss rate adding the technical loss rate to the non-technical loss rate.

Source: Provided by EC

Based on the indices submitted by ECs, the evaluation indices set on the Japanese side for the project are as follows:

Table 3-4.2 Quantitative Evaluation Indices

Name of Indices	Reference Value (Actual Value in 2015)	Target Value (in 2022) (After the project implementation)
Transmittable Capacity of Feeders (MW) (Total of Capacity of Feeders Targeted in the Project)	64.86	88.32 (+36%)
Technical Loss Rate (%) *1	8.0~12.6	2.0~9.2
Duration of Power Outage in the Feeders Targeted in the Project (Min.) (The reduction of power outage caused by a tree touching is intended.) *2	766	0

*1: This index is set up in reference to the effect set by MAGELCO since the evaluation values for loss reduction for MAGELCO was calculated by the system analysis.

*2: This index is set up on a basis of the statistical data for 1 year and submitted by MAGELCO as a typical case.

Table 3-4.3 shows the saved cost equivalent to 1% loss reduction, which were provided by the respective ECs. It is possible to convert the effect of loss reduction to the saving cost in using this table.

Table 3-4.3 Saved Cost Equivalent to 1% Loss Reduction

Name of ECs	Saved Cost Equivalent to 1% Loss Reduction [PhP]
MAGELCO	216,883
LASURECO	619,977
BASELCO	400,000
SULECO	504,000
TAWELCO	120,000
SIASELCO	80,000

Source: Provided by ECs

(2) Quantitative Effects by Provision of Boom Trucks

The work efficiency rate for maintaining distribution facilities and the speed of pole erection work can be expected to become two (2) times or three (3) times compared to the current manual performance after the provision of boom trucks with buckets and with diggers.

3-4-2-2 Qualitative Effects

In the rehabilitation of existing distribution facilities, the replacement of the existing small diameter wire with a thick size, is included. Due to this replacement, the distribution loss rate can be reduced because the resistance value of the wires becomes smaller. Also, it is possible to reduce the distribution loss rate by upgrading the distribution system, namely, changing from existing 7.62kV single phase system to 13.2kV three phase systems. Furthermore, the grounding and short faults caused by trees touching the conductors can be prevented by replacing bare wires with insulated wires, which will contribute to the reduction of power failures attributed to a tree touching, and the improvement of power quality. Additionally, the improvement of voltage drop at the terminal end of distribution lines can be expected due to the resistance reduction by upgrading of wire size. The voltage drop depends on the loading conditions and the length of the distribution lines. According to MAGELCO's trial calculation, it is found that the voltage at the terminal end can be improved from the present status, 84% (11.1kV) to 90% (11.9kV) towards the nominal voltage 13.2kV. In the NEA's regulation, it is stipulated that the operational voltage for distribution lines should be within $\pm 10\%$ (14.5kV – 11.9kV). The mechanism of the distribution loss reduction achieved by upgrading wire size and conversion of distribution system from single phase system to three (3) phase system is as follows:

(1) Upgrade of Wire Size (Distribution Technical Loss Reduction)

As for the existing wire, wire size, #3/0 is mainly employed to the conductors where the current flows. There are also some distribution lines where wire size, #1/0 and #2/0, are employed. If the wire size is upgraded from #3/0 to #4/0, the loss reduction rate is equal to the ratio of resistance of the respective wires since the distribution loss rate is proportional ($\text{Loss} = \text{Current (I)}^2 \times \text{Resistance}$) to the resistance of the wire. According to NEA's design criteria, the resistance values for each wire are shown in Table 3-4.4.

Table 3-4.4 Resistance Values and Allowable Ampacity for Wires (ACSR)

ACSR	Outer Diameter (inches)	DC Resistance Ohms/mile @ 25°C	Allowable Ampacity @90°C [A]
#1/0	0.398	0.885	170
#2/0	0.447	0.702	195
#3/0	0.502	0.556	225
#4/0	0.563	0.441	260

Source: NEA Design Criteria

Accordingly, the improved loss rate becomes equal to 0.79 ($=0.441/0.556$) on the assumption that the original loss rate is 100 after upgrading wire size from #3/0 to #4/0, and this means that the loss rate is reduced by 21%. Table 3-4.5 shows the effect of the technical loss reduction for each feeder by upgrade of the wire size.

Table 3-4.5 Technical Loss Rate Reduction Effect by Upgrading Wire Size

EC	Feeder Name	Existing			Future (After Rehabilitation)			Amount of Technical Loss Reduction
		Wire Size	Type of Distribution System	Nos of Circuits	Wire Size	Type of Distribution System	Nos of Circuits	
MAGELCO	DOS Feeder	#3/0	Three (3) Phase	1	#4/0	Three (3) Phase	1	21%
	Landasan Feeder	#3/0	Three (3) Phase	1	#4/0	Three (3) Phase	1	21%
	Upi Feeder	#3/0	Three (3) Phase	1	#4/0	Three (3) Phase	1	21%
	Parang Feeder	#3/0	Three (3) Phase	1	#4/0	Three (3) Phase	1	21%
LASURECO	40 Feeder 2	#3/0	Three (3) Phase	1	#4/0	Three (3) Phase	2	21%
	5 Tugaya Feeder	#3/0	Three (3) Phase	1	#4/0	Three (3) Phase	1	21%
BASELCO	Lamitan Feeder	#2/0	Three (3) Phase	2	#4/0	Three (3) Phase	1	37%
SULECO	Feeder 4	#3/0	Three (3) Phase	1	#4/0	Three (3) Phase	1	21%
	Feeder 6	#3/0	Three (3) Phase	1	#4/0	Three (3) Phase	1	21%
TAWELCO	Feeder 1	#2/0	Three (3) Phase	1	#4/0	Three (3) Phase	1	37%
SIASELCO	Feeder 3	#1/0	Single Phase	1	#4/0	Three (3) Phase	1	92%

Source: Created by JICA Study Team

In the case of BASELCO and TAWELCO, the wire size is upgraded from #2/0 to #4/0 and the technical loss rate can be reduced by 37%. Moreover, the most effective case is for Feeder 3 of SIASELCO and the technical loss rate become 8% ($=0.441/0.885 \times 1/6$) after the distribution system is upgraded from single phase system to three (3) phase system and simultaneously, wire size is upgraded from #1/0 to “4/0”. As the amount of loss reduction would be 92%, the improvement of loss reduction will be highly expected.

(2) Upgrade of Wire Size (Increase of Wire Capability)

The upgrading of wire size will produce an increase in the capacity of the wire. Accordingly, this will contribute to the development of areas and regions where the feeder will be able to supply the power to the new areas where demand growth is projected.

Table 3-4.6 Effect of Increase of Wire Capacity by Upgrading Wire Size

EC	Feeder Name	Existing			Future (After Rehabilitation)			Increased Capacity [MW] (): Increase Rate
		Wire Size	Allowable Ampacity [A]	Transmittable Capacity [MW]	Wire Size	Allowable Ampacity [A]	Transmittable Capacity [MW]	
MAGELCO	DOS Feeder	#3/0	315	6.48	#4/0	357	7.36	+0.88 (+14%)
EC	Feeder Name	Existing			Future (After Rehabilitation)			Increased Capacity [MW] (): Increase Rate
		Wire Size	Allowable Ampacity [A]	Transmittable Capacity [MW]	Wire Size	Allowable Ampacity [A]	Transmittable Capacity [MW]	
MAGELCO	Landasan Feeder	#3/0	315	6.48	#4/0	357	7.36	+0.88 (+14%)
	Upi Feeder	#3/0	315	6.48	#4/0	357	7.36	+0.88 (+14%)
	Parang Feeder	#3/0	315	6.48	#4/0	357	7.36	+0.88 (+14%)
LASURECO	40 Feeder 2	#3/0	315	6.48	#4/0 (Duplicated)	357	7.36	+1.76 (+27%)
	5 Tugaya Feeder	#3/0	315	6.48	#4/0	357	7.36	+0.88 (+14%)
BASELCO	Lamitan Feeder	#2/0	276	5.68	#4/0	357	7.36	+1.68 (+30%)
SULECO	Feeder 4	#3/0	315	6.48	#4/0	357	7.36	+0.88 (+14%)
	Feeder 6	#3/0	315	6.48	#4/0	357	7.36	+0.88 (+14%)
TAWELCO	Feeder 1	#2/0	276	5.68	#4/0	357	7.36	+1.68 (+30%)
SIASELCO	Feeder 3	#1/0	242	1.66	#4/0	357	7.36	+5.7 (343%)

※ Transmittable capacity was obtained under the condition that the power factor is 0.9 and voltage is the nominal voltage 13.2kV for three phase line and 7.62kV for single phase line.

※ Transmittable capacity (MW): Three phase line = $\sqrt{3}$ (Constant) × Allowable Ampacity × 13.2 (Voltage) × 0.9 (Power Factor)

※ Transmittable capacity (MW): Single phase line= Allowable Ampacity × 7.62 (Voltage) × 0.9 (Power Factor)

Source: Southwire (USA)

Table 3-4.6 shows the increase of transmittable capacity after upgrading of wire size for each feeder. Aside from SIASELCO, five (5) ECs are applying three (3) phase systems and their increased capacity will be from approximately 14% to 30%. On the other hand, “Feeder 3” of SIASELCO, which is currently a single phase system is expected to achieve the remarkable increased capacity of 343% of the existing capacity. This is expected due to a synergistic effect, namely, upgrading wire size and system change from single phase system to three phase system.

(3) Effect of Increased Transmittable Capacity by the Provision of Pole Transformers

According to design criteria submitted by the respective ECs, the maximum load for general residences in the area targeted in the project is approximately 500 [VA] on average. From this point of view, the number of households which can newly receive the power by providing pole transformers is shown in Table 3-4.7.

Table 3-4.7 Households that can be Supplied by the Provision of Pole Transformers

EC	Nos of Pole Transformers Provided [Units]	Total Capacity of Pole Transformers Provided [kVA]	New Households [Households]※
MAGELCO	72	1,800	3,600
LASRECO	127	3,512.5	7,025
BASELCO	35	1,137.5	2,275
SULECO	75	3,034	6,068
TAWELCO	51	1,765	3,530
SIASELCO	65	1,225	2,450

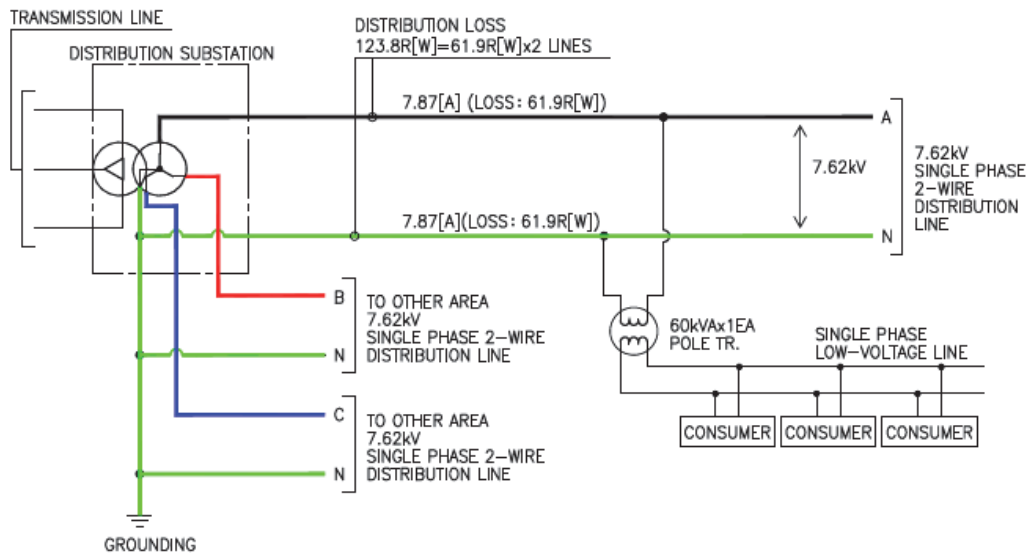
※ Nos of new Households that can be supplied = Total of Capacity of Provided Pole Transformers (kVA) ÷ 0.5kVA (mean power per one household)

Source: Estimation based on the data provided from the respective ECs

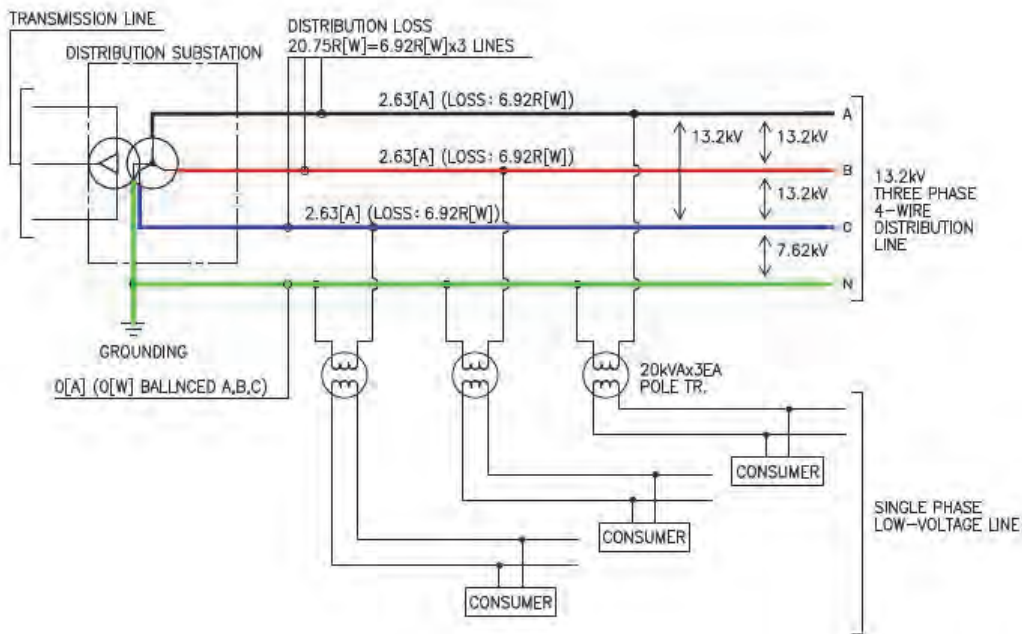
(4) Effect of Upgrading 7.2kV Single Phase System to 13.2kV Three (3) Phase System

As an example of comparison, the distribution loss rates for both cases where a pole transformer with a capacity of 60kVA is connected to 7.62kV single phase system and to 13.2kV three phase system, are calculated respectively. The single phase system and three phase system are illustrated in Figure 3-4.1.

Single Phase System



Three (3) Phase System



Source: Created by JICA Study Team

Figure 3-4.1 Single Phase System and Three Phase System of Distribution Lines

The current value in the single phase system can be obtained by the following formula. The electric current becomes 7.89 (A) in the distribution line applying 7.62kV single phase system.

$$\text{電流}(I) = \frac{60kVA}{7.6kV} = 7.87 [A]$$

Considering out-bound and in-bound lines, the distribution technical loss can be calculated as follows:

$$\text{Distribution Technical Loss} = 7.872 \times R \times 2 = 123.8R \text{ [W]}$$

(The reason for multiplying by “2” is because the loss occurs in two lines, lines for out-bound and in-bound, respectively)

On the other hand, the distribution technical loss rate can be calculated for the case where three (3) pole transformers with a capacity of 20kVA are connected to 13.2kV three (3) phase systems as follows:

$$\text{電流 } I = \frac{60kVA}{\sqrt{3} \times 13.2} = 2.63 \text{ [A]}$$

The electric current becomes 2.63 (A). Here, the distribution technical loss rate can be obtained as follows:

$$\text{Distribution Technical Loss Rate} = 2.632 \times R \times 3 = 20.75R \text{ [W]}$$

(The reason for multiplying by “3” is because the technical loss occurs in three wires, respectively, in the case of three phase systems.)

Therefore, the ratio of loss rate between the one for single phase system and the one for three phase system is equal to $20.75/123.8 = 0.167 \doteq 17\% = 1/6$. Compared to the loss for single phase system, the loss for three (3) phase system is theoretically reduced to 1/6 when the same load (the above case is 60kVA) is procured. However, this distribution loss rate is a value only when the current flowing in the three phases is equally balanced and it would be more than 1/6 when those currents are unbalanced among the phases.

(5) Effect of Provision of Boom Truck with Bucket and Digger

With regard to the pole erection and extraction work, the work efficiency and safety aspect will be improved by the utilization of a boom truck with digger. Furthermore, it contributes to the reduction in the cost of the construction work due to the improvement over the manual and inefficient work, and consequently, the EC’s financial status will be improved as well. Also, the boom truck ensures efficient and safe work for construction and maintenance of distribution facilities and linemen will not be required to climb poles. Accordingly, it is expected that it prevents lineman’s shock hazards and falling accidents. In the Bangsamoro region, there are grounding and short faults caused by a tree touching the lines and they amount to around 30% of the total faults on the distribution lines. Since the boom truck with bucket facilitates tree logging work and the distribution lines are properly maintained, it should highly contribute to the reduction of frequency and duration of power outages caused by a tree touching.

From this point of view, the project has high validity and its effectiveness can be estimated.

Appendices

1. Member List of the Study Team
2. Study Schedule
3. List of Parties Concerned in the Recipient Country
4. Minutes of Discussions (M/D)
5. Other Relevant Data

1. Member List of the Study Team

	Name	Position	Organization	Period
1	Mr. Takayuki Nakagawa	Team Leader	JICA Peacebuilding and Reconstruction Infrastructure and Peacebuilding Department	【2nd Survey】 Aug. 7 to Aug. 16 【3rd Survey】 Oct. 24 to Oct. 29
2	Mr. Masayoshi Soejima	Staff	JICA Peacebuilding and Reconstruction Infrastructure and Peacebuilding Department Japan Disaster Relief Team	【2nd Survey】 Aug. 7 to Aug. 16 【3rd Survey】 Oct. 24 to Oct. 29 【4th Survey】 Dec. 4 to Dec. 10
3	Mr. Noriyoshi Kondo	Chief Consultant Electric Power Policy Management Plan	Oriental Consultants Global Project Management Department	【1st Survey】 Feb. 9 to Feb. 19 【2nd Survey】 Jul.27 to Aug. 16 【3rd Survey】 Oct. 23 to Oct. 29 【4th Survey】 Dec. 4 to Dec. 10
4	Mr. Hiroshi Kadwau	Equipment plan Procurement Plan Cost estimation-1	ditto	【1st Survey】 Feb. 9 to Mar.5 【2nd Survey】 Jul. 24 to Aug. 16 【4th Survey】 Dec. 4 to Dec. 10
5	Mr. Hiroshi Omura	Conflict Consideration	Hayakawa Engineering Office	【1st Survey】 Feb. 17 to Mar.5 【2nd Survey】 Aug. 1 to Aug. 12

2. Study Schedule

Daily Record of 1st Survey in the Philippines (February 9 – March 5, 2016)

	Date		Stay	JICA Team Leader	Chief Consultant	Consultant	Consultant
				Mr.Nakagawa JICA Staff Mr.Soejima			
1	9-Feb	(Tue)	Manila		Fly from Tokyo to Manila		
2	10-Feb	(Wed)	Manila		Preparation of Agreement with Local Consultant		
3	11-Feb	(Thu)	Manila		Meeting with NEA		
4	12-Feb	(Fri)	Manila		Evaluation of estimation of Local Consultant Meeting with JICA Philippines Office		
5	13-Feb	(Sat)	Manila		Preparation of Report		
6	14-Feb	(Sun)	Manila		Preparation of Report		
7	15-Feb	(Mon)	Manila		Meeting with TAWELCO (AM 9:00)		
8	16-Feb	(Tue)	Manila		Meeting with LASRECO (AM 11:00) Meeting with Local Consultant		
9	17-Feb	(Wed)	Manila		Meeting with BASELCO (Canceled)		Fly from Tokyo to Manila
10	18-Feb	(Thu)	Manila		MTG with BASELCO(9:00), SIASELCO(11:00) and SULECO (11:00)		
11	19-Feb	(Fri)	Manila		Courtesy Call DOE Fly to Tokyo		
12	20-Feb	(Sat)	Manila			Preparation of Report	
13	21-Feb	(Sun)	Manila			Preparation of Report	
14	22-Feb	(Mon)	Manila			Meeting with NEA and Data Collection	
15	23-Feb	(Tue)	Manila			Meeting with Cargo Ship (Transportation Company)	
16	24-Feb	(Wed)	Manila			Visiting Factory and Meeting with Joslyn Forge (Pole Manufacturer)	
17	25-Feb	(Thu)	Manila			Sorting out the collected data	
18	26-Feb	(Fri)	Manila			Meeting with MAGELCO	
19	27-Feb	(Sat)	Manila			Preparation of Report	
20	28-Feb	(Sun)	Manila			Preparation of Report	
21	29-Feb	(Mon)	Manila			Meeting with Prudent Customs (Transportation Company) Meeting with MBT (Transportation Company)	
22	1-Mar	(Tue)	Manila			Meeting with USAID Meeting with ADB	
23	2-Mar	(Wed)	Manila			Meeting with Pole Manufacturer (Tehhisin Corp)	
24	3-Mar	(Thu)	Manila			Courtesy Call Embassy of Japan (Cancelled)	
25	4-Mar	(Fri)	Manila			NEDA (AM 9:00) OPAPP (AM 11:00)	
26	5-Mar	(Sat)				Manila to Tokyo	

Daily Record of 2nd Survey in the Philippines (July 24 to August 16, 2016)

No.	Date		Stay	JICA Team Leader	Chief Consultant Mr.Kondo	Consultant Mr.Kadowaki	Consultant Mr.Omura
				Mr.Nakagawa JICA Staff Mr.Sojima			
1	24-Jul	(Sun)	Manila			Fly from Tokyo to Manila	
2	25-Jul	(Mon)	Manila			Lecture on Security@JICA MTG with Tr & Wire Makers	
3	26-Jul	(Tue)	Manila			MTG with Tr & Wire Makers	
4	27-Jul	(Wed)	Manila		Fly from Tokyo to Manila	MTG with Tr & Wire Makers	
5	28-Jul	(Thu)	Manila		MTG with JICA Philippines Office MTG with NEA(14:00)		
6	29-Jul	(Fri)	Manila		MTG with MAGELCO(10:00) MTG with WB(16:30)		
7	30-Jul	(Sat)	Manila		Clarification of Data Collected		
8	31-Jul	(Sun)	Manila Davao		Fly from Manila to Davao		
9	1-Aug	(Mon)	Davao		Clarification of Data Collected		Fly from Tokyo to Manila
10	2-Aug	(Tue)	Davao		MTG with LASURECO(10:00) and BASELCO(17:00)		Lecture on Security @ JICA(10:00) Fly from Manila to Davao
11	3-Aug	(Wed)	Davao		MTG with SULECO(17:00)		
12	4-Aug	(Thu)	Davao		MTG with SIASELCO(17:00)		
13	5-Aug	(Fri)	Davao		MTG with TAWELCO(9:00)		
14	6-Aug	(Sat)	Davao		Clarification of Data Collected		
15	7-Aug	(Sun)	Davao Cotabato	Fly from Tokyo to Cotabato through Manila	Fly from Davao to Cotabato through Manila		
16	8-Aug	(Mon)	Cotabato	MTG with JICA CPO Courtesy Call on BDA (13:30) & ARMM			
17	9-Aug	(Tue)	Cotabato	Field Survey in the MAGELCO Franchise Area MTG with Mr.Naguib Shinarinbo (Expert of Conflict Consideration)			
18	10-Aug	(Wed)	Cotabato	Field Survey in the CLPC(Cotabato Light and Power) Franchise Area (9:30) Courtesy call on ARMMR(15:30)			
19	11-Aug	(Thu)	Cotabato	Courtesy call on IMT (9:00), Fly from Cotabato to Manila MTG with OPAPP			
20	12-Aug	(Fri)	Manila	MTG with NEDA Discussion with NEA & DOE for the Minutes			Fly from Cotabato to Tokyo Through Manila
21	13-Aug	(Sat)	Manila	Clarification of Data Collected			
22	14-Aug	(Sun)	Manila	Clarification of Data Collected			
23	15-Aug	(Mon)	Manila	MTG with DOE & NEA for MOD Courtesy call on NEDA (14:00), Meeting with Steel Pole Maker			
24	16-Aug	(Tue)	Manila	Report to Embassy of Japan (10:00) Fly from Manila to Tokyo			

Daily Record of 3rd Survey in the Philippines (October 23 to 29, 2016)

	Date		Stay	JICA Team Leader	Chief Consultant
				Mr.Nakagawa	Mr.Kondo
				JICA Staff	
				Mr.Sojima	
1	23-Oct	(Sun)	Manila		Fly from Tokyo to Manila via HKG
2	24-Oct	(Mon)	Manila	Fly from Tokyo to Manila Study Team Internal meeting	Meeting with Transportation Company and Meeting Preparation with NEA & EC
3	25-Oct	(Tue)	Manila	Meeting with NEA(9:00 to 12:00) and SULECO Meeting with DOE (15:00 to 17:00)	
4	26-Oct	(Wed)	Manila	Meeting with MAGELCO (9:00 to 12:00) Meeting with LASRECO (13:00 to 16:00)	
5	27-Oct	(Thu)	Manila	Meeting with BASELCO, SIASELCO & TAWELCO (9:00 to 12:00) Discussion on M/D with NEA & DOE (13:00 to 16:00)	
6	28-Oct	(Fri)	Manila	Signing of M/D (DOE and NEA, 11:00)	Fly from Manila to HKG
7	29-Oct	(Sat)	Manila	Fly from Manila to Tokyo	Fly from HKG to Tokyo

Daily Program of 4th Survey in the Philippines (December 4 to 10, 2016)

	Date		Stay	JICA Staff	Chief Consultant	Consultant
				Mr.Sojima	Mr.Kondo	Mr.Kadowaki
1	4 Dec	Sun		JICA Team arrives at Manila		
2	5 Dec	Mon	Manila	AM: Meeting with DOE, NEA - Overviewing Draft Preparatory Survey Report		
3	6 Dec	Tue	Manila	AM: Meeting with DOE, NEA, ECs - Discussing on the document Minutes of Discussion (GOP Undertakings) PM: Explanation on Draft Preparatory Survey Report to DOE,NEA,ECs,BDA (if possible: OPAPP, NEDA)		
4	7 Dec	Wed	Manila	AM: Meeting with DOE, NEA - Discussing on the document Minutes of Discussion (GOP Undertakings) PM: Courtesy call to OPAPP, NEDA or Signing the document Minutes of Discussion (GOP Undertakings) (Signer DOE and NEA)		
5	8 Dec (Regional Holiday)	Thu	Manila	Preparation for the Signing Ceremony and Data Clarification		
6	9 Dec	Fri	Manila	AM: Signing the document Minutes of Discussion (GOP Undertakings)(Signer DOE and NEA)		
7	10 Dec	Sat		JICA Team leaves for Tokyo		

3. List of Parties Concerned in the Recipient Country

List of Parties Concerned in the Recipient Country

Embassy of Japan	
Mr. Makoto Iyori	Minister for Economic Affairs
Mr. Bumpei Sugano	Second Secretary Economic Section
JICA Philippines Office	
Mr. Juro Chikaraish	Senior Advisor for Mindanao Peace Building and Development
Ms. Maiko Morizane	Human Security Group
OFFICE OF THE PRESIDENTIAL ADVISER ON THE PEACE PROCESS (OPAPP)	
Mr. Arvin C. Chua	Director
Mr. Luisito G. Montalbo	Executive Director
Mr. Wendell P. Orbeso	Director IV
NATIONAL ECONOMIC AND DEVELOPMENT AUTHORITY (NEDA)	
Ms. Guada Elvira B. Salamat	Sr. EDS
Mr. William C. Ku	EDS II
Mr. Armando M. Ramirez III	EDS II
Ms. Martha O. Flores	Public Investment Staff
Ms. Shella Marie D. Decena	Public Investment Staff
BANGSAMORO DEVELOPMENT AUTHORITY (BDA)	
Mr. Windel P. Diangcalan	Head
Mr. Nasser Shinarimbo	Consultant for BDA
Mr. Tohami B. Ibrahim	Electric Engineer
ARMM REGIONAL BOARD OF INVESTMENT (RBOI)	
Mr. Ishak Mastura	Regional Board Member
UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)	
Mr. Naguib G. Sinarimbo	Expert of Conflict Consideration
DEPARTMENT OF ENERGY (DOE)	
Mr. Felix William B. Fuentebella	Undersecretary
Ms. Thelma B. Ejercito	OIC – Division Chief
Ms. Madonna M. Naling	Supervising Science Research Specialist
Mr. Emmanuel C. Talog	Supervising Science Research Specialist
Mr. Rodel S. Limbaga	Senior science Research Specialist
Mr. Andrew P. Catayoug	Science Research Specialist
NATIONAL ELECTRIFICATION ADMINISTRATION (NEA)	
Mr. Edgardo R. Masongsong	Administrator
Mr. Edgardo.R. Piamonte	Deputy Administrator, Electric Service Utilities Services
Ms. Sonia B. San Diego	Deputy Administrator, Corporate Resources, and Financial Services
Mr. Antonio D. Cortes	Engineering Dept., Principal Engineer
Mr. Ferdinand P. Villareal	Engineering Dept., Acting Director,
Mr. Fedeico P. Villar,Jr	Engineering Dept., Principal Engineer A
Mr. Bonifacio T. David	Engineering Dept., Principal Engineer C
Mr. Franz Tobias	Engineering Dept. Senior Engineer A
Ms. Ma Chonna O. Deela	Financial Service Account Division, Manager
Ms. Rosie C. Alamillo	Account Management Guarantee Division, Manager

ASIAN DEVELOPMENT BANK (ADB)	
Mr. Choon sik Jung	Energy Specialist, Energy Division, Southeast Asia Department
UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT (USAID)	
Ms. Divina B. Chingcuanco	Chief of Party, B-LEADERS
WORLD BANK (WB)	
Mr. Rowaldo D. Del Mundo	Consultants for WB & Associate Professor of University of the Philippines
ELECTRIC COOPERATIVE (EC)	
MAGELCO	
Mr. Sultan Ashary P. Maongco	General Manager
Mr. Eduard A. Lonsakit	Technical Services Department Manager
Mr. Rasul T. Adzal	Technical Services Department
Mr. Jesus A. Jarito	Asst. Brokerage Manager
LASURECO	
Ms. Ma. Linde F. Jimeno	Exec. Assistant of DOE
Mr. Solaiman SOL C Mutia	Acting General Manager
Mr. Acmad M. Mutia	Department Engineering Manager
Mr. Titing D Atar	Consultant on Special
BASELCO	
Mr. Nijara Inokhi	BCD President
Mr. Filomeno E Batc	General Manager
SULECO	
Ms. Peraida T. Jalan	General Manager
SIASELCO	
Mr. Attha I. Anuddin Alhaji	General Manager
TAWELCO	
Mr. Sildrick S. Alibasa	Board President
Ms. Habibiya Alih Sangoya	General Manager
Mr. Cristino B. Larios	Technical Manager
TRANSPORTATION COMPANIES	
Cargoship Incorporated	
Ms. Menchu Javier	Managing Director
Ms. Marilyn Sotelo	Business Development Officer
Prudential Customs Brokerage Services, Inc.	
Mr. Jesus A. Jarito	Asst. Brokerage Manager
MBT International Freight Forwarder, Inc.	
Ms. Nerissa B. Salamat	Sales Executive

MANUFACTURERS OF DISTRIBUTION EQUIPMENT	
Jocelyn Forge, Inc.	
Mr. Jayson O. Ang	VP-Operations
Teh Hsin Corp.	
Ms. Janet Sy	Head Sales Dept.
Mr. Jesus m. Felipe	QA Head
Super Mfg. Inc.	
Mr. Victor E. Ferreras	
Mr. Thomas D. Ferrer (AVESCO)	
First Phil. Electric Corp. (PHILEC)	
Mr. Odie Mddatu	
London Industrial Products. Inc.	
Mr. Peter Mangasing	
American Wire & Cables Co. Inc.	
Mr. Benjamin M Estebal	
Phelps Dodge Phils	
Mr. Enrico Romeo S Villanueva	
Industrial Galvanizers Corporations of the Philippines	
Mr. Joseph Christy L. Corpuz	

Source: JICA Study Team

4. Minutes of Discussions (MOD)

**MINUTES OF DISCUSSIONS
ON
THE PREPARATORY SURVEY FOR THE PROJECT
FOR
IMPROVEMENT OF EQUIPMENT FOR POWER DISTRIBUTION
IN BANGSAMORO**

Based on the preliminary discussions with the Government of the Republic of the Philippines (hereinafter referred to as “the Philippines”), the Government of Japan decided to conduct a Preparatory Survey for the Project for Improvement of Equipment for Power Distribution in Bangsamoro (hereinafter referred to as “the Project”), and entrusted the Preparatory Survey to Japan International Cooperation Agency (hereinafter referred to as “JICA”).

JICA dispatched the Preparatory Survey Team for the Outline Design (hereinafter referred to as “the Team”) to the Philippines, headed by Takayuki NAKAGAWA, Acting Director of Office for Peacebuilding and Reconstruction, JICA, and is scheduled to stay in the country from 24 July to 16 August, 2016.

The Team held a series of discussions with the officials concerned of the Philippines and conducted a field survey in the Project area. In the course of the discussions, both sides have confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

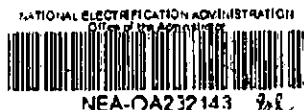
Manila, 14 September 2016



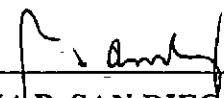
SUSUMU ITO
Chief Representative
Japan International Cooperation Agency
Philippines



MYLENE C. CAPONGCOL
OIC-Undersecretary
Department of Energy
The Republic of the Philippines



9/16/16



SONIA B. SAN DIEGO
OIC-Administrator
National Electrification Administration
The Republic of the Philippines

ATTACHEMENT

1. Objective of the Project

The objective of the Project is to stabilize electrical power supply through improvement of equipment for power distribution in Bangsamoro.

2. Title of the Preparatory Survey

Both sides confirmed the title of the Preparatory Survey as “the Preparatory Survey for the Project for Improvement of Equipment for Power Distribution in Bangsamoro”.

3. Project Site

Both sides confirmed that the sites of the Project is the franchise areas of the Electrical Cooperatives, which is shown in Annex 1.

4. Line Agency and Executing Agency

Both sides confirmed the line agency and executing agency as follows:

- 4-1. The line agency is Department of Energy (DOE), which would be the agency to supervise the executing agency.
- 4-2. The executing agency is National Electrification Administration (NEA). The executing agency shall coordinate with all the relevant agencies to ensure smooth implementation of the Project and ensure that the Undertakings are taken by relevant agencies properly and on time. (The organization charts are shown in Annex 2.)

5. Items requested by the Philippines

- 5-1. As a result of discussions, both sides confirmed that the items requested by the Philippines are as described in the list on Annex 3.
- 5-2. JICA will assess the appropriateness of the above requested items through the survey and will report findings to the Government of Japan. The final components of the Project would be decided by the Government of Japan.

6. Japanese Grant Scheme

- 6-1. The Philippines side understands the Japanese Grant Scheme and its procedures as described in Annex 4, Annex 5 and Annex 6, and necessary measures to be taken by the Government of Philippines.
- 6-2. The Philippines side understands to take the necessary measures, as described in Annex 7, for smooth implementation of the Project, as a condition for the Japanese Grant to be implemented. The detailed contents of the Annex 7 will be worked out during the survey and shall be agreed no later than by the

Explanation of the Draft Preparatory Survey Report.

The contents of Annex 7 will be used to determine the following:

- (1) The scope of the Project.
- (2) The timing of the Project implementation.
- (3) Timing and possibility of budget allocation.

Contents of Annex 7 will be updated as the Preparatory Survey progresses, and will finally be the Attachment to the Grant Agreement. The exemption of the customs duties, internal taxes and other fiscal levies described in Annex 7 are the template of Japanese Grant for all recipient countries. Japanese side and the Philippines side will discuss further about this issue.

7. Schedule of the Survey

- 7-1. JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to the Philippines in order to explain its contents around November 2016.
- 7-2. If the contents of the draft Preparatory Survey Report is accepted in principle and the Undertakings are fully agreed by the Philippines side, JICA will complete the final report in English and send it to the Philippines around January 2017.
- 7-3. The above schedule is tentative and subject to change.

8. Environmental and Social Considerations

- 8-1. The Philippines side confirmed to give due environmental and social considerations during implementation of the Project, and after completion of the Project, in accordance with the JICA Guidelines for Environmental and Social Considerations (April, 2010).
- 8-2. The Project is categorized as C because it has minimal or little adverse impact on the environment and society.

9. Other Relevant Issues

- 9-1. The Philippines is in charge of internal transportation of the items (Annex 3) from the port of disembarkation to the project site.
- 9-2. The disembarkation port above is to be selected from ports as follows;
 - (1) Davao
 - (2) Cagayan de Oro
 - (3) General Santos
 - (4) Zamboanga
- 9-3. "Application Form for Grant Aid from Japan" shall be submitted by the Philippines not later than the end of October 2016.
- 9-4. Questionnaire
DOE and NEA shall answer to the Questionnaire submitted by the Team in

English with relevant documents in a timely manner.

Annex 1: Project Site

Annex 2: Organization Chart

Annex 3: Items Requested by the Philippines

Annex 4: Japanese Grant

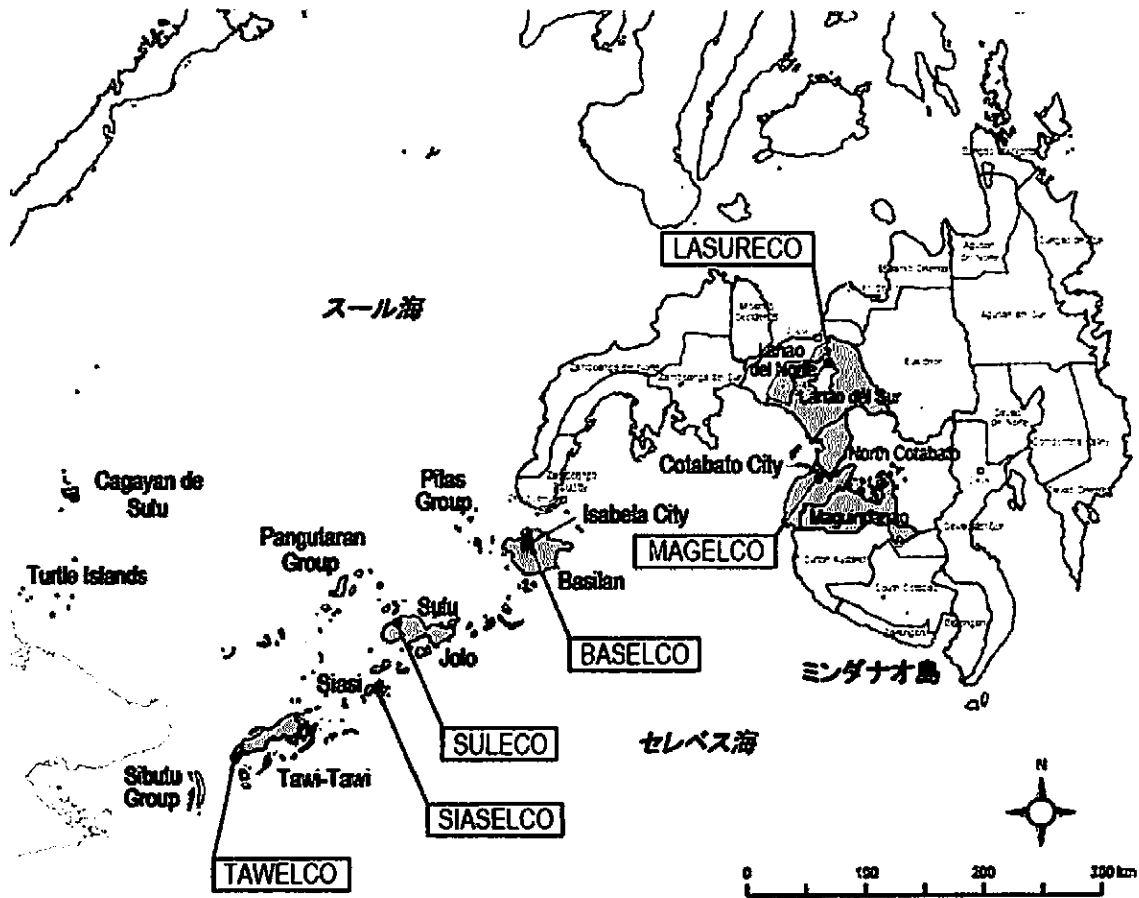
Annex 5: Flow Chart of Japanese Grant Procedures

Annex 6: Financial Flow of Japanese Grant

Annex 7: Major Undertakings to be taken by Each Government (template)

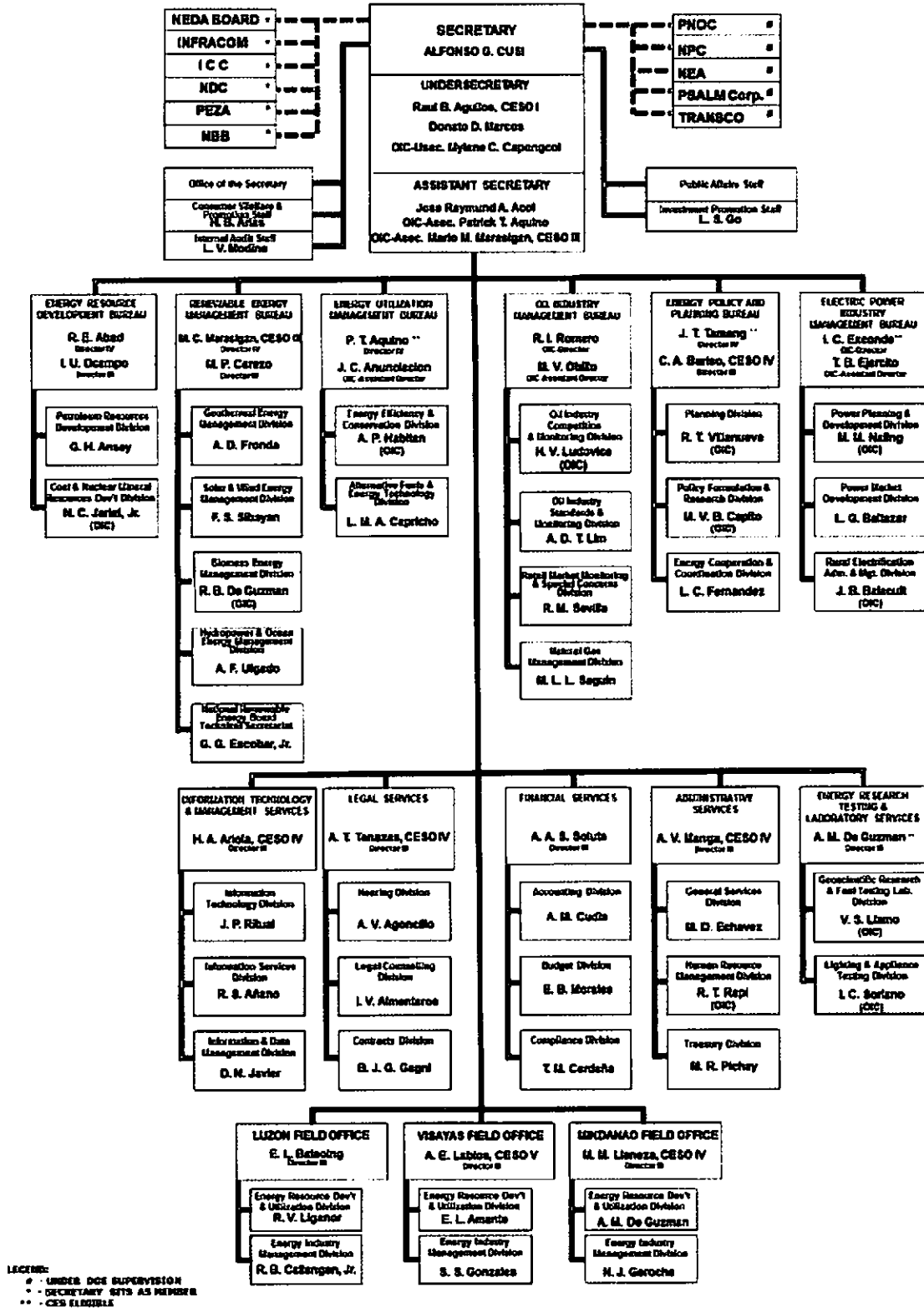
Annex 8: Project Monitoring Report (template)

Project Sites

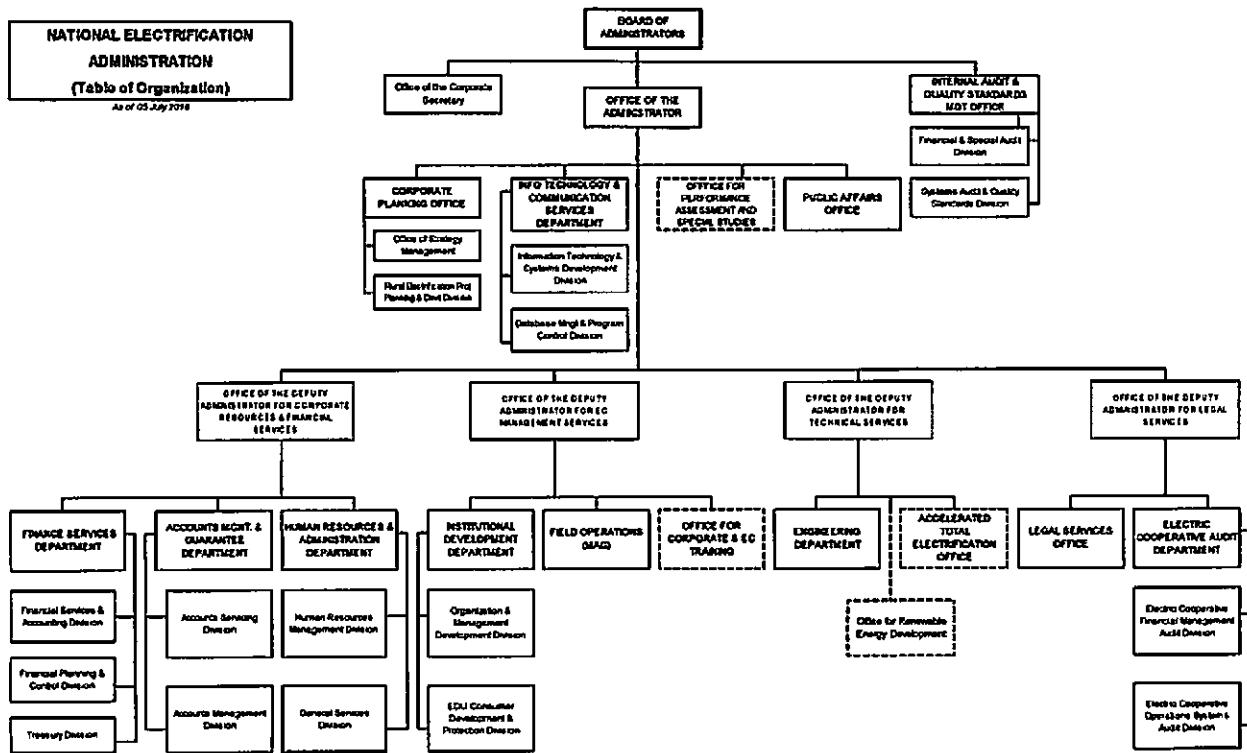


Organization Chart of Department of Energy (DOE)

DEPARTMENT OF ENERGY



Organization Chart of National Electrification Administration(NEA)



Name of ECs	Power Distribution Facilities		Vehicles for Construction & Maintenance Work	
	Name of Feeders	Qty	Boom Truck with Bucket (BTwB)	Boom Truck with Digger (BTwD)
			[Unit(s)]	[Unit(s)]
MAGELCO	DOS Feeder (Datu Odin Sinsuat – Datu Saudi Ampatuan)	Length: 40 km	2	1
	Poles	667 poles		
	Conductors			
	- ASCR #3/0	46 km		
	- ASCR #4/0	138 km		
	- Galvanized 3 Strand 5/16" Diameter	26,680 Ft		
	Pole Trs.	37 units		
	Upi Feeder (Awang – South Upi)	Length: 30 km		
	Poles	500 poles		
	Conductors			
	- ASCR #3/0	35 km		
	- ASCR #4/0	104 km		
- Galvanized 3 Strand 5/16" Diameter	20,000 Ft			
Pole Trs.	500 units			
Landasan Feeder (Landansan – Simuay)	Length: 10 km			
Poles	168 poles			
Conductors				
- ASCR #3/0	12 km			
- ASCR #4/0	35 km			
- Galvanized 3 Strand 5/16" Diameter	8,020 Ft			
Pole Trs.	-			

Name of ECs	Power Distribution Facilities		Vehicles for Construction & Maintenance Work	
	Name of Feeders	Qty	Boom Truck with Bucket (BTwB)	Boom Truck with Digger (BTwD)
			[Unit(s)]	[Unit(s)]
LASURECO	40 Feeder 2 (Marawi – Mulondo)	Length: 21.3 km	1	2
	Poles	426 Poles		
	Conductors			
	- ASCR #3/0	25 km		
	- ASCR #4/0	147 km		
	- Galvanized 3 Strand 5/16" Diameter	17,040 Ft		
	Pole Trs.	43 units		
	5 Tugaya Feeder (Tugaya – Ganassi)	Length: 18.5 km		
Poles	370 poles			
Conductors				
- ASCR #3/0	22 km			
- ASCR #4/0	64 km			
- Galvanized 3 Strand 5/16" Diameter	14,800 Ft			
Pole Trs.	127 units			
BASELCO	Lamitan Feeder (Isabela – Lamitan)	Length: 30 km	1	1
	Poles	550 poles		
	Conductors			
	- ASCR #3/0	35 km		
	- ASCR #4/0	104 km		
- Galvanized 3 Strand 5/16" Diameter	19,000 Ft			
Pole Trs.	35 units			

Name of ECs	Power Distribution Facilities		Vehicles for Construction & Maintenance Work	
	Name of Feeders	Qty	Boom Truck with Bucket (BTwB)	Boom Truck with Digger (BTwD)
			[Unit(s)]	[Unit(s)]
SULECO	Feeder 4 (Jolo – Alt)	Length: 7 km	1	1
	Poles	140 poles		
	Conductors			
	- ASCR #3/0	9 km		
	- ASCR #4/0	25 km		
	- Galvanized 3 Strand 5/16" Diameter	4,550 Ft		
	Pole Trs.	39 units		
	Feeder 6 (Jolo – Maimbung – Indanan - Parang)	Length: 23 km		
	Poles	460 poles		
	Conductors			
- ASCR #3/0	27 km			
- ASCR #4/0	80 km			
- Galvanized 3 Strand 5/16" Diameter	14,950 Ft			
Pole Trs.	36 units			
TAWELCO	Feeder 1 (Bongao – Paht)	Length: 10 km	1	1
	Poles	200 poles		
	Conductors			
	- ASCR #3/0	12 km		
	- ASCR #4/0	35 km		
- Galvanized 3 Strand 5/16" Diameter	7,000 Ft			
Pole Trs.	51 units			
SIASELCO	—	—	1	1

Note

- *1: As the specifications of a pole, "Concrete Pole" and/or "Steel Pole" are requested.
- *2: Conductors mean the wire used for the primary side (13.2kV) of distribution lines, neutral lines, and grounding wires. As the specifications of the power line on the primary side, two (2) types of wires, namely, "Bare ACSR" and/or "Insulated ACSR" are requested.
- *3: Pole Trs. mean Pole Transformers.

JAPANESE GRANT

The Japanese Grant (hereinafter referred to as the "Grant") is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant is not supplied through the donation of materials as such.

Based on a JICA law which was entered into effect on October 1, 2008 and the decision of the GOJ, JICA has become the executing agency of the Japanese Grant for Projects for construction of facilities, purchase of equipment, etc.

1. Grant Procedures

The Grant is supplied through following procedures :

- Preparatory Survey
 - The Survey conducted by JICA
- Appraisal & Approval
 - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
 - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
 - Agreement concluded between JICA and a recipient country
- Implementation
 - Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Scheme from a technical, financial, social and economic point of view.

- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant project. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japanese Grant Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be signed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles, in accordance with the E/N, to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Grant, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. The Grant may be used for the purchase of the products or services of a third country, if necessary, taking into account the quality, competitiveness and economic rationality of products and services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals", in principle.

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals, in principle. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Project, the recipient country is required to undertake such necessary measures as Annex. The Japanese Government requests the Government of the recipient country to exempt all customs duties, internal taxes and other fiscal levies such as VAT, commercial tax, income tax, corporate tax, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract, since the Grant fund comes from the Japanese taxpayers.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant.

(7) "Export and Re-export"

The products purchased under the Grant should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"), in principle. JICA will execute the Grant by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Environmental and Social Considerations

The Government of the recipient country must carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the recipient country and JICA Guidelines for Environmental and Social Consideration (April, 2010) .

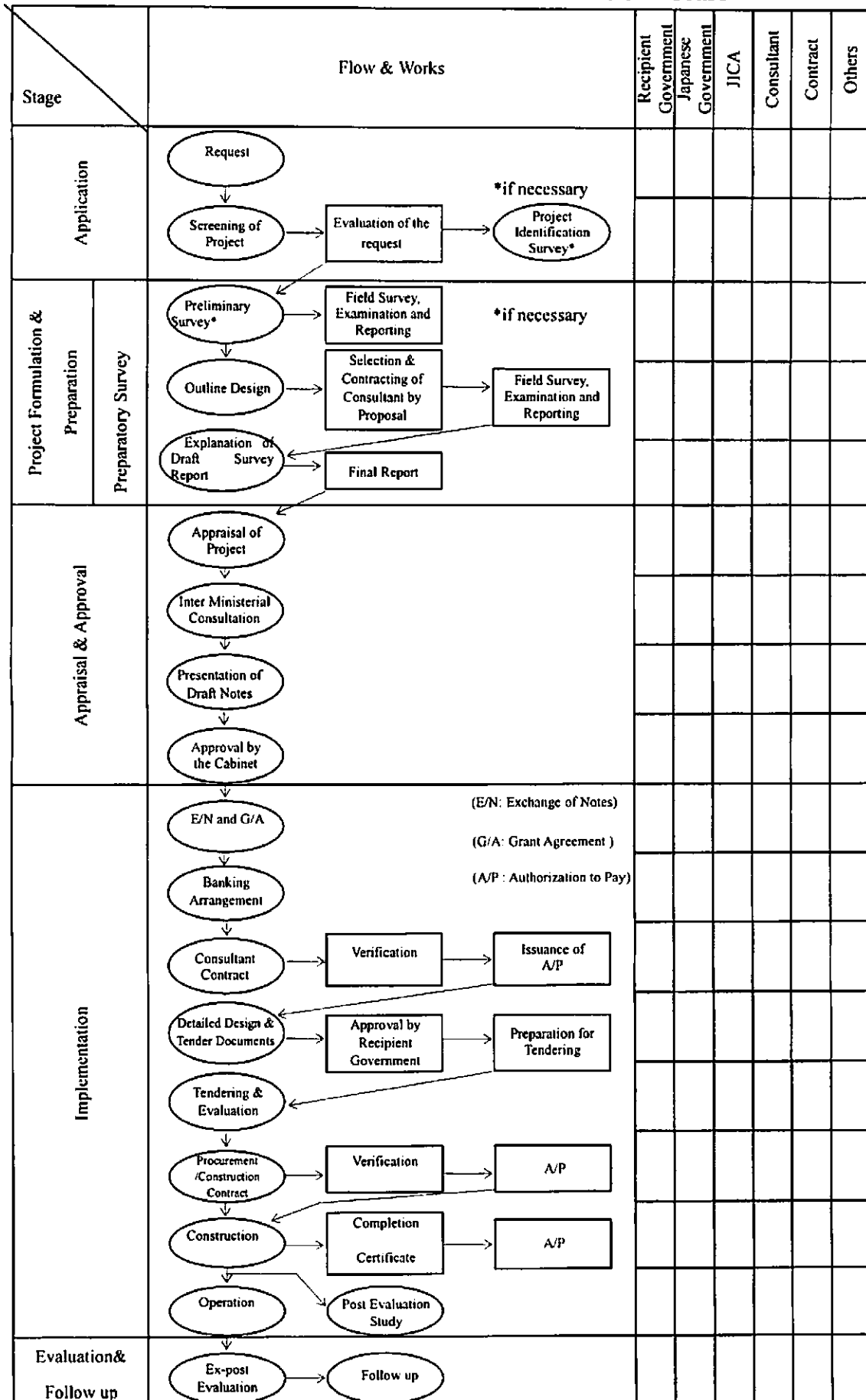
(11) Monitoring

The Government of the recipient country must take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and must regularly report to JICA about its status by using the Project Monitoring Report (PMR).

(12) Safety Measures

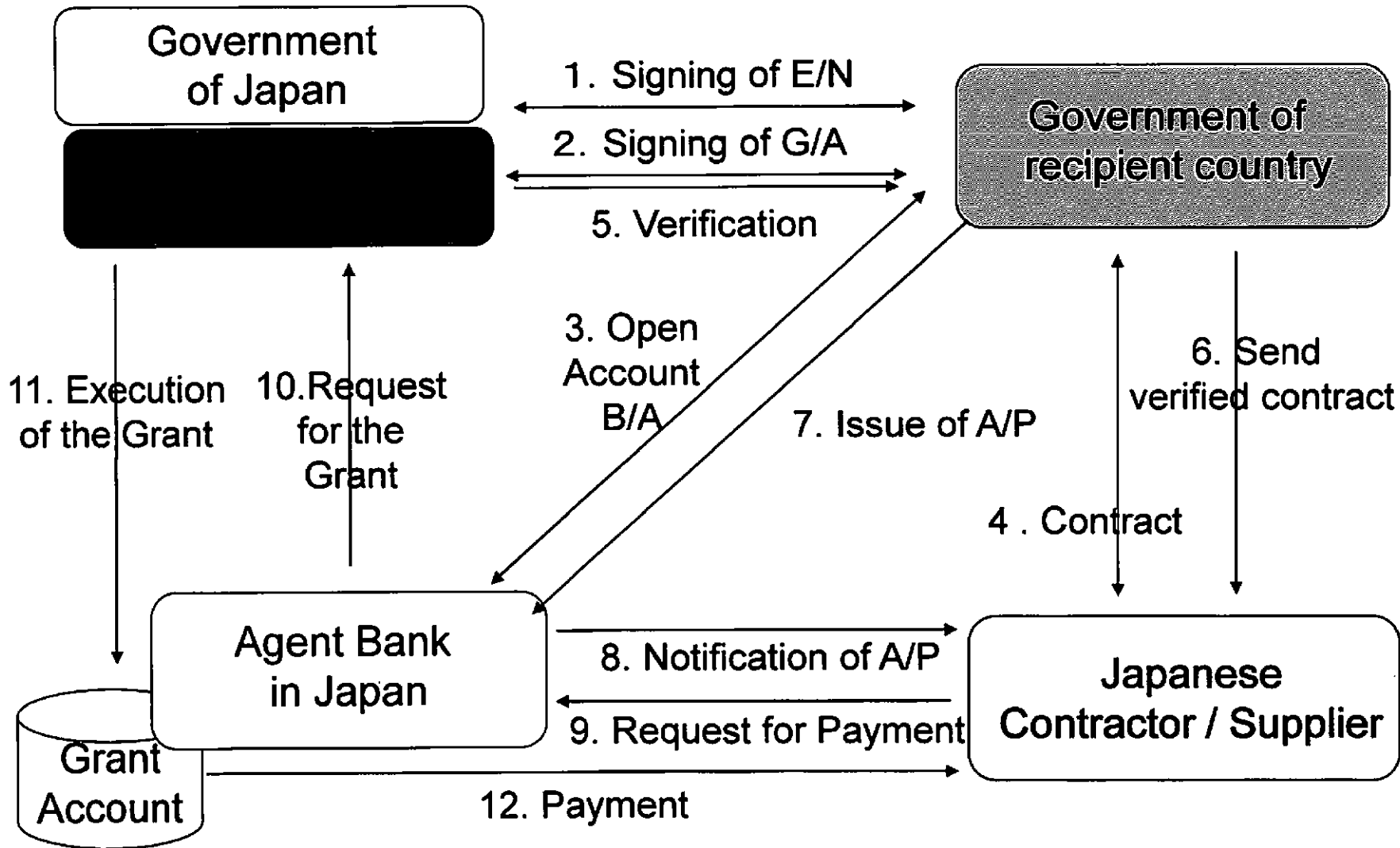
The Government of the recipient country must ensure that the safety is highly observed during the implementation of the Project.

FLOW CHART OF JAPANESE GRANT PROCEDURES



2

Financial Flow of Grant Aid (A/P Type)



A4-16

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Major Undertakings to be taken by Recipient Government

1. Before the Tender

NO	Items	Deadline	In charge	Cost	Ref.
1	To open Bank Account (Banking Arrangement (B/A))	within 1 month after G/A	Ministry of XXX	XXX	

2. During the Project Implementation

NO	Items	Deadline	In charge	Cost	Ref.
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the signing of the contract	Ministry of XXX	XXX	
	2) Payment commission for A/P	every payment	Ministry of XXX	XXX	
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country				
	1) Tax exemption and customs clearance of the products at the port of disembarkation	during the Project	Ministry of XXX	XXX	
	2) Internal transportation from the port of disembarkation to the project site	during the Project	Ministry of XXX	XXX	
3	To accord Japanese nationals and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work	during the Project	Ministry of XXX	XXX	
4	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the Products and/or the Services be exempted; Such customs duties, internal taxes and other fiscal levies mentioned above include VAT, commercial tax, income tax and corporate tax of Japanese nationals, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract	during the Project	Ministry of XXX	XXX	
5	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment	during the Project	Ministry of XXX	XXX	

3. After the Project

NO	Items	Deadline	In charge	Cost	Ref.
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid	After completion of the construction	Ministry of XXX	XXX	
	1) Allocation of maintenance cost				
	2) Operation and maintenance structure				
	3) Routine check/Periodic inspection				

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

Major Undertakings to be Covered by the Japanese Grant

No	Items	Deadline	Cost Estimated (Million Japanese Yen)*	
1	To provide equipment		XX.XX	
	1) To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country			
	a) Marine(Air) transportation of the products from Japan to the recipient country			
	b) Internal transportation from the port of disembarkation to the project site			
	2) To provide equipment with installation and commissioning			
	- XXX XXX XXX			
2	To implement detailed design, tender support and construction supervision (Consultant)		YY.YY	
	Total		ZZ.ZZ	

*; The cost estimates are provisional. This is subject to the approval of the Government of Japan.

Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXXX
20XX, Month

Organization Information

Authority (Signer of the G/A)	_____ Person in Charge _____ _____ (Division) _____ Contacts _____ Address: _____ Phone/FAX: _____ Email: _____
Executing Agency	_____ Person in Charge _____ _____ (Division) _____ Contacts _____ Address: _____ Phone/FAX: _____ Email: _____
Line Ministry	_____ Person in Charge _____ _____ (Division) _____ Contacts _____ Address: _____ Phone/FAX: _____ Email: _____

Outline of Grant Agreement:

Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____
Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:

D

1: Project Description

1-1 Project Objective

--

1-2 Necessity and Priority of the Project

- Consistency with development policy, sector plan, national/regional development plans and demand of target group and the recipient country.

--

1-3 Effectiveness and the indicators

- Effectiveness by the Project

Quantitative Effect (Operation and Effect indicators)		
Indicators	Original (Yr)	Target (Yr)
Qualitative Effect		

2: Project Implementation

2-1 Project Scope

Table 2-1-1a: Comparison of Original and Actual Location

Location	Original: (M/D) Attachment(s):Map	Actual: (PMR) Attachment(s):Map

Table 2-1-1b: Comparison of Original and Actual Scope

Items	Original	Actual
(M/D)	(M/D)	(PMR) Please state not only the most updated schedule but also other past revisions chronologically.

'Soft component' shall be included in 'Items'.		All change of design shall be recorded regardless of its degree.
--	--	--

2-1-2 Reason(s) for the modification if there have been any.

(PMR)

2-2 Implementation Schedule

2-2-1 Implementation Schedule

Table 2-2-1: Comparison of Original and Actual Schedule

Items	Original		Actual
	DOD	G/A	
<p>[M/D]</p> <p>'Soft component' shall be stated in the column of 'Items'.</p> <p>Project Completion Date*</p>	(M/D)		<p>(PMR)</p> <p>As of (Date of Revision)</p> <p>Please state not only the most updated schedule but also other past revisions chronologically.</p>

*Project Completion was defined as _____ at the time of G/A.

2-2-2 Reasons for any changes of the schedule, and their effects on the project.

2-3 Undertakings by each Government

2-3-1 Major Undertakings
 See Attachment 2.

2-3-2 Activities
 See Attachment 3.

2-3-3 Report on RD
 See Attachment 4.

2-4 Project Cost

2-4-1 Project Cost

Table 2-3-1 Comparison of Original and Actual Cost by the Government of Japan
 (Confidential until the Tender)

1

Items			Cost (Million Yen)	
	Original	Actual	Original	Actual
Construction Facilities (or Equipment)	'Soft component' shall be included in 'Items'.			Please state not only the most updated schedule but also other past revisions chronologically.
Consulting Services	- Detailed design - Procurement Management - Construction Supervision			
Total				

Note: 1) Date of estimation:
 2) Exchange rate: 1 US Dollar = Yen

Table 2-3-2 Comparison of Original and Actual Cost by the Government of XX

Items			Cost (Million USD)	
	Original	Actual	Original	Actual
	'Soft component' shall be included in 'Items'.			Please state not only the most updated schedule but also other past revisions chronologically.
Total				

Note: 1) Date of estimation:
 2) Exchange rate: 1 US Dollar = (local currency)

2-4-2 Reason(s) for the wide gap between the original and actual, if there have been any, the remedies you have taken, and their results.

(PMR)

2-5 Organizations for Implementation

2-5-1 Executing Agency:

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

P

Original: (M/D)
Actual, if changed: (PMR)

2-6 Environmental and Social Impacts

- The results of environmental monitoring as attached in [REDACTED] in accordance with Schedule 4 of the Grant Agreement.
- The results of social monitoring as attached [REDACTED] in accordance with Schedule 4 of the Grant Agreement.
- Information on the disclosed results of environmental and social monitoring to local stakeholders, whenever applicable.

3: Operation and Maintenance (O&M)

3-1 O&M and Management

- Organization chart of O&M
- Operational and maintenance system (structure and the number ,qualification and skill of staff or other conditions necessary to maintain the outputs and benefits of the project soundly, such as manuals, facilities and equipment for maintenance, and spare part stocks etc)

Original: (M/D)
Actual: (PMR)

3-2 O&M Cost and Budget

- The actual annual O&M cost for the duration of the project up to today, as well as the annual O&M budget.

Original: (M/D)

4: Precautions (Risk Management)

- Risks and issues, if any, which may affect the project implementation, outcome, sustainability and planned countermeasures to be adapted are below.



Original Issues and Countermeasure(s): (M/D)	
Potential Project Risks	Assessment
1.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
2.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
3.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
Actual issues and Countermeasure(s)	
(PMR)	

5: Evaluation at Project Completion and Monitoring Plan

5-1 Overall evaluation
 Please describe your overall evaluation on Project.

0

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan for the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

Attachment

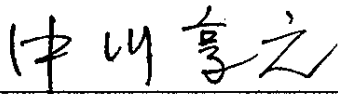
1. Project Location Map
2. Undertakings to be taken by each Government
3. Monthly Report
4. Report on RD
5. Environmental Monitoring Form/Social Monitoring FormMonitoring sheet on price of specified materials (Quarterly)
6. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (Completion Report Only)

**MINUTES OF DISCUSSIONS
ON
THE PREPARATORY SURVEY FOR THE PROJECT
FOR
IMPROVEMENT OF EQUIPMENT FOR POWER DISTRIBUTION
IN BANGSAMORO**

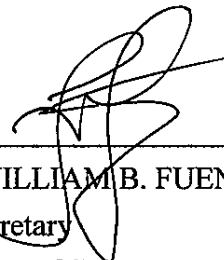
On the basis of Minutes of Discussion signed between the Government of the Republic of the Philippines (hereinafter referred to as "GOP") and Japan International Cooperation Agency (hereinafter referred to as "JICA") on 14 September 2016, JICA dispatched the Preparatory Survey Team for the Outline Design (hereinafter referred to as "the Team") to the Republic of the Philippines, headed by Takayuki Nakagawa, Acting Director of Office for Peacebuilding and Reconstruction, JICA from 24 to 29 October 2016.

The Team held a series of discussions with the officials concerned of GOP. In the course of the discussions, both sides have confirmed the main points described in the attached sheets. The Team will proceed to further works and prepare the Outline Design Report.

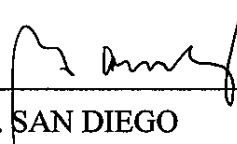
Manila, 28 October 2016



TAKAYUKI NAKAGAWA
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan



FELIX WILLIAM B. FUENTEBELLA
Undersecretary
Department of Energy
The Republic of the Philippines



SONIA B. SAN DIEGO
Officer-in-Charge
National Electrification Administration
The Republic of the Philippines

ATTACHMENT

1. Equipment of the Project

1-1. As a result of discussions, both sides confirmed additional equipment to be included in Annex 3 of the Minutes of Discussions signed on 14 September 2016 as follows, and the Annex 3 is replaced by Annex 2 of this attachment.

Name of Electric Cooperatives	Power Distribution Equipment		Vehicles for Installation and Maintenance Work	
	Name of Feeders	Qty	Boom Truck with Bucket (BTwB)	Boom Truck with Digger (BTwD)
			[Unit(s)]	[Unit(s)]
MAGELCO	Parang Feeder (Simuay- Matanog)	Length: 30 km	-	1
	Poles	426 poles		
	Conductors - ASCR #3/0 - ASCR #4/0 - Galvanized 3 Strand 5/16" Diameter	35 km 104 km 12,500 Ft		
	Pole Trs.	35 units		
LASURECO	-	-	1	-
SIASELCO	Feeder 3 (Substation – Sipanding)	Length: 10 km	-	-
	Poles	200 poles		
	Conductors - ASCR #3/0 - ASCR #4/0 - Galvanized 3 Strand 5/16" Diameter	12 km 35 km 6,000 Ft		
	Pole Trs.	65 units		

1-2. The final equipment of the Project would be decided by the Government of Japan.

2. Transportation Plan

2-1. JICA explained a draft plan for transportation of the equipment of the Project listed on Annex 2, and GOP agreed with the plan.

2-2. Both sides confirmed ports of disembarkation of the equipment of the Project as follows;

- (1) Cagayan de Oro (applicable to transportation to LASURECO)
- (2) General Santos (applicable to transportation to MAGELCO)
- (3) Zamboanga (applicable to transportation to BASELCO, SULECO, TAWELCO and SIASELCO)

2-3. Both sides confirmed that National Electrification Administration and the respective

Electric Cooperatives take responsibility for the internal transportation of the equipment of the Project from the ports of disembarkation to the project sites in a timely manner, and undertake the cost required for the internal transportation including custody charge after inspection and handover to the respective Electric Cooperatives.

2-4. Inspection and handover of the equipment of the Project is conducted at the respective ports of disembarkation.

2-5. National Electrification Administration and the respective Electric Cooperatives shall provide the appropriate places for adjustment work of the vehicles. These places are to be as follows;

(1) MORESCO I (applicable to the vehicles for LASURECO)

(2) SCOTECO II (applicable to the vehicles for MAGELCO)

(3) Appropriate sites in Zamboanga City or ZAMCELCO (applicable to the vehicles for BASELCO, SULECO, TAWELCO and SIASELCO)

2-6. National Electrification Administration and the respective Electric Cooperatives shall provide, if necessary, appropriate places for temporary storage for the power distribution equipment during the internal transportation from the ports of disembarkation to the Project sites. These places are to be as follows;

(1) MORESCO I (applicable to transportation to LASURECO)

(2) SCOTECO II (applicable to transportation to MAGELCO)

(3) Appropriate sites in Zamboanga City or ZAMCELCO (applicable to transportation to BASELCO, SULECO, TAWELCO and SIASELCO)

3. Training

3-1. The training for boom truck operators and linemen of the respective Electric Cooperatives shall be conducted at MAGELCO.

3-2. The training contents shall be considered for the purpose of the following skill acquirement and the training is to be implemented by 2 courses as follows;

(1) Training for boom truck operators

- Training skill acquirement for,
 - Boom truck operation procedures
 - Maintenance method for boom truck
 - Pole erection and extraction by the use of truck

- Duration of training
 - 2 weeks

(2) Training for linemen

- Training skill acquirement for,
 - Method for handling insulated wires

- Duration of training
 - 1 week

- 3-3. The number of the trainees for the each training shall be 2 to 4 personnel from the respective Electric Cooperatives.
- 3-4. The respective Electric Cooperatives bear the cost required for the training implementation excluding personnel fee of trainers.
4. Major Undertakings to be taken by the Government of the Republic of the Philippines
- 4-1. Both sides confirmed GOP authorities in charge of undertakings to be borne by GOP as described in Annex 3. The detailed contents including each cost shall be worked out and agreed by both sides no later than by the Explanation of the Draft Preparatory Survey Report.
- 4-2. National Electrification Administration shall extend financial assistance to the respective Electric Cooperatives to implement the necessary undertakings. National Electrification Administration and the respective Electric Cooperatives will enter into Memorandum of Agreement in connection with financial assistance to the respective Electric Cooperatives after signing of Grant Agreement.
5. Other Relevant Issues
- 5-1. Department of Energy shall take prompt actions to facilitate submission of “Application Form for Grant Aid from Japan” to the Government of Japan.
- 5-2. National Electrification Administration and the respective Electric Cooperative beneficiaries shall provide further information and data related to the followings;
- Method and cost of the internal transportation of the equipment of the Project, from the ports of disembarkation to the Project sites
 - Rehabilitation schedule of feeders targeted in the Project
 - Budget, expense, organization, methodology, record for operation and maintenance (O & M) of the equipment of the Project
 - Expected system loss rate, electrification rate, and numbers of beneficiary households after implementation of the Project

Annex 1: List of Attendees

Annex 2: Equipment of the Project

Annex 3: Major Undertakings to be taken by Each Government

Handwritten signature and initials in black ink, located in the bottom right corner of the page. The signature appears to be 'JF' followed by a large flourish, and the initials 'M. Amato' are written to the right.

List of Attendees

Department of Energy (DOE)

Emmanuel C. Talag, Supervising Science Research Specialist, Power Planning and Development Division

Andrew P. Catayong, Science Research Specialist, Power Planning and Development Division

National Electrification Administration (NEA)

Sonia B. San Diego, OIC

Ferdinand P. Villareal, OIC, Technical Services

Antonio D. Cortes, OIC, Engineering Department

Bonifacio T. David, Principal Engineer C

Electric Cooperative (EC)

BASELCO

Filomeno E. Bate, General Manager

Nijar A. Indahi, Board President

LASURECO

Solaiman C. Mutia, Assistant General Manager

MAGELCO

Sultan Ashary P. Maongco, General Manager

Rasul T. Adzal, Engineering Services Group Manager

Eduardo A. Longakit, Technical Services Department Manager

SIASELCO

Attha I. Anuddin, General Manager

SULECO

Peraida T. Jalani, General Manager

TAWELCO

Habibiya A. Sangoyo, OIC-General Manager

JICA Preparatory Survey Team

Takayuki Nakagawa, Office for Peace Building and Reconstruction, JICA

Masayoshi Soejima, Office for Peace Building and Reconstruction, JICA

Noriyoshi Kondo, Oriental Consultants Global

A handwritten signature in black ink, appearing to be 'J.P. Mansueti', is located in the bottom right corner of the page.

Annex 2

Equipment of the Project

Name of Electric Cooperatives	Power Distribution Equipment		Vehicles for Construction and Maintenance Work	
	Name of Feeders	Qty	Boom Truck with Bucket (BTwB)	Boom Truck with Digger (BTwD)
			[Unit(s)]	[Unit(s)]
MAGELCO	DOS Feeder and Talayan Feeder (Datu Odin Sinsuat – Datu Saudi Ampatuan)	Length: 40 km	2	2
	Poles	667 poles		
	Conductors - ASCR #3/0 - ASCR #4/0 - Galvanized 3 Strand 5/16" Diameter	46 km 138 km 26,680 Ft		
	Pole Trs.	37 units		
	Upi Feeder (Awang – South Upi)	Length: 30 km		
	Poles	500 poles		
	Conductors - ASCR #3/0 - ASCR #4/0 - Galvanized 3 Strand 5/16" Diameter	35 km 104 km 20,000 Ft		
	Pole Trs.	-		
	Landasan Feeder (Landansan – Simuay)	Length: 10 km		
	Poles	168 poles		
	Conductors - ASCR #3/0 - ASCR #4/0 - Galvanized 3 Strand 5/16" Diameter	12 km 35 km 8,020 Ft		
	Pole Trs.	-		
	Parang Feeder (Simuay- Matanog)	Length: 30km		
	Poles	390 poles		
Conductors - ASCR #3/0 - ASCR #4/0 - Galvanized 3 Strand 5/16" Diameter	35km 104km 12,500 Ft			
Pole Trs	35 units			

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Name of Electric Cooperatives	Power Distribution Equipment		Vehicles for Construction and Maintenance Work	
	Name of Feeders	Qty	Boom Truck with Bucket (BTwB)	Boom Truck with Digger (BTwD)
			[Unit(s)]	[Unit(s)]
LASURECO	40 Feeder 2 (Marawi – Mulondo)	Length: 21.3 km	2	2
	Poles	426 Poles		
	Conductors - ASCR #3/0 - ASCR #4/0 - Galvanized 3 Strand 5/16" Diameter	25 km 147 km 17,040 Ft		
	Pole Trs.	43 units		
	5 Tugaya Feeder (Tugaya – Ganassi)	Length: 18.5 km		
	Poles	370 poles		
	Conductors - ASCR #3/0 - ASCR #4/0 - Galvanized 3 Strand 5/16" Diameter	22 km 64 km 14,800 Ft		
Pole Trs.	127 units			
BASELCO	Lamitan Feeder (Isabela – Lamitan)	Length: 30 km	1	1
	Poles	550 poles		
	Conductors - ASCR #3/0 - ASCR #4/0 - Galvanized 3 Strand 5/16" Diameter	35 km 104 km 19,000 Ft		
	Pole Trs.	35 units		

Name of Electric Cooperatives	Power Distribution Equipment		Vehicles for Construction and Maintenance Work	
	Name of Feeders	Qty	Boom Truck with Bucket (BTwB)	Boom Truck with Digger (BTwD)
			[Unit(s)]	[Unit(s)]
SULECO	Feeder 4 (Jolo – Alf)	Length: 7 km	1	1
	Poles	140 poles		
	Conductors - ASCR #3/0 - ASCR #4/0 - Galvanized 3 Strand 5/16" Diameter	9 km 25 km 4,550 Ft		
	Pole Trs.	39 units		
	Feeder 6 (Jolo – Maimbung – Indanan - Parang)	Length: 23 km		
	Poles	460 poles		
	Conductors - ASCR #3/0 - ASCR #4/0 - Galvanized 3 Strand 5/16" Diameter	27 km 80 km 14,950 Ft		
Pole Trs.	36 units			
TAWELCO	Feeder 1 (Bongao – Paht)	Length: 10 km	1	1
	Poles	200 poles		
	Conductors - ASCR #3/0 - ASCR #4/0 - Galvanized 3 Strand 5/16" Diameter	12 km 35 km 7,000 Ft		
	Pole Trs.	51 units		
SIASELCO	Feeder 3 (Substation – Sipanding)	Length: 10 km	1	1
	Poles	200		
	Conductors - ASCR #3/0 - ASCR #4/0 - Galvanized 3 Strand 5/16" Diameter	12 km 35 km 6,000 Ft		
	Pole Trs.	65 units		

Note

- *1. Specifications of a pole; “Concrete Pole” and/or “Steel Pole”
- *2. Conductors mean the wire used for the primary side (13.2kV) of distribution lines, neutral lines, and grounding wires.
- *3. Specifications of the power line on the primary side; two (2) types of wires, namely, “Bare ACSR” and/or “Insulated ACSR”
- *4. Pole Trs. mean Pole Transformers.

Annex 3

Major Undertakings to be taken by Recipient Government

1. Before the Tender

NO	Items	Deadline	In charge	Cost	Ref.
1	To open Bank Account (Banking Arrangement (B/A))	within 1 month after G/A	Department of Finance	XXX	

2. During the Project Implementation

NO	Items	Deadline	In charge	Cost	Ref.
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the signing of the contract	National Electrification Administration	XXX	
	2) Payment commission for A/P	every payment		XXX	
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country				
	1) Tax exemption and customs clearance of the equipment of the Project at the ports of disembarkation	during the Project	National Electrification Administration and Electric Cooperatives	XXX	
	2) Internal transportation from the ports of disembarkation to the project sites			XXX	
3) Custody charge of the equipment of the Project after inspection and handover					
3	To accord Japanese nationals and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work	during the Project	Department of Foreign Affairs	XXX	
4	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the Products and/or the Services be exempted; Such customs duties, internal taxes and other fiscal levies mentioned above include VAT, commercial tax, income tax and corporate tax of Japanese nationals, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract	during the Project	National Electrification Administration and Electric Cooperatives	XXX	
5	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment	during the Project		XXX	
6	To bear all the expenses required for the technical training designed for operators and linemen of respective Electric Cooperatives, excluding personnel fee of trainers	during the Project		XXX	

3. After the Project

NO	Items	Deadline	In charge	Cost	Ref.
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid				
	1) Allocation of maintenance cost	After completion of the construction	National Electrification Administration and Electric Cooperatives	XXX	
	2) Operation and maintenance structure				
	3) Routine check/Periodic inspection				

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

Major Undertakings to be Covered by the Japanese Grant

No	Items	Deadline	Cost Estimated (Million Japanese Yen)*	
1	To provide equipment		XX.XX	
	1) To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country			
	a) Marine transportation of the vehicles for installation and maintenance work from Japan to the recipient country ports of disembarkation			
	b) Internal marine transportation of the power distribution equipment to the ports of disembarkation			
2	To implement detailed design, tender support and procurement supervision (Consultant)		YY.YY	
	Total		ZZ.ZZ	

*: The cost estimates are provisional. This is subject to the approval of the Government of Japan.

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**Minutes of Discussions
on the Preparatory Survey for the Project for
Improvement of Equipment for Power Distribution
in Bangsamoro
(Explanation on Draft Preparatory Survey Report)**

With reference to the minutes of discussions signed between the Government of the Republic of the Philippines (hereinafter referred to as "GOP") and the Japan International Cooperation Agency (hereinafter referred to as "JICA") on 28 October 2016 and in response to the request from GOP, JICA dispatched the Preparatory Survey Team (hereinafter referred to as "the Team") for the explanation of Draft Preparatory Survey Report (hereinafter referred to as "the Draft Report") for the Project for Improvement of Equipment for Power Distribution in Bangsamoro (hereinafter referred to as "the Project"), headed by Masayoshi Soejima, Deputy Director for Office for Peacebuilding and Reconstruction, JICA from 4 to 10 December, 2016.

As a result of the discussions, both sides agreed on the main items described in the attached sheets.

Manila, 9 December 2016



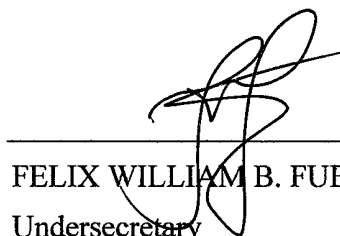
MASAYOSHI SOEJIMA

Leader

Preparatory Survey Team

Japan International Cooperation Agency

Japan



FELIX WILLIAM B. FUENTEBELLA

Undersecretary

Department of Energy

The Republic of the Philippines



EDGARDO R. MASONGSONG

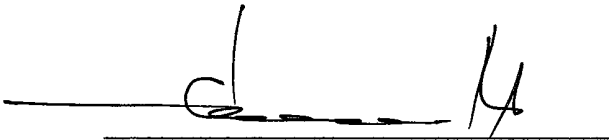
Administrator

National Electrification Administration

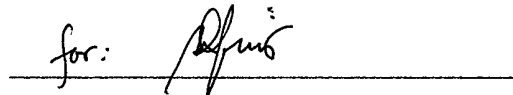
The Republic of the Philippines

Statement of Commitment

Following Electric Cooperatives are committed to implement the Project as agreed in this Minutes of Discussions.



FILOMENO E. BATE
General Manager
Basilan Electric Cooperative, Inc.

for: 

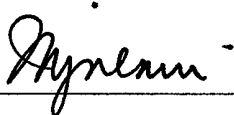
Usec. BENITO L. RANQUE
Chairman
Task Force LASURECO



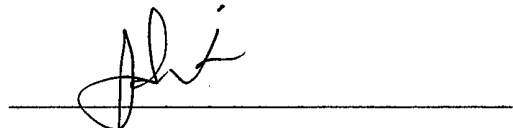
SULTAN ASHARY P. MAONGCO
General Manager
Maguindanao Electric Cooperative, Inc.



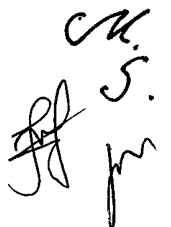
ATTHA I. ANUDDIN
General Manager
Siasi Electric Cooperative, Inc.



PERAIDA T. JALANI
General Manager
Sulu Electric Cooperative, Inc.



HABIBIYA A. SANGOYO
OIC-General Manager
Tawi-Tawi Electric Cooperative, Inc.



ATTACHEMENT

1. Objective of the Project

The objective of the Project is to stabilize electrical power supply through improvement of equipment for power distribution in Bangsamoro.

2. Title of the Preparatory Survey

Both sides confirmed the title of the Preparatory Survey as “the Preparatory Survey for the Project for Improvement of Equipment for Power Distribution in Bangsamoro”.

3. Project site

Both sides confirmed that the sites of the Project are in the franchise areas of the Electrical Cooperatives, which is shown in Annex 1.

4. Responsible authority for the Project

Both sides confirmed the authorities responsible for the Project are as follows:

4-1. National Electrification Administration (NEA) will be the executing agency for the Project (hereinafter referred to as “the Executing Agency”). The Executing Agency shall coordinate with all the relevant authorities to ensure smooth implementation of the Project and ensure that the undertakings for the Project shall be taken care by relevant authorities properly and on time. The organization charts are shown in Annex 2.

4-2. The line ministry of the Executing Agency is the Department of Energy (DOE). DOE shall be responsible for supervising the Executing Agency on behalf of GOP.

5. Contents of the Draft Report

After the explanation of the contents of the Draft Report by the Team, GOP side agreed in principle to its contents.

6. Cost estimate

Both sides confirmed that the cost estimate described in the Draft Report is provisional and will be examined further by the Government of Japan for its approval.

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7. Confidentiality of the cost estimate and technical specifications

Both sides confirmed that the cost estimate and technical specifications in the Draft Report should never be duplicated or disclosed to any third parties until all the contracts under the Project are concluded.

8. Procedures and Basic Principles of Japanese Grant

GOP side agreed that the procedures and basic principles of Japanese Grant as described in Annex 3 shall be applied to the Project. In addition, GOP side agreed to take necessary measures according to the procedures.

9. Timeline for the project implementation

The Team explained to GOP side that the expected timeline for the project implementation is as attached in Annex 4.

The equipment provided by the Project shall be installed by the respective Electric Cooperatives in a timely manner as scheduled in Annex 4.

10. Expected outcomes and indicators

Both sides agreed that key indicators for expected outcomes are as follows. GOP side will be responsible for the achievement of agreed key indicators targeted in year 2022 and shall monitor the progress based on those indicators.

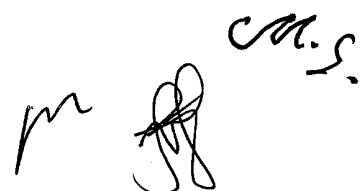
- Transmittable Capacity of Feeders (MW)
- Technical Loss Rate (%)
- Duration of Power Outage in the Feeders (Min.)

11. Undertakings of the Project

Both sides confirmed the undertakings of the Project as described in Annex 5. With regard to exemption of customs duties, internal taxes and other fiscal levies as stipulated in 2-4 of Annex 5, both sides confirmed that such customs duties, internal taxes and other fiscal levies include VAT, commercial tax, income tax and corporate tax, which shall be clarified in the bid documents by National Electrification Administration (NEA) during the implementation stage of the Project.

GOP side assured to take the necessary measures and coordination including allocation of the necessary budget which are preconditions of implementation of the Project. It is further agreed that the costs are indicative, i.e. at Outline Design level. More accurate costs will be calculated at the Detailed Design stage.

Both sides also confirmed that the Annex 5 will be used as an attachment of G/A.

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12. Monitoring during the implementation

The Project will be monitored by the Executing Agency and reported to JICA by using the form of Project Monitoring Report (PMR) attached as Annex 6. The timing of submission of the PMR is described in Annex 5.

13. Project completion

Both sides confirmed that the project completes when all the facilities constructed and equipment procured by the grant are in operation. The completion of the Project will be reported to JICA promptly, but in any event not later than six months after completion of the Project.

14. Ex-Post Evaluation

JICA will conduct ex-post evaluation after three (3) years from the project completion, in principle, with respect to five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact, Sustainability). The result of the evaluation will be publicized. GOP side is required to provide necessary support for the data collection.

15. Items and measures to be considered for the smooth implementation of the Project

Both sides confirmed the items and measures to be considered for the smooth implementation of the Project as follows:

15-1. Financial Issue

National Electrification Administration (NEA) shall extend financial assistance (National Budget, Subsidy or Loan; to be determined before G/A) to the respective Electric Cooperatives to implement the necessary undertakings. National Electrification Administration and the respective Electric Cooperatives will enter into Memorandum of Agreement in connection with financial assistance to the respective Electric Cooperatives after signing of Grant Agreement.

16. Schedule of the Study

JICA will finalize the Preparatory Survey Report based on the confirmed items. The report will be sent to the GOP side around January 2017.

17. Environmental and Social Considerations

The Team explained that 'JICA Guidelines for Environmental and Social Considerations (April 2010)' is applicable for the Project. The Project is

categorized as C because the Project is likely to have minimal adverse impact on the environment under the Guidelines.

18. Other Relevant Issues

18-1. Disclosure of Information

Both sides confirmed that the Preparatory Survey Report from which project cost is excluded will be disclosed to the public after completion of the Preparatory Survey. The comprehensive report including the project cost will be disclosed to the public after all the contracts under the Project are concluded.

18-2. Operation and Maintenance of the Equipment

JICA explained the importance of operation and maintenance of the equipment provided by the Project considering that proper asset management impacts greatly on life-span of the equipment and its maintenance cost. GOP shall secure enough staff and budgets necessary for appropriate operation and maintenance of the equipment. The annual operation and maintenance costs are estimated and shown in Annex 5.

Annex 1 Project Site

Annex 2 Organization Chart

Annex 3 Japanese Grant

Annex 4 Project Implementation Schedule

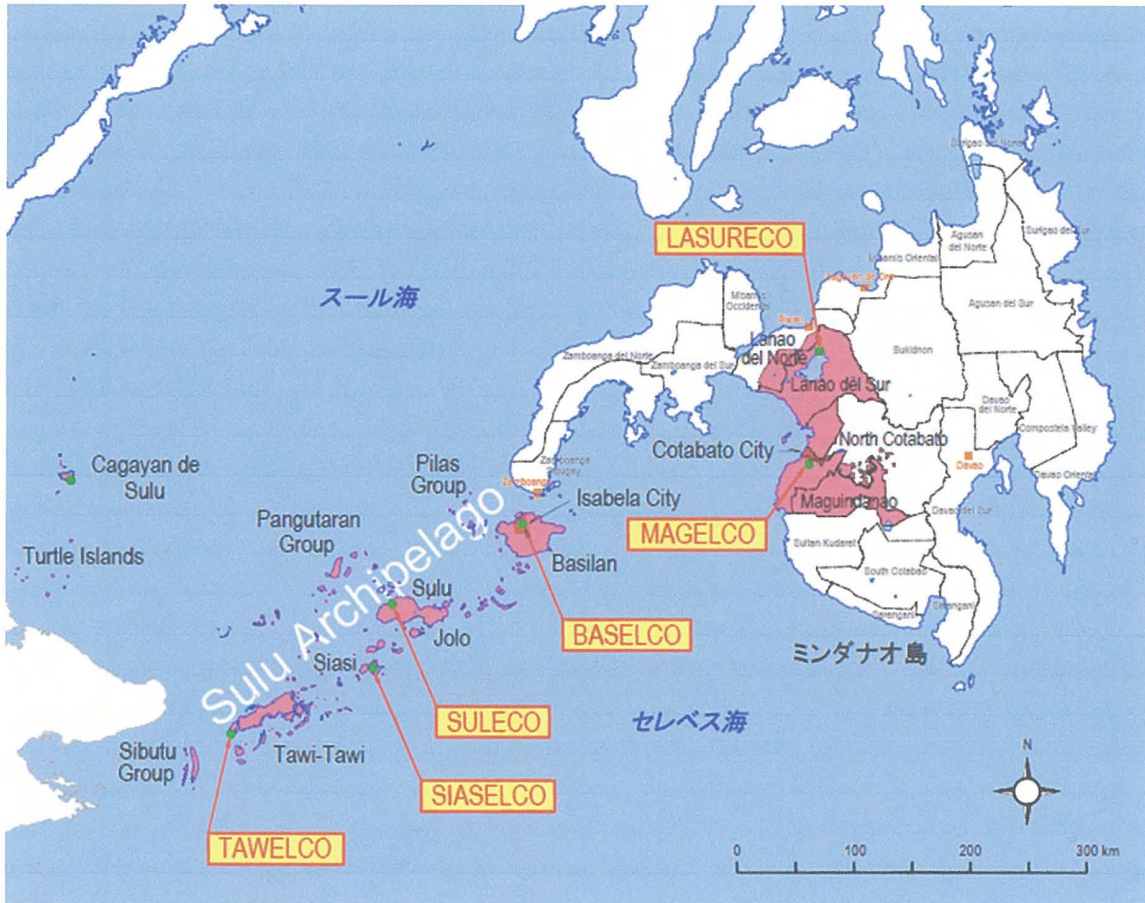
Annex 5 Major Undertakings to be taken by each Government

Annex 6 Project Monitoring Report (template)

Annex 7 List of Attendees

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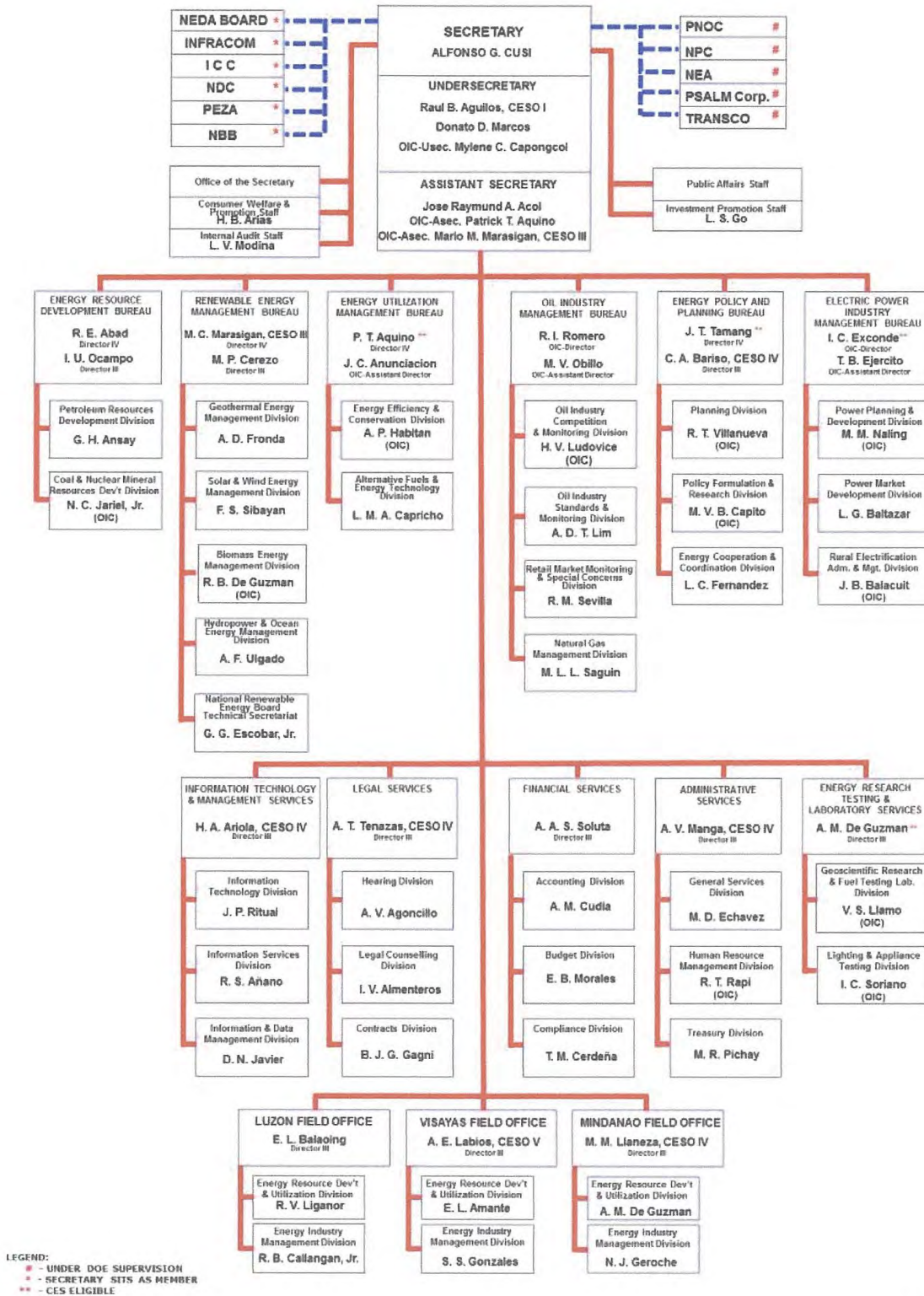
Project Site



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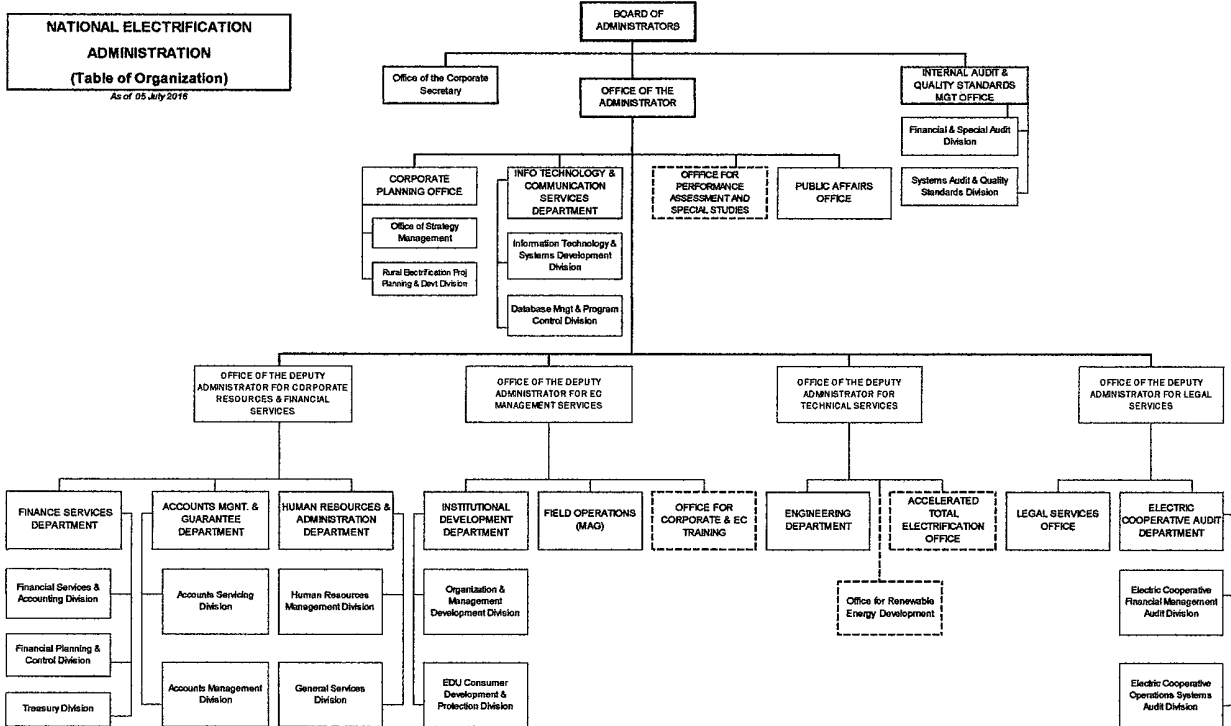
Organization Chart of Department of Energy (DOE)

DEPARTMENT OF ENERGY



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Organization Chart of National Electrification Administration (NEA)



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JAPANESE GRANT

The Japanese Grant is non-reimbursable fund provided to a recipient country (hereinafter referred to as “the Recipient”) to purchase the products and/or services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. Followings are the basic features of the project grants operated by JICA (hereinafter referred to as “Project Grants”).

1. Procedures of Project Grants

Project Grants are conducted through following procedures (See “PROCEDURES OF JAPANESE GRANT” for details):

(1) Preparation

- The Preparatory Survey (hereinafter referred to as “the Survey”) conducted by JICA

(2) Appraisal

- Appraisal by the government of Japan (hereinafter referred to as “GOJ”) and JICA, and Approval by the Japanese Cabinet

(3) Implementation

Exchange of Notes

- The Notes exchanged between the GOJ and the government of the Recipient

Grant Agreement (hereinafter referred to as “the G/A”)

- Agreement concluded between JICA and the Recipient

Banking Arrangement (hereinafter referred to as “the B/A”)

- Opening of bank account by the Recipient in a bank in Japan (hereinafter referred to as “the Bank”) to receive the grant

Construction works/procurement

- Implementation of the project (hereinafter referred to as “the Project”) on the basis of the G/A

(4) Ex-post Monitoring and Evaluation

- Monitoring and evaluation at post-implementation stage

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of

relevant agencies of the Recipient necessary for the implementation of the Project.

- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

The contents of the original request by the Recipient are not necessarily approved in their initial form. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant.

JICA requests the Recipient to take measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the executing agency of the Project. Therefore, the contents of the Project are confirmed by all relevant organizations of the Recipient based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA contracts with (a) consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the feasibility of the Project.

3. Basic Principles of Project Grants

(1) Implementation Stage

1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as “the E/N”) will be signed between the GOJ and the Government of the Recipient to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Recipient to define the necessary articles, in accordance with the E/N, to implement the Project, such as conditions of disbursement, responsibilities of the Recipient, and procurement conditions. The terms and conditions generally applicable to the Japanese Grant are stipulated in the “General Terms and Conditions for Japanese Grant (January 2016).”

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2) Banking Arrangements (B/A) (See “Financial Flow of Japanese Grant (A/P Type)” for details)

a) The Recipient shall open an account or shall cause its designated authority to open an account under the name of the Recipient in the Bank, in principle. JICA will disburse the Japanese Grant in Japanese yen for the Recipient to cover the obligations incurred by the Recipient under the verified contracts.

b) The Japanese Grant will be disbursed when payment requests are submitted by the Bank to JICA under an Authorization to Pay (A/P) issued by the Recipient.

3) Procurement Procedure

The products and/or services necessary for the implementation of the Project shall be procured in accordance with JICA's procurement guidelines as stipulated in the G/A.

4) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the Recipient to continue to work on the Project's implementation after the E/N and G/A.

5) Eligible source country

In using the Japanese Grant disbursed by JICA for the purchase of products and/or services, the eligible source countries of such products and/or services shall be Japan and/or the Recipient. The Japanese Grant may be used for the purchase of the products and/or services of a third country as eligible, if necessary, taking into account the quality, competitiveness and economic rationality of products and/or services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm, which enter into contracts with the Recipient, are limited to "Japanese nationals", in principle.

6) Contracts and Concurrence by JICA

The Recipient will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be concurred by JICA in order to be verified as eligible for using the Japanese Grant.

7) Monitoring

The Recipient is required to take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and to regularly report to JICA about its status by using the Project Monitoring Report (PMR).

8) Safety Measures

The Recipient must ensure that the safety is highly observed during the implementation of the Project.

9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the “Meeting”) will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed by the

Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

- a) Sharing information on the objective, concept and conditions of design from the Contractor, before start of construction.
- b) Discussing the issues affecting the Works such as modification of the design, test, inspection, safety control and the Client's obligation, during of construction.

(2) Ex-post Monitoring and Evaluation Stage

- 1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.
- 2) In principle, JICA will conduct ex-post evaluation of the Project after three years from the completion. It is required for the Recipient to furnish any necessary information as JICA may reasonably request.

(3) Others

1) Environmental and Social Considerations

The Recipient shall carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the Recipient and JICA Guidelines for Environmental and Social Considerations (April, 2010).

2) Major undertakings to be taken by the Government of the Recipient

For the smooth and proper implementation of the Project, the Recipient is required to undertake necessary measures including land acquisition, and bear an advising commission of the A/P and payment commissions paid to the Bank as agreed with the GOJ and/or JICA. The Government of the Recipient shall ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by its designated authority without using the Grant and its accrued interest, since the grant fund comes from the Japanese taxpayers.

3) Proper Use

The Recipient is required to maintain and use properly and effectively the products and/or services under the Project (including the facilities constructed and the equipment purchased), to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Japanese Grant.



4) Export and Re-export

The products purchased under the Japanese Grant should not be exported or re-exported from the Recipient.

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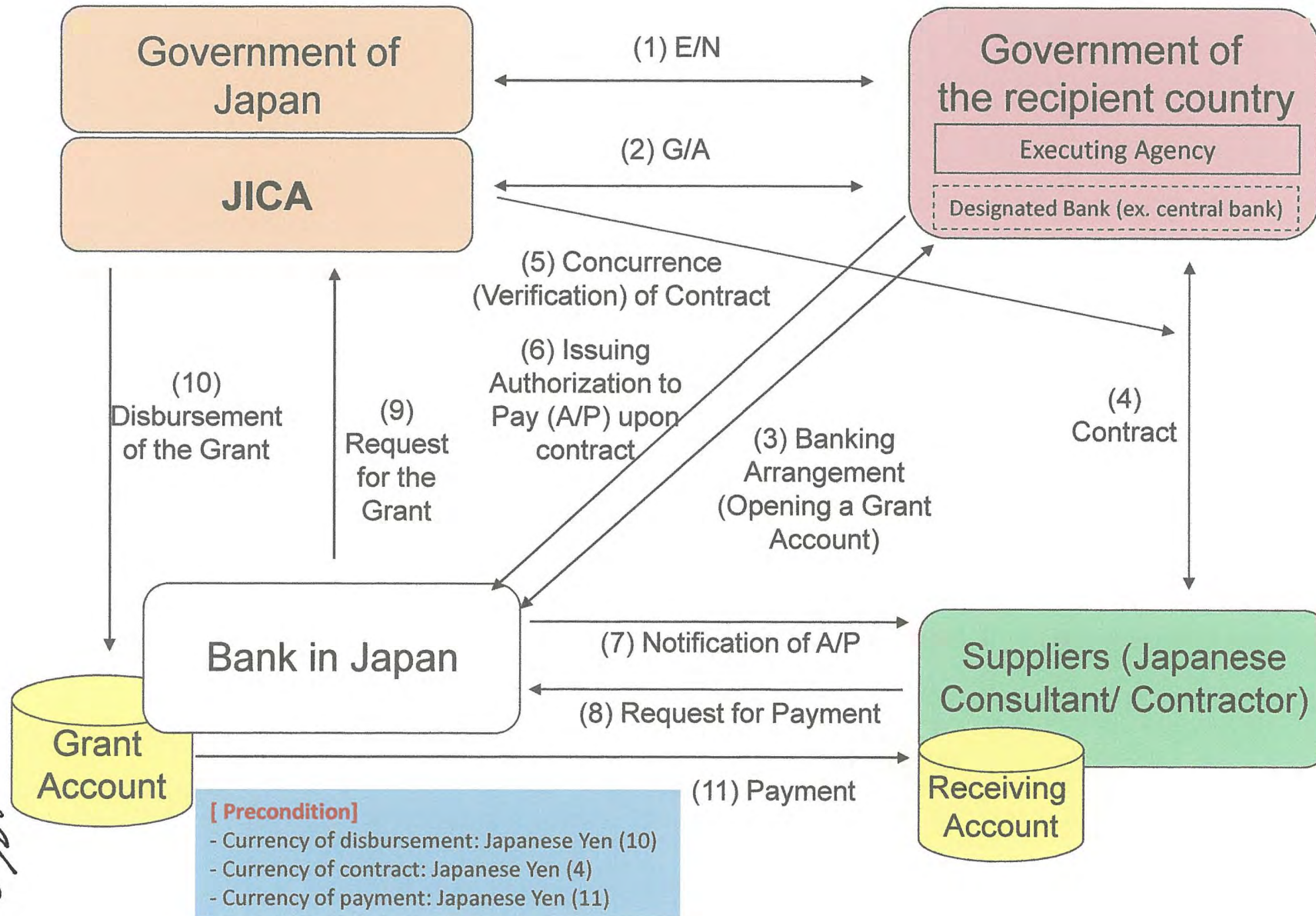
PROCEDURES OF JAPANESE GRANT

Stage	Procedures	Remarks	Recipient Government	Japanese Government	JICA	Consultants	Contractors	Agent Bank
Official Request	Request for grants through diplomatic channel	Request shall be submitted before appraisal stage.	x	x				
1. Preparation	(1) Preparatory Survey Preparation of outline design and cost estimate		x		x	x		
2. Appraisal	(2) Preparatory Survey Explanation of draft outline design, including cost estimate, undertakings, etc.		x		x	x		
	(3) Agreement on conditions for implementation	Conditions will be explained with the draft notes (E/N) and Grant Agreement (G/A) which will be signed before approval by Japanese government.	x	x (E/N)	x (G/A)			
	(4) Approval by the Japanese cabinet			x				
3. Implementation	(5) Exchange of Notes (E/N)		x	x				
	(6) Signing of Grant Agreement (G/A)		x		x			
	(7) Banking Arrangement (B/A)	Need to be informed to JICA	x					x
	(8) Contracting with consultant and issuance of Authorization to Pay (A/P)	Concurrence by JICA is required	x			x		x
	(9) Detail design (D/D)		x			x		
	(10) Preparation of bidding documents	Concurrence by JICA is required	x			x		
	(11) Bidding	Concurrence by JICA is required	x			x	x	
	(12) Contracting with contractor/supplier and issuance of A/P	Concurrence by JICA is required	x				x	x
	(13) Construction works/procurement	Concurrence by JICA is required for major modification of design and amendment of contracts.	x			x	x	
	(14) Completion certificate		x			x	x	
4. Ex-post monitoring & evaluation	(15) Ex-post monitoring	To be implemented generally after 1, 3, 10 years of completion, subject to change	x		x			
	(16) Ex-post evaluation	To be implemented basically after 3 years of completion	x		x			

notes:

1. Project Monitoring Report and Report for Project Completion shall be submitted to JICA as agreed in the G/A.
2. Concurrence by JICA is required for allocation of grant for remaining amount and/or contingencies as agreed in the G/A.

Financial Flow of Japanese Grant (A/P Type)

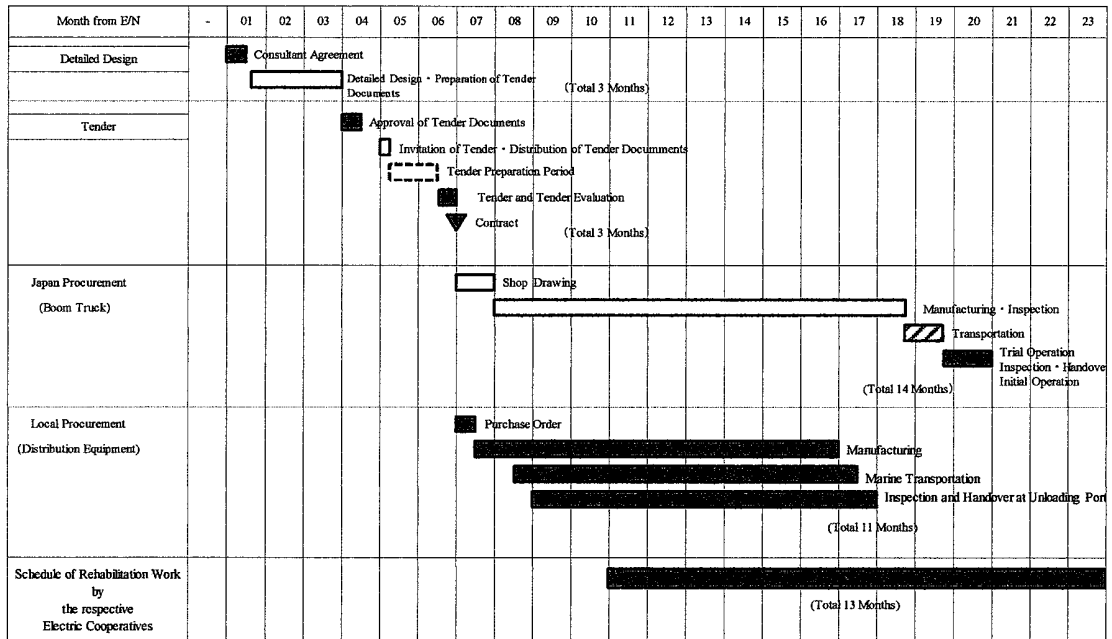


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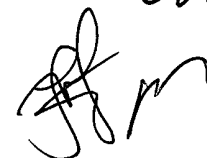
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Annex 4

Project Implementation Schedule



* The equipment provided by the Project shall be installed by the respective Electric Cooperatives in a timely manner as scheduled above.

M.S.


Major Undertakings to be taken by Recipient Government

1. Before the Tender

NO	Items	Deadline	In charge	Cost	Ref.
1	To open Bank Account (Banking Arrangement (B/A))	within 1 month after G/A	Department of Finance	N/A	
2	National Electrification Administration shall determine financial assistance measures (National Budget, Subsidy or Loan) to the respective Electric Cooperatives to implement the necessary undertakings.	before G/A	National Electrification Administration	N/A	


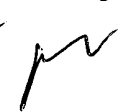
2. During the Project Implementation

NO	Items	Deadline	In charge	Cost (million PHP)	Ref.
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the signing of the contract	National Electrification Administration	0.05	
	2) Payment commission for A/P	every payment	National Electrification Administration	0.05	
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country				
	1) Tax and customs clearance of the equipment of the Project at the ports of disembarkation	during the Project	National Electrification Administration	N/A	
3	To accord Japanese nationals and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work	during the Project	Department of Foreign Affairs	N/A	
4	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne directly by its designated authority without using the Grant (Procedure for VAT is as described in Attachment) ; Such customs duties, internal taxes and other fiscal levies mentioned above include VAT, commercial tax, income tax and corporate tax of Japanese nationals, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract	during the Project	National Electrification Administration	69	
5	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for the transportation (Internal transportation from the ports of disembarkation to the project sites, Custody charge of the equipment of the Project after inspection and handover) and installation of the equipment	during the Project	National Electrification Administration	123.69	
6	To bear all the expenses required for the technical training designed for operators and linemen of respective Electric Cooperatives, excluding personnel fee of trainers	during the Project	National Electrification Administration	0.62	
7	1) To submit Project Monitoring Report after each work under the contract(s) such as shipping, handover, installation and operational training.	within one month after signing of Certificate of Completion for the works under the contract(s)	National Electrification Administration	N/A	
	2) To submit a report concerning completion of the Project			N/A	
8	To submit a report concerning completion of the Project	within six months after completion of the project	National Electrification Administration	N/A	

3. After the Project

NO	Items	Deadline	In charge	Cost	Ref.
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine check/Periodic inspection	After completion of the construction	National Electrification Administration	26.74	

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

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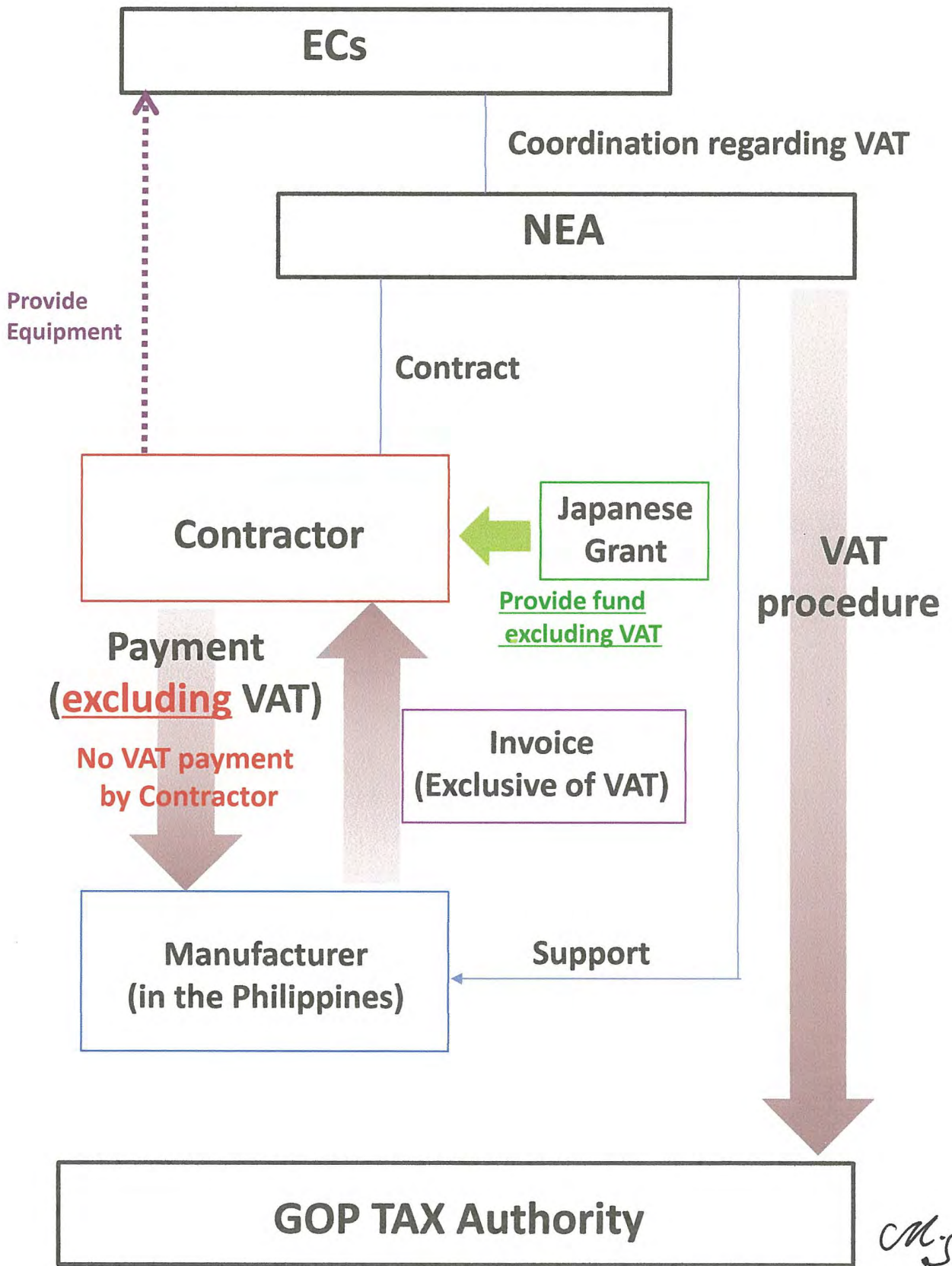
Major Undertakings to be Covered by the Japanese Grant

No	Items	Deadline	Cost Estimated (Million Japanese Yen)*	Ref.
1	To provide equipment	during the Project	753	
	1) To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country			
	a) Marine transportation of the vehicles for installation and maintenance work from Japan to the recipient country ports of disembarkation b) Internal marine transportation of the power distribution equipment to the ports of disembarkation			
2	To implement detailed design, tender support and procurement supervision (Consultant)	during the Project	37	
	Total		790	

*; The cost estimates are provisional. This is subject to the approval of the Government of Japan.

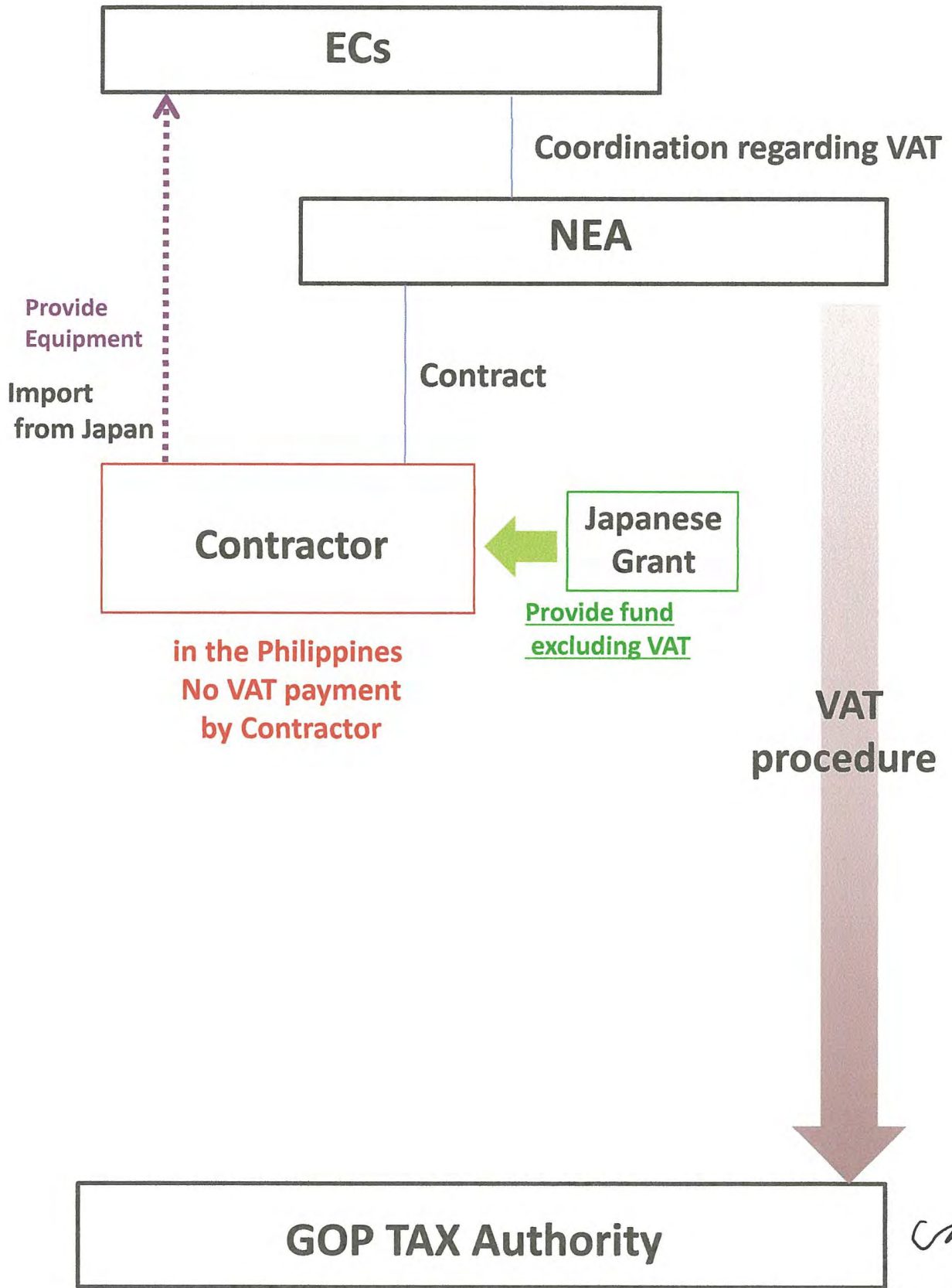
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Procedure for VAT borne by GOP (Procurement in the Philippines)



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Procedure for VAT borne by GOP (Procurement in Japan)



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Annex 6

Date:
Ref. No.

JAPAN INTERNATIONAL COOPERATION AGENCY
JICA Philippine OFFICE
[Address specified in the Article 5 of the Grant Agreement]

Attention: Chief Representative

Ladies and Gentlemen:

NOTICE CONCERNING PROGRESS OF PROJECT

Reference : Grant Agreement, dated _____, for Improvement of Equipment for Power Distribution
in Bangsamoro

In accordance to the Article 6 (3) of the Grant Agreement, we would like to report on the progress of the Project up to the following stages:

[Common]

- Preparation of bidding documents - result of detailed design
- Completion of final works under construction/procurement contract

[Construction]

- Monthly progress [Month/Year]

[Procurement of Equipment]

- Shipping/delivery, hand-over (take over) of equipment
- Installation works
- Operational training

- Other _____

Please see the details as per attached Project Monitoring Report (PMR).

Very truly yours,

[Signature]

[Name]

[Title]

National Electrification Administration
The Republic of the Philippines

cc:

Director General
Financial Cooperation Implementation Department
Japan International Cooperation Agency
[Address specified in the Article 5 of the Grant Agreement]




Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXXX
 20XX, Month

Organizational Information

Signer of the G/A (Recipient)	<p><u>National Economic and Development Authority</u> Person in Charge (Designation) _____</p> <p>Contacts Address: _____ Phone/FAX: _____ Email: _____</p>
Executing Agency	<p><u>National Electrification Agency</u> Person in Charge (Designation) _____</p> <p>Contacts Address: _____ Phone/FAX: _____ Email: _____</p>
Line Ministry	<p><u>Department of Energy</u> Person in Charge (Designation) _____</p> <p>Contacts Address: _____ Phone/FAX: _____ Email: _____</p>

General Information:

Project Title	Improvement of Equipment for Power Distribution in Bangsamoro
E/N	Signed date: Duration:
G/A	Signed date: Duration:
Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____

M.S.


1: Project Description

1-1 Project Objective

1-2 Project Rationale

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

1-3 Indicators for measurement of "Effectiveness"

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr)	Target (Yr)
Qualitative indicators to measure the attainment of project objectives		

2: Details of the Project

2-1 Location


Components	Original <i>(proposed in the outline design)</i>	Actual
1.		

2-2 Scope of the work

Components	Original* <i>(proposed in the outline design)</i>	Actual*
1.		

Reasons for modification of scope (if any).

(PMR)

M.S.


2-3 Implementation Schedule

Items	Original		Actual
	<i>(proposed in the outline design)</i>	<i>(at the time of signing the Grant Agreement)</i>	

Reasons for any changes of the schedule, and their effects on the project (if any)

2-4 Obligations by the Recipient

2-4-1 Progress of Specific Obligations

See Attachment 2.

2-4-2 Activities

See Attachment 3.

2-4-3 Report on RD

See Attachment 11.

2-5 Project Cost

2-5-1 Cost borne by the Grant(Confidential until the Bidding)

Components	Cost (Million Yen)			
	Original <i>(proposed in the outline design)</i>	Actual <i>(in case of any modification)</i>	Original ^(1,2) <i>(proposed in the outline design)</i>	Actual
1.				
Total				

Note: 1) Date of estimation:
 2) Exchange rate: 1 US Dollar = Yen

2-5-2 Cost borne by the Recipient

Components	Cost ()			
	Original <i>(proposed in the outline design)</i>	Actual <i>(in case of any modification)</i>	Original ^(1,2) <i>(proposed in the outline design)</i>	Actual
1.				

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- Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost, and the countermeasures (if any)

(PMR)

2-6 Executing Agency

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original (at the time of outline design) name: role: financial situation: institutional and organizational arrangement (organogram): human resources (number and ability of staff):
Actual (PMR)

2-7 Environmental and Social Impacts

- The results of environmental monitoring based on Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).

3: Operation and Maintenance (O&M)

3-1 Physical Arrangement

- Plan for O&M (number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spareparts, etc.)

Original (at the time of outline design)
Actual (PMR)

3-2 Budgetary Arrangement

- Required O&M cost and actual budget allocation for O&M

Original (at the time of outline design)

Actual (PMR)

4: Potential Risks and Mitigation Measures

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measures corresponding to the potential risks

Assessment of Potential Risks (at the time of outline design)

Potential Risks	Assessment
1. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
2. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
3. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:

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	Contingency Plan (if applicable):
Actual Situation and Countermeasures	
(PMR)	

5: Evaluation and Monitoring Plan (after the work completion)

5-1 Overall evaluation

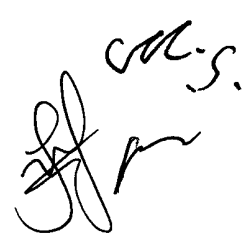
Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan of the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.



Attachment

1. Project Location Map
2. Specific obligations of the Recipient which will not be funded with the Grant
3. Monthly Report submitted by the Consultant
- Appendix - Photocopy of Contractor's Progress Report (if any)
 - Consultant Member List
 - Contractor's Main Staff List
4. Check list for the Contract (including Record of Amendment of the Contract/Agreement and Schedule of Payment)
5. Environmental Monitoring Form / Social Monitoring Form
6. Monitoring sheet on price of specified materials (Quarterly)
7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final) only)
8. Pictures (by JPEG style by CD-R) (PMR (final) only)
9. Equipment List (PMR (final) only)
10. Drawing (PMR (final) only)
11. Report on RD (After project)

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Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

	Items of Specified Materials	Initial Volume A	Initial Unit Price (¥) B	Initial total Price C=A×B	1% of Contract Price D	Condition of payment	
						Price (Decreased) E=C-D	Price (Increased) F=C+D
1	Item 1	●●t	●	●	●	●	●
2	Item 2	●●t	●	●	●		
3	Item 3						
4	Item 4						
5	Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

	Items of Specified Materials	1st	2nd	3rd	4th	5th	6th
		●month, 2015	●month, 2015	●month, 2015			
1	Item 1						
2	Item 2						
3	Item 3						
4	Item 4						
5	Item 5						

(3) Summary of Discussion with Contractor (if necessary)

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Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)
 (Actual Expenditure by Construction and Equipment each)

	Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost	(A/D%)	(B/D%)	(C/D%)	
Direct Construction Cost	(A/D%)	(B/D%)	(C/D%)	
others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost	(A/D%)	(B/D%)	(C/D%)	
Design and Supervision Cost	(A/D%)	(B/D%)	(C/D%)	
Total	(A/D%)	(B/D%)	(C/D%)	

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 2015.

List of Attendees

Department of Energy (DOE)

Madonna M. Naling, Supervising Science Research Specialist, Power Planning and Development Division
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LASURECO

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JICA Philippine Office

Maiko Morizane, Representative
Cristina M. Santiago, Senior Program Officer



5. Other Relevant Data

List of relevant data collected

No.	Name of Documents/Data	Date/ Photo/Map	Copy or Original	Issued by	Published
A ELECTRIC COOPERATIVE (EC)					
1	MAGELCO				
(1)	Briefing materials prepared by MAGELCO during interview	Map and Photos	Electronic Data	MAGELCO	2015
(2)	Answers to questions from Study Team	Data	Hard copy	MAGELCO	2016
2	LASURECO				
(1)	Briefing materials prepared by MAGELCO during interview	Data	Electronic Data	LASURECO	2016
3	BASELCO				
(1)	Answers to questions from Study Team	Data & Photos	Electronic Data	BASELCO	2016
4	SULECO				
(1)	Briefing materials prepared by MAGELCO during interview	Data & Photos	Hard copy	SULECO	2016
5	SIASELCO				
(1)	Data related to Distribution System				
6	TAWELCO				
(1)	Answers to questions from Study Team	Data & Photos	Electronic Data	TAWELCO	2016
7	CASELCO				
B DEPARTMENT OF ENERGY (DOE)					
(1)	Distribution Development Program (DDP)	Data	Electronic Data	DOE	2014/2015
C NATIONAL ELECTRIFICATION ADMINISTRATION (NEA)					
1	ARMM FINANCIAL AND STATISTICAL PROFILE	Data	Hard copy	NEA	2014
2	ARMM FINANCIAL AND STATISTICAL PROFILE	Data	Electronic Data	NEA	2015
3	REGION XII Financial Profile as of September 30, 2014	Data	Hard copy	NEA	2014
4	FACT SHEET	Table	Electronic Data	NEA	2015
5	NEA ENGINEERING BULLETIN DX1320	Design Manual	Hard copy	NEA	Latest Version
D FORWARDER					
1	CARGOSHIP Brochure				
2	MBT Brochure				
E MANUFACTURERS					
1	Jocelyn Forge, Inc. Products Catalogue				

Source: JICA Study Team