The Republic of the Philippines
Bangsamoro Transition Commission (BTC)
Bangsamoro Development Agency (BDA)

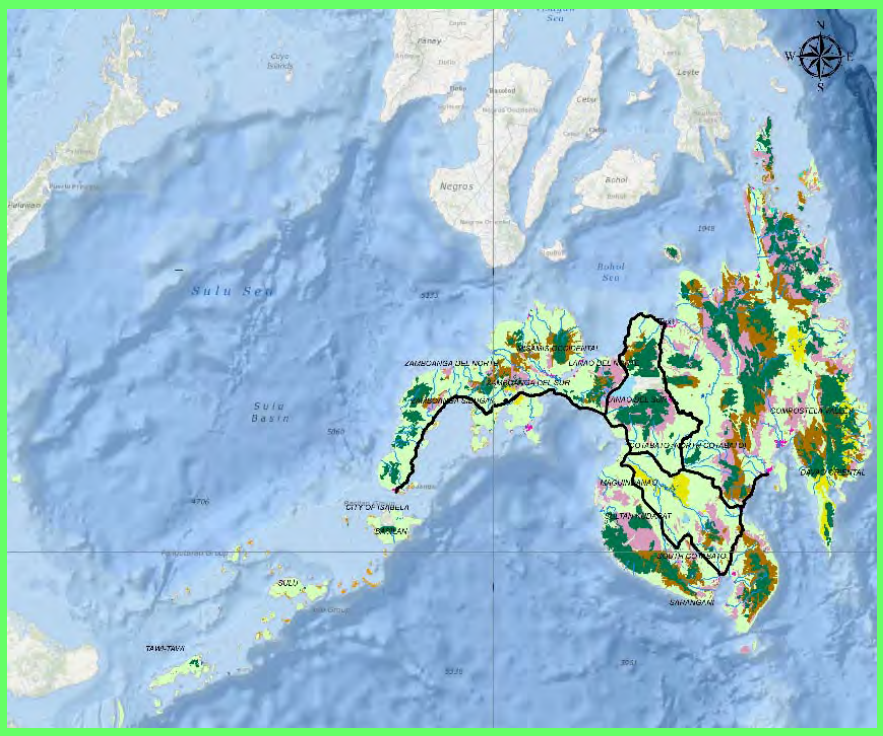
Japan International Cooperation Agency
(JICA)

Comprehensive Capacity Development Project for the Bangsamoro

Development Plan for the Bangsamoro

Final Report

Sector Report 1: Economy



April 2016

RECS International Inc.
Oriental Consultants Global Co., Ltd.
CTI Engineering International Co., Ltd.
IC Net Limited

EI
JR
16-056

The Republic of the Philippines
Bangsamoro Transition Commission (BTC)
Bangsamoro Development Agency (BDA)

Japan International Cooperation Agency
(JICA)

Comprehensive Capacity Development Project for the Bangsamoro

Development Plan for the Bangsamoro

Final Report

Sector Report 1: Economy

Source of GIS map on the cover: JICA Study Team (base map by U.S. National Park Service).

April 2016

RECS International Inc.
Oriental Consultants Global Co., Ltd.
CTI Engineering International Co., Ltd.
IC Net Limited

Currency Equivalents (average Interbank rates for May–July 2015)
US$1.00=PHP 45.583
US$1.00=JPY 124.020
PHP 1=JPY 2.710
Source: OANDA.COM, http://www.oanda.com

Comprehensive Capacity Development Project for the Bangsamoro

Development Plan for the Bangsamoro

Final Report

Sector Report 1-1: Agriculture

Table of Contents

List of Tables

List of Figures

Abbreviations

AAD	annual average daily traffic
AAGR	average annual growth rate
AAIIBP	Al-Amanah Islamic Investment Bank of the Philippines
A&D	alienable and disposable
AC	advisory circular
ACC	Area Control Center
ACSR	aluminum conductor steel reinforced
ADB	Asian Development Bank
AFB	association of farmer beneficiaries
AFMA	Agriculture and Fisheries Modernization Act
AFP	Armed Forces of the Philippines
AHFF	agriculture, hunting, forestry, and fishery
AJD	Agrarian Justice Delivery
AMARDI	Al Mujahidun Agro Resources and Development Inc.
AO	Administrative Order
ARB	agrarian reform beneficiary
ARBO	ARB organization
ARC	agrarian reform community
ARCDSP	ARC Development Support Project
ARCCESS	ARC Connectivity and Economic Support Services
ARG or ARMM-RG	ARMM Regional Government
ARMM	Autonomous Region in Muslim Mindanao
ARMM HELPS	ARMM Health, Education, Livelihood, Peace and Governance and Synergy (Program)
ARMMIARC	ARMM Integrated Agricultural Research Center
ASEAN	Association of South East Asian Nations
ASPBI	Annual Survey of Philippine Business and Industry
AT	Agricultural technician
ATI	Agricultural Training Institute
ATM	air traffic movement
ATM	automated teller machines
AWG	American wire gauge
BASELCO	Basilan Electric Cooperative
BASULTA or BaSulTa	Basilan, Sulu, and Tawi-Tawi
BBAC	Bangsamoro Business Advisory Council
BBL	Bangsamoro Basic Law
BCT	Bangsamoro Core Territory
BDA	Bangsamoro Development Agency
BDH	berthing/deberthing hours
BDP	Bangsamoro Development Plan
BFAR	Bureau of Fisheries Aquatic Resources
BHC	Barangay Health Center
BIAF	Bangsamoro Islamic Armed Force
BIFF	Bangsamoro Islamic Freedom Fighters
BIMP-EAGA	Brunei-Indonesia-Malaysia-Philippines East ASEAN Growth Area
BIW	Bangsamoro Investment Window
BLGU	Barangay Local Government Unit
BLMI	Bangsamoro Leadership and Management Institute
BLMO	Bangsamoro Land Management Office
BOD	board of directors
BOI	Board of Investment
BPO	business process outsourcing
BS	Bachelor of Science
BSP	Central Bank of the Philippines [Bangko Sentral ng Pilipinas]
BSWM	Bureau of Soils and Water Management
BTA	Bangsamoro Transition Authority
BTB	boom truck with bucket
BTC	Bangsamoro Transition Commission
BTD	boom truck with digger
BuB or BUB	bottom-up budgeting
CA	College of Agriculture
CA	compulsory acquisition
CAAM	Conflict Affected Areas of Mindanao
CAAP	Civil Aviation Authority of the Philippines
CAB	Comprehensive Agreement on Bangsamoro
CADT	certificate(s) of ancestral domain title
CAGR	compound annual growth rate
CALABARZON	Cavite, Laguna, Batangas, Rizal, and Quezon
CALT	certificate(s) of ancestral land title
CARD	Center for Agricultural and Rural Development
CARL	Comprehensive Agrarian Reform Law
CARP	Comprehensive Agrarian Reform Program
CARPER	CARP-Extension with Reforms
CASELCO	Cagayan De Sulu Electric Cooperative
CBCRM	community-based costal resource management
CBFM	Community-Based Forest Management (Program)
CBFMA	community-based forest management agreement
CBO	Cotabato (Awang) Airport
CCA	climate change adaptation
CCCH	Coordinating Committee for Cessation of Hostilities
CCDP or CCDP-B	Comprehensive Capacity Development Project for the Bangsamoro
CCT	conditional cash transfer
CDA	Cooperative Development Authority
CD-CAAM	Community Development in CAAM
CDOCCI	Cagayan de Oro Chamber of Commerce and Industry
CDP	Comprehensive Development Program
CDP-ELA	Comprehensive Development Plan-Executive Legislative Agenda
CDRRMC	City Disaster Risk Reduction and Management Council
CDS	cooperative development staff

CEB	Cebu Pacific Air
CEC	cation-exchange capacity
CEPALCO	Cagayan Electric Power and Light Company
CIF	cost, insurance, and freight
CIS	communal irrigation system
CLOA	certificate(s) of landownership award
CLPC	Cotabato Light and Power Company
CLT	certificate(s) of land transfer
CLUP	comprehensive land use plan
CMO	central management office
COSUCECO	Cotabato Sugar Central Corporation
CP	core project
CPO	Cotabato Project Office
CSO	civil society organization
CSR	corporate social responsibility
DA	Department of Agriculture
DA-BAR	Department of Agriculture's Bureau of Agricultural Research
DA-RFO	DA-Regional Field Office
DAF	Department of Agriculture and Fisheries
DAO	Department Administrative Order
DAR	Department of Agricultural Reform
DBM	Department of Budget and Management
DBP	Development Bank of the Philippines
DCCCII	Davao City Chamber of Commerce and Industry, Inc.
DD	detailed design
DDP	Distribution Development Plan
DED	detailed engineering design
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DLPC	Davao Light and Power Company
DME	Distance measuring equipment
DOF	Department of Finance
DOJ	Department of Justice
DOLE	Department of Labor and Employment
DOST	Department of Science and Technology
DOT	Department of Tourism
DOTC	Department of Transportation and Communications
DPWH	Department of Public Works and Highways
DRIMS	Dynamic Response Intelligent Monitoring System
DRRM	disaster risk reduction and management
DRRMCEP	DRRM Capacity Enhancement Project
DSWD	Department of Social Works and Development
DTI	Department of Trade and Industry
DTI-EMB	DTI Export Marketing Bureau
DUs	distribution utilities
DVOR	Doppler VHF omnidirectional range
EA	environmental assessment
EC	electric cooperative
ECA	environmentally critical area
ECC	environmental clearance certificate
ECP	environmentally critical project
EEZ	exclusive economic zone
EIA	environmental impact assessment
EIAM	Environmental Impact Assessment and Management (Division)
EIRR	economic internal rate of return
EIS	environmental impact statement
EMB	Environmental Management Bureau
EO	Executive Order
EPIRA	Electric Power Industry Restructuring Act
ERC	Energy Regulatory Commission
ESWM(P)	Ecological Solid Waste Management (Plan)
EU	European Union
EWS	early warning system
FAA	Federal Aviation Administration
FAB	Framework Agreement on Bangsamoro
FAD	fish aggregating devices
FAO	Food and Agriculture Organization
FDI	foreign direct investment
FFWS	flood forecasting and warning system
FGD	focus group discussion
FIA	federation of irrigators' associations
FIDA	Fiber Industry Development Authority
FIES	Family Income and Expenditure Survey
FIT	farmers information technology
FIT	feed-in-tariff
FMB	Forest Management Bureau
FMR	farm-to-market road
FNRI	Food and Nutrition Research Institute
FS	feasibility study
FTZ	free trade zone
GAA	General Appropriations Act
GDE	grading and balling establishment
GDP	gross domestic product
GEM	Growth with Equity Mindanao (Program)
GIS	geographical information system
GIZ	German Society for International Cooperation [Deutsche Gesellschaft für Internationale Zusammenarbeit]
GM	genetically modified
GMP	good manufacturing practice
GPBP	Grassroots Participatory Budgeting Program
GPH	Government of the Philippines
GPPB	grassroots participatory planning and budgeting
GRDP	gross regional domestic product
GRP	gross regional product
GSR	Green Super Rice
HACCP	hazard analysis and critical control points
HDI	human development index
HEART	Humanitarian Emergency Action Response Team
HF	high frequency
HI	horizontal inequality
HIPC	halal industry promotion center
HVC	high-value crops

HVCDP	High Value Crops Development Program
IA	irrigators' association
IAC	inter-agency committee
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICT	information and communication technology
ICTSI	International Container Terminal Services, Inc.
IDP	internally displaced people
IEC	information and education campaign
IEE	initial environmental examination (or evaluation)
IFAD	International Fund for Agricultural Development
IFMA	Integrated Forest Management Agreement (Program)
IFSAR	interferometric synthetic aperture radar
ILO	International Labour Organization
ILPC	Iligan Light and Power Company
IMEM	Interim Mindanao Electric Market
IMT	international monitoring team
IP	indigenous people
IPA	Investment Promotion Agency
IPC	Investment Promotion Center
IPP	independent power producer
IPRA	Indigenous People Rights Act
IRA	internal revenue allotment
IRI	International Roughness Index
IRSG	International Rubber Supply Group
IT	information technology
IWRM	integrated water resources management
J-BIRD	Japan-Bangsamoro Initiatives for Reconstruction and Development
JAKIM	Department of Islamic Development Malaysia
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
JNC	Joint Normalization Committee
JOL	Jolo Airport
JST	JICA Study Team
JV	joint venture
KBA	key biodiversity area
KOICA	Korea International Cooperation Agency
L	length
LAD	land acquisition and distribution
LAMP	Land Administration and Management Project
LAMPCO	Linabu Agrarian Multi-Purpose Cooperative
LASURECO	Lanao Del Sur Electric Cooperative
LBP	Land Bank of the Philippines
LCA	local conservation area
LCL	less than full container load or less container load
LDRRMC	Local DRRM Council
LDRRMF	Local DRRM Fund
LGU	local government unit
LGUOUs	LGU-owned utilities
LiDAR	light detection and ranging
LMB	Land Management Bureau
LMIP	Leyte-Mindanao Interconnection Project
LOA	length overall
LRA	Land Registration Authority
LTI	Land Tenure Improvement
Magelco or MAGELCO	Maguindanao Electric Cooperative
MAO	Municipal Agriculture Office
MASL	meter(s) above sea level
MC	moisture content
MDGs	Millennium Development Goals
MEDP	Missionary Electrification Development Plan
MEP	Mindanao Energy Plan
MF	microfinance
MFI	microfinance institution
MGB	Mining and Geo-science Bureau
MHPP	mini-hydro power plant
MICC	Matling Industrial and Commercial Corporation
MILF	Moro Islamic Liberation Front
MIS	Management Information Service
MIMAROPA	Mindoro, Marinduque, Romblon, and Palawan
MINDA or MinDA	Mindanao Development Authority
MLGU	municipal local government unit
MMAA	Muslim Mindanao Autonomy Act
MMDA	Metropolitan Manila Development Authority
MMHCBI	Mindanao Muslim Halal Certification Board Inc.
MNLF	Moro National Liberation Front
MOA	memorandum of agreement
MOOE	maintenance and other operating expenses
MPA	marine protected area
MPC	multi-purpose cooperative
MPDC	Municipal Planning and Development Coordinator
MRB	Mindanao River Basin
MRBIMDMP	MRB Integrated Management and Development Master Plan
MRCC	Mindanao Regional Control Center
MRDP	Mindanao Rural Development Program
MRF	material recovery facility
MSME	micro, small, and medium enterprises
MSU	Mindanao State University
MSU-IIT	MSU-Iligan Institute of Technology
MSU-LNCAT	MSU-Lanao National College of Arts and Trade
MSU-TCTO	MSU-Tawi-Tawi College of Technology and Oceanography
NADA	Needs Assessment Design Analysis
NAIA	Manila Ninoy Aquino International Airport
NAMRIA	National Mapping and Resource Information Agency
NAPC	National Anti-Poverty Commission
NASA	National Aeronautics and Space Administration
NCIP	National Commission on Indigenous Peoples
NCMF	National Commission on Muslim Filipinos

NCR	National Capital Region
NDCC	National Disaster Coordinating Council
NDRRMC	National Disaster Risk Reduction and Management Council
NEA	National Electrification Administration
NECP	non-environmentally critical project
NEDA	National Economic Development Authority
NFA	National Food Authority
NGA	National Grains Authority
NGCP	National Grid Corporation of the Philippines
NGO	non-governmental organization
NGP	National Greening Program
NIA	National Irrigation Administration
NICCEP	National Industrial Cluster Capacity Enhancement Project
NIPAS	National Integrated Protected Areas System
NIS	national irrigation system
NLUC	National Land Use Commission
NOAH	Nationwide Operational Assessment of Hazards
NPC	National Power Corporation
NPC-SPUG	NPC-Small Power Utility Group
NREL	National Renewable Energy Laboratory
NREP	National Renewable Energy Program
NSO	National Statistics Office
NWFP	non-wood forest product
NWRC	National Water Resources Council
OBOR	optimum berth occupancy rate
OCD	Office of Civil Defense
OCT	original certificate(s) of title
ODA	official development assistance
OECD	Organization for Economic Cooperation and Development
OFID	OPEC Fund for International Development
OIC	Organization of Islamic Cooperation
OPAg	Office of the Provincial Agriculturist
OPAPP	Office of the Presidential Advisor on the Peace Process
OPEC	Organization of Petroleum Exporting Countries
OPV	Office of the Provincial Veterinarian
OPV	open-pollinated variety
ORG	Office of the Regional Governor
OSCC	Office for Southern Cultural Communities
OTOP	one town one product
PA	protected area
PAG	private armed group
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PAL	Philippine Airlines
PAMANA	Philippine Development Program and Framework for Peace and Development [Payapa at Masaganang Pamayanan]
PAMB	Protected Area Management Board
PAO	Provincial Agriculture Office
PAPI	precision approach path indicator
PB	Power Barge
PCA	Philippine Coconut Authority
PCAARRD	Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development
PCB	power circuit breaker
PCC	Philippine Carabao Center
PCC	Portland cement concrete
PCCI	Philippine Chamber of Commerce and Industry
PCDP	Provincial Comprehensive Development Plan
PCIC	Philippine Crop Insurance Corporation
PCN	pavement classification number
PD	Presidential Decree
PDP	Philippine Development Plan
PDPFP	Provincial Development and Physical Framework Plan
PEIS	Philippine Environmental Impact Statement
PENRO	Provincial Environment and Natural Resources Office
PERF	Production Economic Research Fund
PEZA	Philippine Economic Zone Authority
PFDA	Philippine Fisheries Development Authority
PhilFIDA	Philippine Fiber Development Authority
PHIVOLCS	Philippine Institute of Volcanology and Seismology
PICRI	Philippine Industrial Crops Research Institute
PIOUs	private investor-owned utilities
PMO	project management office
PO	people's organization
PP	Presidential Proclamation
PPA	Philippine Ports Authority
PPP	public private partnership
PRA	Philippine Retirement Agency
PRDP	Philippine Rural Development Program
PRTC	Philippine Rubber Testing Center
PSA	Philippine Statistics Authority
PSALM	Power Sector Assets and Liabilities
PSC	project steering committee
PSE	Philippine Stock Exchange
PTA	Parent-Teacher Association
PTB	passenger terminal building
PTF-MRBRD	Presidential Task Force on MRB Rehabilitation and Development
RA	Republic Act
RBCO	River Basin Control Office (of DENR)
R&D	research and development
RAED	Regional Agricultural Engineering Division
RBOI	Regional Board of Investment
RC	reinforced concrete
RCC	regional control center
RCM	rice crop manager
RDC	regional development council
RDE	research, development, and extension

RDRRMO	Regional DRRM Office
REDPB	Regional Economic and Development Planning Board
RE	renewable energy
REZA	Regional Economic Zone Authority
RGDP	regional gross domestic product
RHU	Rural Health Unit
RIS	River Irrigation System
RNS	National Route Numbering System
RPMA	Regional Ports Management Authority
ROPAX or RoPax	roll-on/roll-off passenger
RORO or RoRo	roll-on/roll-off
ROW	right-of-way
RPDO	Regional Planning and Development Office
RWY	runway
SB	Small Business
SEA	strategic environmental assessment
SERD-CAAM	Socio-economic Restoration and Development of Conflict-affected Areas in Mindanao
SEP-CDP	Socio-Economic Profile-Comprehensive Development Program
SEZ	special economic zone
SGCP	State of the Grid in China
SIASELCO	Siai Electric Cooperative
SME	small and medium-sized enterprise
SMS	short message system
SOCSKSARGEN	South Cotabato-Sultan Kudarat-Saranggani-General Santos City
SPUG	small power utilities group
SRA	Sugar Regulatory Administration
S/S or SS	substation
SSIPs	small-scale irrigation projects
SUCs	State Universities and Colleges
SULECO	Sulu Electric Cooperative
SV	supervision
SWIMP	small water impoundments with multipurpose potential (or small water impounding project)
SWISA	small water irrigation system association
TAWELCO	Tawi-Tawi Electric Cooperative
TCP	Technical Cooperation Project
TCT	transfer of certificate of title
TDP	transmission development plan
TESDA	Technical Education and Skills Development Authority
TIKA	Turkish Cooperation and Coordination Agency
TISP	Transition Investment Support Plan
T/L	transmission line
TMS	Technical Management Services
TP	turboprop
TransCo	National Transmission Corporation
UAS	Upi Agricultural School
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USM	University of Southern Mindanao
USMARC	USM Agricultural Research Center
VAT	value added tax
VCA	value chain analysis
VHF	very high frequency
VLT	voluntary land transfer
VOS	voluntary offer to sell
VPA	vehicle parking area
VSU	Visayas State University
VTT	Value transformation training
WASH	Water, Sanitation and Hygiene (programs by UNICEF)
WB	World Bank
WDIL	wind direction indicator light
ZAM	Zamboanga International Airport
ZAMBASULTA	Zamboanga, Basilan, Sulu, and Tawi-Tawi

Unit of Measurement

Area		Weight	
m^2	square meter	µg	microgram
km^2	square kilometer	mg	milligram
ha	hectare (= 10,000 m^2)	kg	kilogram
		t	ton (=1,000 kg)
Energy		DWT	deadweight tonnage
W	watt	GRT	gross register tonnage
kW	kilowatt	GT	gross tonnage
kWh	kilowatt-hour	kTOE	kilo ton of oil equivalent
MW	megawatt	MT	metric ton
GWh	gigawatt-hour		
kV	kilovolt	Volume	
MVA	megavolt-ampere	L	liter
		m^3	cubic meter (= 1,000 liter)
Length			
mm	millimeter	Other	
cm	centimeter	°C	degree Celsius
ft	foot or feet	%	percent
m	meter	mil.	million
LM	linear meter	MPa	megapascal
km	kilometer	mps	meter per second

Time	
sec, s	second
min	minute
hr	hour
yr	year

Currency

JPY	Japanese yen
PHP	Philippine peso
US$ or USD	United States dollar

CHAPTER 1 INTRODUCTION

1.1 Objectives of the Study

The Comprehensive Capacity Development Project for Bangsamoro has been implemented since July 2013. As part of the Project, a present study (the Study hereafter) is undertaken to prepare an integrated regional development plan for the future jurisdiction of the new autonomous region of Bangsamoro, focusing on thematic areas assigned to JICA including agriculture.

Specifically, the Study will prepare an integrated regional development plan for the jurisdiction of the new autonomous government, and in the process try to effect broad capacity development encompassing individual capacity of administrators, organizational capacity of the future autonomous government, and institutional and social capacity for community development and related institutional development.

The objectives of the Study are defined as follows:

1) To compile basic data to be used for development planning in the jurisdiction of the new autonomous government;
2) To prepare an integrated master plan for strategic development of the Bangsamoro region; and
3) To contribute to broad capacity development through the planning process encompassing individual administrators, the new autonomous government and its constituent local government units (LGUs), and related institutions and communities.

Agriculture is the most important economic sector in the Bangsamoro as it constitutes about 67% of the region's economy. Its vast lowland and upland are mostly utilized for agriculture while the long stretch of coastline particularly in the island provinces provide onshore and offshore fishery. It goes without saying that most people are in the business related to agriculture and fishery. While there are small and medium scale enterprises in commercial farming, majority of agriculture crops and livestock producers are small farmers who make meager income from farming rice and corn and a few high value crops.

Yet it cannot be denied that the Bangsamoro region is well-endowed with natural resources that make it a haven for agriculture. The agriculture study of this project intends to undertake basic studies of the sector to be able to propose a development plan suitable for the region's endowments and one that responds to the wishes and aspirations of the Bangsamoro people.

1.2 Methodology

Secondary data both from the national government agencies, the Autonomous Region of Muslim Mindanao (ARMM) and LGUs were widely used to analyze the past circumstances, undertakings and historical performances to understand the current predicament of agriculture prevailing in the region. Interfacing with the local officials, non-governmental organizations (NGOs) and people's organizations such as cooperatives and associations through meetings, forums including focus group discussions (FGDs) were methods used to confirm information and to understand realities of agriculture circumstances not captured by hard data. The FGDs are effective ways to obtain options and aspirations of the local people such as the small farmers.

All throughout the study, data used are referred to ARMM which covers exactly the same area as the core area of Bangsamoro. The data compilation of the national government agencies under ARMM practically means the data for the five provinces of Basilan, Lanao del Sur, Maguindanao, Sulu and Tawi-Tawi. The term ARMM and Bangsamoro are used alternatively in this report to refer to the five provinces.

CHAPTER 2 PHYSICAL CONDITIONS OF THE BANGSAMORO AREA

The physical conditions are described as they are related to agricultural activities. These include characteristics of the land area, the water resources and climate. Political territory and geography are discussed to delimit the area coverage and locate the study area.

2.1 Political Territory and Geography

The draft Bangsamoro Basic Law (BBL) defines the Bangsamoro Core Territory (BCT) as consisting of the following:

1) The present geographical area of the ARMM;
2) The municipalities of Balo-i, Munai, Nunungan, Pantar, Tagoloan, and Tangkal in Lanao del Norte Province and all the barangays in the municipalities of Kabacan, Carmen, Aleosan, Pigkawayan, Pikit, and Midsayap that voted for the inclusion in the ARMM during the 2001 plebiscite; and
3) Cotabato City and Isabela City.

All other contiguous areas where there is resolution of the local government unit or a petition of at least 10% of the registered voters in the area asking for their inclusion at least two months prior to the conduct of the ratification of the Bangsamoro Basic Law and the process of delimitation of the Bangsamoro.

The Bangsamoro Development Plan-Integrative Report[1] estimated the total land area to be 1,488,353 ha. Politically, the Bangsamoro will constitute five provinces, two component cities, 116 municipalities and 2,490 barangays including 39 barangays in North Cotabato. Of the estimated total area, the present ARMM will constitute the 87% of the total area of the Bangsamoro. Table 2.1 shows the area distribution.

Table 2.1 Land Area of Proposed Bangsamoro Region

Province/Area	Area (ha)	Share (%)
Basilan	132,723	8.92
Lanao del Sur	387,289	26.02
Maguindanao	504,760	33.91
Sulu	160,040	10.75
Tawi-Tawi	108,740	7.31
Total ARMM	1,293,552	86.91
6 municipalities of Lanao del Norte	108,048	7.25
39 Barangays of North Cotabato	45,780	3.07
Cities of Lamitan & Isabela	40,973	2.75
Total Additional Area	194,801	13.09
Total Bangsamoro	1,488,353	100.00

Source: The Bangsamoro Development Plan Integrative Report.

However, for purposes of the study, the Bangsamoro region is tentatively defined as the whole five provinces of Lanao del Sur, Maguindanao, Basilan, Sulu and Tawi-Tawi. Two of the five provinces, Lanao del Sur and Maguindanao are located in the mainland of Mindanao while three are island provinces of Basilan and Sulu and Tawi-Tawi, each surrounded by smaller island-municipalities and island-barangays.

Maguindanao is located in the southwestern part of Mindanao sharing a boarder with Sultan Kudarat Province in the south, North Cotabato Province on the east to northeast and Lanao del Norte on the north. Lanao del Sur is north of Maguindanao and bounded by Bukidnon on the east to northeast, by Lanao del Norte on the northwest and by Illana Bay on the west. The three provinces of Basilan, Sulu and Tawi-Tawi are like several sizes of stones rolled to the sea from Zamboanga City.

[1] Development Plan 2015 to mid-2016 and mid-2016–2022

Basilan Province is located 17 nautical miles off the coast of the mainland Mindanao separated by a strait. It is located across the southern tip of Zamboanga peninsula and is bounded on the north by Basilan Strait, on the east by Moro Gulf, on the southeast by the Celebes Sea and other west by the Sulu Sea. Geographically, it lies between latitudes 6°16'48" and 6°45'56" North and between longitudes 121°26'00" and 122°24'38" East. The province is composed of two component cities and 11 municipalities with a total of 255 barangays.[2]

The island of Sulu straddles between Basilan and Tawi-Tawi, right after Basilan at some nautical miles behind. The province is surrounded by the Sulu Sea on the west and the Celebes Sea on the east.

Sulu is followed by Tawi-Tawi Province. The province is on the southwestern tip of the Philippine archipelago and lies along the earth's equatorial zone. It has been traditionally the Philippines' back door sharing sea border with Sabah State of Malaysia and Kalimantan Province of Indonesia. It is a few hours away from the Sabah by motorized *banca* [boat]. Thus, it qualifies as the country's front door to these Asian countries including Brunei and Singapore.

2.2 Land Resources

The total land area of the five provinces of the Bangsamoro is 1,771,957 ha. As shown in Table 2.2, more than half of the area is that of Maguindanao Province while Lanao del Sur shares more than one fifth. The two provinces combined located in mainland Mindanao constitute more than 75% of the Bangsamoro study area. Only less than 25% is contributed by the three island provinces.

Table 2.2 Land Area of Bangsamoro Study Area

Province	Area (ha)	Share (%)
Basilan	137,900	7.78
Lanao del Sur	385,030	21.73
Maguindanao	972,910	54.91
Sulu	167,377	9.45
Tawi-Tawi	108,740	6.14
Total	1,771,957	100.00

Source: ARMM Regional Development Plan Mid-Term Update 2013–2016.[3]

Each of the three island provinces are groups of islands with the largest islands hosting the respective capital LGUs, majority economic activities and population.

2.2.1 Topography, slope and vulnerability to erosion

Figure 2.1 shows the topographic map of the western half of the island of Mindanao. It covers the five provinces of the Bangsamoro region in the mainland, the island province of Basilan and small portion of Sulu. Tawi-Tawi islands are not shown. The mainland province of Maguindanao sits on wide plains and Lanao del Sur on plateau. The island provinces have generally narrow coastal plains with increasing elevations moving to the center of the islands.

Lanao del Sur Province is located at an elevation of 702 m above sea level at the surrounding area of Lake Lanao. Being in Central Mindanao, the province is characterized by pronounced undulating slopes and vast plateau. The western part of the province is characterized by high slopes from Lake Lanao moving to northwest. Going to the southwest, slopes gradually soften in the areas near the long coastline, which is western part of the province. From Lake Lanao going east, elevation increases to 900 m. It has packets of valleys of flat lands particularly in the eastern part of the province. Hilly lands are scattered all over the province at varying slopes.

Based on the slope map of Lanao del Sur Province, undulating to very steep slopes are characteristics of the municipalities of Tugaya, Balindong, Bacolod Grande, Madalum, Marantao, Madamba, Pualas, Ganasi, Calanogas, and Pagayawan. The municipalities of Picong, Malabang, Balabagan, and

[2] Basilan CDP-ELA 2011–2013
[3] Most recently published document containing data on land area during this study.

Kapatagan are located in the coastal areas with almost flat lands. Wao and Bumbaran in the eastern part of the province have undulating to rolling slopes.

Figure 2.1 Topographic Map of Bangsamoro and Surrounding Area

The province of Maguindanao may be divided into two physiographic units, the southwest cluster and the Maguindanao lowland. The southwest mountain cluster includes two high mountains: Mt. Binaca and Mt. Blit. They are separated by the valleys of the Matuber River and Lawasa-ig. The Maguindanao lowland includes the extremity of the Cotabato base northeast of the provincial highlands. The area approaches the seas and the swamps of Ligawasan Marsh and Libungan Marsh. Thick accumulation of detritus materials derived from the weathering and erosion of the adjacent emergent land mass compose the area.[4]

Maguindanao is mostly flat lands with slopes 0–3%. The western part of the province, particularly the municipalities of Upi, South Upi, and Datu Blah Sinsuat, is hilly with slopes gently sloping to undulating to rolling. The municipality of Datu Blah Sinsuat has rolling to steep slopes.[5] These high sloped areas of the province are identified with severe erosion.

The province of Basilan is a group of islands with one large island. The large island has rolling terrain with flat lands located mostly along the coastal areas. From the coastal areas, slopes are rather moderate but become steeper as they go into the central part of the island where elevation is highest. Its highest peak called the Basilan peak is about 960 m above sea level. Elevations of the coastal areas and islets are about 20 m at the lowest point. A total area of 54,574 ha is plain with slope of zero to 8%. About 18% of the land area is undulating to rolling with about 18% slope. On the other hand, some small

[4]http://www.maguindanao.gov.ph/index.php
[5]Ibid.

islands of the province have slopes of up to 30%.[6]

The province of Sulu is composed of 400 islands. The largest island, which is the mainland Sulu, constitutes half of its total area, thus some islands are islets yet unnamed. These islands are divided into four groups; Jolo, Pangutara, Tongkil-Banguigui, and Siasi-Tapul. The mainland Sulu is mountainous and of volcanic origin. Mountains are scattered throughout the island forming small pockets of valleys and wide stretches of undulating to rolling lands, which are utilized for farming. The Siasi Island is also of volcanic origin with hilly interior. Other islands are swampy, forested, flat and low islands of coral formation. Less than 20% of all provincial lands, mostly in the mainland, have more than 18 degrees slope. The Pata Island is dominantly undulating to rolling with slopes from 8 to 18%. Other islands have flat to gently sloping lands.[7]

Tawi-Tawi Province is composed of one large island as the mainland Tawi-Tawi and about more than a hundred islands. The mainland is characterized by a continuous range of rolling hills covered with verdant forests. It is generally flat land with a narrow undulating coastal areas. Almost all surrounding smaller islands are flat. According to the Provincial Framework Plan of Tawi-Tawi, about 55% of the province's land area is flat. These are the municipalities of Sibutu, Sitangkai, Simunul, Sapa-sapa, South Ubian, part of Tandubas, Languyan, Panglima Sugala, and Bongao. About 30,885 ha have undulating to rolling terrain found in Panglima Sugala, Languyan, and small areas of Bongao and South Ubian. About 1.6% of the province's land area found in Panlima Sugala is classified steep with 30–50% slope. Generally, Tawi-Tawi is not prone to erosion. In many respects, Tawi-Tawi is a veritable tropical paradise. The seas are characterized by extensive coral reefs, which make navigation difficult.[8]

2.2.2 General land use

The Bangsamoro area covers more or less 1.3 million ha of alienable and disposable (A&D) lands, classified and unclassified forests. About 533,000 ha[9] are reported farm lands as of 2002. This is about 39% of the total land area of Bangsamoro. Of this total farm land area, 62% are arable land and 44% are under permanent crops[10]. In the provinces of Maguindanao and Lanao del Sur, the Moro Islamic Liberation Front (MILF) camps occupy sizable portion of the forests and A&D lands, which may be suitable for agriculture. The Ligawasan marsh also occupies a large portion of the area of Maguindanao. Both sites of MILF camps and Ligawasan marsh lands have implications to the development of agriculture in Bangsamoro.

(1) Agricultural land use

The Maguindanao province is largely agricultural. Substantial part of the A&D land has been effectively utilized for agriculture, and the agricultural land use covers 360,340 ha or 47.8% of the provincial land.[11] The ratio of the A&D land is the largest of all the provinces in Bangsamoro. Major crops planted in Maguindanao include paddy, corn, and coconut. Other major commercial crops include banana, mango and coffee. Harvested areas of corn and paddy and planted areas of other major crops add up to 449,068 ha, implying the crop intensity of 1.25. Mixed farming of coconut and corn under coconut trees is widely observed in the province. Presently there are bearing oil palms and mangoes in Ampatuan, Datu Abdullah Sangki, Talayan, Datu Unsay, Datu Saudi Ampatuan, Guindulungan, and Datu Odin Sinsuat.

The banana plantation of La Frutera located at Buluan has a total area of 1,500 ha.[12] Similarly, 750 ha with banana (Cavendish) plantation owned by Mr. Sonny Dominguez is in the municipality of Datu Paglas. Oil palm has also started in the municipalities of Gen. S. K. Pendatun and Paglat, with a total of about 6,000 ha already planted.[13] Banana plantations are being vigorously promoted under the

[6] Basilan Socio Economic Profile-Comprehensive Development Program (SEP-CDP), Basilan Provincial Government
[7] Sulu SEP-CDP, Sulu Provincial Government
[8] Tawi-tawi SEP-CDP
[9] Agriculture and Fisheries Philippine Yearbook 2011
[10] Some lands under permanent crops are also counted under arable lands
[11] Maguindanao Socio-Economic Profile
[12] Based on interview with Mr. Agollo, Manager of La Frutera
[13] Based on interview with Ms. Marina Wahab, PCA-ARMM

leadership of Governor Mangudadatu. Currently, soil suitability analysis is being conducted in various parts of the province for growing Cavendish banana.[14]

In the Province of Lanao del Sur, agricultural production areas within A&D lands that constitute a total of 84,386 ha which are divided according to the type of crops planted, such as: 19,262.3 ha for seasonal crops; 50,738.4 ha for annual crops and 576.6 ha for perennial crops and fruit bearing trees. The protected areas within A&D land include 11,780 ha of irrigable lands cultivated for rice production.[15]

The entire province of Basilan is basically devoted to agriculture. The province is broadly categorized as production land-use and timberland and forestland. Production land use constitutes roughly 73% of the area classified and released as A&D. Around 27% are either timberland or forestland. The province has a total rice field area of 1,086 ha both irrigated and rainfed/upland areas. The total area devoted to corn production in the province is around 414 ha. Corn (yellow and white) are mostly planted in upland areas and usually intercropped with cassava. Around 15,503 ha are planted to rubber, of which 7,148 ha or 47% are farms operated by individual farmers and 7,905 ha are farms subjected to the Comprehensive Agrarian Reform Program (CARP) and are now owned and operated by cooperatives of agrarian reform beneficiaries (ARBs). About 67,012.22 ha is planted to coconut.[16]

The province of Sulu is predominantly an agriculture area planted with a variety of agricultural products. About 94,500 ha (56%) are agricultural land. Coconut trees cover 64,360 ha, cassava 2,257.5 ha, abaca 3,333 ha, coffee 2,423.75 ha, rice 1,007 ha, corn 736.35 ha, fruit trees 6,354.5 ha, vegetables 271.45 ha and other crops 7,288 ha.[17]

The province of Tawi-Tawi has an approximate area of 61,738.831 ha of A&D, or 56% of the total land area. These agricultural lands are mostly located in Panglima Sugala, Bongao, Languyan, Sapa-Sapa, and Simunul. The agricultural lands of Tawi-Tawi especially the mainland is planted to rice (337 ha), corn (527 ha), cassava (16,057 ha), coconut (35,304 ha), mango (868 ha), banana (1,204 ha), coffee (1,158 ha), vegetables (64 ha), fruits and other annual crops. There are also abaca and fruit-bearing trees.[18]

(2) MILF camps

According to undisclosed sources, MILF controls about 33 military camps around Mindanao and most are located in the Bangsamoro area. Six of these camps have already been turned over by MILF to the Philippine Government. These camps include, Camp Abubakar as-Siddique in Maguindanao, Camp Bilal in Lanao del Norte and Lanao del Sur, Camo Omar ibn al-Khattab in Maguindanao, Camp Rajamuda in North Cotabato and Maguindanao, Camp Badre in Maguindanao, and Camp Busrah Somiorang in Lanao del Sur.

A task force consisting of the Government and MILF was formed to assess the needs, plan appropriate programs, and undertake the necessary measures to transform these areas into peaceful and productive communities.[19] Accordingly, Camp Abubakar is the largest camp with about 32,000 ha suitable for growing crops. Camp Busrah, which is perched on the wide plateau of Lanao del Sur covers a 12,000-ha irrigated rice land under the Malig River irrigation system. While some areas are planted to corn and fruit trees, a wide area is grassland, which could be suitable for crop cultivation. Woodlands are still prevalent in the camp.

(3) Ligawasan Marsh

Ligawasan Marsh, which is one of the largest wetlands, is conglomeration of the three marshes; the Ligawasan Marsh proper, Ibpanan Marsh, and Libungan Marsh. It comprises 10% of the Mindanao River basin. This conglomeration supports a variety of flora and fauna and has been identified as a distinct and unique region among the 15 biogeographic regions of the Philippines due to the presence of

[14]Based on interview with Provincial Agriculturist of Maguindanao by Mr. Ephraim Agcaioli, JST researcher
[15]CDP-ELA (2013–2016) of the province.
[16]Socio-Economic Profile of Basilan Province
[17]Sulu Socio-Economic Profile
[18]Tawi-Tawi Socio-Economic Profile
[19] The Manila Times, http://www.manilatimes.net/aquino-pact-restores-strengthens-milf-camps/72020

significant varieties of flora and fauna. These marsh lands are habitats of various birds and animal species including crocodiles.[20] Due to its ecological significance, the Ligawasan marsh was included in the National Integrated Protected Areas System (NIPAS) under the category of Natural Biotic Area. This would put the Ligawasan marsh under the protection of RA 7586, which accords due regard for the natural resources as well as conserve the biological and cultural diversity of the area.[21]

The wetlands cover about 20 municipalities in the provinces of Maguindanao, North Cotabato and Sultan Kudarat. It also covers Cotabato City where waters in the wetland pass thru and drain to the Illana Bay and the Moro Gulf. It is a 288,000 ha complex of channels, small lakes and ponds, marshes and arable land formed by three constituents and connecting marsh areas. It has 1,100 ha of mangrove swamps in Cotabato City where the Mindanao River flows into the sea. The marshlands have five major land uses; woodland forest, wetland (marsh/swamps), open grassland and built-up areas, which are settlements of inhabitants in the area.

There is a large expanse of agricultural lands particularly in the 10 municipalities under the Department of Environment and Natural Resources (DENR) investment plan.[22] Six out of 10 of these municipalities are in Maguindanao with about 77,256 ha of agricultural land and more than 7,000 ha of open grassland or shrubland. Due to the siltation brought by the confluence of rivers in the marshland, the areas that could be cultivated increased although much of these are submerged during wet seasons. Common crops planted during dry season are rice and corn.

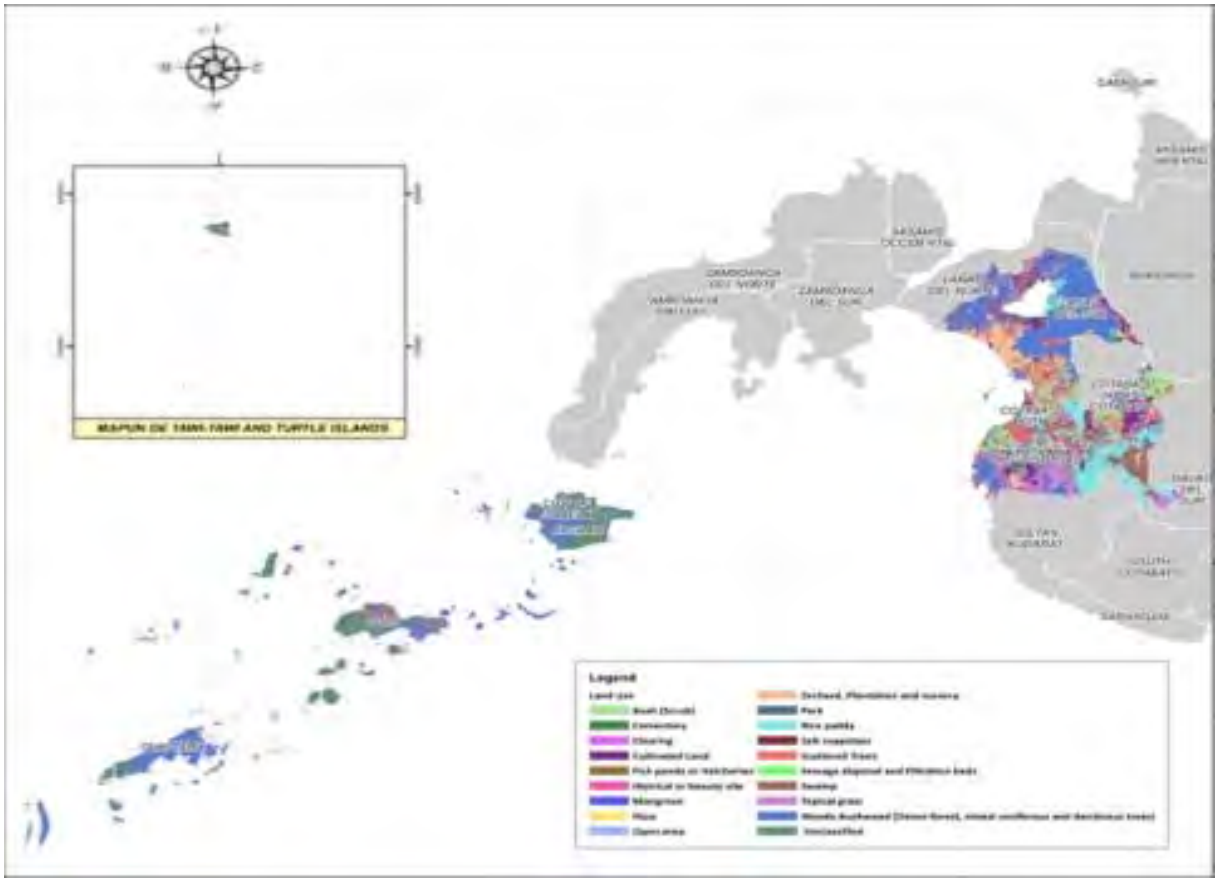


Figure 2.2 Land-Use Map of Bangsamoro Region

2.2.3 Soil types and suitability

The soil types of the Bangsamoro region in the mainland Mindanao are shown in Figure 2.3. They are

[20] Ligawasan Marsh Protected Areas Suitability Assessment (PASA) Study, March to September, 2001
[21] The Wetland Biodiversity Component-Ligawasan Marsh Study Volume II, DENR Dec.2004
[22] Investment Plan includes the municipalities of SK Pendatun, SS Barongis, Pagalungan, Datu Montawal, Datu Piang, and Paglat in Maguindanao and in North Cotabato, Pikit, M'lang, Kabacan and Tulunan.

combinations of clay loam (CL) and sandy loam (SL). Typically, Cotabato City and its northern part are covered by clay[23] and clay loam. Lanao del Sur are covered by sandy soil (S) and silt loam (SiL) and mountain soil. The nearby Lanao del Norte is also covered by mountain soil. Many studies indicate that content of clay on soil has correlation with value of the cation-exchange capacity (CEC), which is the capacity of soil to hold positively charged nutrients for plant use. Therefore, the high value of CEC will appear higher on high clay content. In general, characteristics of clay soils are excellent for water retention and nutrient storage due to high value of CEC. On the other hand, it has poor capacity to drain rain water. Conversely, sandy soil has some advantage of good drainage and breathability, although it has poor capacity of nutrient storage and water retention

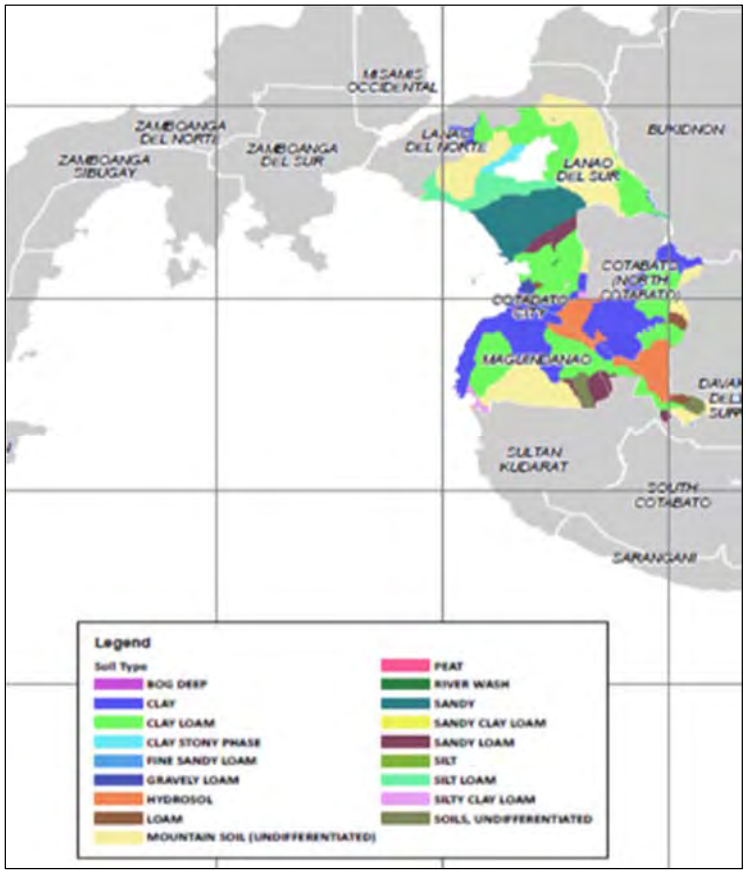


Figure 2.3 Soil Texture Type[24]

Figure 2.4 is a map of Mindanao showing soil sub-groups based on soil properties. The map shows that soil types of the Bangsamoro region in mainland Mindanao is mainly composed of Gleyic or Eutric Cambisols, Orthic Acrisols, and Luvisols. A large part of the Maguindanao province is Gleyic or Eutric Cambisols. According to FAO reports, Cambisols area accommodate genetically young soils, slight or moderate weathering of parent material, and proceeding from the soil fusion to become next soil type. The Cambisol is less common in the humid tropical region because heavy rain and high temperature promote soil fusion. However, it is very common in areas with active geologic or soil erosion even in tropical regions. In general, Cambisols make good agricultural land with high nutrient for plant use. With groundwater influence in alluvial plains, Cambisols are highly productive paddy soils.

The Acrisols have very acidic property with low base. It has higher clay content in the subsoil than in the topsoil. Some acid-tolerant cash crops such as pineapple, cashew, tea and rubber can be grown with some success. Recently, there are confirmed increasing areas of Acrisols planted with oil-palm (e.g., in Malaysia). Acrisols are suitable for production of rainfed and irrigated crops only after liming and full

[23] According to *Soil Textural Triangle, United States Department of Agriculture* (USDA), clay loam is 15–25 % clay, 30–65% sand, and 20–45% silt; sandy loam 0–15%clay, 65–85% sand, and 0–15% silt; sand 0–5% clay, 85–100% sand, and 0–15% silt
[24] Map produced by SERD-CAAM Project

fertilization.

Other areas of Basilan and Sulu provinces are mainly composed of Luvisol, and Tawi-Tawi Province is composed of Fluvisols and Luvisol and other various subsoil types. Fluvisols accommodate genetically young soils in fluvial, lacustrine or marine deposits and has high concentration of nutrient. Luvisols have also high concentration of nutrients for plant growth and good physical property for cultivation.

The comprehensive land use plans (CLUPs) of the provinces of Bangsamoro has also identified specific types of soils in each province to determine crop suitability. These are described briefly as follows.

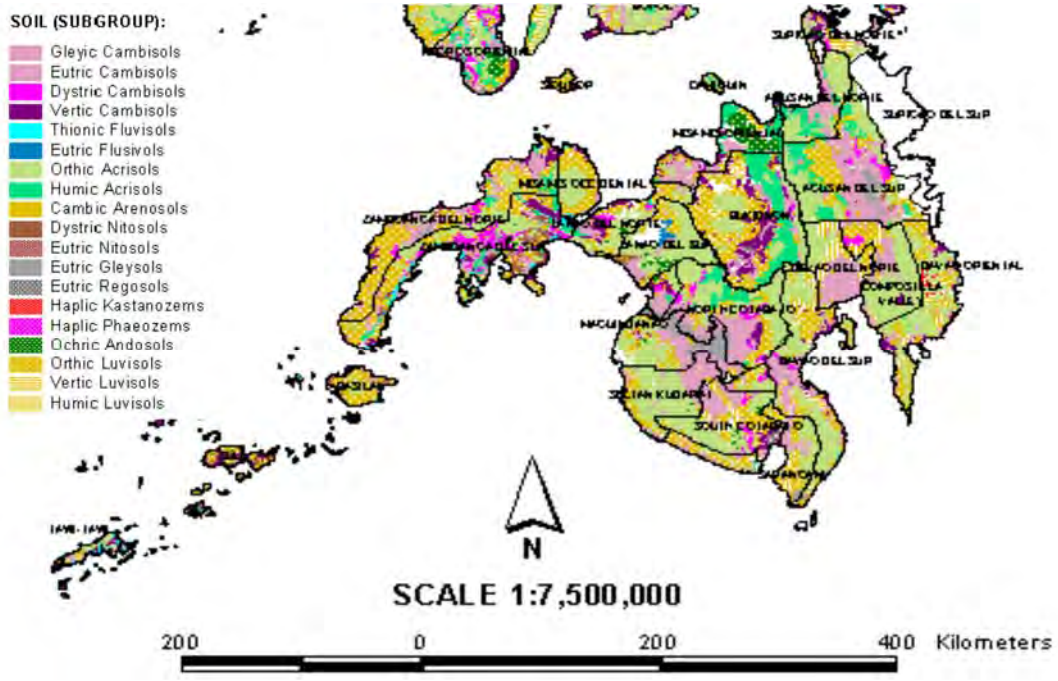


Figure 2.4 Soil Map of the Philippines by Subgroup[25]

(1) Maguindanao Province

There are about ten types of soil found in the province. Among the principal soil types are clay loam and sandy loam, which are favorable for the cultivation of rice and corn. These soil types are in the areas of the municipalities of Datu Piang, Buluan, Datu Paglas, Upi, Ampatuan, Datu Odin Sinsuat, Kabuntalan, Sultan Kudarat, and Parang. Buldon and Matanog generally have sandy loam soil. Mountain soils, which are undifferentiated, are mostly in the northwestern and southwestern part of the province. Ampatuan and Datu Odin Sinsuat also have these soil types[26].

(2) Lanao del Sur Province

The Bureau of Soils identified 11 types of soil common in the province, a large portion of which is suitable for rice and a corn. Salaman clay loam accounts for 0.52%, Ramain and Buaya-an loam clay 0.50%, and Pu-an loam clay 0.21%. All these are recognized as good soil types suitable for agricultural cultivation.

The moderately good type of soil is the Binidayan silt loam which is 11%, while the fairly good soil but limited for cultivation are the Adtuyon clay loam, Langkong sandy loam and Kundarangan clay loam comprising about 33%. The soil types limited to pasture and forest are Malabang sandy loam, Adtuyon-bam Castillan complex, Caromatan silt loam, Bolinao silt loam, Kidapawan clay loam, and Jansan clay loam with 15.6%. The soil type suitable for forestry is mountain soil with 30.15%. Another soil type

[25] http://www.apipnm.org/swlwpnr/reports/y_ta/z_ph/phmp231.htm#s221
(Bureau of Soils and Water Management) http://www.fao.org/3/a-i3794e.pdf (FAO)
[26]Maguindanao Socio-Economic Profile, CLUP

the Kudarang loam clay that comprises 30.2%.[27]

(3) Basilan Province

The soil type of Basilan province is mostly of Bulaon clay with few Bancal clay loam. In central parts of the mountain, soils are undifferentiated.[28] The central parts of the main island have undifferentiated soils. Alluviums, which are made of eroded materials from preexisting rocks were deposited along river channels especially the lower reaches of the flood plains located mostly on the northern part of the province.[29]

(4) Sulu Province

According to the Bureau of Soils and Water Management (BSWM), there are three general types of soils covering Sulu namely Ultisols[30], Alfatisol[31], and Inceptisols[32]. In larger islands, soil is igneous rock of volcanic origin while the smaller islands have limestone soils arising from coral formations. Jolo has the three major soil types. Pata and the Siasi-Tapul group are of Inceptisol types.

(5) Tawi-Tawi Province

The province has three general types of soil, namely: (1) soils of the plains and valleys, (2) soils of the upland, and (3) miscellaneous land types. Parts of Tawi-Tawi have traces of Quinguasilty clay loam, which are from the Quingua[33] series. The silty clay loam surface soil ranges in color from yellowish brown to brown, friable and has fine granular texture. Loam surface soils brown to yellow brown and has a depth of 30 to 40 cm. It is loose, very friable, and highly permeable. On the other hand, the southern part of Tawi-Tawi is characterized by the San Miguel sandy loam soil. Also found in the province is Tapul clay.

2.3 Climate

There are four weather stations operated by the Philippine Atmospheric, Geographic and Astronomical Sciences Administration (PAGASA). One is located at the campus of Mindanao State University (MSU) in Marawi City, one in Jolo, Sulu, one at the University of Southern Mindanao (USM) campus in Kabacan, North Cotabato, and one at the airport of Awang, Cotabato City. Of these, only the Awang airport station is operating.

The Bangsamoro area has only two types of climate, Type III and IV. Type III is characterized by the absence of pronounced maximum rain period with very dry season lasting only for one to three months. Type IV has a short dry season with rainfall more or less evenly distributed throughout the year. All three island provinces' climate is of Type IV. The same climate is in small area of the western portion of Maguindanao, which has mostly Type III. The whole province of Lanao del Sur has Type III climate.[34]

The heavy wooded forest and mountains surrounding Lanao del Sur provide a natural shield against

[27]Lanao del Sur SEP-CDP
[28] Tawi-Tawi SEP-CDP
[29]Provincial Commodity Plan, Basilan Province, www.drive.daprdp.net/plan/pcip/PCIP+of+Basilan
[30] The central concept of ultisols is that soils have a horizon that contains an appreciable amount of translocated silicate clay (an argillic or kandic horizon) and few bases (base saturation less than 30%). Base saturation in most ultisols decreases with depth
[31] The central concept of alfisols is that soils have an argillic, a kandic, or a natric horizon and a base saturation of 35% or greater. They typically have an ochricepipedon, but may have an umbricepipedon. They may also have petrocalcic horizon, a fragipan or a duripan
[32] The central concept of inceptisols is that of soils of humid and sub humid regions that have altered horizons and have lost bases or iron and aluminum but retain some weatherable minerals. They do not have an illuvial horizons enriched with their silicate clay or with an amorphous mixture of aluminum and organic carbon. The inceptisolsmay have many kinds of diagnostic horizons, but argillic, natrickandic, spodic and oxic horizons are excluded
[33]Quingua loam soil extensively found in Bongao is considered to be suitable for diversified upland field crops (*Provincial Development and Physical Framework Plan 2008–2013*).
[34]Climate Map, PAGASA

typhoons and floods. The elevation of the province is about 700 m above sea level. This makes the climate change from a warm to near temperate in the Lake Lanao vicinity. The month of January to April is generally considered dry season while the month of May to December is considered wet or rainy season. The wettest months of the year are June, July and August. The moderate climate of the province is considered as one of its assets in terms of its potential for tourism, being known as the Summer Capital of the South.

There are two agro-climatic zones in the Basilan province, the wet and moist zones, although it is predominantly within the moist agro-climatic zone, which tolerates a moderate moisture deficit during dry season. As such it is capable of sustaining a year round maximum production due to moisture availability. The wet zones are characterized by an annual rainfall of 2,500 mm.[35]

The climate of Sulu is warm, moist and precipitation is fairly steady throughout the year. On average, Sulu has 152 rainy days a year with 2,050 mm annual rainfall. The dry months are December to April while May to November constitute the wet months. The average annual temperature of Sulu is 26.8 °C with the maximum and minimum of 30.9 and 22.7 °C, respectively. The coldest months are from December to February while the hottest months are from April to September.[36]

In the Mapping Philippine Vulnerability to Environmental Disasters released in 2005, the Manila Observatory of the Ateneo de Manila University mapped out the vulnerabilities of various areas in the Philippines. It is reported that during the projected 2080 climatology, Western Mindanao will have little change in rainfall and typhoon occurrences although it will experience significant temperature increases. The Bangsamoro provinces including BaSulTa were expected to experience significant temperature rise. However, this temperature increase has resulted in the low composite risk scores that are related to El Niño-induced drought.[37]

The succeeding sections describe three climatic elements, namely, rainfall, temperature, and humidity based on average monthly data for the last 10 years (2004–2013).

2.3.1 Rainfall

Rainfall is the most important climatic element in the Philippines. Rainfall distribution throughout the Country varies from one region to another, depending upon the direction of the moisture-bearing winds and the location of the mountain systems.[38]

Table 2.3 shows the average monthly rainfall recorded in Cotabato City from 2004 to 2013. These data could describe the pattern in Maguindanao and the southern part of Lanao del Sur. Rainfall is almost evenly distributed. Dry months receive about half (more or less) of the rainfall of wet months. January could be considered driest month. The high rainfall received in the month of July 2009 was due to Typhoon Sendong, which devastated the provinces of Lanao del Norte and Misamis Oriental causing floods along the coastal areas.

The rainfall pattern in the island provinces of Basilan, Sulu and Tawi-Tawi could be represented by the recorded data in the PAGASA station in Zamboanga City as this is the nearest station that could produce the official data. Based on proximity, the rainfall data may be more accurate for the province of Basilan but least accurate for the province of Tawi-Tawi. The average monthly rainfall data per record of Zamboanga City is shown in Table 2.4. Over the last 10 years, the island provinces received an average rainfall of about 1,345 mm. As shown in the table, any month could be a dry month although on average, March is the driest.

Comparatively, the island provinces generally receive lower rainfall than the provinces in the mainland of Mindanao. The average annual rainfall in the mainland provinces of Lanao del Sur and Maguindanao is about twice that of the island provinces. Both mainland and island provinces have almost evenly

[35] Basilan CDP-ELA 2011–2013
[36] Sulu CDP-ELA 2011–2013
[37] Mapping Philippine Vulnerability to Environmental Disasters, Manila Observatory, Ateneo de Manila Univesrity, www.vm.observatory.ph
[38] http://pagasa.dost.gov.ph/pagasa-feeds/53-climate-and-agromet/156-climate-of-the-philippines

distributed rainfall.

Table 2.3 Monthly Average Rainfall Recorded in Cotabato City

(Unit: mm)

Year	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Annual
2004	115.9	61.4	108.8	174.8	487.7	563.0	589.6	264.9	656.9	445.7	120.1	221.8	3,810.6
2005	66.8	6.1	69.3	75.1	320.7	352.6	301.8	256.2	293.2	323.6	183.4	480.8	2,729.6
2006	73.5	239.3	231.8	204.6	267.6	448.3	210.8	317.9	250.1	326.3	183.6	137.8	2,891.6
2007	138.3	61.0	47.0	122.0	152.0	342.0	397.0	113.0	221.0	171.0	137.0	130.0	2,031.3
2008	116.0	133.0	289.6	375.0	545.0	586.0	217.0	219.0	338.0	270.0	307.0	118.0	3,513.6
2009	140.0	128.0	135.0	370.0	395.0	301.0	1151.0	173.0	549.1	236.0	196.0	119.0	3,893.1
2010	150.0	94.8	51.4	155.9	468.0	293.3	384.5	239.4	302.4	505.5	274.0	263.2	3,182.4
2011	130.9	212.9	220.2	76.3	272.7	456.5	346.1	291.1	196.5	291.2	177.9	120.9	2,793.2
2012	122.1	204.0	55.9	296.6	216.5	290.1	444.6	218.8	448.3	306.0	148.0	94.7	2,845.6
2013	130.3	149.2	90.2	163.2	115.1	238.9	393.4	185.7	145.0	280.5	196.5	91.1	2,179.1

Source: PAGASA, CAD, and CDS.

Table 2.4 Average Monthly Rainfall Recorded in Zamboanga City

(Unit: mm)

Year	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Annual
2004	37	40	1	186	139	160	74	39	46	194	19	21	955
2005	64	18	54	59	134	86	231	112	163	62	72	110	1,164
2006	33	118	110	84	122	166	15	143	174	380	77	66	1,488
2007	103	33	33	70	87	(2)	285	213	197	289	(2)	99	1,409
2008	117	149	94	85	267	393	157	215	189	181	166	14	2,027
2009	68	59	106	149	125	57	181	46	343	157	124	69	1,484
2010	73	14	80	123	82	116	235	194	180	186	149	104	1,535
2011	181	151	144	43	108	51	85	111	83	126	83	71	1,236
2012	163	203	56	117	42	54	169	86	298	231	132	77	1,627
2013	150	64	21	70	183	148	224	106	85	630	161	96	1,938

Source: ibid.

2.3.2 Temperature

All of the Philippine territory is located in the tropics and the differences in temperatures in various locations are influenced by altitude. The temperatures in areas located in high altitudes are lower and higher in the lower altitude levels.[39] The province of Lanao del Sur is mostly located in a 700 m altitude and hence, has cooler temperature. Unfortunately, it could not be measured since the weather station in Marawi City is non-operational. However, temperatures in the province could approximate those recorded in Malaybalay nearest Lanao del Sur and at an elevation of 627 m, which is closer to that of most areas of Lanao del Sur.

Figure 2.5 shows the average monthly temperature from 2004 to 2013 at three weather stations. The mean temperatures recorded in Cotabato City and Zamboanga City are about the same and in the vicinity of 27 and 28 °C. Maximum temperatures are in the vicinity of 29 to 33 °C while minimum temperatures are within 21 to 24.5 °C. On the other hand, mean temperatures recorded in Malaybalay are about 23 to 24 °C with the maximum and minimum within the range of 28–31 and 17–19 °C, respectively. The areas in most of Lanao del Sur could have lower temperatures since the province's altitude is more than 70 m higher than Malaybalay.

2.3.3 Humidity

Humidity refers to the moisture content of the atmosphere. Due to high temperature and the surrounding bodies of water, the Philippines has a high relative humidity. The average monthly relative humidity varies between 71% in March and 85% in September. The combination of warm temperature and high relative and absolute humidity give rise to high sensible temperature throughout the archipelago. It is especially uncomfortable during March to May, when temperature and humidity attain their maximum

[39] Latitude is an insignificant factor in the variation of temperature while altitude shows greater contrast in temperature.
[39] http://pagasa.dost.gov.ph/pagasa-feeds/53-climate-and-agromet/156-climate-of-the-philippines

levels.[40]

Figure 2.6 shows the average monthly humidity recorded in Cotabato City and Zamboanga City. Humidity recorded over the last 10 years in Cotabato are much lower than those recorded in Zamboanga City, which is accounted to the larger water bodies surrounding Zamboanga than Cotabato. This could also imply a higher humidity in the island provinces of BaSulTa. However, the extremely low humidity data from the Zamboanga weather station in the months of June and November are due to insufficient data.

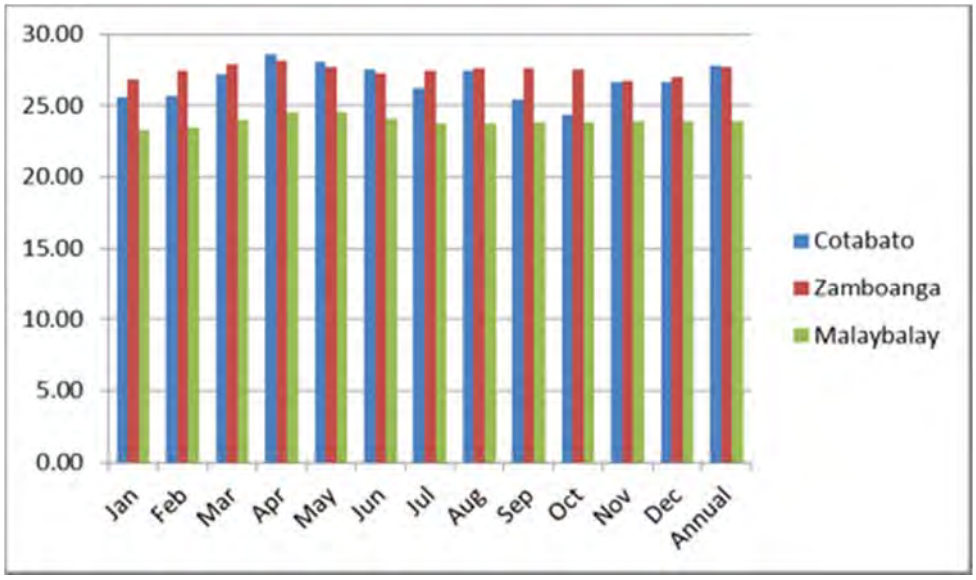


Figure 2.5 Average Monthly Temperature, 2004–2013

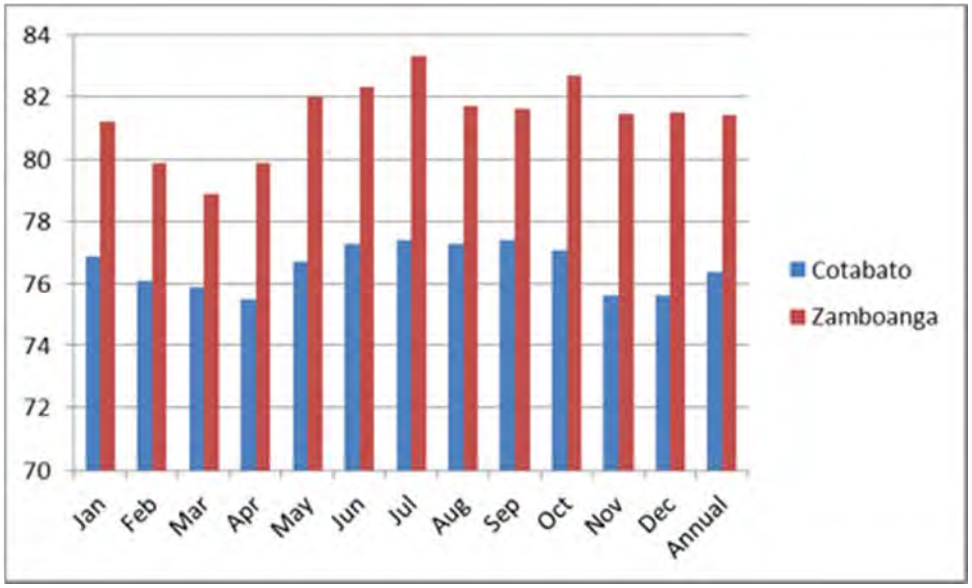


Figure 2.6 Average Monthly Humidity, 2004–2013

2.4 Water Resources

Water resources are either surface or groundwater, which are both replenished by the water cycle. These resources are harnessed to supply the water requirements of both crops, livestock and poultry production.

[40] http://pagasa.dost.gov.ph/pagasa-feeds/53-climate-and-agromet/156-climate-of-the-philippines

2.4.1 Surface waters

The Bangsamoro territories in the mainland of Mindanao, Lanao del Sur, and Maguindanao are endowed with abundant surface water resources (Figure 2.7). Lake Lanao is located about 700 m above sea level and surrounded by communities and packets of flat lands cultivated for crop production. It is the largest lake in Mindanao and the main source of the Agus River that finds its way to the Illana Bay through the famous Maria Cristina falls. Multi-stage hydro power plants were installed and operated by the National Power Corporation along this river at the municipality of Saguiaran. Lake Buluan in Maguindanao covers many municipalities.

The territory is also lined with rivers and streams. The Mindanao River "rises in the central highlands of northeastern Mindanao . . . as the Pulangi and then flows south to where it joins the Kabacan to form the Mindanao [River]. It meanders northwest through the Libungan Marsh and Liguasan Swamp . . . At Datu Piang the river turns to enter Illana Bay of the Moro Gulf in two tributaries—the Cotabato and Tamentaka—after a . . . 320-[km] course. With its many tributaries—Pulangi and Maridagao (north), Alah (south), Malabul, Dalapuan, and Alip (east)—the river system forms a wide fertile basin."[41]. The Mindanao River basin is one of the 18 major river basins. There are 18 municipalities in Maguindanao and six municipalities in Lanao del Sur covered by this river basin[42].

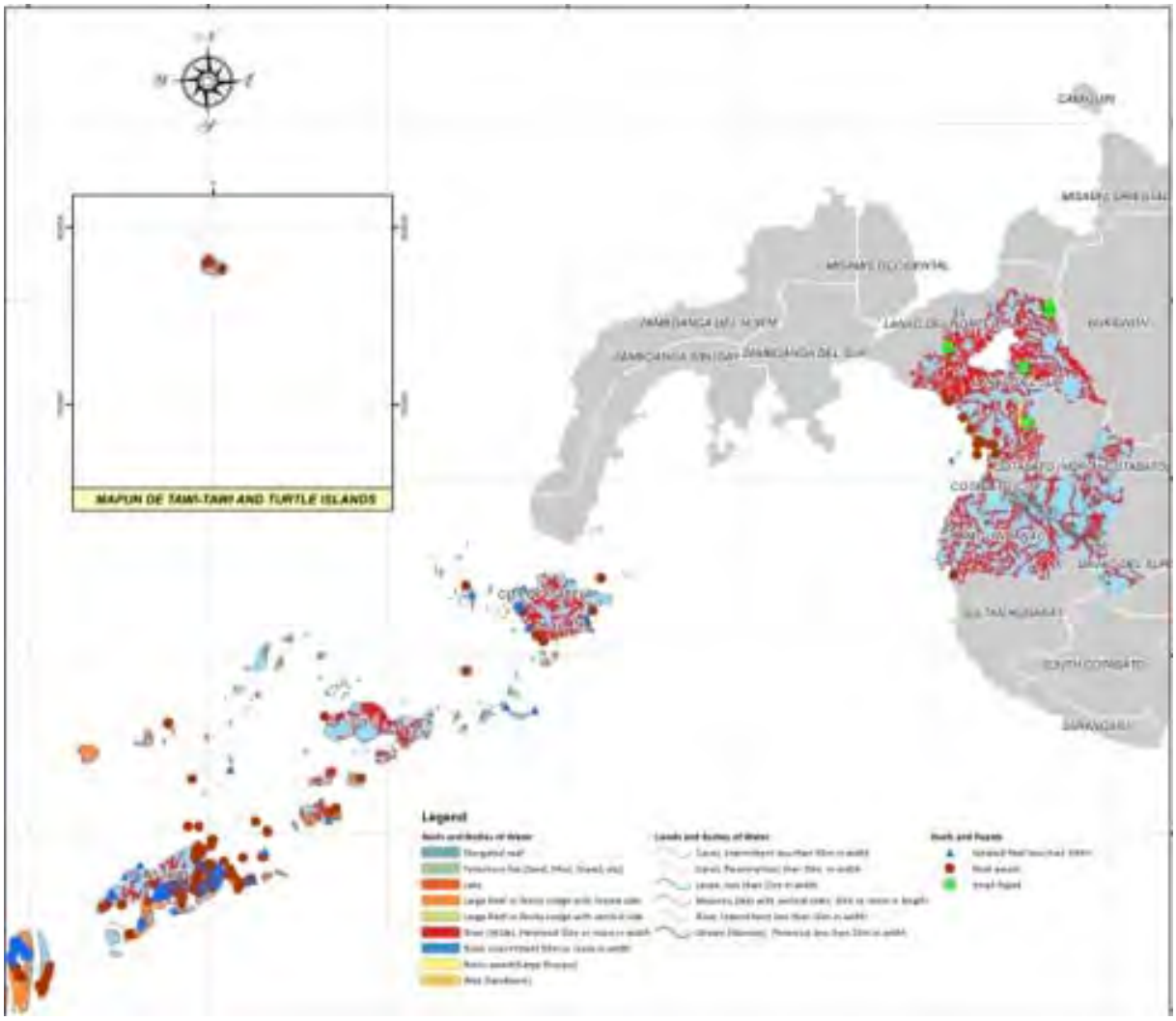


Figure 2.7 Map of Surface Waters (Lakes, Rivers, and Streams) in Bangsamoro

The rivers in Basilan, like the Bagauan River in Lamitan City and the Aguada River in Isabela City as

[41] http://www.britannica.com/EBchecked/topic/383611/Mindanao-River
[42]www.dilg.gov.ph/DILG Resources

well as the Kumalarang River, are among the rivers that sustain agriculture and commerce. Rivers in the mainland Sulu are small but provide water requirement for agriculture. A number of crater lakes in the mainland can also be found, the most prominent of which are Lake Seit and Lake Panamao.

2.4.2 Groundwater

Groundwater is classified into three categories: shallow well areas with a depth of 20 m or less, deep well areas with a depth of more than 20 m, and difficult areas where groundwater resources are almost inexistent.

Maguindanao is well endowed with generous groundwater resources. It has a large portion of shallow well areas, which extends from the middle part of the province towards the east. Coastal areas along the Mindanao Sea are deep well areas and only a small proportion of land in the western part of the province is considered difficult areas. Lanao del Sur is almost the opposite of Maguindanao. The province has extensive areas with inexistent groundwater resources (difficult areas). Portions in the north and southeast of Lake Lanao are deep well areas. Basilan has no groundwater data. The groundwater of mainland of Sulu is classified difficult. Tawi-Tawi has shallow well areas at the southern part but the rest are practically difficult areas. Figure 2.8 is a map of groundwater distribution in Bangsamoro.

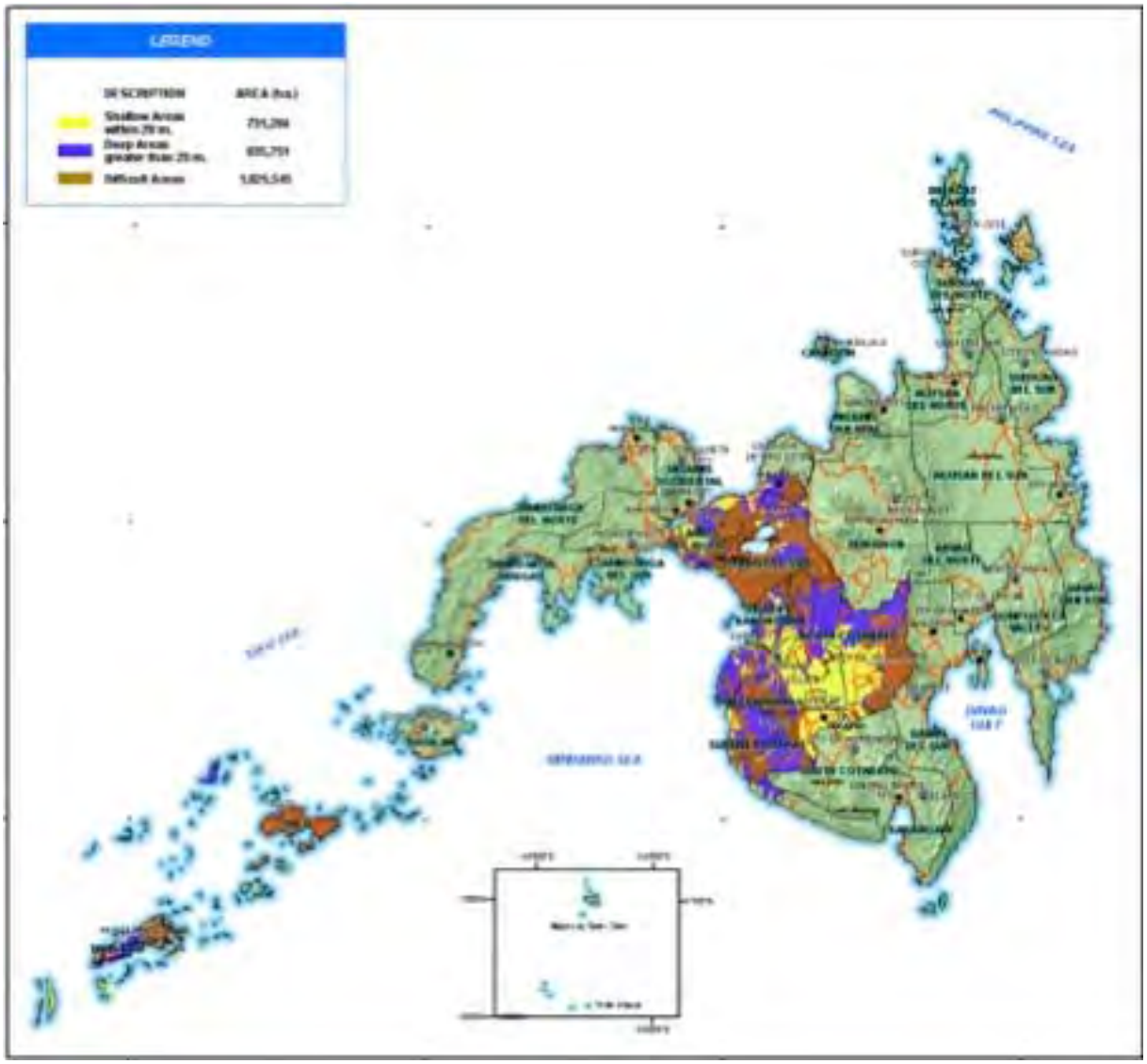


Figure 2.8 Groundwater Map of Bangsamoro

CHAPTER 3 STATE OF FARM INFRASTRUCTURE

Critical for agricultural development are infrastructure that support production and marketing of agricultural products. These are irrigation and roads duly connected by bridges, both considered public goods that should be provided by government.

3.1 Irrigation

Water is an important input to agricultural production. In order to optimize the productivity of land, water should be available at the right time. This is the reason for development of irrigation systems. All over the Country, more than 1.6 million ha have already been provided with irrigation facilities out of the 3.0 million ha total of estimated irrigable area (or 56% developed). Mindanao's irrigable area is about 937 ha and only 31% of the Country's total. About 42% have already been developed.

Table 3.1 shows the development status of irrigation in all regions in Mindanao. ARMM or the Bangsamoro region's potential irrigable area is about 17% of Mindanao but only about 11% of Mindanao's irrigated areas. In terms of development, Bangsamoro has the least area developed at 45,306 ha, which is only 29% of its potential as compared to Zamboanga Peninsula and Northern Mindanao with 58% and 54%, respectively.

Table 3.1 Irrigable and Irrigated Area, 2013

	Irrigable area (ha)	Irrigated area (ha)	Development (%)
Philippines	3,109,609	1,678,595	56
Mindanao	937,613	390,833	42
Zamboanga Peninsula	74,952	43,801	58
Northern Mindanao	113,631	60,869	54
Davao Region	147,313	63,119	43
SOCCSKSARGEN	286,263	112,112	39
Caraga	159,249	65,626	41
ARMM	156,205	45,306	29

Source: CountryStat (http://countrystat.psa.gov.ph/).

In the last 10 years, irrigation development in Bangsamoro was very slow. Growth of irrigated area is only about 7% mostly coming from development of communal irrigation systems (basically, small areas growing by 11%). Table 3.2 shows that the size of irrigated areas almost stagnated from 2004 to 2010. During this period, growth of irrigated area was only 0.2% per year. Development of both national irrigation systems and communal systems are very slow growing at an annual rate of 0.4% and 0.3%, respectively.

Table 3.2 Status of Irrigation Development in Bangsamoro

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Estimated total irrigable area (ha)	156,720	156,720	156,720	156,720	156,720	156,720	156,720	156,720	156,720	156,205
National irrigation System (ha)	16,065	15,987	15,987	15,987	16,105	16,520	16,520	23,234	23,234	25,643
Communal irrigation System (ha)	6,970	7,057	7,057	7,057	7,057	7,057	7,125	15,830	16,783	19,278
Private irrigation system (ha)	225	225	225	225	225	225	225	90	90	90
OGA-assisted IS (ha)								295	295	295
Total (ha)	23,560	23,269	23,269	23,269	23,387	23,840	23,870	39,449	40,402	45,306
Remaining potential development area (ha)	133,460	133,451	133,451	134,008	133,890	133,440	133,410	116,756	115,803	110,900

Source: ibid.

3.2 Barangay Roads and Farm Roads

The Bangsamoro area has a total road length of about 7,734.5 km. Considering the total land area of

the region, the road density is at 0.29, which is only half of the national average. Of the total road length in Bangsamoro, 13% are under national administrative road classification. Provincial and municipal roads account for 18% and 7%, respectively. Barangay roads are by far the most extensive with a total road length of 4,824.2 km or about 62% of the total road length.

Of the total road length, 14% are concrete paved and 85% are still gravel or earth surfaced. National roads account for 72% of the total concrete roads. Of provincial roads, 25% are concrete while municipal roads only 2% concrete. Barangay roads are only 0.20% concrete. Concrete barangay roads account for only 1%) of the total concrete roads.

Barangay roads are also called farm-to-market roads (FMRs) as these are the roads that extend to farms or agricultural production areas and link the producers to the distribution centers or brings out agricultural products and made available to consumers. The quality of FMRs is important to minimize losses during and lessen cost of transport of agricultural products.

Table 3.3 Bangsamoro Road Lengths by Administrative Class and Pavement Type

	Type of Pavement (km)							
Administrative	Concrete		Asphalt		Gravel/Earth		Total	
level	Length	%	Length	%	Length	%	Length	%
National	802.615	72	10.603	50	179.622	3	994.062	13
Provincial	277.520	25	10.353	49	1,096.618	17	1,385.229	18
Municipal	21.700	2	0.250	1	510.950	8	532.931	7
Barangay	9.510	1	-	0	4,814.722	73	4,824.241	62
Total	1,111.345	100	21.206	100	6,601.912	100	7,736.463	100
Pavement/Total		14		0.27		85		100

Source: ARMM-RPD Midterm Update, 2013–2016.

CHAPTER 4 AGRICULTURAL LAND HOLDINGS AND TENURE STATUS

Description of agricultural landholding in this report is based on the 2002 Agriculture Census. This is the latest available data as the 2012 Census report has not yet been published by Agriculture by the Philippine Statistics Authority (PSA).

4.1 Agricultural Land Classification

According to the 1991 Agriculture and Fisheries Survey, the total area of farms in Bangsamoro is 477,928 ha. Of this total, about 68% is arable lands and 31% are under permanent crops. Less than 1% are permanent meadows and pastures and other uses. In the same survey conducted after 10 years (2002), the area of farms increased to 533,410 ha. This is an increase of 12% or 55,482 ha, which means A&D lands converted to farms. This increase is consistent with increase in farms under permanent crops and permanent meadows.

An increase of 85,457 ha and 415 ha of farms planted to permanent crops and meadows, respectively are significant and more than the total increase in the total area of farms. It means that areas under *all other land* and some arable land were converted to permanent crops. Overall increase in area under permanent crops is consistent with increases in areas harvested in various tree crops, the largest being coconut and rubber over the 10 year gap of census years between 1991 and 2002.[43] The next census year is expected to show further increases in area of permanent crops due to development of banana and oil palm plantations.

Table 4.1 Change in ARMM Land Use Classification, 1991–2002

Year	Land classification				
	Total farm area	Arable land	Land under permanent crops	Land under permanent meadows and pastures	All other land
1991	477,928	324,187	150,304	507	2,930
2002	533,410	328,649	235,761	922	1,578
Change (%)	12	1	57	82	-46

Source: Agriculture and Fisheries, Philippine Yearbook 2011.

4.2 Number and Average Size of Farms

Table 4.2 shows the number and average size of farms in the ARMM or Bangsamoro Region in 1975 and 2002 taken from the Agriculture Census conducted for these years. The data in the table are reflections of agrarian reform implementation, which was started under Presidential Decree No. 27 issued in 1972 and continued under Republic Act No. 6657 (or RA 6657), the Comprehensive Agrarian Reform Law (CARL) passed in 1988 and RA 9700, CARP Extension with Reforms (CARPER). From 1975 to 2002, the number of farms grew at an annual rate of 2.1% while the area of farms grew at 0.75% annually.

As a result, the average size of farms in ARMM was reduced from 2.95 ha to 2.15 ha (Table 4.3). Basilan Province has the largest average size of farms in 1975 and still in 2002, although reduction is also large at 2.15 ha. Some tree crop plantations like rubber and coconut, which used to be commercial farms before the land reform were kept intact and are now being managed by ARB cooperatives. Sulu has relatively the smallest average size in 2002 at 1.20 ha, which is less than half of the average size 27 years ago.

It is expected that land sizes would have shrunk from 2002 to 2012 since implementation of CARPER continued until June 30, 2014. This would then be reflected in the 2012 Agriculture Census, which has

[43]CountryStat (http://countrystat.psa.gov.ph/)

not yet been published as of the writing of this report.

Table 4.2 ARMM Number and Area of Farms

No./Area	Year		AAGR
Region/Province	1975	2002	%
No. of Farms			
ARMM	142,430	248,528	2.16
Basilan	7,894	25,344	4.59
Lanao del Sur	56,242	64,813	0.55
Maguindanao	43,319	95,089	3.07
Sulu	23,491	49,392	2.90
Tawi-Tawi	11,484	13,890	0.73
Area of Farms (ha)			
ARMM	438,833	533,410	0.75
Basilan	42,620	82,480	2.57
Lanao del Sur	152,254	140,111	-0.32
Maguindanao	134,699	221,174	1.93
Sulu	64,132	59,501	-0.29
Tawi-Tawi	45,128	30,144	-1.54

Source: ibid.

Table 4.3 Change in Average Size of Farms

	Year		AAGR
Region/Province	1975 (ha)	2002 (ha)	%
ARMM	2.95	2.15	-1.21
Basilan	5.40	3.25	-1.93
Lanao del Sur	2.71	2.16	-0.87
Maguindanao	3.11	2.33	-1.10
Sulu	2.73	1.20	-3.11
Tawi-Tawi	3.93	2.17	-2.26

Source: ibid.

4.3 Land Tenure

In the Agricultural Census of 2002, there were 248,528 farms in the entire Bangsamoro with a total area of 533,410 ha (Table 4.4). Of them, 162,429 were owned-farms, accounting for 65% of the total. Owned- and partly owned-farms constituted almost 80% of the total. Still, 12% of the farms were tenanted. The rest were farms on lease.

With reference to the 1991 Census of Agriculture, the number of farms grew by about 10% over the 11 years. Owned- and partly owned-farms grew at about the same rate. On the other hand, tenanted farms grew even higher at 13% despite the agrarian reform program.

Table 4.4 Number of Farms and Area of Farms by Tenurial Status, 2002 Census

Province	Number of Farms						Area of Farms					
	Total	Owned d/	Partly Owned e/	Tenanted	Leased	Other Forms	Total	Owned d/	Partly Owned e/	Tenanted	Leased	Other Forms
Lanao del Sur	4,813	41,184	8,404	7,503	4,365	2,863	140,111	89,801	24,365	13,965	6,961	4,142
Maguindanao	5,089	5,432	19,127	11,719	4,388	4,711	221,174	131,951	51,180	23,412	7,845	5,289
Tawi-Tawi	3,890	10,827	418	1,802	57	738	30,144	22,281	2,080	4,602	57	1,106
Sulu	9,392	34,758	4,818	8,095	400	875	59,501	38,847	10,484	8,567	334	841
Basilan	5,344	21,268	1,774	1,292	252	724	82,480	69,948	7,029	4,327	573	632
Bangsamoro	48,528	162,429	34,541	30,411	9,462	9,911	533,410	352,827	95,118	54,782	15,770	12,010

Source: NSO, 2002 Census on Agriculture and Fisheries.

4.4 Land Tenure-related Conflicts

The long running conflict in Mindanao particularly in the Bangsamoro region has initially started with

land ownership issue. It is still a major cause of armed struggles between governments and separatist groups. Land conflicts in Muslim Mindanao is an interplay of several causes briefly described as follows.

1) Perceived legalized land-grabbing. The U.S. government-sponsored program on settlement of Mindanao from 1935 to 1946 brought thousands of Christian families from all over Luzon and Visayas as settlers. Each family was given 24 ha to own and till while corporations were given 1,000 ha. The settlers implemented a western system of land management characterized by titling of land parcels with determined boundaries. Accordingly, Christian families were superimposed on the lands of the Indigenous peoples (IPs) and Muslim occupants, who then existed on the communal system of managing lands.
2) The coming of the settlers and the imposition of the individual ownership of lands under the Torrens titling system by the Government started the conflict between the settlers and the Muslims and the IPs. Ownership of land is evidenced by a title, which the Muslims and IPs did not recognize. Under the legal system of the Philippines, the Muslims and IPs were evicted from their lands. They left their lands carrying grievance, which they took to the hills.[44]
3) Informal land markets. Complexity and costliness of formal land markets resulted to informal land market characterized by verbal agreements, absence of titles, buying prices much lower than the actual value and more often facilitated by community leader whose self-interest would complicate the market. All these factors often led to multiple transfers and competing claims of the same parcel of land.45
4) Fragmented nature of land governance. Four government agencies issuing land titles are uncoordinated; (1) DENR issues titles for alienable and disposable lands (2) DAR issues CLOA on private lands, (3) the National Commission for Indigenous Peoples (NCIP) issues CADT/CALT, and (4) the Land Registration Authority (LRA) oversees registration of land titles by the Registry of Deeds by the municipalities and cities. This uncoordinated policies and procedures led to duplication of titles resulting to more than one claimants over the same piece of land or overlapping boundaries.
5) Insufficiently funded cadastral survey. The Land Management Bureau (LMB) of DENR funds is sorely lacking to be able to establish boundaries between lots and to locate lost markers. With limited budget, LMB is currently doing cadastral survey in ARMM only to establish boundaries between municipalities.

Abandonment of lands due to violent struggles (*rido*, armed struggles between government forces and secessionist/rebel groups). After sometime, these abandoned lands are taken over by other groups. Conflicts start when original occupants return to claim the land. Recently, even some lands with CLOA and CLT are under this kind of conflict. Situations are even worse when claimants do not have titles or proof of ownership.

The Framework Agreement on Bangsamoro (FAB) recognized that the resolution of land conflicts as a condition to a lasting peace. Under the Part IV, 2 and 3, the FAB provides for measures on addressing the land issues stating among others the recognition of grievances and the restoration of rights over properties unjustly taken away. This FAB provision is an important measure to take towards development of the Bangsamoro area by way of putting vast tracts of land under productive use.

[44] Judy T.Gulane, A Policy Brief: Land Governance in Bangsamoro, April 2014; www.International-Alert.org/sites/default/files?Philippines-PolicyBriefLandGovernance-EN2014.ph
[45]Ibid.

CHAPTER 5 AGRO-SOCIO ECONOMIC CONDITIONS OF FARM FAMILIES

5.1 Cultural and Ethnic Diversity

The region is characterized by a diverse ethnicity with several groups of IPs, Muslim tribes and Christians from Luzon, Visayas and the coastal municipalities of western, northern and eastern Mindanao.

The current mix of ethnic groups in Bangsamoro is a result of migration over the years. The region was occupied by IPs before Sariff Kabungsuan arrived in the shores of Cotabato together with a group of Muslims from Indonesia. Some IPs were converted to Islam and they constitute the present Muslim population of the area. In the 1930s to 1940s, the Philippine Government declared Mindanao a settlement area and brought families from Luzon and Visayas to various parts of Mindanao. These settlers constitute the Christian population in Mindanao and the Bangsamoro. With the vast area of uncultivated lands, more people were enticed to settle in Mindanao particularly in the southern and western parts.

Table 5.1 shows the ethnic profile of the Bangsamoro provinces. The Maguindanaoans, Iranuns, Maranaos, and Tausugs are predominantly Muslims. Ilonggos, Cebuanos, Tagalogs, Bicol, Ilocano, Zamboanguenos, and other groups are generally Christians. These groups of people are found mostly in Maguindanao and Basilan. Lanao del Sur is predominantly Maranao-Muslims. The island provinces of Sulu and Tawi-Tawi are mostly IPs.

Table 5.1 Ethnic Composition of the Bangsamoro

Province/Municipality	Ethnic Composition	
	Existing Ethnic Groups	Dominant Ethnic Group
Basilan	Yakan, Tausug, Zamboangueno, Chavacano, Samal, Bajao, Cebuano, Ilonggo, Tagalog, Ilocano, Waray, Bicolano, Maranao, Iranon, and Maguindanaon	Yakan, Tausug
Lanao del Sur	Maranao, Ilonggo, Cebuano, Ibanag, Iranon, Tagalog, Maguindanaon, and others	Maranao
Maguindanao	Maguindanaon, Iranon, Tiduray, Ilonggo, Ilocano, Tagalog, Chavacano, Maranao, Cebuano, and others	Maguindanaon, Iranon, Tiduray
Sulu	Tausug, Sama (Samal), Abaknon, Bajao, (Sama Dilaut), Ibanag, Kiniray-a, and others	Tausug, Sama (Samal), Abaknon
Tawi-Tawi	Sama Daliya, Tausug, Sama (Sama Akanon), Jama Mapun, Bajao (Sama Dilaut), and others	Sama Daliya, Tausug
Lanao del Norte, BCT	Maranao, Cebuano, Boholano, others	Maranao, Cebuano
Lanao Cotabato, BCT	Maguindanaon, Cebuano, Ilonggo, Ilocano, Manobo, Tausug, Manarao, Iranon, Kapangpangan, Bicolano, Boholano, and others	Maguindanaon, Cebuano, Ilonggo

Source: Environmental and Social Baseline Survey for CCDP-Bangsamoro.

5.2 Population and Households

The population profile and growth trends are informative of the security situation of the Bangsamoro region. As presented in Table 5.2, the population of the Bangsamoro region in 2010 is about 3.26 million with about 29% each coming from the mainland provinces of Lanao del Sur and Maguindanao. The smallest population is Basilan. The growth of population from 2000 to 2007 is about 6.6% annually with all provinces growing in about the same rates. During this period, the region was peaceful with less and perhaps unpublicized offensive operations from the government military and rebel groups. Peace process between the Government and the MILF group was also in progress.

From 2007 to 2010, however, population declined drastically with the whole region's population decreasing by 21%. While all the five provinces' population decreased, most people leaving the region are from Maguindanao. Over the three year period, Maguindanao's population decreased by 329,000,

which is about 28% of its total in 2007. It was during this period that an MILF faction separated and formed the Bangsamoro Islamic Freedom Fighters (BIFF).

The struggle between MILF and the splinter group BIFF caused unrest in Maguindanao, particularly in the strongholds of the BIFF. This struggle somehow affected the nearby Lanao del Sur whose population decreased by 18% from 2007. Although the island provinces are far from the strife created by the emergence of the BIFF, the operation of the Abu Sayaff group heightened engaging in criminal offenses such as killings, rapes, and kidnapping for ransoms of media personalities, missionaries, and even local people. Basilan was the most affected province during this period with its population reduced by 26%.

Table 5.2 Population and Growth of Bangsamoro by Province

Province/Region	2010	2007	2000
Basilan			
Total Population	293,322	408,520	259,796
Annual Growth Rate (1990–2000, 2000–2007, 2000–2010)	1.22	6.44	3.78
Lanao del Sur			
Total Population	933,260	1,138,544	800,162
Annual Growth Rate (1990–2000, 2000–2007, 2000–2010)	1.55	4.98	2.92
Maguindanao			
Total Population	944,718	1,273,715	801,102
Annual Growth Rate (1990–2000, 2000–2007, 2000–2010)	1.66	6.60	2.72
Sulu			
Total Population	718,290	849,670	619,668
Annual Growth Rate (1990–2000, 2000–2007, 2000–2010)	1.49	4.45	2.80
Tawi-Tawi			
Total Population	366,550	450,346	322,317
Annual Growth Rate (1990–2000, 2000–2007, 2000–2010)	1.29	4.72	3.51
Bangsamoro			
Total Population	3,256,140	4,120,795	2,803,045
Annual Growth Rate (1990–2000, 2000–2007, 2000–2010)	1.51	6.63	

Source: Provincial Quickstats (www.psa.gov.ph).

The largest numbers of households are in the mainland provinces of Maguindanao and Lanao del Sur (Table 5.3) as these are also the largest provinces in terms of land area. The trend in the growth of the number of households in Bangsamoro follows that of the population. From 2000 to 2010, the annual growth rate of the number of households in Bangsamoro is 1.57%. This trend is true to all the five provinces. The same as population, the number of households decreased drastically over the 2007 to 2010 period. Bangsamoro's number of households decreased by more than 174,000 or about 24% of its total in 2007. Large percentage point decreases during the said period are from Lanao del Sur and Basilan, although, in absolute numbers, Maguindanao has the largest number of households (87,842) leaving the province. People are not only leaving by themselves but are bringing their families with them out not only from the province but also out of the region for safety.

In 2010, the average size of households in the Bangsamoro is 6.04, which is much higher than the Philippine average of 4.60. In fact, it is the highest among all regions in the country. Figure 5.1 shows this comparison.

Of the five provinces, Lanao del Sur has the largest household size of 6.46 in 2010 decreasing from 6.8 in 2000. In general, size of households in the region slightly decreased over the 10 year period (2000 to 2010). The magnitude of rural population explains the large sizes of households in the Bangsamoro region. Economic activities in rural areas is dominated to a large extent by agriculture, which is labor intensive. Having a large family or household supplies more helping hands in the farms.

Table 5.4 shows the distribution of urban-rural population of the Bangsamoro area. In 2010 survey of population, about 86% of the population are in rural areas. It is an increase of 4.0 percentage points from 82% in 2007. Urban population averaged 14% decreasing by 4.0 percentage points, which is contrary to the growth of rural population. Provinces with much less concentration of population in the urban areas are Basilan and Lanao del Sur with only about 4% in the urban areas. Sulu has the most urban population concentration at 25% of its total.

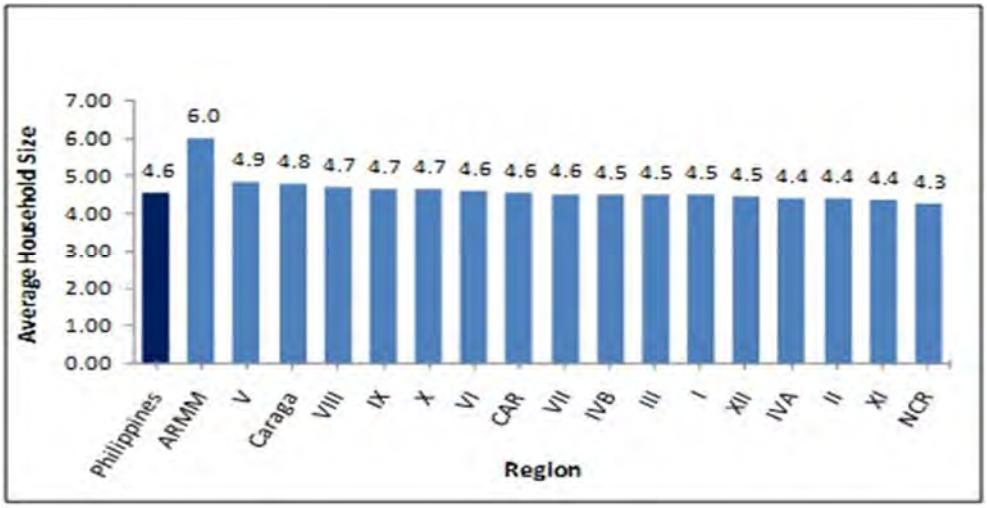


Figure 5.1 Average Household Size by Region in the Philippines, 2010[46]

Table 5.3 Number and Size of Households in Bangsamoro

Province/Region	2010	2007	2000
Basilan			
Number of households	51,552	78,185	47,793
Average household size	5.69	5.22	5.43
Lanao del Sur			
Number of households	143,786	166,785	117,435
Average household size	6.46	6.82	6.80
Maguindanao			
Number of households	157,715	245,557	143,669
Average household size	5.98	5.19	5.57
Sulu			
Number of households	122,001	145,728	98,151
Average household size	5.89	5.83	6.31
Tawi-Tawi			
Number of households	63,887	77,052	54,345
Average household size	5.72	5.83	5.93
Bangsamoro			
Number of households	538,941	713,307	461,393
Average household size	6.04	5.78	6.08

Source: Provincial QuickStats (www.psa.gov.ph).

Table 5.4 Urban-Rural Population in Bangsamoro, 2007 and 2010

	2010		2007	
Province/Region	Number	%	Number	%
Basilan	293,322	100	408,520	100
Urban	11,504	4	33,825	8
Rural	281,818	96	374,695	92
Lanao del Sur	933,260	100	1,138,544	100
Urban	38,791	4	18,663	2
Rural	894,469	96	1,119,881	98
Maguindanao	944,718	100	1,273,715	100
Urban	154,963	16	342,018	27
Rural	789,755	84	931,697	73
Sulu	718,290	100	849,670	100
Urban	179,279	25	237,399	28
Rural	539,011	75	612,271	72
Tawi-Tawi	366,550	100	450,346	100
Urban	61,709	17	99,278	22
Rural	304,841	83	351,068	78
Bangsamoro	3,256,140	100	4,120,795	100
Urban	446,246	14	731,183	18
Rural	2,809,894	86	3,389,612	82

Source: ibid.

[46]Source: www.psa.gov.ph

The marked decrease in population from 2007 to 2010 is true for all rural and urban areas. By proportion, more residents in the urban areas migrated elsewhere. Significantly, Basilan and Maguindanao urban populations decreased at 69% and 61%, respectively. On the contrary, urban population in Lanao del Sur increased by more than 100%. This shows that some of the rural residents transferred to the urban areas like Marawi City. By comparison, urban people would have better capacity to migrate to other places than people in the rural areas where their livelihood are land-based.

5.3 Gender

Figure 5.2 shows the gender composition of the five provinces in Bangsamoro based on census data of 2000, 2007, and 2010. The Bangsamoro region has a fairly balanced gender composition. With minute difference, Maguindanao has more male population compared to female population for all three years being compared. In contrast, Lanao del Sur has more women than men. In 2010, Sulu and Tawi-Tawi have more female population like Lanao del Sur.

Due to the physical nature of farming, activities are generally led by males. However, females, especially the wives of farmers play an important role in agriculture. Backyard production of vegetables and other crops, and even livestock and poultry keeping are usually undertaken by wives of farmers for consumption and/or for sale, which provide augmentation income while waiting for harvest of major crops.

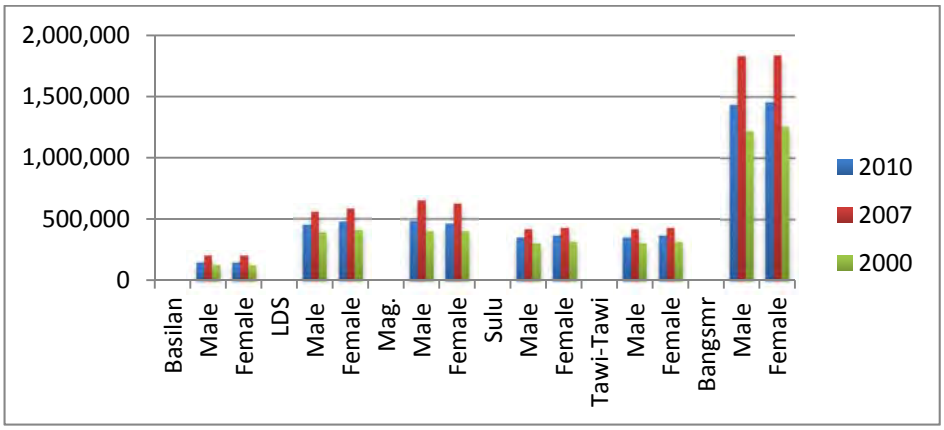


Figure 5.2 Gender Profile of Bangsamoro by Province: 2000, 2007, 2010[47]

5.4 Population Age Structure and Labor Force

All the five provinces of the Bangsamoro have almost the same age profile. Less than 45% are 14 years old and below. More than half are in the age bracket 15–64 years old. Over 65 years old are a small portion of less than 2%.

In general, the dependent population includes ages 0–4 and 65 years old and above. This segment is about 17% of the entire population, and it varies slightly from one province to another. In 2010, people over 65 years old are less than 2%. On the other hand, the fraction of the population of ages 0–4 is less than 15%. The dependent population increased more in Sulu and Tawi-Tawi than in the three other provinces.

RA 9231 defined children as all persons under 18 years of age. The succeeding implementing rules and regulations of the law defined the rights and privileges of the children, which included protection from abuses and anti-child labor practices. These issuances effectively made persons with ages below 18 years old unemployable. Following this policy, the labor force in the Bangsamoro would be less than 50% of the population.

Table 5.5 shows labor force as percent of population per province. From year 2000 to 2010, labor force

[47]Based on data from Philippine Statistics Authority, Provincial Quickstats, www.psa.gov.ph

as percent of population decreased in Basilan, Maguindanao and Sulu. This was maintained in Tawi-Tawi and Lanao del Sur. Assuming that there is 100% employment, the dependency rates in the provinces of Basilan, Lanao del Sur and Maguindanao is more than one. On the other hand, Tawi-Tawi shows one dependent for every member of the labor force. For Sulu, there is less than one dependent for every person in the labor force.

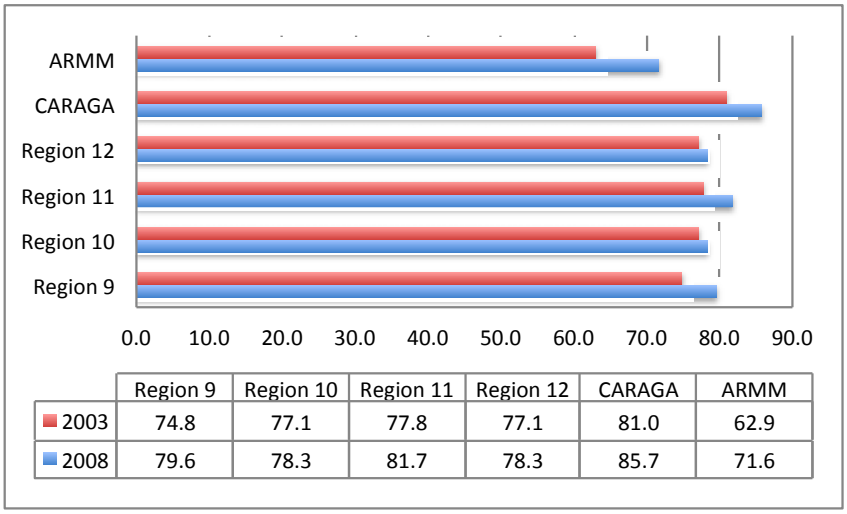
Table 5.5 Labor Force (Aged 18–65) as Percentage of Population

Province	2010	2007	2000
Basilan	46	48	48
Lanao del Sur	47	45	47
Maguindanao	47	50	50
Sulu	51	51	52
Tawi-Tawi	50	48	50

Source: Provincial Quickstat (www.psa.gov.ph).

5.5 Level of Education

In the absence of rural data for levels of education in the Bangsamoro, the regional and provincial data are used to describe the rural population's education profile in this report. The functional literacy rate[48] of Bangsamoro is the lowest among Mindanao regions. As shown in Figure 5.3, Bangsamoro's functional literate in 2008 is only 71%, which is 8.0 percentage points below the levels in Region 9 or Zamboanga Peninsula, which is the second lowest in Mindanao and 14 percentage points lower than CARAGA, which is the highest. In fact, all of Mindanao fall below the national literacy rate of more than 95% in the same year.[49]



	Region 9	Region 10	Region 11	Region 12	CARAGA	ARMM
2003	74.8	77.1	77.8	77.1	81.0	62.9
2008	79.6	78.3	81.7	78.3	85.7	71.6

Figure 5.3 Functional Literacy Rate (10–64 Years Old)[50]

At the provincial level, the 2010 survey shows that most of the population ages 5–64 have low level of education. The portion of the population with one year or less grade school education ranges from 14 to 25% while those in the elementary level are in the range of 36 to 48%. Basilan has the lowest level education, which constitute about 66% of the said age bracket. These figures mirror the profile of education in the rural areas as about 86% of the total is rural population.[51]

In the five provinces of the Bangsamoro region, Lanao del Sur has a better education profile. It has the least percentage of low education and the highest percentage of population in the tertiary level of

[48]Defined as portion of the 15 years old and above population being able to read and write.
[49] Philippines:Country Implementation Profile, International Conference on Population and Development Beyond 2014, www.icpdbeyond2014.org
[50]Regional QuickStat, www.psa.gov.ph
[51]All discussions based on figures from Provincial QuickStat, www.psa.gov.ph

education (college level and above).

5.6 Income and Expenditure Levels

Table 5.6 shows the average income of farming households by source. The income data indicate that farming households generally derive income from farming (54%). Six regions in Mindanao are of this category. The next largest source is off-farm, which basically activities related to farming. It is not the same for Bangsamoro region as most of the farm families derive only about 46% of their income from agriculture and their next largest source of income is non-farm related activities.

Table 5.6 Average 2002–2003 Farm Household Income by Source

(Unit: PHP 1,000)

Country/Region	Total	Farm	Off-farm	Non-farm	Others
Philippines	106,181	57,628	6,763	31,389	10,401
Western Mindanao					
Zamboanga Peninsula	99,327	54,135	5,946	33,431	5,815
Northern Mindanao	82,299	49,988	4,256	23,279	4,776
Southern Mindanao					
Davao Region	101,673	69,496	5,593	17,573	9,011
Central Mindanao					
SOCCSKSARGEN	134,406	84,331	9,347	33,658	7,070
Caraga	84,569	54,004	11,118	13,892	5,555
ARMM	73,356	34,026	5,737	24,936	8,657

Source: CountryStat (http://countrystat.psa.gov.ph/).

Food is basic necessity and it is at the base of the hierarchy of needs. Hence, it is the top priority for his household's expenses. In general, the higher the food expenses as percentage of income, the poorer the household. Table 5.7 shows the average expenditure of farm households and income taken from Table 5.6. Table 5.7 reveals that farm families all over the Country spend an average of about 37% of their income on food. In SOCCSKSARGEN[52], only 29% is spent on food by farm families. On the other hand farm families in Bangsamoro spend about 51% of their income on food.

Table 5.7 Average Farm Household Expenditures, 2011

Country/Region	Total income (PHP 1,000)	Expenditure (PHP 1,000)		
		Food	Recurring	Non-recurring
Philippines	106,181.00	40,186.77	9,726.12	12,629.45
Zamboanga Peninsula	99,327.00	35,593.31	9,290.50	9,305.59
Northern Mindanao	82,299.00	30,457.54	5,737.55	5,629.91
Davao Region	101,673.00	31,191.25	6,415.21	10,765.54
SOCCSKSARGEN	134,406.00	39,391.41	16,726.17	12,041.16
Caraga	84,569.00	31,384.62	4,940.71	8,385.67
ARMM	73,356.00	37,439.13	6,161.47	9,355.40

Source: ibid.

5.7 Level of Investment in Farming

Investments in agricultural production vary in forms and levels. Corporate farms are expected to infuse optimum level of investment on establishment of farms, production, processing and marketing of products. The corporate farms (especially those in Cavendish banana and palm oil production) are self-complete and financing is made available every cropping. In small farms, agricultural production are financed through the following.

1) Farmers who self-finance from their income or borrowing from banks or informal sources. Small farmers usually turn to informal lenders rather than banks. Many farmers interviewed in the area has not experienced borrowing from banks.

[52] South Cotabato, Cotabato City, Sultan Kudarat, Saranggani, General Santos City

2) Traders who lend money in exchange for contract to buy. Some farmers have long relationship with traders they call "suki" who advance money to finance labor and inputs.

3) Processors who finance production and pay farmers for land rental and farm labor and management. Large agro-processors like Lamsan Corporation finance corn farmers to get the volume the facility need to fill the plant capacity. These farms could have optimum levels of investment.

Small farmers, particularly those who produce tradeable commodities like rice, corn, copra, and rubber, do not generally invest in optimizing yield. They are also the subsistence farmers who do not have or have little capability to self-finance farming operations. They are majority in the Philippine agriculture landscape and in particular, the Bangsamoro region. According to the 2011 CDP-ELA of the Bangsamoro provinces poverty incidence is much pronounced in the rural communities. Thus, the low level of investment in farming in the Bangsamoro is not difficult to predict.

The incidence of poverty particularly in the rural areas are clear indication that farmers cannot afford optimum investment for farming activities, although this is not unique to Bangsamoro. The same is experienced in the entire farming sector in the Philippines. By comparison, however, Bangsamoro shows distinctive effect of poverty on farm outputs as would be shown in the discussions of agricultural production performance.

Table 5.8 shows the comparison of costs of production in irrigated and rainfed rice and white corn in the five regions of Mindanao as estimated by the Bureau of Agricultural Statistics with reference to survey conducted in 2009.[53] These figures are based on expenditures of farmers for crop production by region and are shown to reflect levels of investment in crop production.

Table 5.8 Comparison of Production Costs in 2009

Cost Type/Region	Irrigated Rice	Rainfed Rice	White Corn
Total Costs (PHP/ha)			
Zamboanga Peninsula	39,203.00	35,835.00	16,345.00
Northern Mindanao	42,703.00	37,730.00	21,274.00
Davao Region	52,475.00	37,068.00	14,844.00
SOCCSKSARGEN	41,443.00	35,267.00	20,071.00
CARAGA	36,568.00	36,065.00	18,463.00
ARMM	39,558.00	37,824.00	25,669.00
Land Owner's Share (PHP/ha)			
Zamboanga Peninsula	4,546.00	2,443.00	740.00
Northern Mindanao	3,431.00	291.00	344.00
Davao Region	4,642.00	2,822.00	95.00
SOCCSKSARGEN	3,930.00	2,745.00	839.00
CARAGA	3,059.00	2,877.00	2,163.00
ARMM	9,728.00	6,154.00	1,391.00
Cash Cost (PHP/ha)			
Zamboanga Peninsula	16,408.00	15,515.00	6,354.00
Northern Mindanao	17,302.00	12,194.00	8,730.00
Davao Region	19,759.00	11,602.00	5,591.00
SOCCSKSARGEN	14,213.00	11,787.00	10,678.00
CARAGA	17,619.00	14,190.00	6,758.00
ARMM	11,965.00	8,986.00	8,344.00
Non-Cash Cost (PHP/ha)			
Zamboanga Peninsula	15,514.00	11,414.00	2,521.00
Northern Mindanao	15,993.00	5,663.00	1,660.00
Davao Region	20,052.00	12,255.00	842.00
SOCCSKSARGEN	19,326.00	14,151.00	2,213.00
CARAGA	13,660.00	14,268.00	5,045.00
ARMM	14,527.00	10,601.00	5,232.00

Source: ibid.

[53] Bureau of Agricultural Statistics, www.bas.gov.ph

By total cost of production in irrigated and rainfed rice, Bangsamoro is lowest although not too far from Zamboanga Peninsula. However, the difference is really shown by costs paid in cash. Farmers in the Bangsamoro make lowest cash investment, maybe due to inadequacy or unavailability of cash. Costs paid in cash by farmers are largely inputs (seeds, fertilizers, chemicals). In the case of Bangsamoro farmers, cash costs are due to fertilizers, rental of farm equipment but almost nil on seeds. In other regions, farmers spend on buying high quality seeds. Bangsamoro farmers also pay more for land rental, 25% for irrigated and 16% of the total cost for irrigated and rainfed lands, respectively.

For white corn production, Bangsamoro farmers make the highest investment compared to other regions in Mindanao. Cash and non-cash costs are 32 and 20%, respectively. Both are only 52% of the total cost and about 43% are imputed costs. For white corn farmers, imputed costs are mainly farm operator, family labor, exchange labor. Compared to rice production, corn farmers pay much lesser on rental, only 5% of the total cost.

CHAPTER 6 GOVERNMENT AND OTHER INSTITUTIONS IN AGRICULTURAL SUPPORT SERVICES

Support services for agricultural development in Bangsamoro is largely provided by government institutions although there are NGOs sporadically operating in various parts of the region. Support services consists of provision of technology, provision of production inputs, roads (particularly FMRs), irrigation, credit support, crop insurance, marketing assistance and farmers' organization. Table 6.1 shows the various government institutions providing support services funded through approved programs.

Table 6.1 Support Services for Agriculture and Government Agency Providers

Type of Service	Service Provider	Source of Funds
Technology (R&D and Extension)	SUCs	Allocation from GAA
	PCA, PhilFIDA, DAR	Allocation from GAA
	DAF	National programs (e.g., DA-AgriPinoy, GPBP, TSIP, OPPAP-PAMANA)
	DAR	Allocation from GAA
Production Inputs	PCA, PhilFIDA, DAR	Allocation from GAA
	DA/DAF	National programs (e.g., DA-AgriPinoy, GPBP, TSIP, OPPAP-PAMANA)
Roads		
National	DPWH	Allocation from GAA
Provincial/Municipal	LGU	Development Fund (20% of IRA)
Barangay/FMR	DA/DAF	National Programs (e.g., DA-AgriPinoy, GPBP, TSIP, OPPAP-PAMANA)
	LGUs	Development Fund (20% of IRA)
	DAR	ARB support programs
Irrigation	NIA	Allocation from GAA
	BSWM	DA Programs
	DA/DAF	National programs (e.g., DA-AgriPinoy, GPBP, TSIP, OPPAP-PAMANA)
	LGUs	Development Fund-20% of IRA
	DAR	Allocation from GAA
Credit	LBP	Loan portfolio, national government programs
Crop Insurance	PCIC	Guarantee portfolio, national government programs
Market Assistance	DA/DAF	National Programs (e.g., DA-AgriPinoy, GPBP, TSIP, OPPAP-PAMANA)
	NFA	Allocation from GAA
	DAR	Allocation from GAA
Farmers' organization	CDA, NIA, BSWM, PCA, DAR	Allocation from GAA

Resources used to deliver support services to develop agriculture in ARMM regardless of source goes through the coffers of the Autonomous Regional Government (ARG) and disbursed for the projects of DAF-ARMM. The DAF-ARMM converts the funds into materials and services and download to the Provincial Agriculture Office (PAO). Based on its allocations of the resources received from DAF-ARMM, PAO distributes to the Municipal Agriculture Offices (MAOs).

Sometimes, provincial and municipal/city governments allocate funds for agriculture from their development funds, which is mandated by the Local Government Code to be 20% of their Internal Revenue Allotment (IRA). This LGU allocation adds up to the funding for agricultural support services. MAOs deliver the materials and technical services through their agricultural technicians (ATs).

FMRs and other infrastructure like markets, solar dryers, etc. are contracted to local construction firms. Infrastructure projects funded from the development funds of LGUs are also implemented by themselves. Figure 6.1 shows the flow of delivery of support services from government starting from release of funds from various agriculture programs of the national government to the delivery of services to the farmers. For 2012–2014, the agricultural support programs are the Agri-Pinoy, GPBP/BuB, the TISP and the Payapa at Masaganang Pamayanan (PAMANA). These programs are discussed in the section on DAF-ARMM.

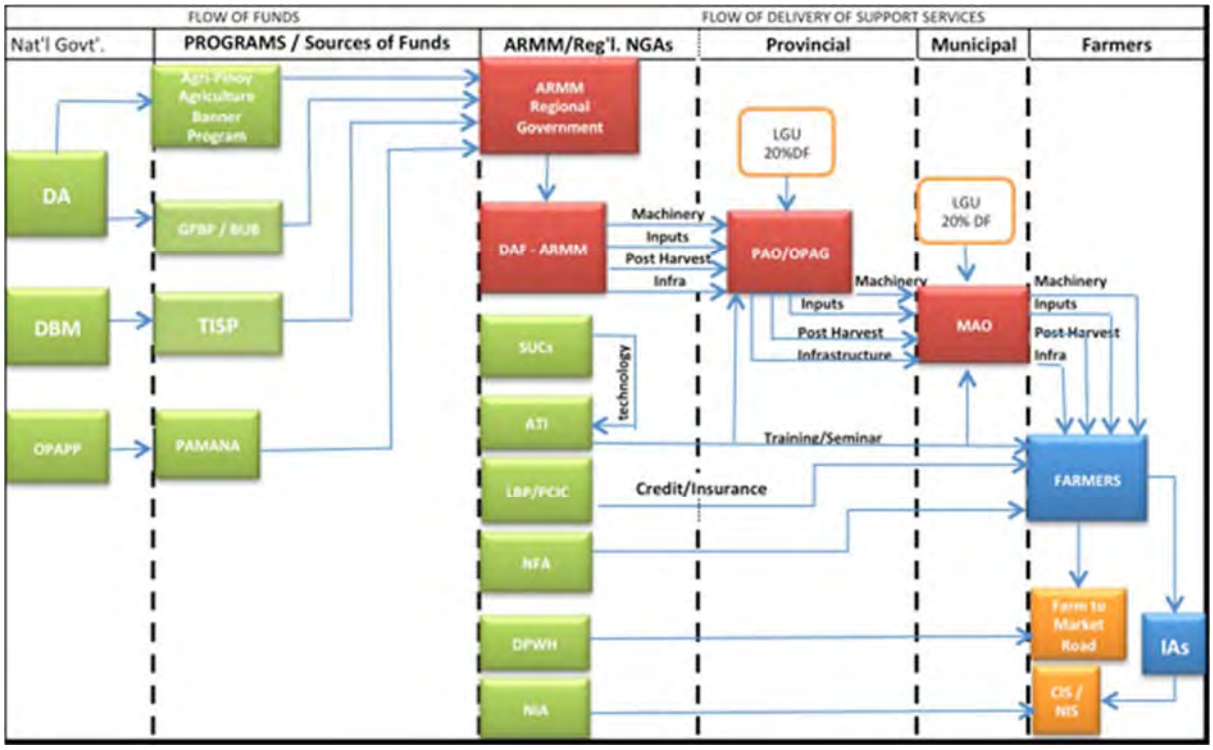


Figure 6.1 Delivery of Government Support Services for Agriculture

The ARG budget from the General Appropriations Act (GAA) generally covers personal services and maintenance and other operating expenses (MOOE). There is none for capital outlay. Thus, construction of FMRs and irrigation systems are funded from projects or programs of the national government agencies such as those mentioned in Table 6.1. In addition to the programs mentioned, a number of national government agencies have their own programs: the National Irrigation Administration (NIA) for irrigation development, the DPWH for roads, LBP and Philippine Crop Insurance Corporation (PCIC) for credit, the SUCs for R&D, and the Agricultural Training Institute (ATI) for agricultural extension. These agencies implement projects directly from their respective capabilities (funds and technology), which were established through the years of their existence.

The succeeding sections discuss agencies and players in the delivery of support services to farmers or agricultural producers in the ARMM. Discussions are on their organizations, operations, fund sources, and accomplishments.

6.1 Department of Agriculture and Other National Government Agencies

6.1.1 Department of Agriculture (DA)

The Department of Agriculture (DA) is the government agency responsible for the promotion of agricultural development by providing the policy framework, public investments, and support services needed for domestic and export-oriented business enterprises. In the fulfillment of this mandate, the primary concern of the Department is to improve farm income and generate work opportunities for farmers, fishermen and other rural workers. It encourages people's participation in agricultural development through sectoral representation in agricultural policy-making bodies so that the policies, plans and programs of the Department are formulated and executed to satisfy their needs. Notwithstanding the autonomy, ARMM still participates in this process.

As stipulated in the Philippine Development Plan (PDP) 2011–2016, "Chapter 4: Competitive and Sustainable Agriculture and Fisheries Sector," the agricultural and fishery sector provides food and vital raw materials for the rest of the economy. As the sector grows and modernizes, it releases surplus labor to the industry and services sectors. Rising productivity and efficiency in the sector are critical in

maintaining the affordability of food and purchasing power, especially among the poor.

The sector's development is therefore vital in achieving inclusive growth and poverty reduction as well as attaining the targets under the Millennium Development Goals (MDGs). The MDGs "are the world's time-bound and quantified targets for addressing extreme poverty in its many dimensions—income poverty, hunger, disease, lack of adequate shelter, and exclusion—while promoting gender equality, education, and sound environment".[54]

In pursuit of its mission and vision, DA through its bureaus and attached agencies undertake both development and regulatory functions. It implements the national government's program for agriculture and fisheries and derives funding from the General Appropriations Act, which is enacted by the Philippine Congress yearly. The national budget is provided through the General Appropriations Act of the Philippine Congress and is passed normally before the end of the calendar year to make the budget and funds available to executing agencies by the beginning of the Philippine fiscal year starting in April and ends in March of the following year.

Over the years, the development of the agriculture and fisheries sector has been performing below expectations and potential, despite the passage of the Agriculture and Fisheries Modernization Act (AFMA) in 1997. From 2000 to 2008, agriculture and fisheries growth averaged 3.8% annually, hitting a low of 1.8% in 2004 and a high of 5.1% in 2006. However, the last two years were marked by progressively slower growth rates of 4.9% in 2007 and 3.2% in 2008. The lack of financial support for the AFMA, inappropriate allocation of meager resources as well as issues of bad governance contributed to the situation[55]. Budget and corresponding expenditure fell below the AFMA's intended allocation PHP 20 billion per year.

Table 6.2 on the national government expenditures and the agriculture share show the utter deficiency in agriculture financial support from 2004 to 2013. So far, the landscape has not changed. Advocates for agricultural development believes that share of agriculture budget in the total budget of the country should at least approximate the share of agriculture in the gross domestic product (GDP). In 2013, the share of agriculture in GDP is 12% while expenditure is only 5.5%.

Table 6.2 National Government Agriculture Expenditures

Year	Natl. Gov. expenditure (PHP mil.)	Agricultural expenditure	
		Amount (PHP mil.)	% of natl. total
2004	867,010	28,462	3.3
2005	947,554	39,782	4.2
2006	1,044,827	38,711	3.7
2007	1,155,509	60,042	5.2
2008	1,314,613	94,358	7.2
2009	1,434,146	81,422	5.7
2010	1,472,977	86,239	5.9
2011	1,580,017	56,012	3.5
2012	1,828,981	88,186	4.8
2013	2,005,900	111,138	5.5

Source: CountryStat (http://countrystat.psa.gov.ph/).

6.1.2 Other agriculture-related national government agencies operating in ARMM

The functions, assets and personnel of national government corporations were not devolved to ARMM due to the nature of their organization as defined by the law that created them. These government agencies that continue to operate in ARMM are the National Irrigation Administration (NIA) for irrigation development, the Philippine Coconut Authority (PCA) for the development of the coconut industry and oil palm, PhilFIDA for the development of fiber crops, and the National Food Authority

[54]www.da.gov.ph
[55]Financing Agriculture Modernization: Risks & Opportunities, Policy Brief February 2009

(NFA) for market support for grains.

(1) Irrigation Development under NIA and BSWM

1) NIA development scheme and accomplishments

Irrigation infrastructure like roads are expensive and has to be undertaken by the Government. Thus, irrigation development is generally consolidated under NIA. NIA is a government-owned and controlled corporation primarily responsible for irrigation development and management. The NIA funds for irrigation development is appropriated by the Philippine Congress. Thus, irrigation development of the region does not only depend on the programming and prioritization of the agency, but it also takes a lot on the regional governments' and LGUs' petition for irrigation support in their jurisdiction. Irrigation component of the national government's rice program is usually handled by NIA with the corresponding funding.

The irrigation development program of NIA covers development of potential irrigable areas into irrigation system either small scale of less than 1,000 ha under communal irrigation systems (CISs) development or large scale of more than 1,000 ha under the national systems development program. In both categories of irrigation systems, the farmers are important players as users of irrigation service. Farmers are encouraged to organize into irrigators' associations (IA), which are further organized into larger organizations as IA federations. The national irrigation systems (NISs) are operated by NIA, which charges irrigation service fees to the users. NIA undertakes capacity building for IA federations to operate, own and manage the NIS under its program on full turnover of NISs. On the other hand, NIA develops and constructs CISs and turns over to an irrigators' association (IA) on a cost-recovery agreement.

The organization of IAs is under the grand scheme of the government to turn over operation of irrigation systems, both CIS and NIS to the farmers/irrigators. CISs turnover scheme has been in place since NIA started. On the other hand, NISs' turnover to IAs is under a long-term plan for preparing IAs to manage large irrigation systems. Under the grand plan, NIA involves the farmers as irrigators from irrigation project development, strengthens it and gradually turns over NIS to the federation of IAs. Figure 6.2 shows the process.

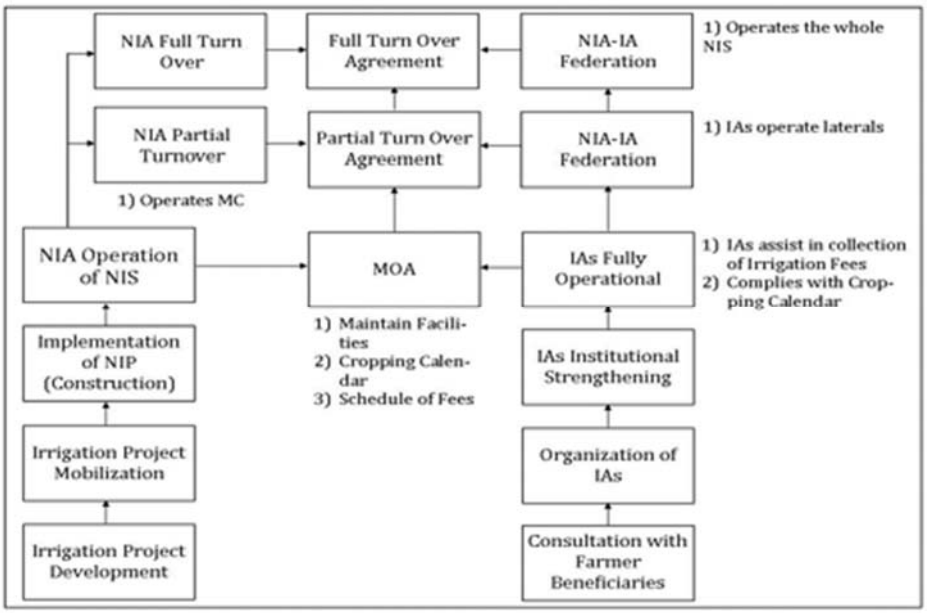


Figure 6.2 NIA Process of Developing NIS for Eventual Turnover to IAs

IAs play a key role in irrigation development not only in the maintenance of irrigation facilities such as canals and structures but most importantly, in managing the distribution of water. One CIS has one IA while an NIS has several IAs. Although there is no hard and fast rule, one IA in an NIS covers an area of about 200–300 ha on average. Currently, the organization IAs has advanced to various levels

following the organizational setup of NIA as shown in Figure 6.3. This model of irrigators' institutional development provides the farmers/irrigators better line of communications with NIA. At the apex of the IA organization is the National Federation of IAs, whose president sits at the NIA Board of Directors as private sector representative.

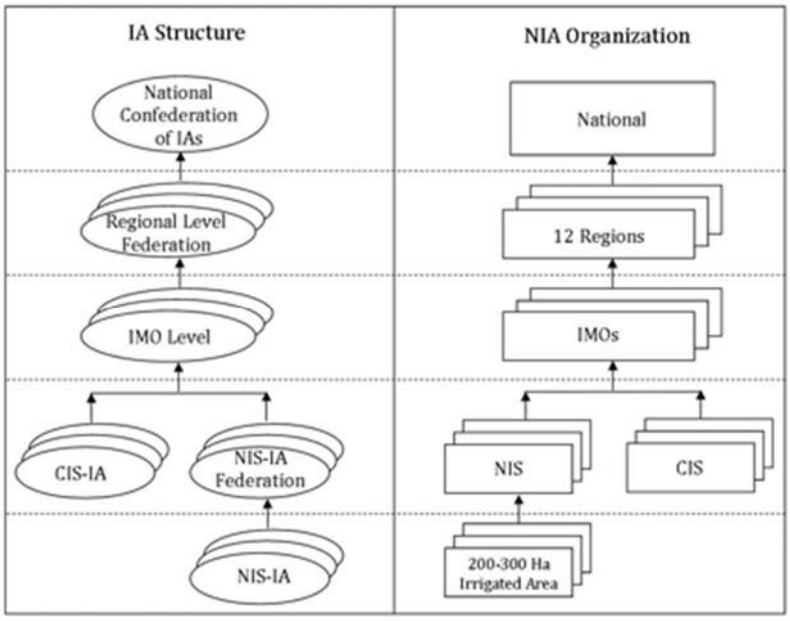


Figure 6.3 IA and NIA Levels of Organization Structure

At the onset, operation of NIS is done in partnership with the IAs. Planting of rice could be scheduled according to the water distribution plan agreed among the members of the IAs and among IAs within an NIS by establishing a cropping calendar.[56] This cropping calendar necessarily includes the schedule of water distribution. NIA teaches IAs in NISs as well as CISs that supply of water to the fields should start at the fields served by the last gate of the lateral canal or turn out of the farm ditches of distribution canals moving upstream. This way water is well distributed. Such a scheme is illustrated in the diagram shown in Figure 6.4. The scheme does not only facilitate equitable distribution of water, it also organizes farming activities in a way that pooled farm equipment can be orderly shared by IA members.

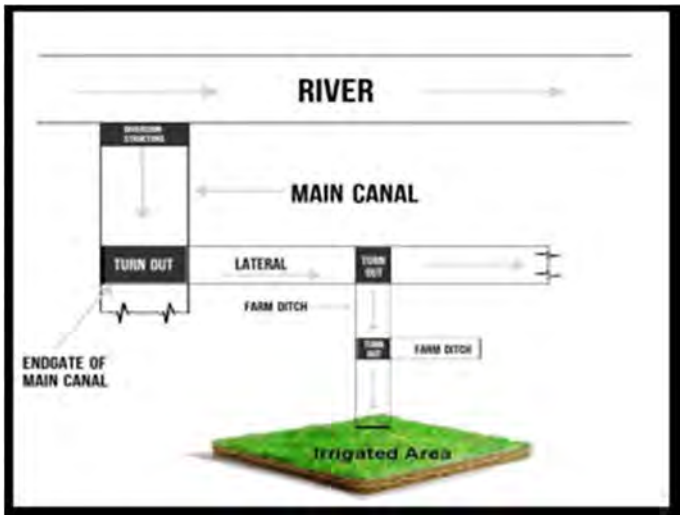


Figure 6.4 Water Distribution in Irrigation System

[56]NISs have more than 1,000 ha irrigated areas with a number of IAs depending on contiguity and size; one IA usually covers areas supplied by a main farm ditch (MFD).

2) Irrigation development accomplishment in Bangsamoro

Accomplishments of NIA in development of irrigation systems in the Bangsamoro region are 25,643 ha under the NIS category and 19,278 ha under the communal irrigation systems category.

NIA operates eight NISs with a total irrigated area of 28,380 ha in the two provinces of ARMM, Lanao del Sur and Maguindanao. However, only 24,339 ha are serviced by the eight NIS in ARMM (Table 6.3). Maridagao with an irrigated area of 5,608 ha covers North Cotabato with 3,838 ha and Maguindanao with only 1,770 ha. The eight NISs are performing poorly at it only irrigates barely 55% of the total area during wet season and only 51% during dry season. Ideally, irrigation systems should at least double the cropping for rice in a year. In some areas, irrigation enables rice farmers to plant three times. According to NIA, the poor performance of the NISs is mainly due to the low level of funds allocated for the operation and maintenance.

Table 6.3 Existing NISs in Bangsamoro Region

System	Province	Service area (ha)	Firmed-up area (ha)	Irrigated area (ha)	
				Wet	Dry
Ditsaan Ramain	Lanao del Sur	475	475	0	0
Nalaig RIP	Lanao del Sur	2,750	2,750	478	456
Rugnan RIS	Lanao del Sur	3,050	3,050	932	902
Alip RIS	Maguindanao	3,311	3,311	1,648	2,157
Kabulnan RIS	Maguindanao	11,783	11,783	7,450	6,904
Maridagao RIS	Maguindanao	1,770	1,770	1,362	1,094
Pagalungan RIS	Maguindanao	1,200	703	630	368
Talayan RIS	Maguindanao	700	700	656	653
Total		24,339	23,842	12,501	11,880

Source: National Irrigation Administration, River Irrigation System (RIS).

NIA has turned over 87 CISs with a total irrigated area of 12,215 ha. Table 6.4 shows the performance of CISs. Out of the 12,215 ha total service area in the five provinces, only 34% is operational.

Table 6.4 Existing Communal Irrigation Systems in Bangsamoro

Province	CISs (n)	Total service area (ha)	Total firmed-up area (ha)	Operational area (ha)	Non-operational area	
					(ha)	(%)
Basilan	3	145	145	84	61	42
Lanao del Sur	30	5,970	5,970	1,752	4,218	71
Maguindanao	36	5,454	5,454	2,001	3,453	63
Sulu	7	435	435	236	199	46
Tawi-Tawi	11	211	211	78	133	63
Total/overall	87	12,215	12,215	4,151	8,064	66

Source: ibid.

3) BSWM scheme of development and accomplishments

BSWM is a staff bureau of DA created under Executive Order No. 116. One of its mandates is to undertake the design, preparation and implementation of small-scale irrigation projects (SSIPs) with the local government units and the Regional Field Units of DA.[57] The SSIPs implemented by BSWM are funded from the Agri-Pinoy Program and other funds from foreign-assisted programs managed by the National Agriculture and Fisheries Council. BSWM develops the plans and programs for the development of SSIPs under the rice and the high-value crop (HVC) programs of the government. Under the rice program, projects cover an irrigable area of about 30 ha on average. For HVCs, project areas are much smaller with about 3.0 ha.

Identification of projects is undertaken by the DA-Regional Field Offices (RFOs) in consultation with the farmers in the area. Initially, projects were being designed by the BSWM central office. At present, these are now done by the DA-RFOs through its interim Regional Agricultural Engineering Division

[57]Mandates of BSWM, www.bswm.da.gov.ph

(RAED). RAED subsequently undertake the preparation of feasibility study submitted to BSWM for evaluation together with the project design. Approved projects are implemented by the DA-RFO through RAED. RAED either directly implements projects through bidding or enters into a memorandum of agreement (MOA) with an LGU. The irrigators' associations under the BSWM projects are called small water irrigation system associations (SWISA), whose organization start during project identification. Table 6.5 shows the institutions and their participation in irrigation development under BSWM.

Table 6.5 Institutions and Activities in Irrigation Development under BSWM

Institution	Pre-development	Project development	Construction	Operation
DBM	1. approves projects	1. Releases funds		
DA-BSWM	1. Evaluates project proposal 2. Includes project in DA Rice or HVC Program	1. Checks design	1. Evaluates construction progress for policy purposes	1. Evaluates operation for policy purposes
DA-RFO thru RAED	1. Identifies projects with farmers& LGU 2. Designs project 3. Submits proposal with design and feasibility study 4. Conducts information & education of the farmers thru a community development officer	1. Inters into MOA with LGU 2. Alternatively, bids out project construction	1.Awards project to winning bidder for construction 2. Monitors construction progress 3. Accepts/reject projects from contractors 3. Monitors projects under LGU 4. Submit monitoring report to BSWM	1. Turns over irrigation facilities to SWISA under MOA 2. Provide assistance and monitor operation by SWISA
LGU	1. Provides assistance in identification of projects	1. Inters into MOA with DA-RFO 2. Bid out projects 3. Alternatively construct project by administration		
SWISA	1.Initial activities for organization	1. Formalize organization 2. Registration and licenses 3. Receive trainings		1. Operates irrigation system 2. Receives training from RAED 3. Draw up cropping calendar for members to follow

Source: Bureau of Soils and Water Management Office, DA.

(2) Philippine Coconut Authority (PCA)

The Philippine Coconut Authority (PCA) was created pursuant to Presidential Decree 232 on June 30, 1973. It is tasked to develop the industry to its full potential and is mandated to oversee the development of the coconut and other palm oil industry in all aspects. The functions of PCA are to implement nationwide coconut planting-replanting and farm productivity programs; conduct research, development, and extension (RDE); and establish quality standards for coconut products. In line with its objectives and functions, PCA undertakes RDE focusing on varietal improvements, biotechnology, crop nutrition and integrated crop protection, maintains seed farms, distributes seedlings for replanting and salt for fertilization, building up of entrepreneur cooperatives of coconut farmers.

The creation of ARMM did not include devolution of the functions of PCA to ARG. However, to continue the PCA services to the coconut farmers in ARMM, PCA created another regional office, PCA-ARMM with office located in Cotabato City. It covers Lanao del Sur, Maguindanao and BaSulTa provinces. It provides services to coconut farmers in the region, thus coconut farmers in ARMM get

similar services as other coconut farmers in other parts of the Country.

(3) Philippine Fiber Development Authority (PhilFIDA)

The Philippine Fiber Development Authority (PhilFIDA) is the agency created by the consolidation of the Fiber Industry Development Authority (FIDA) and the Cotton Development Authority (CODA) as confirmed by the Department of Budget and Management (DBM) on 29 May 2013 under the Rationalization Plan (RP). It has nine regional offices, two of which are in Mindanao (Davao City and Zamboanga City). It is mandated to promote the accelerated growth and development of the Philippine fiber industry in all its aspects including research and development, production support, processing, and trade regulation. The major fiber crop being supported by PhilFIDA in the Bangsamoro region is abaca.

Despite the presence of abaca farms in Bangsamoro, PhilFIDA has no presence in the area. Its regional offices 9, 10 and 11 are located in Pagadian City, Cagayan de Oro City and Davao City, respectively. Region 11 operates a nursery in Bago Oshiro, Davao City. This facility produces planting materials from tissue culture for propagation of stocks through field multiplication. Recently, its production of planting materials are funded by the Department of Agriculture to support the victims of Typhoon Pablo in Davao Oriental.

(4) Market support as a function of National Food Authority (NFA)

The National Food Authority (NFA) was created through Presidential Decree No. 4 dated September 26, 1972 under the name of the National Grains Authority (NGA) with the mission of promoting the integrated growth and development of the grains industry covering rice, corn, feed grains and other grains like sorghum, mongo, and peanut. Over time, the agency has undergone several reorganizations and revision and refocusing of its functions. Currently, its core functions include ensuring food security and stabilization of supply and prices of staple cereals. It is one of the national government agencies operating the ARMM territories but organizationally kept under the national government.

NFA delivers an important support services to the farmers, rice farmers in particular. NFA participates in the buying of palay in order to protect the farmers from depressed prices, which normally occur during harvest season. However, according to NFA Region 14, the agency's procurement of palay has diminished due to the acceptable market prices at the farm gate. The current price support for rice is PHP 17.00/kg and for corn, PHP 10.00/kg. According to NFA, the prices of palay have already reached PHP 20.00/kg, which far surpasses the price support of the government. Table 6.6 shows the procurement participation of NFA in rice.

Table 6.6 Historical Rice Procurement Participation of NFA

Province	2008 (kg)	2009 (kg)	2010 (kg)	2011 (kg)	2012 (kg)	2013 (kg)	2014 (kg)	Total (kg)
Maguindanao	299,142	0	0	0	0	11,305	0	11,305
Lanao del Sur	0	0	0	0	0	17,910	156	18,066
Sulu	0	0	0	0	0	0	0	0
Tawi-Tawi	0	0	0	0	0	0	0	0
Total	299,142	0	0	0	0	29,215	156	29,371

Source: NFA, Region 14 (ARMM).

6.2 Financial Institutions and Agricultural Credit Support

There is not much demand for financial services in ARMM. Data of the Central Bank of the Philippines (BSP) showed that in 2011, the deposit liabilities in the region is only PHP 3.9 million while loan portfolio is barely PHP 0.43 million or a loan-deposit ratio of 11%. Both deposits and loans in the region are the lowest in the Country. This is accounted to poverty and distances to banks, which are all located in the cities or urban centers. More than 80% of the municipalities do not have any bank. As presented in Table 6.7, there are 36 bank branches in all the five provinces with about a half located in Cotabato City.[58]

[58]Working Paper No. 7, Banking and Finance in the ARMM, www.pcid.org

Table 6.7 Banks Operating in Bangsamoro Provinces

Province	Classification	No. of Banks
Lanao del Sur	Commercial Banks	4
	Rural/Savings Bank	1
Maguindanao	Commercial Banks	1 + 17[59]
	Rural/Savings Bank	1
Basilan	Commercial Banks	3
	Rural/Savings Bank	2
Sulu	Commercial Banks	4
	Rural/Savings Bank	
Tawi-Tawi	Commercial Banks	3
	Rural/Savings Bank	

Source: Provincial CDP-ELA, BSP.

This low availability of financing is reflected in the economic regional economic account. Bangsamoro's contribution is the lowest in the GDP at 0.72%. With the region's largely agriculture dominated economy, commercial banks do not see opportunities for lending.

6.2.1 Land Bank of the Philippines (LBP)

The Land Bank of the Philippines (LBP) created by RA 3844 (Agricultural Land Reform Code) on 8 August 1963 to finance the acquisition and distribution of agricultural estates for distribution to small landholders. LBP is a government financial institution that strikes a balance in fulfilling its social mandate of promoting countryside development while remaining financially viable. This dual function makes LBP unique. The profits derived from its commercial banking operations are used to finance the Bank's developmental programs and initiatives. Like other commercial banks in Philippines, LBP is under the supervision of BSP. [60]

Agricultural financing needs are currently almost single-handedly handled by LBP due to the limited operations of commercial banks in the region. It has seven branches in all the provinces: One in Basilan (Isabela City), two in Lanao del Sur, two in Maguindanao, one in Sulu, and one in Tawi-Tawi. Three branches are also operating Cotabato City. LBP financing can be accessed thru four lending centers; Bukidnon, Cagayan de Oro City, Kidapawan, North Cotabato and Zamboanga City. Borrowers can go to any Lending Center on the basis of accessibility. For the same purpose, borrowers from Bangsamoro area are directed in the following centers:

- Cagayan de Oro and Malaybalay Lending Centers for Lanao del Sur
- Kidapawan Lending Center for Maguindanao
- Zamboanga Lending Center for BASULTA

LBP implements the credit component of the national government's Sikat-Saka and the Agricultural Credit Production Program. Under the Sikat-Saka Program, individual farmers can borrow from LBP on the basis of the viability of their projects.

LBP, generally cater to group lending especially to agricultural cooperatives to finance their projects. Due to the poor performance of cooperatives, LBP is already lending to non-cooperatives with good track record. LBP also supports cooperatives in many aspects of their operations to help them become viable and be able to pay their loans. LBP provides trainings on accounting and financial management and conduct regular visitation. According to LBP, cooperative officers appreciate visits of LBP as it encourages their members to pay their loans.

Tables 6.8 and 6.9 show the loan exposure of LBP from 2004 to 2012 and the corresponding number of borrowers. Agricultural loans decreased from 2004 to 2012, indicating that the number of borrowers also decreased. LBP refers to peace and order as the main obstacle to lending in the Bangsamoro region. Rebels, ransom kidnappers, and other lawless groups continue to operate in the region. Loan repayment has been low due to the dole-out mentality of the people and lack of permanent addresses of farmers who often move due to military operations and rido. Moreover, difficult access to the island provinces

[59]Banks operating in Cotabato City
[60]Land Bank of the Philippines, www.landbank.com

is exacerbated by precarious infrastructure such as roads, power, and telecommunications.[61]

Table 6.8 LBP Agricultural Loan Exposure by Province

(Unit: PHP 10^6)

Province	2004	2005	2006	2007	2008	2009	2010	2011	2012
Basilan	29.990	26.079	21.641	16.745	14.476	14.476	22.033	20.345	21.542
Lanao del Sur	82.962	83.239	80.974	79.212	79.328	73.127	73.613	28.722	26.796
Maguindanao	120.734	111.468	104.046	104.257	88.914	68.184	40.307	41.607	33.638
Sulu	2.540	2.566	4.447	2.380	2.380	0	0	0	0
Tawi-Tawi	12.290	14.913	14.565	12.672	12.659	6.012	2.500	7.396	2.765
Total	248.516	238.265	225.673	215.266	197.757	161.799	138.453	98.070	84.741

Source: Mindanao Lending Group, Land Bank of the Philippines.

Number of borrowers reduced by almost 75% from 2004 to 2012. The number of borrowers from the island provinces is small in 2004. From 2009, no farmers from Sulu is borrowing while the number of borrowers in Basilan and Tawi-Tawi are few. At present, Cagayan de Oro Lending Center, has only one cooperative borrower from Lanao del Sur.

Table 6.9 Number of Borrowers from LBP by Province

Province	2004	2005	2006	2007	2008	2009	2010	2011	2012
Basilan	5	4	4	4	4	4	6	3	4
Lanao del Sur	58	51	56	34	34	39	38	12	10
Maguindanao	63	53	48	50	41	31	22	26	21
Sulu	4	4	4	2	2	0	0	0	0
Tawi-Tawi	10	10	7	7	7	3	1	3	2
Total	140	122	119	97	88	77	67	44	37

Source: Ibid.

6.2.2 Microfinance

Microfinance, also called microcredit, is banking on the unbankables, bringing credit, savings, and other essential financial services within the reach of people who are too poor to be served by regular banks, in most cases because they are unable to offer sufficient collaterals.[62] Institutions operating micro-finance include rural banks, cooperative banks and non-government organizations (NGOs). Recently, commercial banks like BDO have started offering microfinance, initially as corporate social responsibility program. With successes in this type of banking, however, many commercial banks have included this in their regular loan portfolio.

Microfinance addresses the issues of accessing financing from regular banks. Under microfinance, collaterals are waived in favor of other instruments like guarantee of community leaders like mayors, barangay captains, sultans, datus or even religious people[63] or group borrowing where members serve as guarantors of each other's loans. Although microfinance has had numerous successes in the international and national arena, both in farm and non-farm undertakings, it does not address the issue of agriculture's vulnerability to weather conditions and social unrest.

Agricultural projects that fail due to destruction by typhoons or abandonment of farms due to armed conflict cannot be covered by microfinance without concomitant insurance. Under microfinance "crop failure" is still paid by the borrower. Otherwise, a microfinance institution will not survive. Thus, the challenge of microfinance in agriculture is natural calamities[64] and peace and order condition in the case of Bangsamoro.

Although microfinance institutions carry a mission to uplift the economic condition of the poor, they

[61]VP Maria Celeste Burgos, Mindanao Lending Group, Land Bank of the Philippines, Lending to Agriculture and Development, www.pcid.org
[62]Gert van Maanen, Microcredit: Sound Business or development Instrument, Oikocredit, 2004; www.microfinanceinfo.com
[63]Interview with Cooperative Bank of Cotabato, Kidapawan City, July 14, 2015
[64] Interview with Mindanao Microfinance Council, Davao City July 15, 2015

have to earn profit their undertakings in order to survive. Thus, the lending rate in microfinance is dictated by the cost of funds used to lend or re-lend.

With the occurrence of Typhoons Pablo and Sendong in 2008 and 2010, Mindanao is not anymore typhoon-free as it used to be although these typhoons had little effect in the areas of Bangsamoro. Being far from the Pacific Ocean where strong typhoons are bred, PAGASA does not expect Western Mindanao to suffer from strong typhoons. Western Mindanao, particularly Bangsamoro provinces can also be spared from draughts due to abundant water resources in the area.

However, peace and order is still the most critical deterrent to the flow of credit into the Bangsamoro region even for microfinance. Most microfinance entities operate in the peripheries of the region like North Cotabato, South Cotabato, Bukidnon, Lanao del Norte and Misamis Oriental. They are not confident about success in financing entrepreneurial activities in Bangsamoro due to frequent armed struggles either between rebels and military or clan wars (rido).[65] Due to proximity, some of them have ventured into operating in Bangsamoro areas, however operations in the area were stopped due to poor collection.[66] Social unrest is the main reason for microfinance to shy away from Bangsamoro.

6.2.3 Philippines Crop Insurance Corporation (PCIC)

The Philippines Crop Insurance Corporation (PCIC) is a government owned and controlled corporation attached to the Department of Agriculture. The PCIC's principal mandate is to provide insurance protection to farmers against losses arising from natural calamities, plant diseases and pest infestations of their palay and corn crops as well as other crops. PCIC also provides protection against damage to/loss of non-crop agricultural assets including but not limited to machineries, equipment, transport facilities and other related infrastructures due to peril/s insured against. The Philippines is vulnerable to natural disasters which cause devastation of crops and miseries to agricultural producers and providers of agricultural credit.

Apart from protecting farmers from financial losses, crop insurance was also considered as an instrument that can be offered as *surrogate* collateral to banks and other financial institutions to influence and encourage them to continue participating and supporting government credit programs. Since late 1979 starting with rice and corn, PCIC has expanded insurance coverage to many agricultural crops including HVCs, livestock, fishery products, and non-crop agricultural assets (e.g., warehouses, rice mills, irrigation facilities, and agricultural equipment). Insurance also included terms insurance package for loan repayment protection plan, accident and dismemberment security scheme, and agricultural producers' insurance schemes.

Most of the insurance cover in the Bangsamoro area is built-in in the credit components of government programs for agriculture. PCIC and LBP collaborate in the provision of credit services. Production loans that are given to farmers or commercial farms are coupled with insurance to ensure the loan. Although this scheme is a direct benefit to LBP, the insurance helps the farmers secure loans to finance farming. However, financing from LBP is inadequate and more often, small farmers resort to borrowing from relatives and other informal credit providers.[67]

All of the insurance packages are available for farmers and agricultural producers in the Bangsamoro area. However, due to unprofitable operations, PCIC decided to suspend all insurance coverage programs of PCIC in Maguindanao. The suspension was imposed 10 years ago and has not yet been lifted. Although there is no suspension in Lanao del Sur, there has been no PCIC insurance coverage as there are no loans extended by LBP in the province. First, LBP has no loan exposure in the province. Second, the small number of personnel and the perception on peace and order are major draw backs for PCIC to reach out to Lanao del Sur. The only insurance coverage extended by PCIC to Lanao del Sur is the insurance cover for the 20 dairy cattle imported from New Zealand by National Dairy Authority delivered to MSU-Main Campus.

[65]Cotabato Cooperative Bank, Kidapawan City, July 14, 2015
[66]Rural Bank of Datu Paglas, Municipality of Datu Paglas, July 14, 2015
[67]JICA Study Team interviews with various farmers.

6.3 State Universities and Colleges (SUCs) and Research, Development, and Extension

The State Universities and Colleges (SUCs) play key role in the provision of RDE services for the growth of the agricultural sector in the Philippines. Along with instruction, they are tasked to undertake research and development. This section discusses SUCs' RDE program in agriculture.

6.3.1 Mindanao State University (MSU) System

The Mindanao State University (MSU) System is the only university in the Philippines with a special mandate of integrating the cultural communities, especially the Muslims into the mainstream of the nation's socio-cultural and political life. It has multi-regional service areas. Its 11 collegiate campuses are located in eight provinces and four out of the six regions in Mindanao. Of the 11 campuses, 5 are located in the Bangsamoro region: the main campus and MSU-LNCAT in Marawi City, MSU-Maguindanao in Dalican, MSU-Sulu in Jolo, and MSU Tawi-Tawi in Bongao. Each of the campuses including those in other regions offers courses in agriculture and fisheries. Among others, degree programs offered are Bachelor of Science (BS) in agricultural engineering, agronomy, animal husbandry, and agricultural education and extension.

Like other SUCs, the research fund allocated from the university budget is small and the Director for Agriculture Research must find funding for research proposals. On the main campus, funding for only students' research conducted as part of academic requirement can be found. Students do not receive any grant from the university; rather they fund their research by themselves. Albeit rare, some students obtain support from agricultural companies. In 2014, MSU-Maguindanao published the Needs Assessment Design Analysis (NADA) and the Varietal Trial for Four GSR Lines of Rice in Maguindanao condition, both commissioned by DAR-ARMM. Generally, research outputs are those produced by the students as in the case of the main campus.

The MSU main campus hosts the Philippine Carabao Center (PCC) to promote carabao raising and increase the number of heads in the provinces of Lanao del Norte and Lanao del Sur. Carabao is being promoted for meat and milk production and to increase the number of working animals in the area. Due to lack of accomplishment in the past, the PCC central office decided to merge PCC in the MSU main campus with PCC-USM in Kabacan. However, the President of MSU requested to retain the center and in return assured that PCC will be managed to function as expected. After a year of putting the center under a new Executive Director, PCC has more than doubled the number of heads of carabaos in the center and has resumed the dispersal program.

The MSU-College of Agriculture also operates a dairy farm supported by the government of New Zealand, which supply the cattle and technologies.

6.3.2 University of Southern Mindanao (USM)

The University of Southern Mindanao (USM) is nestled in a 1,024 ha campus in Kabacan, North Cotabato. It is one of the prime state universities in Mindanao. USM is mandated to carry out a four-fold functions of instruction, research, extension, and resource generation.

The research function of the university is geared towards discovery and expansion of science knowledge and development of appropriate technologies for its clientele through collaborative and interdisciplinary R&D activities. The USM Research and Development Office (USM-RDO) coordinates all research activities in the university, establish research priority areas consistent with the priority areas of the region and the national government, evaluate research proposals and endorse to funding by USM and other agencies.

USM operates two research centers: the USM Agricultural Research Center (USMARC) and the Philippine Industrial Crops Research Institute (PICRI). USMARC is the national research center for corn and fruits. It is also the regional center and cooperating station for rice, root crops, legumes, vegetables, poultry and livestock, farming systems, soil and management, forage and pastures and socio-economics. PICRI is the national research center for rubber, cacao, coffee, spices and essential oil-bearing crops, fiber crops, oil crops and other industrial crops. PICRI hosts the Philippine Rubber Testing Center (PRTC), which is the lone rubber testing center in the Country that assists the rubber

producers keep up with the quality standards and become competitive in the international market.

The extension program of the university is being implemented through the University Extension Services Center. This center facilitates the transfer of packages of technologies generated from the researches of the university. It holds trainings and other methods of technology dissemination to the farmers and other technology users.

The RDE program of the university is funded from its internally generated funds (from tuition fees), national government budget and the Production Economic Research Fund (PERF) and external sources. Usually, the bulk of the funds is coming from external sources, such as the Department of Agriculture's Bureau of Agricultural Research (DA-BAR), the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD), the Commission on Higher Education (CHED), the Visayas State University (VSU), and DA. In 2012, the university received funds from the World Cacao Foundation, Inc. The research budget of the university in 2012 is shown in Table 6.10.

Table 6.10 Research, Development, and Extension Funds of USM in 2012

Fund Source	Amount	% of Total
National budget	6,367,000.00	8.11
Local fund (from tuition and fees)	793,083.00	1.01
PERF	1,714,924.63	2.18
External sources	69,620,148.46	88.31
Total	78,495,156.09	100.00

Source: 2013 USM Annual Report.

Although USM is situated outside Bangsamoro, its proximity benefits the regions' agriculture. Many technologies from the university find way to ARMM Integrated Agricultural Research Center (ARMMIARC), particularly to ATs who provide technical advice to the farmers.

The USM campus houses two agencies of the national government that also provide agricultural support services: PCC and PRTC. PCC promotes increase in carabao population for various purposes such as draft, meat, and milk. PRTC provides conducts testing of crude rubber and issues grade certification.

6.3.3 Other agricultural schools and research institutions

The Upi Agricultural School (UAS) was established in 1919 as primary and elementary school. In the 1970s, it started to offer undergraduate courses in agriculture such as agriculture technology and agricultural education. Being situated in an agricultural community, UAS endeavors to be responsive. Its current projects include improvements in coffee, coconut and rubber production. These three separate programs have nursery, techno-demo farms and plantations. The demonstration farms are intended to showcase technologies and provide planting materials. Plantations are established to further demonstrate farm level performances and also to earn income for the school. Other UAS projects are on bio-N, Trichoderma, and vermiculture. In an effort to respond to Muslim communities, UAS started a project on halal goat-raising.

With little funding from government budget, UAS is able to source funds from various entities like the local government of Upi, Metro Kutawato Development Authority (MKDA), DAF-ARMM, DA-BSWM, and the J-BIRD project of JICA.

In addition, there are state colleges with agriculture programs and currently partners of the Bureau of Agricultural Research (BAR) of the national DA. They derive funding from BAR for conduct of researches in their locations. These are the following:

1) Adiong Memorial Polytechnic State College in Ditsaan, Ramain, Lanao del Sur;
2) Basilan State College in Isabela, Basilan;
3) Sulu State College in Jolo, Sulu; and
4) Tawi-Tawi Regional Agricultural College in Bongao, Tawi-Tawi.

6.4 ARMM Institutions for Agricultural Development

RA 6734 or the Organic Act for the Autonomous Region in Muslim Mindanao as the law title expresses, provided for the establishment of ARMM with a basic structure within the framework of the Constitution and sovereignty and territorial integrity of the Republic of the Philippines (Article 1 Section 2). Consistently, the law provided for the devolution of powers of the national government over the area coverage of the autonomous government under Article V. Under Article VII, the ARMM is provided a Regional Assembly vested with legislative powers, of which the power of the purse is included. The Regional Assembly approves the budget of the Autonomous Region (Section 3 Article VII).

Under Article X, ARMM is to exercise fiscal autonomy and has the power to create its own sources of funds and to levy taxes, fees and charges subject to the guidelines and limitations under the Constitution and the organic Act. Thus, the sources of revenues of ARMM include:

1) Taxes imposed by the Regional Government;
2) Fees and charges imposed by the Regional Government;
3) Appropriations, internal revenue allotments and other budgetary allotments form the national government; and
4) Block grants derived from economic agreements or conventions, donations, endowments, foreign assistance, and other forms of aid.

Agriculture and fisheries regulatory and development are among the functions of the national government devolved to ARMM under Section 2 (6) of Article V. This necessitated the establishment of the Department of Agriculture and Fisheries (DAF) under the direction and supervision of the Autonomous Government.

6.4.1 DAF-ARMM

The DA's functions over ARMM were devolved to the ARG on May 17, 1991 by virtue of Executive Order No. 460. The powers and function, the control and supervision over its offices in the region and for other purposes were likewise devolved and this paved the way for the birth of DAF in ARMM

DAF-ARMM envisions a modernized smallholder agriculture and fisheries for a diversified rural economy that is dynamic, technologically advanced and internationally competitive. As such, its mission is to help and empower the farming and fishing communities and the private sector to produce enough, accessible and affordable food for every Filipino and a decent income for farmers in the region.[68]

DAF-ARMM is headed by the Regional Secretary supported by the Assistant Regional Secretary. It has three directors, each in charge of administration and finance, field operations and RDE. The Regional Secretary maintains coordination with the national DA and its attached agencies for implementation of national programs in ARMM and the Regional Agriculture and Fisheries Council (RAFC) for the integration of all agriculture and fisheries-related program implementation. . The office of the Director for Field Operations directly supervises the provincial agriculture officers and the municipal agriculture officers, whose offices are within the structure of DAF-ARMM. Figure 6.5 shows the organizational set up of DAF-ARMM.

The DAF-ARMM's programs are all directed towards supporting the farmers, large and small although more services are targeting small producers. Its programs may be categorized into production support, market assistance and regulations. Production support is intended to increase productivity of producers and consequently increase their incomes. Frontline services for production support in crops include distribution of subsidy in the form of inputs such as planting materials, fertilizers and chemicals; farm machineries such as tractors, tillers, threshers, and farm implements; postharvest facilities such as dryers and simple processors; provision of infrastructure for irrigation and FMRs and dissemination of technology through the agricultural technicians, demo farms, and trainings.

To support crop production, ARMMIARC maintains and operates laboratories for analysis of soils, seeds, propagation of trichoderma, and plant nurseries. Frontline services for livestock and poultry include

[68]DAF-ARMM, www.daf-armm.gov.ph

dispersal of livestock and poultry; provision of technology through the technicians, trainings and demonstrations (including halal livestock production); and conduct vaccinations and artificial insemination. For livestock and poultry, ARMMIARC operates the Regional Animal Diseases and Diagnostic and undertakes upgrading of small ruminants and production of forage and pasture seedlings.

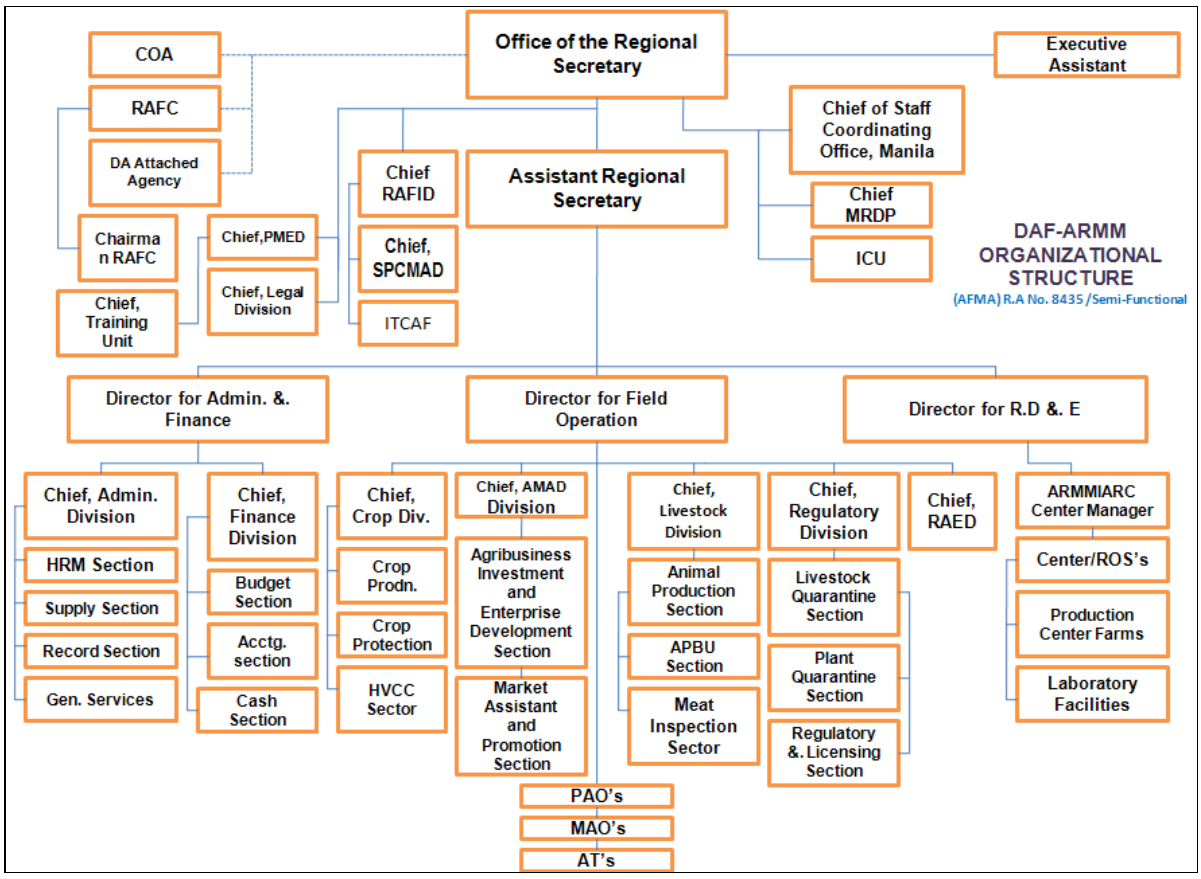


Figure 6.5 Organizational Chart of the Department of Agriculture-ARMM

Frontline services for market assistance include distribution of print materials, conduct of market survey and establishment of *bagsakan* [agricultural product wholesale market] in strategic areas. Farmers are also supported through the regulatory functions of DAF-ARMM. The agency is responsible for the issuance of various permits pertaining to meat safety, veterinary health, and domestic transport of plants/plant by-product. Similarly, it is responsible for the registration and/or accreditation of feed production establishments, livestock and poultry dealers, livestock handlers, veterinary drug/biologic outlets, and seed growers.

The sources of funds for the operation of DAF-ARMM are the regular ARMM-General Appropriations Act (GAA), the national government, and foreign assistance through foreign assisted project and local funds. Like the national government, the ARMM Legislature also enacts the budge of ARMM and this is where the budget for the operations of DAF is taken from. The funds from the national government come to ARMM as national programs implemented in the region. Foreign assisted projects contracted by ARMM are also appropriated for the agricultural development projects in the region.

Table 6.11 shows the approved budget for agriculture and agrarian reform services under DAF and DAR of ARMM. About two thirds of the annual budget is allocated to paying the personnel of the two departments and one third is left for MOOE, which are used for the services given to the farmers. It should be noted that for the annual budgets over six years, there was no allocation for capital outlay.

DAF-ARMM depends on the national government for implementation of development programs and projects. The funds coming from the national government are program-based. From 2012 to 2014, these programs and projects are AgriPinoy, GPBP/BuB, TISP and PAMANA.

Table 6.11 Budget for Implementation of Agriculture and Agrarian Reform Services (RDAFAR)

Year	Personal services	Maintenance & operation expenses	Capital outlays	Total	% of total budget for programs & projects
2008	248,257,000	140,965,000		389,222,000	6.72
2009	289,918,000	123,800,000		413,718,000	5.99
2010	294,003,000	138,172,000		432,175,000	6.04
2011	320,988,000	111,665,000		432,653,000	5.22
2012	346,263,000	114,579,000		460,842,000	5.10
2013	395,985,000	117,301,000		513,286,000	4.96

Source: Department of Budget and Management, www.dbm.gov.ph.

The agricultural development program under the current administration is called the AgriPinoy. The Agri-Pinoy program is a nationwide regular program of the national government for agriculture. It is also called the agriculture banner program. It covers the national government's program on rice, corn, high-value crops (HVC) and livestock and poultry. Under each program, the government provide the following:

1) Production support services
2) Irrigation development services
3) Other infrastructure and postharvest development services
4) Market development services
5) Extension support, education and training services
6) Research and development services
7) Support for policy-oriented services for the AgriPinoy Program

The AgriPinoy program has covered all the Bangsamoro provinces under its rice, corn, and HVC development programs as well as livestock and poultry. Table 6.12 shows the funding for the four banner programs of Agri-Pinoy for ARMM. In 2012, the program served 211,311 farmers in total.

Table 6.12 Agri-Pinoy Fund Allocations for ARMM

Banner Program	2012	2013	2014
Rice Program	83,271.00	249,000.00	294,704.21
Corn Program	132,826.00	50,000.00	77,421.80
HVCDP Program	5,003.00	21,000.00	40,769.00
Livestock & Poultry	12,295.00	11,000.00	15,000.00
Total	233,395.00	331,000.00	427,895.01

Source: DAF-ARMM.

The TISP is a one-year program whose projects were funded from the Development Assistance Program (DAP), which was challenged on various legal and administrative issues. The TISP is a one-year program funded from the Stimulus Fund- DAP of the Office of the President. It funded several types of agricultural support service, in particular, for FMRs. In 2013, the total allocation for agriculture was PHP 325 million, of which about 90% went to construction and rehabilitation of FMRs. The rest were used to finance rubber nursery, cassava grate and halal goat raising. The TISP was halted following the administrative and legal issues hurled against the DAP.

The GPBP/BuB is multi-sector program, under which local people identify projects. The GPBP/BuB is an ARG Program that funds such grassroots projects. This program covers all the five provinces under ARMM (Table 6.13). Like TISP, the GPBP/BuB program covers projects on construction, rehabilitation and concreting of FMRs, livelihood, postharvest facilities and other infrastructure and irrigation rehabilitation and concreting of barangay/farm-to-market roads.

The Payapa at Masaganang Pamayanan (PAMANA) is a project of OPAPP for development of peace and implemented by ARG. It is a national government program that extends development intervention to isolated, hard to reach and conflict affected communities to ensure that these areas are not left behind in development. All Bangsamoro provinces are covered by this program under its two cluster area: ZAMBASULTA for Basilan, Sulu and Tawi-Tawi and Central Mindanao for Lanao del Sur and

Maguindanao. The project covers all types of location-specific assistance. In the Bangsamoro region, PAMANA has established trading posts thru the cooperatives.

Table 6.13 GPBP/BuB Funding for Agriculture, 2014

(Unit: PHP 1,000)

Project	Basilan	Maguindanao	Lanao del Sur	Sulu	Tawi-Tawi	Total
Farm-to-Market Roads	27,425.00	325,711.79	255,360.00	90,600.00	24,125.00	723,221.79
Livelihood	34,463.91	35,509.30	27,924.65	31,435.24	16,780.00	146,113.10
Postharvest & Other Infra.	4,485.60	29,885.00	20,829.25	40,440.95	1,000.00	96,640.80
Irrigation	-	8,800.00	5,280.00	-	-	14,080.00
Total	66,374.51	399,906.09	309,393.90	162,476.19	41,905.00	980,055.69

Source: DAF-ARMM (www.daf.armm.gov.ph).

For the GPBP/BuB, TISP and PAMANA, the allocation for agriculture is disbursed for the projects of DAF-ARMM. These programs are multi-component, which include projects on provision of; livelihood, infrastructure, such as FMRs and irrigation, postharvest facilities and machineries, farm inputs and market support facilities like product wholesale markets. The Agri-Pinoy is totally for agriculture and hence, all funds received by the ARG are disbursed for the projects of DAF-ARMM, accordingly.

DAF-ARMM coordinates the implementation of the Philippine Rural Development Program (PRDP), which is a World Bank financed project and the Technical Cooperation Project (TCP)-5 under Philrice and funded by JICA. It is an expanded program from the Mindanao Rural Development Program (MRDP), which has also covered the Bangsamoro region. The PRDP aims to increase rural incomes by enhancing productivity in agriculture. The PRDP uses value-chain analysis, expanded vulnerability and suitability and provincial/city commodity investment plan.[69]

These tools are used to guide government planners to plan infrastructure development in the rural areas and design support services for the farmers/producers and to guide the farmers to plan their investments in agriculture. The PRDP uses the tools to approve and monitor projects proposed by the LGUs and rural institutions. LGUs/DAF-ARMM are requested to submit project proposals, which are evaluated by PRDP on the basis of its pre-qualification criteria for approval. Only approved projects are funded by PRDP. Currently, there are no projects being implemented in Bangsamoro since no project proposals has been received from the Bangsamoro areas.

On the other hand, the TCP-5 is a project that develops and promotes rice-based farming systems that integrates production of cash crops such as vegetables and fruits. Under the project, Philrice develops area-specific farming systems to increase rice yield and to provide rice farmers diversified sources of income. Techniques like farmer field school (FFS) and farmer-to-farmer (FTF) training are being employed to fast track dissemination of technologies and good farming practices. Through shared efforts of the farmers-collaborators, DAF technicians and Philrice, systems are being improved to enhance adaptability.

The rice crop manager (RCM) is a kind of "disruptive innovation"[70] as it changes method of agricultural extension services. Under the RCM, all conditions for growing rice in an area is analyzed, on which basis fertilizer, water application, rice variety and other parameters are recommended. Employing the RCM have staggering results. TCP5 showed that farmers following all recommendations are able to harvest as much as 12 ton/ha, which is more than four times higher than the region's average in irrigated areas and higher than the usual productivity of well-managed farms. The ARMMIARC further improved the RCM by creating a database of farmers and including an identification system where farmers receiving the RCM assistance are given an ID that they can present when they report progress, have queries or ask for further assistance. This is an innovation that enhances the system of monitoring and evaluation to understand the weaknesses of extension services.

[69]DA-PRDP, www.daprdp.net

[70] Disruptive innovation is a new buzz word that defines the new order of development in the newly concluded 2015 Asia-Pacific Economic Forum (APEC). It is an innovation of existing system for a more responsive, effective and efficient ways of doing things.

6.4.2 DAR-ARMM and agrarian reform

On September 22, 1991, following the passage of RA 6734, the late former President Corazon C. Aquino signed Executive Order No. 482 mandating the devolution of the powers and functions of DAR in ARMM including the control and supervision over DAR provincial offices within the region. This led to the signing of memorandum of agreement between DAR and ARMM turning over the three DAR provincial offices of Sulu, Tawi-Tawi and Maguindanao to ARG including personnel, programs, projects, funds, and assets. The DAR provincial offices of Lanao del Sur and Basilan were turned over to ARMM in 1996 and 2004, respectively.

Consequently, the Comprehensive Agrarian Reform CARP and CARPER were implemented in the area of autonomy. DAR-ARMM is mandated to implement the program components such as Land Tenure Improvement, Program Beneficiaries Development, and Agrarian Justice Delivery (AJD), which are funded from the Agrarian Reform Fund (Fund-158). Other expenses of the agency are funded from the General Fund or Fund-101.

Land tenure improvement (LTI)

Land tenure improvement (LTI) is accomplished through land acquisition and distribution (LAD) to the qualified beneficiaries. Lands are acquired through: compulsory acquisition (CA), voluntary offer to sell (VOS), operation land transfer (OLT) and emancipation patent under PD 27. Most of the lands distributed or for distribution were acquired through VOS and CA. Lands acquired under the agrarian reform are paid for by the Government through the Land Bank of the Philippines (LBP), which was primarily established for the purposes of the agrarian reform program.

An inter-agency committee (IAC) was established to authenticate titles of agricultural lands sold to the government. The IAC is composed of representatives from the National Bureau of Investigation (NBI), LBP, DENR, and DAR as chair.

DAR also facilitates the process of leasehold agreement between the farmer-beneficiaries and landowners while land transfer is going on. This is done to make the land productive while being readied for transfer or distribution. According to DAR, there is decreasing interest among landowners to enter into leasehold agreement. As such, the activity was not funded in 2014.

By law, the CARP was to end on June 30, 2010. It was extended for another four years to end June 30, 2014 due to the large amount of lands uncovered in the CARP and was named CARPER. Under CARPER, VOS was deleted and CA was prioritized for implementation. With CARPER also ended, land acquisition has already stopped. However, lands that were already acquired will have to be distributed. The status of LAD in the five provinces of ARMM is shown in Table 6.14.

As of November 30, 2014, the total balance against ARMM scope is still a huge area of land of 113,564 ha. Unless, there is another extension, the remaining areas will remain with the land owners. Complying with the provisions of the CARPER, the DAR-ARMM continued with the land distribution program. From January to December 2015, Emancipation Patents (EP) and CLOAs generated corresponded to a total of 1,821 ARBs and 3,904.2 has. As of ending 2015, total ARBs is 109,900 corresponding to 266,614.2 ha.

Table 6.14 Cumulative LAD Accomplishment (as of November 30, 2014)

	Area (ha)					
	Bangsamoro	Basilan	Lanao del Sur	Maguindanao	Sulu	Tawi-Tawi
Scope	376,275	37,026	163,916	124,735	18,937	31,662
Accomplished	262,710	25,091	132,925	78,232	5,898	20,564
Balance	113,564	11,935	30,990	46,502	13,039	11,098
ARBs involved	108,079	10,036	53,170	31,280	5,368	8,225

Source: DAF-ARMM.

Under the AJD program, the DAR provides the following services to the agrarian reform beneficiaries (ARBs); provision of agrarian legal assistance to ARBs (representation of ARBs before the regular courts and/or before the DARAB), resolution of agrarian law implementation cases (done by the DAR

Regional Secretary or his authorized representatives, and resolution of adjudication cases.

Agrarian adjudication delivery (AJD)

Under the AJD program, DAR provides the following services to ARBs:

1) Provision of agrarian legal assistance to ARBs (representation of ARBs before the regular courts and/or before DARAB)
2) Resolution of agrarian law implementation cases (done by the DAR Regional Secretary or his authorized representative.
3) Resolution of adjudication cases

The implementation of agrarian reform is incomplete even to areas where LAD had been accomplished. Some ARBs complained of not getting their portions due to the lack of assistance to subdivide the areas under a CLOA. This would need survey, which is an expensive service that ARBs cannot afford. Some ARBs abandon the awarded lands due to erroneous survey leading to disputes and others leave due to natural calamities and arm conflict.

The difficulty is CARP implementation in the Bangsamoro area is exacerbated by the problems created by land conflicts. According to DAR, ARBs in conflict affected areas leave and abandon their lands. These lands are occupied by people and when their rightful ARB return, they experience difficulty in ejecting the illegal occupant. These type of cases add up to the agrarian adjudication that DAR have to deal with.

Beneficiaries Development Program

This program is an intervention to enable ARBs to maximize land productivity and increase economic livelihood opportunities and participate in community service as well as governance. Currently, DAR-ARMM is implementing two foreign-assisted projects:

1) Agrarian Reform Community Project Phase II (ARCP II) is an ADB-supervised project being implemented by DAR-ARMM for a period of five years. It is funded by the OPEC International Development Fund (OFID) providing US$30 million for ARMM.
2) Agrarian Reform Infrastructure Support Project Phase III (ARISP III) funded by JICA covering the municipalities of Saguiaran and Masiu in Lanao del Sur Province. The project has an approved project budget of PHP 60.37 million to construct FMRs and communal irrigation systems.

DAR-ARMM is also implementing two other projects; the ARC Development Support Project (ARCDSP) scheduled for implementation 2012 to 2017. It is designed to cover 10 ARCs distributed as five each in Maguindanao and Lanao del Sur.

The ARC Connectivity and Economic Support Services (ARCCESS) has been adopted by DAR-ARMM to accelerate the delivery of support services to the ARBs. The ARCCESS process ensures that the intervention provided by the project is the actually need of the ARC. The program starts with need identification, which is the basis for designing the project for a specific ARC. The support services are given to ARCs by batch.

6.4.3 DENR-ARMM and promotion of agricultural production in forest areas

DENR-ARMM is the result of the devolution of DENR operations in ARMM through Executive Order 425 Series 1990. DENR-ARMM executes the same programs with agricultural production-related components as the national DENR. As part of its strategy to preserve forest resources and prevent denudation of forests, DENR undertakes three programs: the Community-Based Forest Management (CBFM), the Integrated Forest Management Agreement (IFMA) and the National Greening Program (NGP). The CBFM and the IFMA are agreements on use of forestlands for production purposes while the NGP is a reforestation program that aims to plant 1.5 billion trees in 1.5 million ha.

The CBFM is a program of the Philippine Government to encourage reforestation and sustainable management of forests. Under a CBFM agreement, a community is entitled to develop and use a forest area and its resources for 25 years. DENR and the local government are mandated to provide technical assistance to CBFM participants to help them manage the forests sustainably. Under the agreement, the

government would help participants access investment capital, identify markets, and build marketing capabilities. CBFM agreements may be made in all areas classified as forest lands, including allowable zones within protected areas not covered by prior vested rights.[71] The principal participants in the program are local communities including indigenous people represented by their people's organizations (POs) and traditional tribal councils.

The IFMA is a production-sharing contract entered into by and between DENR and a qualified applicant. DENR grants to the latter the exclusive right to develop, manage, protect and utilize a specified area of forestland and forest resources therein for a period of 25 years with provision for renewal for another 25-year period. This is consistent with the principle of sustainable development and in accordance with an approved Comprehensive Development and Management Plan (CDMP) and under which both parties share in its produce.[72]

The NGP is a massive forest rehabilitation program of the government established by virtue of Executive Order No. 26 issued on Feb. 24, 2011 by President Benigno S. Aquino III. It seeks to grow 1.5 billion trees in 1.5 million ha nationwide within a period of six years, from 2011 to 2016. The NGP is a convergence initiative among the Departments of Agriculture, Agrarian Reform and DENR. Half of the targeted trees to be planted under the program would constitute forest tree species intended for timber production as well as protection. The other 50% would comprise of agroforestry species.

Areas eligible for rehabilitation under the program include all lands of the public domain. Specifically, these include forestlands, mangrove and protected areas, ancestral domains, civil and military reservation, urban greening areas, inactive and abandoned mine sites and other suitable lands.[73] Aside from being a reforestation initiative, the NGP is also designed to reduce poverty. The program provides alternative livelihood activities for marginalized upland and lowland households related to seedling production and care and maintenance of newly planted trees. It is also seen as a climate change mitigation strategy as it seeks to enhance the Country's forest stock as carbon sink.

6.4.4 Cooperative Development Authority (CDA)-ARMM and development of cooperatives as entrepreneurs

The Cooperative Development Authority (CDA) was created by RA 6939 to promote the development of cooperatives as instruments of social equity and economic development. CDA-ARMM handles the devolved functions of the national CDA in the region. However, it is still endowed with the powers under RA 6939. The powers and functions of CDA granted by the law are both development and regulatory. Among the development functions CDA are to support organizing of cooperatives, coordinate the efforts of LGUs and private entities in developing cooperatives, develop the managerial and entrepreneurial skills of cooperatives, and to administer grants coursed through the government for cooperatives. As a regulator, CDA registers cooperatives and their federations, require submission of financial statements and order cancellation of certificate of registrations in cases of non-compliance with requirements.

Since the introduction of cooperatives in the Philippines, few have been successful in developing entrepreneurial cooperatives. According to the cooperative development staff (CDS) of CDA, there are various reasons for the failure of cooperatives. The most common are as follows:

- Many cooperatives are organized when it is required to receive grants from projects. After the project implementation and once the grants are gone, cooperatives die.
- Absence of continuous good leadership. Cooperative that stood the test of time has a succession of good leaders equipped with acumen to hold together the members, knowledgeable in the financial and business undertakings of the cooperative.

The thrust of CDA is to provide training for cooperatives not only in establishing cooperatives but also on providing trainings for leadership, financial and business management. Due to its limited manpower

[71]Community-Based Forest Management in the Philippines, www.sourcewatch.org
[72]DENR Administrative Order No. 99-53
[73]The National Greening Program, www.ngp.denr.gov.ph

and resources, however, CDA can only conduct training for organization and registration. Other training needs of the cooperatives are given by private entities accredited by CDA. However, cooperatives complain of fees, which are beyond the capability of a starting cooperative.

CDA has registered a total of 1,869 cooperatives over the years of its operation in Bangsamoro (Table 6.15). The most number are cooperatives in Maguindanao at 35% of the total. Basilan has the least number of registered cooperatives. Of the total, only 21% or 395 are active. Active cooperatives are those that comply with the regular requirements such as submission of financial reports and other reportorial requirements. Sulu has the most number of active cooperatives, which are about 60% of its total registered cooperatives. Tawi-Tawi has the least number of active cooperative but it also has the least registered. On the other hand, Maguindanao has the largest number of registered but the most number of failing cooperatives (mostly cooperatives that have not been reporting for about a year).

Table 6.15 Status of Registered Cooperatives in Bangsamoro

Province	Registered	Active	Inactive			
			A	B	C	D
Basilan	52	17	3	0	30	2
Lanao del Sur	575	72	28	0	248	88
Maguindanao	655	43	41	27	416	128
Sulu	421	252	54	0	7	0
Tawi-Tawi	166	11	22	0	137	27
Total	1,869	395	148	27	838	245

Source: CDA-ARMM.

Cooperatives by definition are self-help organizations. Organization of individuals into cooperatives is being encouraged for the members to be able to undertake activities where they can earn a living collectively. As a means to encourage, cooperatives are given tax exemptions in various aspects of their transactions and support to start a business. Many government and non-government organizations have also channeled farming assistance to cooperatives. These assistance has probably made cooperatives forget their purpose and became dependent on dole-out in the form of production support, for example. Nevertheless, cooperatives can become potent institution to improve rural incomes for people with resources to develop and have the genuine motive to undertake income generation as a group. It is probably the method of nurturing of cooperatives that need rethinking.

6.4.5 Office of the Southern Cultural Communities (OSCC) and National Commission on Indigenous Peoples (NCIP) and protecting the rights of indigenous peoples

Land conflict is an overarching issue in the development of the Bangsamoro area. The issues related to the integration of indigenous peoples and Muslim Filipinos have always been recognized since the American regime. In 1997, the Philippine Congress enacted RA 8371-the Indigenous Peoples Rights Act (IPRA), which created the NCIP. Before the IPRA, OSCC was already in place and was among the national government agencies devolved to ARG. With the defined powers and functions of ARG under the Organic Act, OSCC was effectively detached from NCIP. Nevertheless, OSCC operates under the legal framework of IPRA, which was adopted by the ARMM Legislative Assembly to recognize the rights of the IPs in ARMM.[74]

Despite the IPRA, OSCC does not carry the functions of NCIP. It is under the supervision of ARG and continues to carry out its functions under EO 122-C and does not have the following power and functions of NCIP under RA 8371:

1) Issue CADT or CALT (Section 44)
2) Hear and decide disputes arising from delineation of domains (Section 62)
3) Quasi-judicial power (Section 69)

These functions are material to settlement of land disputes in the Bangsamoro but were unfortunately not applicable in most of the Bangsamoro area under the Organic Law nor in its subsequent amendment

[74]Resolution No. 269, adopted 15 August 2003 by the ARMM Regional Legislative Assembly

under RA 9054. The province of Basilan which chose to be under ARMM after the passage of the IPRA is covered by NCIP not OSCC.

6.5 Local Government Units and Their Agricultural Development Programs

6.5.1 Lanao del Sur

The provincial government of Lanao del Sur maintains an Office of the Provincial Agriculturist (OPAg) consisting of 28 regular personnel, 2 utility workers, and 25 casual employees. Its agricultural support program approved by the provincial legislative body includes distribution of pre- and post-harvest facilities, agri-rolling program, capability building of technicians and farmers, establishment of nursery, establishment of halal office, slaughterhouse and laboratory, carabao for work loan program, Manokan sa Barangay Program, Kambingan para sa Kaunlaran.[75] These programs are downloaded to the municipalities through the MAOs.

6.5.2 Maguindanao

The provincial government of Maguindanao operates an OPAg and an Office of the Provincial Veterinarian (OPV). The former implements agriculture programs (both crops and livestock development) funded from the provincial government, DAF-ARMM and the national government under various offices. The latter undertakes programs on animal health. The office of PA consists of 44 employees, of which 35 are permanent while seven are casuals. The OPV has 20 permanent, one temporary and three casuals. Most of these employees have technical backgrounds and work as agricultural extension workers.

6.5.3 Basilan

The Office of the Provincial Agriculturist of Basilan is composed of technical personnel who implement agriculture programs of the province and all support programs from DAF-ARMM and national government agencies in coordination with municipal agricultural officers. All technical personnel have their areas of expertise in agriculture and serve as agricultural extension workers. The province's agriculture program includes: establishment of techno-demo farms, distributions of farm inputs, machinery and postharvest facilities, organization of cooperatives and capability building for technicians thru seminars, conferences and tours.

The integration of "one town one product" (OTOP) into the local economy is one major component of expansion and maintenance of the Provincial Rubber Nursery strategy of the local government of Basilan to help boost the priority industries. The provincial government is committed to support the OTOP and assured assistance for the development of the products. Agriculture along with fisheries is a foundation of the province's economy.

Basilan holds a high competitive advantage in the production of rubber, and as such the government implements special program, which includes expansion of the Provincial Rubber Nursery to be able to distribute 12 million rubber planting materials. The program also includes establishment of a mini-rubber processing plant for the small growers. This would entail acquisition of coagulating tanks and conduct of trainings on best practices.

6.5.4 Sulu

The provincial government of Sulu endeavors to increase agricultural production output. For this objectives, its investment program for agriculture includes: completion of cadastral survey of farms, construction of FMRs, establishment of demo-farms, support services for organic farming, coco-based farming systems, high value commercial crops and construction of small irrigation projects.

[75]Lanao del Sur CDP-ELA 2013–2016

6.5.5 Tawi-Tawi

The province of Tawi-Tawi's agricultural development program consists of lobbying for financial support and inclusion of Tawi-Tawi in the national programs of government and imposing the policies set by the national government. The provincial government continually requests DENR-LMB to conduct surveys to delineate and identify areas for protection and prime agricultural lands. The projects that have been secured for Tawi-Tawi include

1) Agricultural productivity enhancement projects including distribution of hogs, wires, fertilizers, and seeds;
2) Construction of FMRs and CIS in ARCs; and
3) Organizing of POs in ARCs.

IEC is also among the activities of the provincial government. Under its comprehensive development plan, the Tawi-Tawi provincial government advocates the following:

1) Maximization of utilization of prime agricultural lands especially in the mainland
2) Issuance of moratorium on the conversion of prime agricultural lands into other uses
3) Prohibition of settlements in prime agricultural lands

CHAPTER 7 AGRICULTURAL PERFORMANCE

Chapters 2 through 6 of this sector report discusses the factors affecting agricultural production in the Bangsamoro region. To a large extent, agricultural production performance is dependent on physical attributes of the area, among which are climate, water resources and soils. Recently, agricultural production challenges include the vagaries of climate change. However, these are also tempered by good agricultural practices and measures to mitigate if not prevent the impact of natural disasters like floods and droughts.

However, optimization of these resources need intervention especially by the governments and the producers. The adequacy or inadequacy of these interventions are made apparent in the discussions of production performance. With the Bangsamoro being largely agricultural, economic status of people can also be tied to the performance of the sector. This is indicated by income levels from farming activities. It also indicates the ability of the agricultural activities to support the food requirement of the population. Thus, the analysis of the sector's performance are discussed here in terms of: (1) production volumes, planted areas, productivity, (2) food sufficiency levels, (3) income for the producers, (4) economic efficiency, and (5) contribution to the regional economy.

7.1 Production Volume, Planted Area, and Yield of Major Agricultural Products

The selection of crops discussed in this section refers to strategic importance, for example, grains as food staples. Other crops such as abaca, coconut, rubber, cassava, coffee, cacao, and other fruits remain as important crops due to long value chains, which characteristically have higher value added. Although production volumes are still small, other crops are discussed to show the potentials of these crops to the development of the region. As presented in the subsequent sections, some of these crops have strong comparative advantage in terms of area suitability and value added.

7.1.1 Grains

The Bangsamoro region produces two major grain crops important for the region's and the Country's food security. Rice or palay is Filipino staple food while corn is a major food and feed crop.

(1) Palay/paddy

The Bangsamoro area produces only about 3% of the Country's production volume of paddy. Among the 16 regions of the Philippines, the Bangsamoro is the second smallest producer[76] of palay not only due to the small area but also due to the low productivity particularly in the rainfed areas. About 65% of the total paddy production in Bangsamoro is from rainfed areas. In the last 10 years, volume of production grew by only 2.5%. Production in irrigated areas grew by a measly 0.38% compared to rainfed condition's 4%. Maguindanao produce about 67% of Bangsamoro's total followed by Lanao Sur at 30%. The rest, which is a small percentage are produced by the island provinces of BaSulTa. Production in irrigated areas has been declining in both provinces of Maguindanao and Lanao del Sur since 2007. In contrast, production from rainfed areas has been increasing.

The total area harvested in 2013 is 226,700 ha. From 2004 to 2013, area harvested increased at the rate of 2.2% annually. This increase is due to the increase in areas under rainfed condition, which grew at 3.0% annually. Over the last 10 years, this area harvested increased by about 39,000 ha. On the hand, harvested areas in irrigated condition only grew at a very minute rate of 0.23% annually although harvested areas continuously declined from 2007 to 2010 and again in 2012. Irrigated rice harvested area fluctuated over the period for various reasons including deteriorating condition of irrigation systems.

Palay is mostly planted in Maguindanao where widest lowland plains are located. In 2013, it comprised about 67% to the total harvested area in the region. Lanao del Sur shares about 31% of the planted areas. The very small portion of areas (2%) is shared by the island provinces mostly in the mainland of Basilan.

[76]Caraga is smallest producer but only by a small margin of 29,000 MT

Due to the terrain and soil of Sulu and Tawi-Tawi, rice production is nil.

In 2013, Bangsamoro's productivity in paddy is only 2.7 ton/ha, which is a result of a negative growth rate of 2% from 2004. It is the lowest among Mindanao regions. Productivity in Northern Mindanao, which is highest is 4.3 ton/ha. This makes a difference of 1.6 ton/ha more than that in Bangsamoro. Productivity in both irrigated and rainfed conditions are comparatively low. Bangsamoro's productivity in irrigated areas has also been lower than all regions in Mindanao. In 2004, it is about the same as many regions, however, from 2011 to 2013, productivity declined while neighbors increased, widening the difference. In 2013, Bangsamoro's productivity in irrigated areas is 1.0 ton/ha lower than that of Northern Mindanao's 4.40 ton/ha. Productivity in rainfed areas is also lower than the regions in Mindanao. At 2.43 ton/ha, it is also lower by 1.0 to/ha than Zamboanga Peninsula's 3.43 ton/ha. However, modest as it may be, productivity is on an upward trend in the 10 years of 2004–2013.

Compared to the performance of its neighbors in Mindanao, Bangsamoro lags behind. Rice production consumes large quantities of water and its availability at the right timing is key to productivity. Unfortunately, only about 25% of the area is irrigated. However, in both irrigated and rainfed conditions, rice productivity is comparatively low. It is lowest among neighboring regions. The physical condition of Bangsamoro show large areas suitable to paddy production. However, the low productivity could also be influenced by upland rice production, which has always been low in yield due to use of native varieties. The comparatively low productivity in both irrigated and rainfed areas also points to inadequacy in other inputs such as fertilizers and good farming practices. Figure 7.1 shows the performance in paddy production over the 10 years.

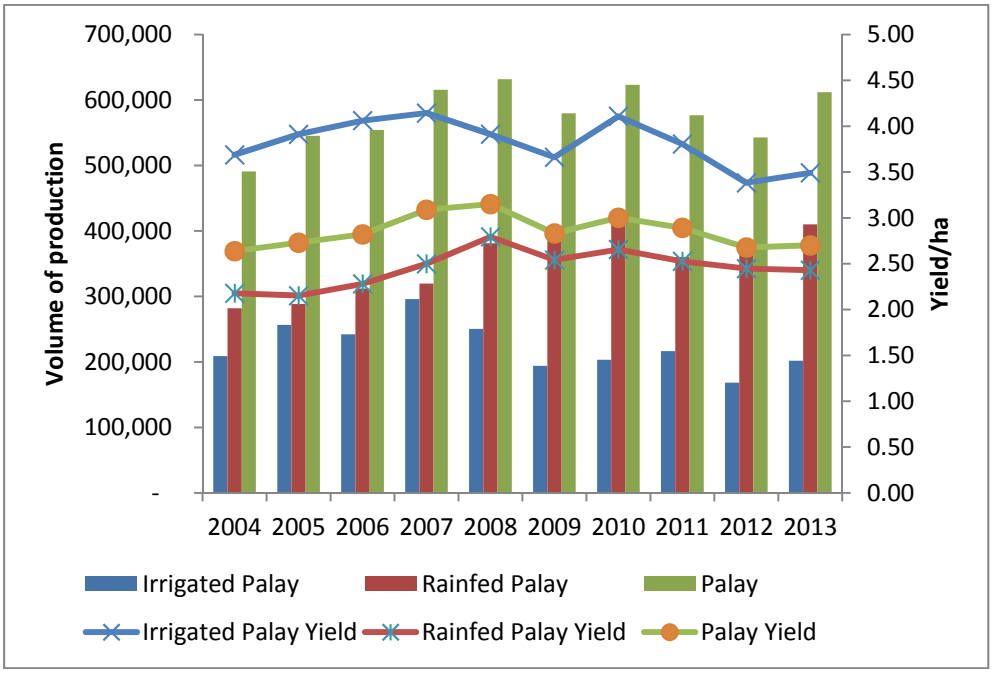


Figure 7.1 Palay Production Volume and Yield in Bangsamoro, 2004–2013

(2) Corn

Corn is next to rice in terms of strategic importance to the Bangsamoro region. Bangsamoro produces about 10% of the Country's total and about 20% of Mindanao's total. Overall, yield is low in comparison with the country's average and its Mindanao neighbors. The low yield can be attributed to the huge portion of white corn production, which are main native varieties.

Native corn varieties like many other native crop varieties are low yielding compared with their hybrid counterparts. Production of white corn in Bangsamoro ranges from about 70 to 85% of the total or about 77% on average. The region produces more than 25% of the Country's white corn production and about 35% of Mindanao's. Two other large producers of corn in Mindanao are Northern Mindanao and SOCCSKSARGEN.

Comparing with other regions' productivity, Bangsamoro has consistently topped all over Mindanao for 2004–2013. For the same period, its productivity is by far better than the national performance. Production of white corn will continue as it plays an important part in the Filipino diet as rice substitute and as snack food. Due to its soft texture and thin pulp, it is best preferred as grain substitute for rice and as boiled young corn. Yellow corn is generally used as feed for livestock.

Yellow corn production in Bangsamoro is about 23% of the total production in the 10 years. It is 4% of the total Country's production and a little less than 10% of Mindanao's over the 10 years. Productivity is a little less than the overall Country's performance but comparable. Production of yellow corn is contributed by only two provinces in Bangsamoro, Maguindanao and Lanao del Sur, the former having more production and area harvested in the 10 years. Production is low and it is interesting to note that yellow corn areas have been decreasing over the 10 years (0.6%) and at a higher rate for the last 5 years (6%). Consequently, this trend is followed by the volume of production.

Low productivity of corn is attributed to low levels of inputs as corn is generally produced by small farmers. Inadequate application of fertilizer and use of poor planting materials, usually taken from previous harvest are among the practices that define corn production in the region. This is particularly true to white corn production. Because corn can grow under a non-irrigated condition, corn is planted almost anywhere. It is planted as intercrop to coconuts or as monocrop in a few hectares or less. It is also common to see corn planted in high slopes where top soil is easily eroded and hence, devoid of nutrients. Yellow and white corn production and yield from 2004 to 2013 are shown in Figure 7.2.

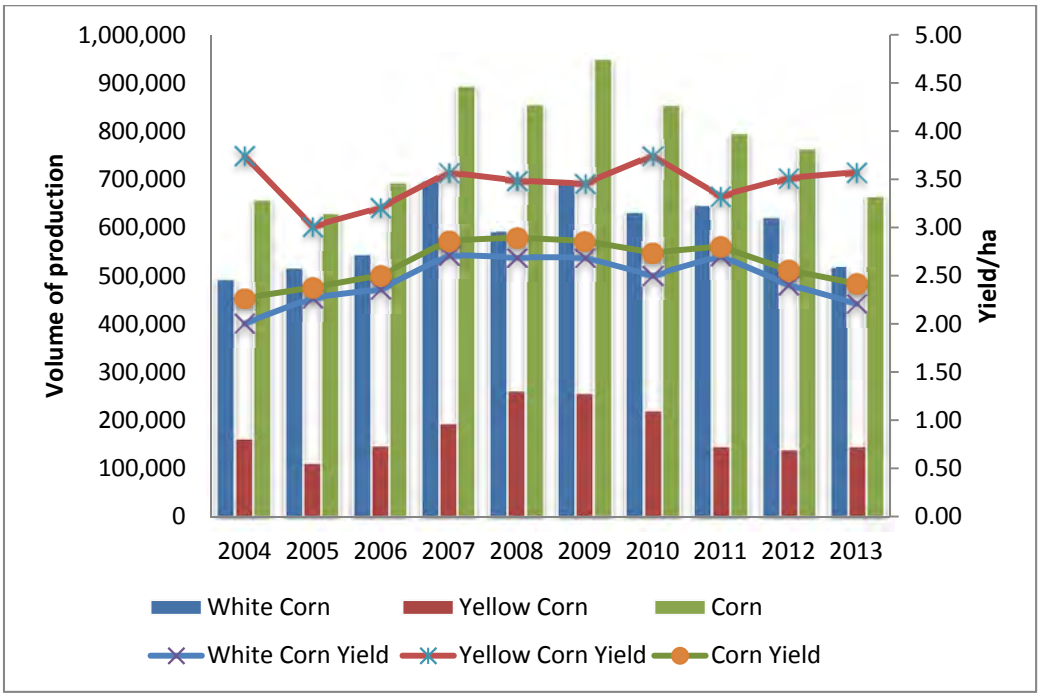


Figure 7.2 Corn Production Volume and Yield in Bangsamoro, 2004–2013[77]

[77]Data source: CountryStat (http://countrystat.psa.gov.ph/).

Corn Fields on Flat Land as well as High Slope Areas

7.1.2 Permanent crops

The Bangsamoro region is home to several permanent crops that are within the first important 20 crops of the Philippines. These crops include coconut, abaca, rubber, banana, coffee, cacao and various fruit trees. Many of these crops are significant in terms of export and great potential due to longer value chain and high value addition that goes along.

(1) Coconut

Coconut is an important crop in the Philippines. It has a long value chain as many products can be produced from processing. These products can vary from food to non-food. Food products are varied but include sugars and various health food preparations. Non-food products include coco-diesel as engine fuel and oleo-chemicals used for production of various cosmetic and domestic products such as soaps and other cleaning agents.

The coconut palm is a tropical plant and grows in almost any tropical condition although it is more productive in some conditions like well-distributed rainfall of 2,000 to 3,000 mm per year, over 27 °C, and more than 67% humidity. It can tolerate wide range of soil conditions. However, the palm does show certain growth preferences. A variety of factors such as drainage, soil depth, soil fertility and layout of the land has great influence on the growth of the palm. The major soil types that support coconut are alluvial, sandy loam, coastal sandy and reclaimed soils with a pH ranging from 5.2 to 8.0. Recommended spacing in plantations are 10 m x 10 m if intended for intercropping, 8.5 m x 8.5 m for monocrop and 12 m x 10 m for double-row planting.[78]

Over the last 10 years, production in the Bangsamoro area averaged 1.2 million ton/year, based on volume of nuts with husk. This is about 8.2% of the Country's production and about 14% of production in Mindanao. Mindanao itself produce about 50% of the total production of the Philippines. The largest producer in Bangsamoro is Maguindanao (40% of the region for the last 10 years) followed by Basilan and Sulu (17 and 16%, respectively).

Growing at an annual growth rate of 1.6%, the area planted to coconut in the region in 2013 reached 322,677 ha. A large part of this increase is due to the increased area in Maguindanao (6%). Basilan area decreased by less than 0.5% annually while the rest remained all throughout the last 10 years. About 28% of the coconut planted area is from Maguindanao and 21% each from Basilan and Sulu. Lanao del Sur coconut areas is small and mostly found in the western coastal municipalities up to the municipalities along the sloping areas. On the other hand, Tawi-Tawi is a small island with limited land area. Coconut thrive in coastal areas due to the tree's preference for salty soil.

In the last two years, the number of productive trees in Mindanao is stable with small increases and decreases. This is also true in the Bangsamoro Region where only Maguindanao showed a steady growth of 3.6% per annum while Lanao del Sur and Basilan had an overall negative growth. Yield per tree is low compared with the Philippines' average and all regions of Mindanao. Again, this is attributed to the low yields in the island provinces and Lanao del Sur. Maguindanao's coconut trees produce at a

[78]Interview with Ms. Marina Wahab of the Philippine Coconut Authority, Region 12, on February 19, 2015

comparative performance with other areas in Mindanao.

Average annual yield is a little bit lower compared to the national average but much lower than most of the regions in Mindanao. Davao Region's productivity is almost twice that of the Bangsamoro. Low productivity can be attributed mainly to the low productivity in the island provinces and Lanao del Sur. High productivity in Maguindanao has boosted the level for the whole region. Maguindanao's productivity at 5.8 ton/ha (and 61kg/tree in 2013) is comparable to the high performances of many regions in Mindanao. Generally, productivity is modestly increasing in all of Bangsamoro area. The number of old trees and pests in coconuts continue to adversely affect productivity in the region. Basilan Province still suffers from cocolisap infestation despite aggressive campaign on the application of integrated pest management (IPM) and other appropriate cultural methods.

Generally, small farmers do not apply fertilizers on coconut for lack of financing, ignorance or simply content with the productivity. The small budget of the PCA can only allow application of salt although coconut would bear more and quality nuts with application of potash muriate, ammonium sulfate, and solaphos.[79] Intercropping, especially with corn and other temporary crops is being encouraged as coconut trees benefit from the application of fertilizers to the second crop. The western stretch of coastal municipalities of Balabagan, Malabang, and Kapatagan are mostly intercropped with abaca, cassava, corn, and a few fruit trees (Photo 7.1). Down to the municipalities of Matanog, Parang, Sultan Kudarat, Sultan Mastura, and others, intercrops are mostly corn and bananas.

With the introduction of coco-pugon[80], the issue on aflatoxin in copra have already been minimized (Photo 7.2). This was well-received by coconut farmers as this technology saves them time and labor. Sun-drying normally takes 3-4 days[81] but with the coco-pugon, coconut meat drying takes only 48 continuous hours, which is less laborious.[82] Distribution of this technology remains an issue as most farmers complain of lack of drying facilities to process fresh coconuts into copra.

Photo 7.1 Coconut-Cassava and Coconut-Abaca Intercropping

Photo 7.2 Coco-Pugon in Balabagan Municipality

[79]Ibid.
[80]Coconut meat dryer for copra making
[81]Usual practice although recommended is at least 5 days
[82]Interview with Ms. Marina Wahab, Philippine Coconut Authority, Region 12, 2015 dated 19 February 2015

(2) Rubber

Rubber tree (*Hevea brasilienis*) is the source of natural rubber. It is grown between 15 degrees north and 10 degrees south with hot and humid climate and a well-distributed rainfall of 1,900 mm or more per year and temperatures ranging from 24 to 35 °C. It thrives best in deep, well-drained loamy soil with an optimum pH range of five to six. It is usually planted as monocrop with at 5 m x 5 m spacing, although rubber can be intercropped with coffee and other crops.[83]

The largest rubber-producing countries are Thailand, Malaysia, and Vietnam. In 2012, the Philippines was ranked ninth in the world[84], but its production volume is so much smaller than those big three. Rubber production in the Philippines is unique to Mindanao where almost 100% of all the rubber (445,000 ton in 2013) in the Country was produced. The largest producers are Zamboanga Peninsula and SOCCSKSARGEN; Bangsamoro comes in third but far behind. In Bangsamoro, more than 90% of rubber is produced in Basilan, where the first rubber plantation was established in the early 1950s under Menzi Corporation. The small share is from Maguindanao and Lanao del Sur.

Consistent with production, Zamboanga Peninsula has largest area. Davao Region is less than half of that and Bangsamoro is only 40%. Unlike the steady annual growth of area planted in Zamboanga Peninsula and SOCCSKSARGEN, the growth of rubber production areas in Bangsamoro increased drastically from 2006 to 2007 by almost 13,000 ha, and again from 2011 to 2012 by about 8,000 ha. This could be attributed to operation of commercial plantation scale by private investors and the continuous promotion program of the provincial government of Basilan for re-planting and expansion of areas. The modest area in Maguindanao has also increased drastically from 2008 to 2009 and proceeded until 2013. On an annual basis, Bangsamoro area for rubber production increased by 17%, which follows from the growth of area in Basilan Province.

Productivity all over Mindanao and the Country is declining and can be accounted to the aging population of rubber trees and cutting of some trees due to slump in prices.[85] On a per hectare basis, productivity in Bangsamoro (which is synonymous to productivity of Basilan) is only about half of the nation's average and less than half of SOCCSKSARGEN, which is the highest performer. Among the Bangsamoro provinces, Lanao del Sur is highest in productivity but the small production could not make a significance in the total performance of the region. This is due to the small number of tappable trees.

On the basis of yield per tree, Bangsamoro shows comparable high performance although this has been declining since 2006. Basilan's yield per tree dropped from 2012 to 2013 by 38%, which determined the performance of the entire region. On the other hand, Lanao del Sur sustained an increased in the same period. On the basis of statistics, Lanao del Sur deserves an investigation on its potential capability to be a major rubber producer.

Rubber is an important agricultural product due to the income advantage. Although it takes six to seven years to grow rubber to tappable age, rubber assures farmers of income for 20 to 25 years.[86] As an industrial crop with a long value chain having multiple final products, it creates sizable employment and value added. Farmers produce and sell rubber cup lumps and/or latex, which are processed into rubber sheets, crumb, crepe and latex concentrates. Each of these intermediate products are manufactured into automotive, products, industrial and hygienic products.[87]

At present, the local rubber industry is characterized by poor quality produce due to a mix of factors from its farm-level production system to utilization by end product manufacturers. These are described as follows.

[83]Information derived from interview with USM scientists and UAS technicians
[84]Philippine Postharvest Industry Profile-Rubber (www.philmech.gov.ph/phindustry/rubber.htm)
[85]R&D Agenda for the Natural Rubber Industry, 1st Philippine Rubber Investment and Market Encounter, September 19, 2012, Clark, Pampanga
[86]R&D Agenda for the Natural Rubber Industry, 1st Philippine Investment and Market Encounter, September 19, 2012, Clark, Pampanga
[87] The Natural Rubber Industry, Performance, Policies and Strategic Directions. Congressional Oversight on Agriculture and Fisheries Modernization (COCAFM)

1) Plantation

Plantation is rather expensive to establish as it requires huge capital investment that small farm holdings are difficult to develop without support. Planting materials expensive and the use wildlings (with low productivity) is prevalent. Rubber takes six to seven years before it becomes productive and farmers need cash flow to support their families. At this level, rubber production needs an appropriate technical support particularly dissemination of planting materials and financing. Rubber can be intercropped with other crops and livestock. This integration can provide farmers with the needed cash flow and enables intensification of land use.

2) Harvest

Once a rubber tree is ready for tapping, it can continuously and regularly produce latex. There are two major concerns in harvesting of latex that lead to poor quality and low income for the planters. First, tapping of rubber trees is critical because wrong tapping leads to reduced productivity. Hence, the industry needs to supply an adequate number of tappers in rubber producing areas. Second, latex deteriorates in 24 hours and needs to be processed into cup lumps if there are no off-takers of fresh latex. Instead of formic acid and other recommended acids, some farmers use sulfuric acid (usually battery solution) as coagulating agent. This practice is detrimental to the quality of rubber and is carried through the final product.[88]

3) Intermediate Processing (crumbs and sheets)

Processing of rubber into crumbs and sheets is water-intensive due to the cleaning of cuplumps and the separation of their unusable portions that go to waste. Because of incorrect and deceitful practices, rubber processing has a larger impact on the environment.

(3) Banana

The Philippines is a world supplier of Cavendish banana and one of the top three suppliers together with India and China. The three largest importers of the Country's bananas are Japan, the Middle East, and China.[89] All of the Cavendish varieties are produced in Mindanao. The largest banana producer in terms of volume is Davao Region. However, it is also widely grown in Northern Mindanao particularly in the province of Bukidnon and SOCCSKSARGEN Region. These three regions are also the largest producers of the Cavendish varieties. The Bangsamoro is relatively a new entrant to the production of Cavendish with the establishment of plantations in Datu Paglas, Buluan, and lately Bumbaran. Annual growth of production in the Bangsamoro is mainly contributed by the growth in Maguindanao. This is due to the continued growth of Cavendish production, which has been steadily increasing from 2008 to 2013.

Banana grows best in tropical areas with temperatures ranging from 220C to 310C and can be grown from sea level up to 100 m elevation. Soils that are deep, friable, well-drained with 40% clay, 75% silt and 85% loan with pH of 6.5 are most favorable. Water is necessary for all stages of growth and would grow well in areas with 2,000–2,500 mm annual rainfall. For the Cavendish variety, recommended banana plant spacing is 2 m x 2.5 m or about 2,000 plants per ha. For volume planting, spacing of 2 m x 3 m with 2 plants per hill is allowed. This spacing makes 3,200 plants per ha.[90]

In 2013, banana production in Bangsamoro was 459,000 ton, which is about 5% of the total Country's production. It is the fourth largest banana producing region but very small compared to the two largest producing regions, Davao and Northern Mindanao. Of the total production, 68% is a mix of local varieties while 32% are Cavendish variety. It is modestly growing and most of the growth of production volume in the region is attributed to growth of Cavendish banana, which are grown in commercial plantation scale. Over the last five years, Cavendish production grew at 4.4% annually compared to the

[88]Value Chain Analysis for Rubber-Zamboanga Sibuguey (www://drive,dadrdp.net/plan/vca)
[89]FAOStat
[90] Value Chain Analysis for Cavendish Banana-Maguindanao, www://drive.daprdp.net/plan/vca/VCA of Cavendish Banana (Maguindanao).pdf

growth of local varieties of 1.2%.

Over the last 10 years, harvested area of banana in Bangsamoro was modestly increasing even in the provinces of Maguindanao and Lanao del Sur. The increases in production are due to the increase in productivity, particularly for Cavendish variety, which increased from 22.13 ton/ha in 2004 to 29.93 ton in 2013. Still, productivity of Cavendish banana is way below the productivity of other regions in Mindanao. On the other hand, productivity of local varieties is 11 ton/ha in the same year. Overall productivity of banana in the Bangsamoro region is only 14 ton/ha since local varieties, which are non-plantation cultivation still constitute about 70% of the total production.

Photo 7.3 Packing Operation of Cavendish Banana for Export

Cavendish banana is an export commodity and grown in commercial plantations with self-complete production and marketing systems. As an export crop, prices are determined by international prices.

On the other hand, local varieties are generally produced in small farms and marketed by farmers directly to consumers or aggregators who supply to retailers, hotels and restaurants. Some local varieties like Saba and Cardava are processed into chips and other snack foods. About 35% of total Cardava production in Mindanao is processed into banana chips and in the recent months is being exported as fresh banana. The other 65% are sold fresh in wet markets, most of which do not meet the quality requirements for processing. Currently, the Cardava variety is processed into frozen banana (microwavable, flour, plain paper sheet, fiber, puree, syrup, and vacuum packed fried banana[91]. Other varieties are also processed into food additives like catsup.

Problems encountered by small banana farmers include diseases, theft and low prices. Banana and abaca are both attacked by bunchy top and mosaic diseases. In addition, banana diseases include bract mosaic, banana streak and fusarium. DA and PCAARRD are joining hands to combat these diseases occurring nationwide.

Like other agricultural products, pick up prices at the farms are low. However, farmers prefer traders getting the product from the farm since handling and transport costs is not usually justified by the volume of produce. Local varieties are usually transported unripe in order to minimize losses. However, major losses in banana production are still incurred during transport. Unlike Cavendish, local varieties have thinner peels. Bananas, both local and Cavendish varieties, when sold to the local public markets do not have proper packaging to reduce damage. Those delivered to institutional buyers like hotels and restaurants that are strict on quality are well packaged with unblemished appearance.

[91]Davao Region Industry Clusters Roadmap 2014-2030

Photo 7.4 Banana (Saba Variety) Loaded in Jeepney for Delivery

(4) Abaca

Abaca (*Musa textilis Nee*), is indigenous to the Philippines and its fiber is known worldwide as Manila hemp. The fiber is obtained from the leaf sheaths of the abaca plant, which is similar to banana in appearance. At present, there are only two countries commercially producing abaca fiber, the Philippines and Ecuador. The abaca varieties in Ecuador originally came from the Philippines, particularly from Mindanao. Abaca fiber is considered the strongest among natural fibers and is used as raw material for cordage, fiber crafts and pulp for the production of specialty paper products like security papers, tea bags, cigarette papers, meat and sausage casings, non-woven and other thin printing papers. Specialty paper products account for about 80% of global abaca consumption, 14% by cordage products and the rest, by fiber crafts and other usage.

The Philippines supplies about 84% of the world abaca fiber requirements while Ecuador supplies about 16%. During the last five years, the Philippines produced an annual average of about 68,000 metric tons of abaca fiber. Of the total, 76% were processed locally into pulp, cordage and fiber crafts, mostly for export. The remaining 24% were exported in raw form. Demand for abaca, particularly in pulp form has been increasing due to the growing concern for environmental protection and forest conservation provided more opportunities for natural fibers, like abaca. It is expected that demand for abaca fiber, particularly by local pulp processors will continue to expand as world demand for abaca pulp continue to grow. In spite of high demand for abaca and high abaca prices, local production has not kept pace with demand.

Photo 7.5 Abaca Plant and Stripped Fibers

Photo 7.6 Abaca Intercropped with Coconut, Lanao del Sur

Abaca has been found growing in virtually all types of soils and climate in the Philippines. However, the most productive soil for abaca is volcanic in origin; rich in organic matters, loose, friable, and well-drained clay loam type. It requires a water table of 80 cm with 60–80% saturation and a soil pH of 6.0 to 7.0. Undulating or rolling to hilly or mountainous areas lower than 500 m above sea level with deep surface soil with slopes from 200 m to 600 m altitude are ideal for abaca production.

For normal growth of abaca plants, the soil must contain adequate amounts of organic matter, potassium, calcium, and magnesium. Abaca requires warm and humid climate for optimum growth and productivity. Although the optimum temperature requirement for abaca has not been fully determined, it grows in areas with temperatures of 20 °C during cool months and 25 °C during warm months. Thus, abaca is good for intercropping with coconut and trees that could dissipate high temperatures and sunlight directly from the sun.

A relative humidity of 78 to 85% and a fairly distributed rainfall throughout the year are conducive to good growth. The area must be free from cyclonic winds and typhoons, if not the plants must be provided with cover trees or windbreaks to dissipate the force.[92] Abaca is best integrated with coconut trees as abaca thrives under shaded areas.

Abaca is grown practically all over the Philippines, except in the northernmost part of the Country. At present, some 121,400 ha are planted to abaca in the Country involving 76,100 farmers. The abaca areas are mostly located in Bicol, Eastern Visayas, Southern and Western Mindanao, and Caraga. In Bangsamoro, the provinces of Sulu and Lanao del Sur are the largest producers. Sulu has a total area of 3,333 ha. Planted to abaca found in the municipalities of Indanan, Maimbung, Panglima Estino, Parang, Patikul, and Talipao. The concentration of these areas is in Indanan and Patikul, which share 56% and 34% of the total, respectively. In Lanao del Sur, abaca production is most active in 20 municipalities: Butig, Lumbatan, Lumbayanague, Bayang, Sultan Dumalongdong, Lumba Unayan, Tubaran, Pagayawan, Binidayan, Puala, Madamba, Madalum, Calanogas, Malabang, Balabagan, Kapatagan, Kapai, Balindong, Marogong, and Tubaran.[93]

The average annual production of abaca in the Philippines is about 68,000 ton. The largest producer is Bicol Region followed by Eastern Visayas. Far second is Davao Region. The Bangsamoro region produces barely half of the Davao Region's production but in 2013, Bangsamoro sustained an increase while Davao's production decreased. The largest producer in the Bangsamoro is Sulu where about 60% of its total comes from. Lanao del Sur is second but produces only half of Sulu's production. Overall production in the country declined due to harsh weather conditions like typhoons. Lanao del Sur was affected by Typhoon Pablo, which caused the decrease in volume from 2011 to 2012.

Abaca-planted and harvested areas in Bangsamoro increased modestly from 2004 to 2013 (Figure 7.3)

[92]PhilFIDA

[93] ARMM-Local Industry Promotion 2011 taken from Sulu Provincial Development and Physical Framework Plan and Potential Products Study Report, Lanao del Sur, Maranao People Development Center, Inc., 2010

despite significant increases in the provinces of Sulu, Lanao del Sur, and Basilan. These increases were tempered by the decrease in planted areas of Maguindanao. The decrease could be accounted for by conversion of abaca farms to other crops, especially banana that grows well in the soil suitable for abaca. Matanog, which lies on the slopes going up to Lanao del Sur, was once an abaca producer, but most abaca plants in the municipality were damaged by combat operations in the area. In contrast, abaca productivity in Lanao del Sur and Sulu is commendable at levels higher than the largest and established region producers. Over the 10 years from 2004 to 2013, the average productivity in Lanao del Sur is 750 kg/ha, which is much higher than Sulu's 560 kg/ha. Regardless, the productivity of both provinces is higher than the Country's average and other known abaca producing regions.

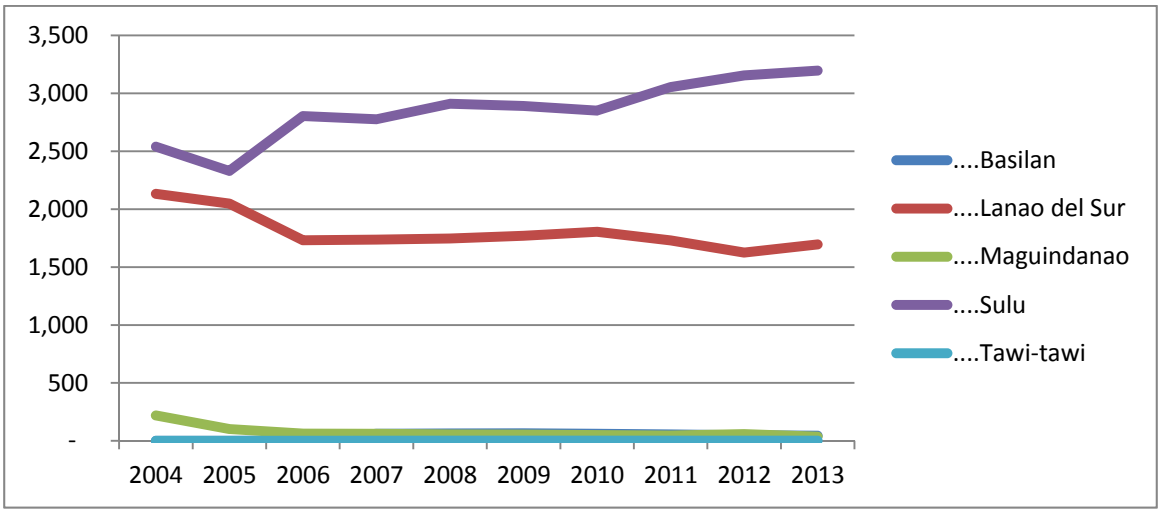


Figure 7.3 Abaca Production Volume in Bangsamoro, 2004–2013

The western part of Lanao del Sur and the northern part of Maguindanao particularly the areas covered by Camp Abubakar and the hilly lands of the islands of Sulu met the physical requirements for growing abaca. Municipalities in these areas have been producing abaca for a long time now although production has diminished overtime due to diseases, mainly bunchy top and mosaic. In the last 10 years, Maguindanao's production had been comparatively small although it used to be the main crop of the Municipality of Matanog before Camp Abubakar was crushed by the military and MILF encounter in year 2000 under the "all-out war" policy of the government. Currently, abaca in the area is barely tended and commonly seen underneath coconut trees planted randomly.

According to the farmers they were not visited by technicians from government or other entities. Generally, technical assistance is unheard of. A few farmers own mechanical stripping machines powered by diesel engines and accept stripping for tolling. Tolling fee is equivalent to 20% of the output. Of the 80% output, 50% goes to the owner of the stripper as payment for labor in drying and bundling. Thus, the farmer practically gets 40% of the total fiber produced. Dry abaca fibers are purchased on site from the farmers by traders. Sulu has a different system, farmers sell tuxy to the middlemen, who extract the fibers using decorticating machines. These middlemen sell the fibers to the traders outside Bangsamoro, specifically Zamboanga.[94] Some farmers follow the system in Lanao del Sur.

Owing to low income derived from abaca farming and the tedious process of extracting the fiber, farmers especially the younger ones shy away from abaca farming and look for other jobs in the urban areas. Also, because most of the abaca plantations are already old, typhoon-damaged and infected with diseases, productivity is very low. The national average yield is about 650 kg/ha/year. In Ecuador, the average yield is reportedly about 1,800 kg/ha/year and has only three abaca varieties, Tangongon, Bongolanon, and Maguindanao, which are Mindanao varieties. On the contrary, there are about 200 varieties existing in the Philippines and most of these are found in Luzon and Visayas

[94]ARMM-Local Industry Promotion 2011

Photo 7.7 Drying of Abaca Fiber in Balabagan, Lanao del Sur

Photo 7.8 Abaca Stripping Machine in Lanao del Sur

The major challenges of abaca production in the Bangsamoro region as well as the entire Philippines include diseases in plants and processing and extraction of abaca fiber. Major diseases, bunchy top and mosaic are still prevalent in the area. The traditional abaca extraction is stripping. It produces good quality fiber. However, it is labor-intensive with very low efficiency because it is done generally by manual labor. Decorticating machines have already been developed and in use by some farmers; however, the quality of the fiber extracted is inferior to the fiber extracted from stripping. Thus, the challenge for abaca production is coming up with good and appropriate technology for abaca extraction.

(5) Coffee

Coffee is the second largest valued commodity in international trade, and the most widely traded tropical agricultural commodity after petroleum. Trade in coffee is dominated by Latin America and the Caribbean countries, which account for 57% of the total world exports, mainly of robusta varieties.[95]

Coffee is non-food but it is considered a staple consumption among Filipinos. Instant coffee is almost in all Filipino households. Coffee shops have also proliferated in the Country following the trend in developed countries like U.S. and those in Europe. The Philippines is already in deficit in terms of locally produced coffee. Due to the current trend in coffee consumption in the Philippines, the Department of Agriculture is promoting coffee production.

[95] Development of Inclusive Markets in Agriculture and Trade, United Nations Development Program, www.ug,undp.org

There are four varieties of coffee produced in the Philippines. These are arabica, robusta, excelsa, and liberica. Robusta is the variety procured and processed by a large agro-industrial processor (Nestle) while arabica is the variety popularly served in coffee shops. Bangsamoro produces mostly robusta, which accounts for about 70% of the total production (Figure 7.4). Arabica is far second at only 15% of the total and is followed closely by excelsa. Liberica coffee is still very small at 1.5%. Farmers in Maguindanao are excited about the promising arabica variety, which commands higher price.

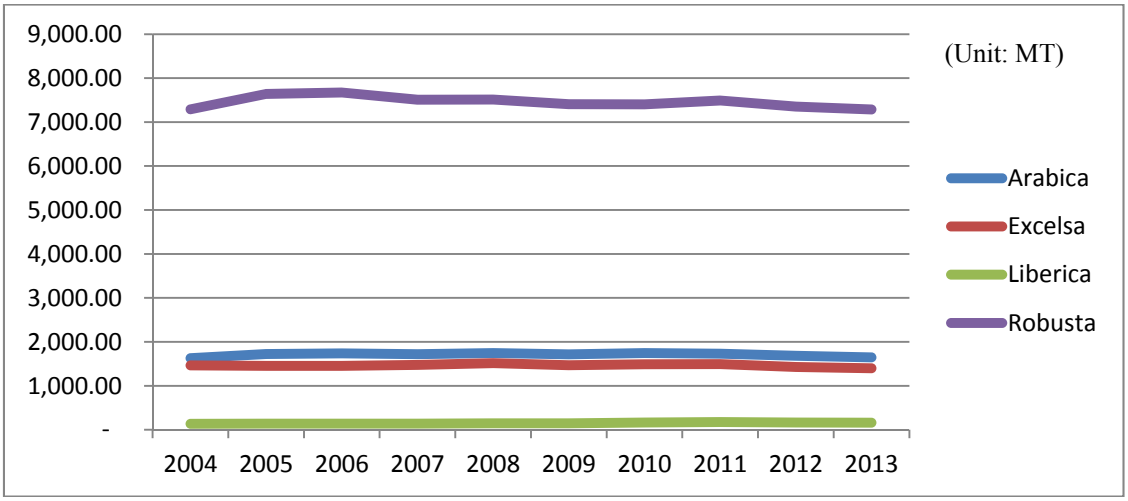


Figure 7.4 Coffee Production in Bangsamoro by Variety, 2004–2013

In the 2004–2013 period, the Philippines production of coffee averaged at about 95,000 ton/year although the trend was decreasing at an average rate of 3%. Such negative growth rate is due to declining production of Davao Region, which is one of the largest coffee producing region. Such decline is supported by the corresponding decline in harvested area due to conversion of some areas to senorita banana in Compostela Valley and Cavendish and lakatan bananas in Davao City[96].

Bangsamoro produced an average of 10,779 ton annually or only about 11% of the total production in the Philippines although it is the third largest producer. Its production is less than 50% of each of the production volume of Davao and SOCCSKSARGEN. Bangsamoro's production has hardly increased nor decreased in the 10 years (Figure 7.5). Basilan, which is the third largest coffee producing province in Bangsamoro, experienced decrease in production at 1.6% per year; however, this was tempered by the modest increases in Maguindanao and Sulu, which are much larger coffee producers. Tawi-Tawi's production also decreased but its volume is too small to make an impact.

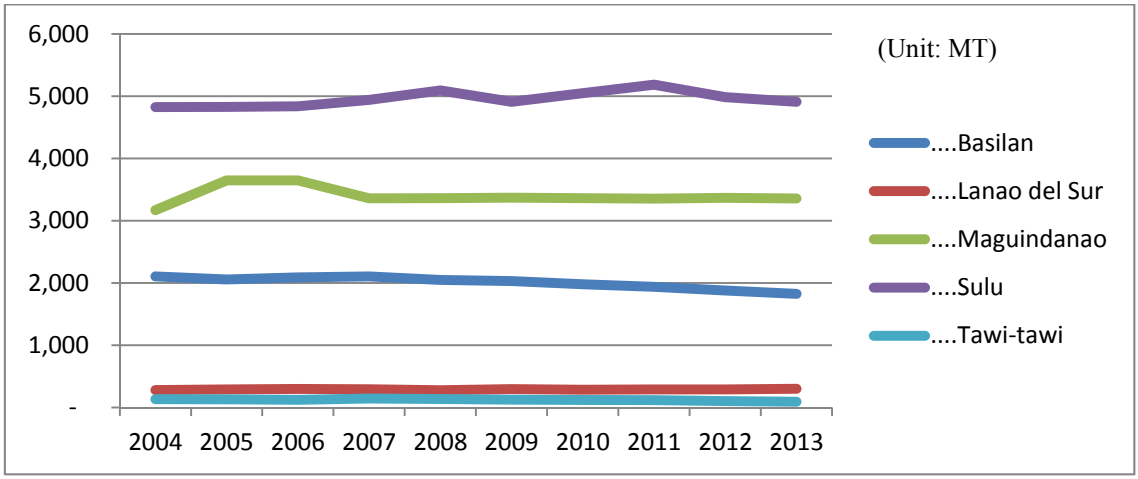


Figure 7.5 Coffee Production in Bangsamoro by Province, 2004–2013

[96]Crop Statistics of the Philippines, 2009-2013

The total aggregated coffee harvested area in Bangsamoro averaged at 13,360 ha, which is almost unchanged in the last 10 years. This trend is the same in all provinces. Shares of harvested areas in Bangsamoro by province are shown in Table 7.1. Except for Tawi-Tawi, each province has a fair share of area for coffee. Despite the relatively small areas of Basilan and Sulu, coffee harvested areas approaches the size of Maguindanao, which is the largest province by size.

Table 7.1 Coffee Harvested Area, 2004–2013

Region/ Province	Average Harvested Area (ha), 2004–2013	%
Bangsamoro	13,690.32	100
Basilan	3,296.00	24
Lanao del Sur	2,419.10	18
Maguindanao	4,278.85	31
Sulu	3,567.70	26
Tawi-Tawi	128.67	1

Source: CountryStat (http://countrystat.psa.gov.ph/).

Productivity is the key advantage of the Bangsamoro region. It produces the most coffee per ha compared with most regions in the Philippines although SOCCSKSARGEN is still a region to beat. Except for Lanao del Sur, coffee production in all provinces of Bangsamoro are higher than most regions. Sulu is exceptional among Bangsamoro provinces and other regions. It has sustained high productivity over the last 10 years. The Bangsamoro provinces exhibit different productivity per coffee variety. Table 7.2 shows this comparison. By far, Sulu is not only the largest producer but also the most efficient in the region. It produces all four varieties with very high productivity. Its productivity in Robusta variety is the highest at 2.47 ton/ha, which is almost thrice that Maguindanao Province. This level of productivity is within the desired productivity when the correct agronomic practices and harvesting culture is applied.[97] The remarkable municipalities in production of coffee are Patikul, Parang, Talipao, Panglima Estino, Luuk, and Indanan. The largest coffee-growing area is found in Patikul, which cover more than 60% of Sulu's total planted area.[98]

Table 7.2 Average Annual Productivity of Various Variety[99]

Region/ Province	Average Annual Productivity of Various Varieties (MT/ha)				
	Coffee	Arabica	Excelsa	Liberica	Robusta
Bangsamoro	0.79	0.95	0.94	0.25	0.76
Basilan	0.61	0.98	0.25	--	0.58
Lanao del Sur	0.12	0.03	--	--	0.12
Maguindanao	0.79	0.62	0.19	--	0.85
Sulu	1.38	1.35	1.07	0.25	2.47
Tawi-Tawi	0.76	0.83	1.07	--	--

(6) Cacao

Cacao is grown in all humid tropical lowland regions within 20 degrees north and south of the equator, most notably Central and South America, West Africa and South East Asia to include Malaysia, Indonesia and the Philippines. It is a shade loving forest dweller that needs to be planted in association with taller shade trees. It bears fruits in 18 months but reaches full bearing capacity in four years producing 70 to 100 pods or more per tree per year.[100] Cacao cultivation is preferable in clay loam to sandy loam. It thrives in an area with rainfall between 2,000 to 3,000 mm. The first cacao in Asia was planted in the Philippines (Basilan in particular) in 1670 while commercial farms were already existed

[97] Development of Inclusive Markets in Agriculture and Trade, United Nations Development Program, www.ug,undp.org
[98] ARMM-Local Industry Promotion 2011
[99] Based on data from CountryStat (http://countrystat.psa.gov.ph/)
[100] Davao Region Industry Clusters Roadmaps, 2014-2030, p. 80

in the 1950s.

There are established practices in order to optimize productivity of cacao. Production of reliable seedling/planting materials is a bit of a long process that requires supply of certified seeds from an accredited producer and bud stick from a budwood garden. Certified seed are grown for three months, after which it is cut for grafting with a bud stick taken from a budwood garden. The grafted plant takes another three months to be planted. In total, it takes six months to produce a cacao seedling. Cacao tree needs to be continuously and properly pruned in order to optimize productivity. Also, it requires careful harvesting, especially cutting off the fruit from the cushion of a trunk of branch as succeeding fruits grow from the same part (Figure 7.6).[101]

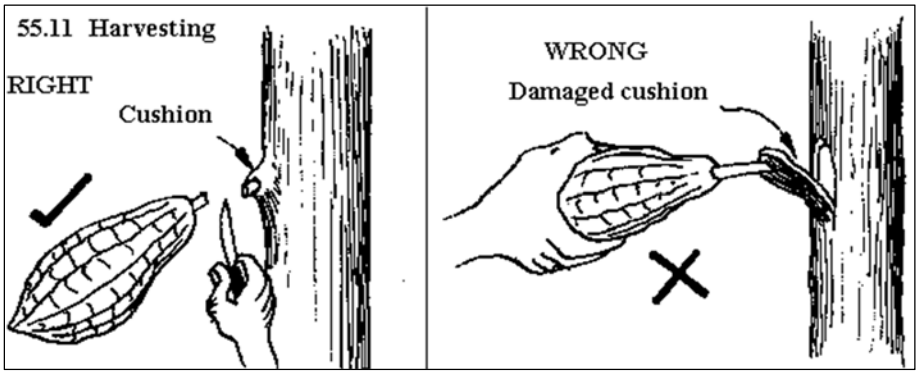


Figure 7.6 Care in Harvesting Cacao

Cacao production is being promoted as an industrial crop. Average production all over the Philippines in the 10 years of 2004–2013 is about 5,184 ton/year. Mindanao accounts for 90% of the national cacao production with the Davao Region contributing 70%. Of these farms, 90% are small farm holdings. The Bangsamoro contributes a measly 2% to this total, of which 52% were produced in Lanao del Sur and 28% in Sulu.

As in the rest of the Country, Bangsamoro's cacao production in the 10 years was on a downward trend at an annual rate of 6% from 150 ton in 2004 to 85 ton in 2013 (Figure 7.7). The average yield per tree in the region is about 1.0 kg, which is low compared to the productivity of well-managed crop of 2.0 kg/tree. Tawi-Tawi, Lanao del Sur, and Sulu are better at cacao production with yield per tree of 1.35, 1.23 and 1.0 kg, respectively. Yields in Bangsamoro provinces are comparable to Davao Region's averages. However, decrease in productivity was significant due to high cost of production, pest and diseases, aging trees, and lack of information on the proper culture of cacao.

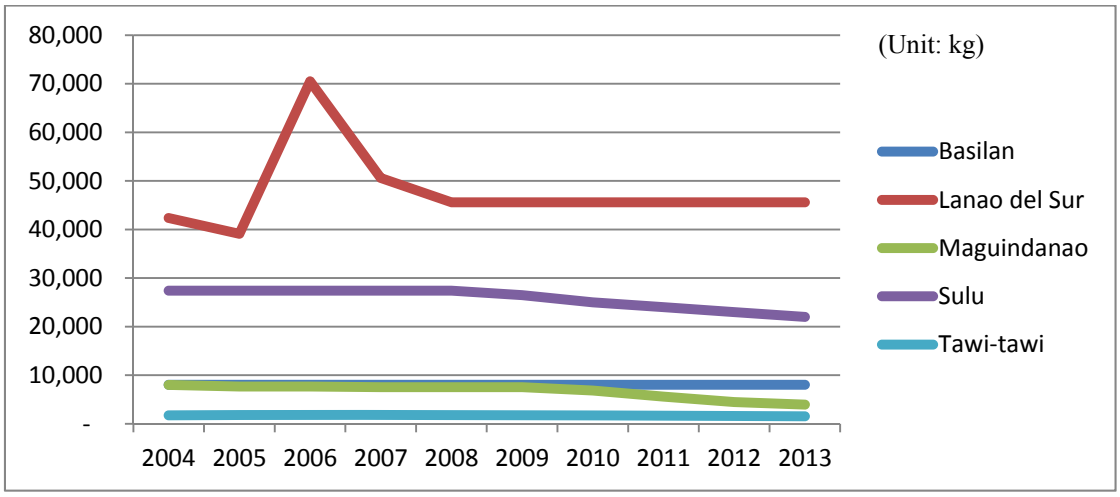


Figure 7.7 Cacao Production in Bangsamoro by Province, 2004–2013

[101]Interview with Engr. Edwin Banquerigo, National Coordinator for Cacao Cluster Development

Areas have decreased over the period along with productivity. Decreasing production could be caused by declining productivity, which eventually led conversion of cacao areas into other crops. The largest drop in harvested area (500 ha) in the 10 years was in Lanao del Sur.

Despite the current poor performance, the Philippines is among the countries in Asia seen to have a competitive edge in cacao production given its strategic location and growing condition. According to industry estimates, cacao production stands at 10,000–12,000 ton, which is double that of BAS data, from the 25,000 ha planted. This is way below the supply for local grinding requirement estimated at 40,000 ton, making the Philippines a net importer of cacao and cacao preparations.[102] A cooperative in Lamitan, Basilan sells dried fermented cacao beans to a buyer in Manila at around PHP 110-120/kg. Accordingly, the price of cacao beans usually remains high because of the continued deficit in supply.[103]

While the sector has so much to offer, development remains slow. Using industrial clustering as a development strategy, the 2013–20 Philippine Cacao Industry Cluster Plan and the Southern Mindanao Regional Cacao Industry Roadmap, anchored on the value chain approach, were crafted to serve as the blue print for the implementation of various interventions at the national and regional level. The roadmap uses six upscaling strategies, namely, 1) industry strengthening, expansion, and promotion, 2) farm productivity improvement, 3) easy access to quality seedling materials, 4) promotion of value adding activities, and 5) trade promotion and market development and 6) continual research and development.[104]

To oversee the development of the industry, the Cacao Industry Council of Southern Mindanao (CICSMin) was created in 2014 and the National Cacao Industry Cluster Technical Working Group was organized last August 28, 2015. These public and private sector partnership is expected to establish industry strategic direction, formulate and advocate policies to trigger development and spearhead the integration and coordination of national development initiatives and redirected it towards the attainment of the 2020 Cacao Challenge.[105]

(7) Oil palm

Palm oil is now the world's largest contributor in the vegetable oil market, accounting for over 52% of the global supply. Due to the fast growth of production of palm, it has already surpassed coconut oil utilization in the world. Major world suppliers are Indonesia and Malaysia.[106] Palm oil is a direct substitute of coconut oil as vegetable oil for cooking and as diesel engine fuel (biodiesel). Supply of palm oil for cooking is also growing in the domestic market.

While palm oil can be seen as direct competitor of coconut oil in the domestic market, it should not worry the coconut farmers since coconut has longer value chain due to the good number of end products from coconut. Moreover, the biodiesel allowed to fill the mandated blending to diesel oil under the Republic Act 9367-The Philippine Biofuels Act is only for coconut-based biodiesel. The Department of Energy's standards (PNS for biodiesel and biodiesel blends) are only for coco methyl ester (CME), which can only be derived from coconut oil.

Oil palm was first introduced in Basilan in the 1950s, with the establishment of a 200 ha plantation under the Menzi Agricultural Corporation. In the late 1960s, Kenram Plantation was also established in the province of Sultan Kudarat. In the 1980s, commercial plantations in Agusan del Sur and Davao del Norte Provinces together with oil mills were also established. Maguindanao is the only province producing palm oil in the Bangsamoro region. Planting of oil palm started with a few farmers, which sold to the nearby Kenram plantation and oil mill. Expansion of areas in the late 1990s was sponsored by Agumil (then operating most plantations in Agusan del Sur) to fill the capacities of its oil mills. It established a nursery in Tacurong, South Cotabato and signed up farmers with lands to a contract growing arrangement of oil palms.[107]

[102]State of Cacao Inudstry, Edwin Banquerigo, DTI National Cacao Industry Cluster Coordinator
[103]ARMM-Local Industry Promotion 2011
[104]State of Cacao Inudstry, Edwin Banquerigo, DTI National Cacao Industry Cluster Coordinator
[105]Ibid.
[106]ARMM-Local Industry Promotion 2011
[107]Braving It and Making It: Insights from Successful Investors in Muslim Mindanao, Cielito Habito 2012

Photo 7.9 Oil Palm with Fruit Bunch Ready for Harvest

Currently, about 6,000 ha have already been planted in this province.[108] Out of this area, 1,940 ha are being harvested with 240,560 total bearing trees producing 106,528 ton as of 2013.[109] Massive planting must have occurred in 2007-08 as harvested areas increased from 2010 to 2011 by 675 ha with corresponding 129,000 bearing trees. In 2011, productivity of oil palms in Maguindanao in terms of fresh bunch was at 12.7 ton/ha and 139 kg/tree. These are commendable considering that high productivity according Agumil practice are about and 36 ton/ha and 288 kg/tree.[110] In comparison with provinces in other regions, Maguindanao's productivity is at par with Agusan provinces and Bukidnon, which are best performers in oil palm production.

Oil palm can provide farmers continuous cash. Palm trees start to bear fruits 28–30 months after planting. It continuously bear fruits allowing harvest every 15–20 days. Hence, farmers can hope for a steady cash flow like a regularly paid employee for 22–30 years, the oil palm's productive number of years.

The income benefits of growing oil palms, there are certain constraints to the development of plantations, as follows:

1) Acquisition cost of planting materials is expensive. At PHP 250/seedling, it will cost the farmer PHP 31,750/ha for seedling alone. Thus, development of plantations on contract growing scheme need an assistance from the oil mill investor as in the model of development by Agumil.
2) Deterioration of quality after harvest. Fruit bunches shelf life is good only for 24 hours, after which quality deteriorates followed by reduced prices.
3) Land tenure disputes. Multiple claimants may arise after a plantation is established. Thus, a thorough "due diligence" should be conducted before a plantation is established.
4) High investment for plantations and processing. There is a need for large-scale investments for opening up new plantations in A&D areas and processing plant. Security still poses a constraint in inviting investors to the Bangsamoro area.

(8) Mangosteen

Mangosteen, *Garcina mangostana*, is believed to have originated in the Malay Archipelago. The largest producers are Thailand, Indonesia, Vietnam, Malaysia, and the Philippines, which is the smallest of them.

[108]Ibid.
[109]Based on CountryStat data (http://countrystat.psa.gov.ph/)
[110]According Agumil Philippines data for 2010, number of bunches per tree/year = 1 to 12 with bunch weight of 16–24kg
Source: ARMM Local-Industry Promotion 2011

In 2009, the Philippines produced only 2% of Thailand, which is the largest producer.[111] Mangosteen is becoming an important crop due to its medicinal properties. Various parts of the fruit and even the leaves and bark can be processed into medicine and food supplements due to the high concentration of the potent antioxidant called Xanthones[112].

Mangosteen thrives in warm, humid environment. Ideal temperature is 20–30 °C. At less than 20 °C, growth slows down. It grows well in areas with well distributed rainfall although they grow well under dry condition with irrigation. It needs soil that is rich, porous, deep and wet but well-drained. Heavy clay with generous mixture of sand and silt, water table of about 2 m, and elevations of 0 to 500 m make an ideal condition for growth. It takes two years for seedlings to be ready for transplanting. It usually flowers in 10 to 15 years although fruiting can be shortened to eight to nine years through a well-cared asexual propagation. Flowering to fruiting takes about six months.[113]

Although mangosteen is produced in CALABARZON, Davao Region and SOCCSKSARGEN, the bulk of production in the Philippines is in Bangsamoro. On average, Bangsamoro produce 64% of the total. The other 36% is shared among Davao Region, SOCCSKSARGEN and Northern Mindanao. In fact, all over Bangsamoro, production of mangosteen is also concentrated in the island province of Sulu. It makes Sulu the single largest mangosteen producing province in the Country. Production volume of mangosteen is rather irregular mainly due to the weather condition during the flowering and fruiting period. Although the trend is decreasing over the 2004–2013 period (Figure 7.8).

In the 10 years, no observed change in area harvested as well as number of bearing trees. The slump in production is only affected by productivity, which dropped drastically in 2005 and nil in 2008. Mangosteen plant has no known serious pests or diseases although it is subject to mites, aphids, fructifier ants, and mealy bugs. It can easily be integrated with other tropical fruit trees such as marang and lanzones. In Sulu, it is intercropped with peanut and other leguminous crops and other companion crops like abaca and banana.[114] Fruits are easy to harvest and therefore, do not require high labor requirement.[115]

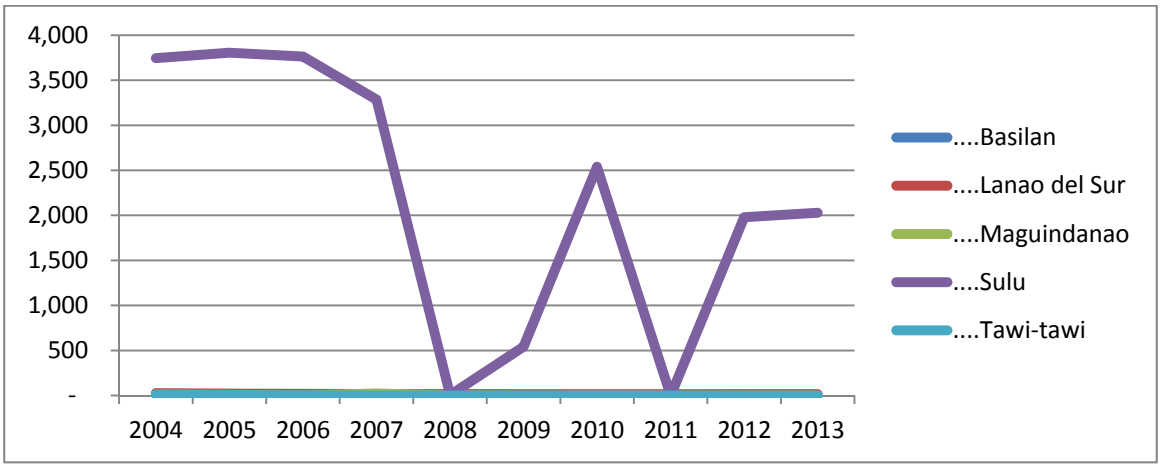


Figure 7.8 Production Volume of Mangosteen in Bangsamoro by Province, 2004–2013

(9) Other perennial crops

The Bangsamoro region is also home to various fruit trees particularly in the island provinces. Although these are yet produced in much smaller quantities compared to other regions in the Country, the competitiveness of producing these fruits are evident in their productivity. These products have high potential for increasing value added of the Bangsamoro region through processing and export. The

[111]Committee on Commodity Problems, Intergovernmentnal Groups on Banana and Tropical Fruits, Market Potential for Mangostee and Salaca, May 3-5, 2011, Yaounde, Cameroon, www.fao.org
[112] Dr. Alfredo S. Villarico, MD, medical practictioner, Kidapawan City
[113]Growing Mangosteen for Business, www.businessdiary.com.ph
[114]Growing Mangosteen for Business, www.businessdiary.com.ph
[115]Dr. Alfredo S. Villarico, MD, medical practictioner, Kidapawan City

products include the following.

1) Mango: Mango is one of the top export fruits of the Philippines. The Carabao variety, which endemic in the Philippines provides a competitive advantage over all other mango exporting countries. Carabao mango flowering can be induced and produce fruit during off seasons. Thus, plantations can program production on the basis of market supply and demand condition. In terms of productivity, mango does not possess an advantage over its Mindanao neighbors. Bangsamoro as a whole has very small productivity by comparison. Productivity is much smaller in the Carabao variety, which is the top mango variety export of the Country.

   Basilan has a good comparative productivity although it has very small volume of production. Mango is practically produced in all parts of the country. Production trend of mango in the Philippines is consistently decreasing particularly due the trend in major producing regions. On the contrary, Mindanao regions like Northern Mindanao, Davao, and SOCCSKSARGEN have upward production trend. Bangsamoro did not follow the trend in its Mindanao neighbors. Over the last ten years, mango production decreased by about half. This is mainly due to the decline in Sulu, which is the largest producer in ARMM. Maguindanao Province used to produce about 5,000 MT in 2004 but declined to less than half in 2011. However, with the establishment of plantations in earlier years, production in 2012 and 213 reverted to the level of 2004.

2) Durian: Due to its strong taste and smell, durian market is still limited to a certain portion of the entire domestic market. It is an exported commodity but the market is dominated by other Asian countries led by Thailand and Malaysia, which have appropriate government policy support. Durian is largely eaten raw, hence processing is minimal (blast freezing). A small portion of production are processed into candies and pastries, mainly for local consumption.[116]

   Bangsamoro is the far second producer of durian in the Country. In 2013, it is second to Davao Region, which produces about 75% of the Country's production. In the same year, Bangsamoro's production is only 12% and 15% of the Country and of Davao Region, respectively. Production of durian in Bangsamoro is synonymous to production in Sulu as more than 95% of the Bangsamoro's production is in Sulu. Production in other provinces is not significant due to small volumes and low productivity.

   During the years 2004 to 2013, planted area in Bangsamoro grew at about 1.6% due to addition of planted area in Basilan. Sulu planted area, although consistently increasing over the last 10 years was very modest at 0.4%. Bangsamoro has been consistently highest in productivity over the last 10 years. It is even higher the Davao Region's productivity. Although the trend is decreasing from 2004 to 2009, it picked up from the lowest at 4.9 ton/ha and continued to increase until 2013 at 9.02 ton/ha.

3) Lanzones: It is largely produced in Sulu with productivity higher than the rest of the Country. Sulu produces about 70% of the total produced in the Country. Currently, lanzones is consumed raw and has no foreseeable prospect for higher value adding.

4) Pineapple: Although not a tree crop, it is a multi-year crop. Current productivity is less than the major pineapple producing regions only because Bangsamoro's culture of pineapple is small areas and hardly applied with fertilizer. In comparison, large producing regions, such as Northern Mindanao and SOCCSKSARGEN are hosts to large pineapple plantations of Del Monte and Dole Philippines, respectively. Dole Philippines has made initial survey of some areas in Bangsamoro for possible expansion of the plantation in is the municipalities of Alamada, Buldon and Barira. According to officials of the company, these areas are suitable to pineapple in terms of climate and soil quality.

5) Papaya: It constitutes a small production in Bangsamoro, which is one of the smallest producer with productivity comparable to national average but way below its neighbors in Mindanao. Papaya production in Bangsamoro are mostly few standing trees in farms or backyards. In

[116]Davao Region Industry Clusters Roadmaps, 2014-2030

contrast, neighboring regions in Mindanao produce solo papaya in well managed plantations bought by large agri-business companies like Dole Philippines and Del Monte.

6) Calamansi: It is produced in small quantities and mainly in Maguindanao and Sulu. It has significant productivity being higher than the national average. Productivity in Bangsamoro has also been increasing over the last 10 years that in 2013, it is already close to MIMAROPA, the largest calamansi producer in the Country. Calamansi has a long value chain with a good number of uses and wide range of processed products. Calamansi is being processed into various preparations for cold and hot drinks. Large food and beverage producing companies with popular brands have calamansi-based ready-to-drink products.

7.1.3 Temporary crops

(1) Cassava

Cassava production in the Philippines was mainly for food and some starches. As in Thailand, cassava is also used as feedstock for production of ethanol in a 300,000 L/day capacity distillery in Negros Occidental. There are various varieties of cassava and care should be taken especially when used as food. Some varieties like Mandioca Sao Pedro Preto are not edible due to the high content of hydrocyanic acid, which is poisonous.[117] With increases in industrial processing uses of cassava, production grew but rather at a modest pace. Contract growing has been the major growth driver over the last 10 years.

Cassava can be a long term crop from six to two years depending upon the intended use. It grows in a loose soil and areas that are not water logged. It can be planted any season although it needs wet soil during the first four to five weeks from planting. Harvesting and storage requirements should be observed in order to avoid spoilage and losses.

Photo 7.10 Uprooted Cassava at Harvesting

The Country's total production in 2013 is about 2.36 million ton growing at the rate of 4% per year from 2004 of 1.64 million ton (Figure 7.9). This growth was influenced by the rapid growth in Northern Mindanao and SOCCSKSARGEN. On average, Bangsamoro's share is about 50% of the Country's total production in the last 10 years. Cassava production in Lanao del Sur started in 1954 with the expansion of Matling Industrial and Commercial Corporation's (MICC) operations to include processing of starch. Lanao del Sur accounts for 50% of the total production in Bangsamoro. The next largest producer is Basilan with about 25% share of the region's total while Sulu's production is about 17%. The rest are produced in Tawi-Tawi and mainly for food as cassava is the main source of carbohydrates in the province.

For 2004–2013, production increase was high in Northern Mindanao and SOCCSKSARGEN at an annual rate of 10% and 14%, respectively. It was not the case in Bangsamoro. During the period, cassava-harvested area modestly increased as there were no new users. MICC is the captive market of production in Lanao del Sur. In the municipalities of Malabang, Balabagan, Kapatagan, and other

[117]Cassava Production Guide, www.businessdiary.com.ph

nearby municipalities, cassava is intercropped with coconut.

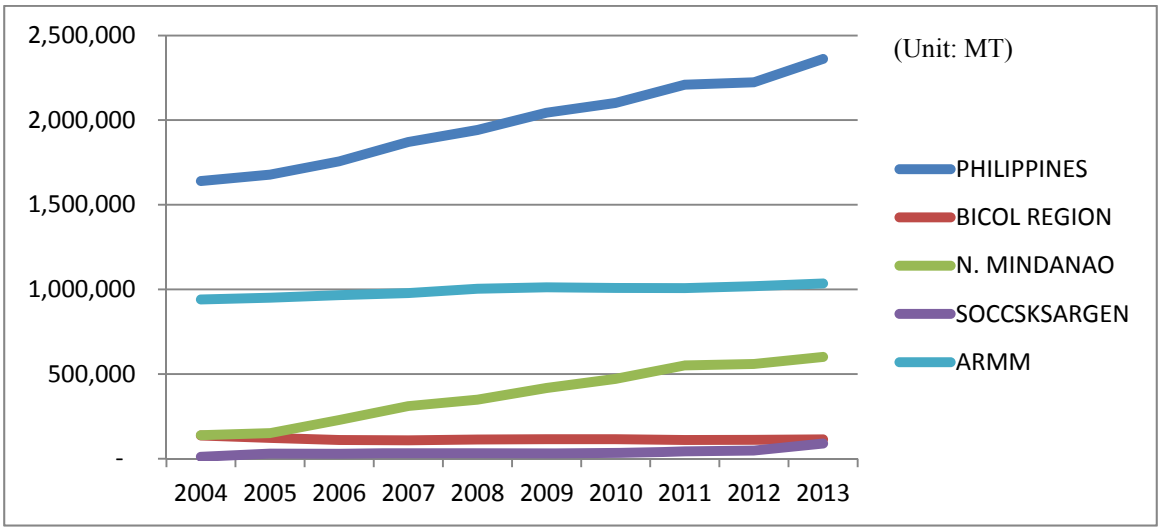


Figure 7.9 Cassava Production in Selected Regions and the Philippines[118]

Productivity in Bangsamoro is comparatively low due to the poor productivity in Maguindanao, Sulu and Tawi-Tawi. Lanao del Sur and Basilan have higher cassava yield but still half of the averages of Northern Mindanao and SOCCSKSARGEN. Productivity in Lanao del Sur is caused by low yields from farms of independent farmers. The Matling Cooperative produces cassava at 20 ton/ha. Members are being assisted by the cooperatives in terms of technology and inputs such as planting materials and fertilizer.

(2) Sugarcane

Sugarcane is a one year crop and needs less care especially during the second half of its growing period, when farmers can engage in other activities where they can earn income. However, sugarcane have to be within an economic distance to the sugar mill for sugarcane to be a viable economic activity otherwise transport will take a toll on the cost of production. As a plantation crop, viability of sugarcane requires economies of scale. The Sugar Regulatory Administration (SRA) estimates a minimum of 30 ha farm for a viable operation. Thus, the government supports the aggregation of small farms into block farms of 30 ha minimum size under the recently enacted Sugarcane Development Act or RA 10659.

The Bangsamoro's production of sugarcane follow the nationwide trend as production follows the price trends. When prices are up, production in the following year increases but when prices are down, production also decreases. Sugarcane farmers usually shift to corn when prices are more advantageous. Sugarcane shift to corn is easy as both have the same land preparation for planting. Otherwise, production outputs could be caused by the weather conditions from planting to harvest. Sugarcane is a resistant crop even against strong typhoons.

Bangsamoro production is barely 2% of the Country's total production although production drastically increased in 2013 sharing 3% of the Country. The largest producer is Western Visayas, particularly Negros Island. In Bangsamoro, production is mostly in the province of Lanao del Sur, particularly the municipalities of Wao and Bumbaran. These towns are nearest the two sugar mills in Bukidnon where sugarcane is delivered and processed into sugar. The sugarcane areas in Maguindanao started to increase in 2007 but recently, significant area were lost to other crops.

Sugarcane production in Bangsamoro is competitive to the extent that its productivity is high. In 2013, it is even higher than the established producing regions. Lanao del Sur's productivity is higher than the national average and Maguindanao's is higher than that of the Western Visayas, the major sugar producing region in the Country (Figure 7.10).

[118]Based on data from CountryStat (http://countrystat.psa.gov.ph/)

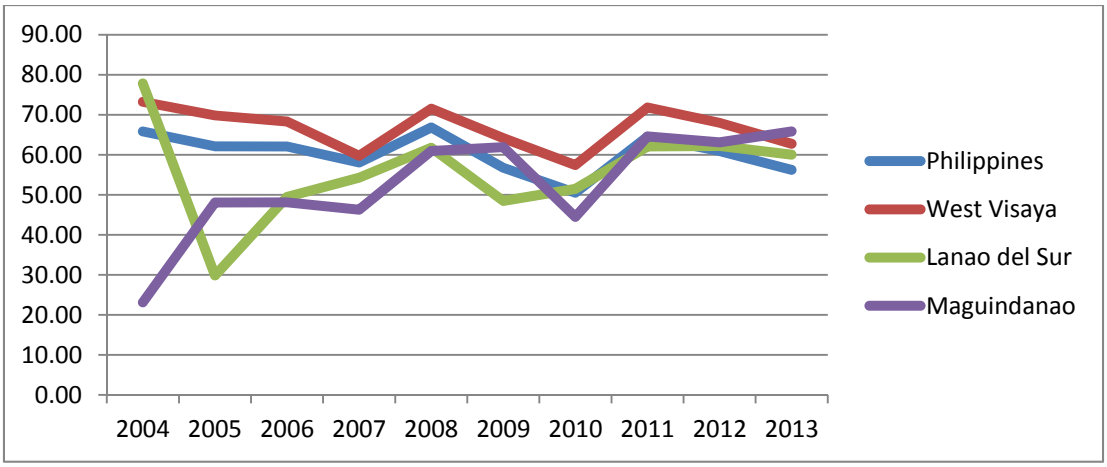


Figure 7.10 Sugarcane Productivity in Selected Areas and the Philippines

Sugarcane is a worldwide traded commodity. Almost all countries worldwide produce sugar. Tropical countries produce sugar from sugarcane while countries in the temperate zones produce sugar from beets. With most countries producing sugar, the world market prices is often not reflective of cost of production. Generally, domestic prices in sugar producing countries are much higher than their export prices. The volatility of sugar prices in the world market is too high and is largely governed by supply and demand situations. Although each country try to manage domestic prices to protect their producers, supply from the three largest sugar producing countries; Brazil, Thailand and India can turn prices haywire.

Production is easily affected by weather conditions. When rains occur during harvest, production reduces as more sugar in the canes do not crystalize. Similarly, if the canes are not harvested, there is a proportional decrease in production because the canes' vegetative growth continues. On very good weather conditions in all parts of the world, surplus sugar supply is a normal phenomenon. When supplies are high, smuggling into the country is rampant. When supply is low, smuggling outside the country occurs. In the Philippines, supply and demand balance is being taken care of by the Sugar Regulatory Administration in order to protect both producers[119] and consumers.

With surplus production starting 2003, the Philippine Congress passed the Biofuels Law in order to utilize excess sugarcane and to spur opening up new areas for agriculture. The law mandated locally produced ethanol and biodiesel blend of not less than 10% and 2% by volume to gasoline and diesel, respectively. The total ethanol requirement in 2013 due to the Law was about 400 million liters. Only about 30% of this volume could be met by local production. Although ethanol can be produced from cassava and other starch-bearing crops, sugarcane is still the most commercially viable feedstock for ethanol production. With the mandated blending of ethanol to gasoline, supply of sugarcane is in huge deficit.

Bangsamoro is highly suitable for sugarcane; however, competition with other commercial crops is tough. Sugarcane is a one-year crop and farmers would need another crop to sustain their needed cash flow before the harvest. According to some experienced plantation developers, farm workers in Maguindanao and Lanao del Sur are averse to harvesting canes due to discomfort. In general, labor for harvesting sugarcane is slowly disappearing and there is a need for mechanization of harvesting, which is only viable under economies of scale. This further justifies that sugarcane is for commercial plantations or block farming.

(3) Other temporary crops

Bangsamoro also produces other temporary crops in smaller quantities but with significant productivity showing potential for crop diversification, rotation or integration. These crops include the following:

[119]Sugar producers include sugar mills and sugarcane planters who both own raw sugar from a sharing system of 30-70 as defined by Republic Act __. Sugarcane planters are still dominated by small landholders.

1) Mongo: Bangsamoro is ranked fourth in the national mango production with productivity comparable to the national average. Farmers plant this crop to rotate with rice crop as a method of restoring nitrogen to the soil.
2) Ginger: Bangsamoro was not the largest ginger producer in the Country with its production accounting for only 3.5% on average but increasing in the last 10 years. In 2013, Bangsamoro was ranked ninth in the national production. The area's productivity had also increased until 2013, when it became the single highest with CALABARZON as poor second.
3) Gourd: In Bangsamoro, productivity of gourd is high but production is low, so is harvested area.
4) Ube: Likewise, productivity of ube is high but production is low in Bangsamoro.

7.2 Livestock, Poultry, and Meat Production

7.2.1 Operation of livestock and poultry

Livestock and poultry in Bangsamoro are largely grown in backyard scale, which is small scale production rather than commercial scale production. Backyard and commercial scale are defined according to the number of heads in a production unit. DA categorized the scale of operation in accordance with the descriptions shown in Table 7.3.

In general, households raise a few heads of livestock in the backyard. Farming households may have one or more carabaos used in farming crops. Some may have received small carabao from the PCC dispersal program. Cattle are mostly bought, grown and sold at marketable age for slaughter. Goats are easier to grow and market, hence attractive for farm families to raise as it can provide immediate cash when needed. Forage crops or fodder trees are hardly observable. There are no storage of feeds like silos nor feed making.[120]

Generally, livestock and poultry raising follows the traditional ways. Carabao, cattle and goats are kept in the shade or in cages from noon to evening and brought to the open field for grazing in the morning. Swine are raised by non-Muslim families in pig pens or under the trees in the backyard. Some households in urban centers with space in their backyards raise one or a few heads for cash or in preparation for feasts, Christmas or birthdays of family members. Farmers in the barangays nearer the municipal or city centers are able to avail of veterinary services and other livestock and poultry raising assistance from the municipal or provincial agriculture offices on a regular basis. Otherwise, farmers availing services is nil.

Table 7.3 Categorization of Scale of Operation for Livestock and Poultry

Scale of Operation	Description
Livestock (carabao, cattle, goat, and swine)	
Backyard	Any farm or household raising at least one head of animal and does not qualify as a commercial farm.
Commercial	Satisfies any of the following Conditions: a) at least 21 head of adults and zero young b) at least 41 head of young animals c) at least 10 head of adults and 22 head of young
Poultry (chicken, duck, turkey, etc.)	
Backyard	Any farm or household raising at least one head of bird or poultry and does not qualify as a commercial farm.
Commercial	Satisfies any of the following Conditions: a) 500 layers or 1,000 broilers b) 100 layers and 100 broilers if raised in combination c) 100 head of duck regardless of age

Source: Glossary of Terms, Philippine Statistics Authority (www.psa.gov.ph).

Chicken and ducks, which are the most common poultry raised in Bangsamoro, are also raised in backyard scale, which could explained the dominance of native chicken varieties in the region. Native

[120] JICA, Development Study on Local Industry Promotion in ARMM. November 2011

chickens are endemic breeds from the wild and domesticated many years before although some have already been crossed with imported breeds. The practice of raising native chicken in free-range has been kept ever since in the farms as it incurs very minimal cost. Native chicken commands higher price in the market due to superior taste compared with broiler chicken.

The following sections describe the magnitude of production and growth of inventory of the major livestock and poultry in the Bangsamoro area. This is followed by meat production made available for local consumption.

7.2.2 Carabao

Carabaos are used mainly as "beast of burden" rather than for meat or milk despite the establishment of the Philippine Carabao Center (PCC) to promote carabao for meat and milk production. Although there are hand tractors, carabaos are still widely used to pull the plow and other implements for field preparation for planting and transporting farm supplies and materials in short distances. Carabaos are still more often used in small rainfed palay and corn areas. Dairy buffalo (Photo 7.11) crossed with native carabao yield about 4.5 L/day of milk.[121]

Photo 7.11 Imported Dairy Buffalo to Cross with Native Carabao

Carabao milk is more appropriate for farming communities as it has more calorie than cow milk. Table 7.4 taken from the PCC-USM milking station shows comparison of carabao, cow and goat milk composition. It has more fat making more useful for many processed food like yogurt and sweets like pastillas.[122] This can provide household requirement with extra that can be sold and greatly improve nutrition of children in the rural areas. Carabeef are still priced lower than beef (cattle meat) and still have lower preference among consumers. Old carabaos not fit to work in the farms are slaughtered for meat, thus creating a reputation that carabeef is tough.

Carabao-raising in Bangsamoro is on a backyard-scale. Commercial raising existed until 2007. Most carabao-raising is found in Maguindanao where rice and corn farms are extensive and larger than the rest of the region. On average, Maguindanao constitute 69% of the total carabaos in the region. Overall, the carabao inventory in Bangsamoro is decreasing at a rate of 3% as it mirrors decrease in Maguindanao (Figure 7.11). The number of carabaos is increasing in Basilan, Sulu, Tawi-Tawi, and Lanao del Sur. The decreased number of carabaos in Maguindanao and Lanao del Sur is mainly accounted for by the farmers' preference to hand tractors, which are a better substitute to carabaos for land preparation for corn and rice crops. Despite the proximity of Maguindanao and Lanao del Sur to the PCC stations in

[121]Philippine Carabao Center, www.pcc.gov.ph
[122]Ibid.

USM and MSU, respectively, multiplication of carabao for milk and meat have little success.

Table 7.4 Comparison of Cow, Carabao, and Goat Milk

COMPOSITION OF WHOLE MILK FROM COW, CARABAO AND GOAT, per 100 g edible portion

COMPONENTS	COW	CARABAO	GOAT
Water (g)	87.5	80.0	86.20
Energy (kcal)	65	124	72
Protein (g)	3.3	5.4	3.6
Fat (g)	3.6	9.5	4.1
Carbohydrate (g)	4.8	4.3	5.3
Crude Fiber (Diet. Fiber) (g)	0.0	0.0	0.0
Ash (g)	0.8	0.8	0.8
Calcium (mg)	139	187	124
Phosphorus (mg)	93	98	95
Iron (mg)	0.4	0.2	0.7
Retinol (µg)	35	50	35
β-Carotene (RE) (µg)	25	20	0
Total Vit. A (RE) (µg)	39	53	35
Thiamin (mg)	0.04	0.04	0.04
Riboflavin (mg)	0.18	0.18	0.27
Niacin (mg)	0.10	0.10	0.10
Ascorbic Acid (mg)	2	2	3

Source: The Philippine Food Composition Tables, 1997
Food & Nutrition Research Institute
Department of Science & Technology

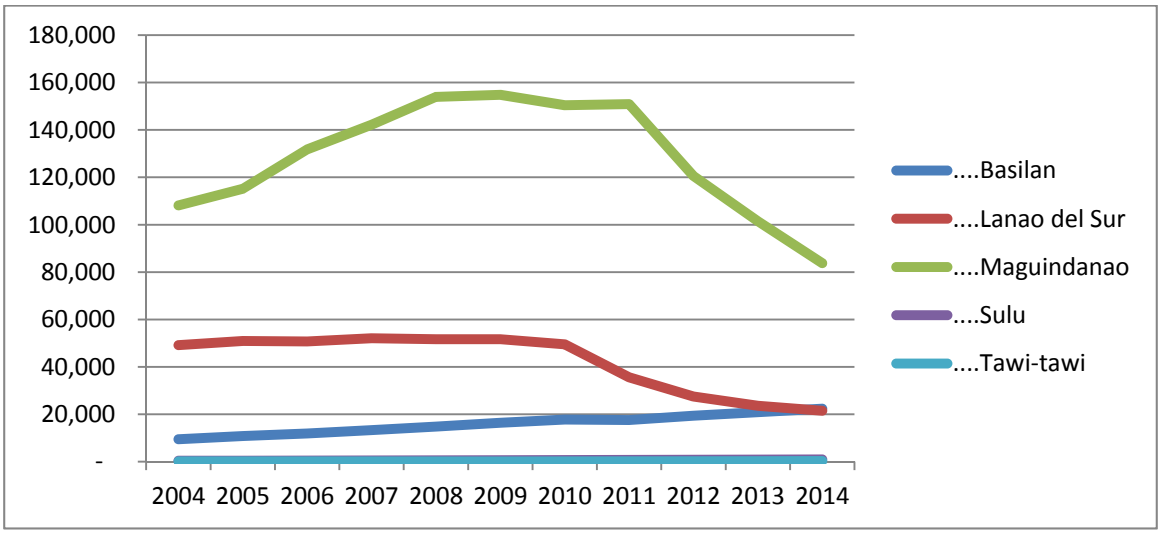


Figure 7.11 Carabao Inventory in Bangsamoro by Province, 2004–2013

Although farmers recognize the value of carabaos in their lives, they do not give appropriate care for lack of information. Most farmers have no knowledge and importance of balanced nutrition for carabaos. Except for those that are reached by veterinarians and extension workers of PCC, farmers generally do practices they learned from parents. These practices include feeding with fresh grasses growing around the farm and providing water for soaking their bodies. Feed management for good nutrition and proper care for animals does not exist for lack of knowledge.

PCC, under its various programs undertake farm extension, development and other corollary support to increase carabao population and positively affect nutrition and income of farm families. However, PCC has little success in ARMM. According to the PCC located in the USM campus, Maguindanao is included in their scope. However, its operation in Maguindanao is hampered by the peace and order situation of the province. For the same reason, the PCC located in MSU, Marawi City has no accomplishment and will soon be merged with the PCC in USM. The management of MSU wants to retain the PCC in the campus and have improved the program and gearing up for continuation of the dispersal program for Maguindanao and Lanao del Sur. In the last three years of operation, MSU-PCC

doubled the number of carabaos in its brood.

The presence of PCC in the Bangsamoro area should be continued to arrest the declining trend of carabao population to impact farmer's income and enhance nutrition of the people. Carabao dispersal is an important program of the PCC and should be expanded such that one household has at least one carabao for farm work or for milk. Organizing the farm households into associations or cooperatives to go into milk production, processing, and marketing has a great potential for farm household income and improving nutrition of children in the community. It can also be a farm activity for farmers' housewives.

7.2.3 Cattle

In an effort to address meat requirement of the Country and localize value added, the Philippine Government used to import cattle and distribute to farmers under a dispersal program. At present, the importation and trade of cattle and meat are left to the private sector. Currently, private individuals do the dispersal under various agreements with the farmers. For reproduction, the farmers usually take the first offspring and the succeeding are given to the owner. For cattle fattening, those who have extra income or can access loans buy cattle and sell after a desired weight is achieved. Like carabaos, cattle is fed with available grasses in the vicinity. Hence, having 1 or 10 cattle does not require much investment and the margin that farmers make after 120 to 180 days is reasonable.

During the 10-year period of 2004–2013, cattle inventory in Bangsamoro averaged at 3% of the Country's inventory and 10% of Mindanao's total. Cattle was largely raised in backyard scale but unlike carabao, cattle inventory consisted of about 2% from commercial scale in 2013. It grew from 335 heads in 2004 to 1,398 heads in 2013 especially with the start of commercial operation in Lanao del Sur in 2008 and Tawi-Tawi in 2012.

Bangsamoro's commercial cattle--raising steadily increased over the 10 years although it was still much smaller than Northern Mindanao and SOCCSKSARGEN, the two Mindanao regions that host large commercial cattle farms. In 2013, the cattle inventory was rather evenly distributed among the provinces of Bangsamoro, except for Tawi-Tawi with relatively small backyard cattle inventory (Figure 7.12). There had been a little concentration in Maguindanao and Lanao del Sur, particularly in 2009. The inventory in the two provinces started to decline from then on.

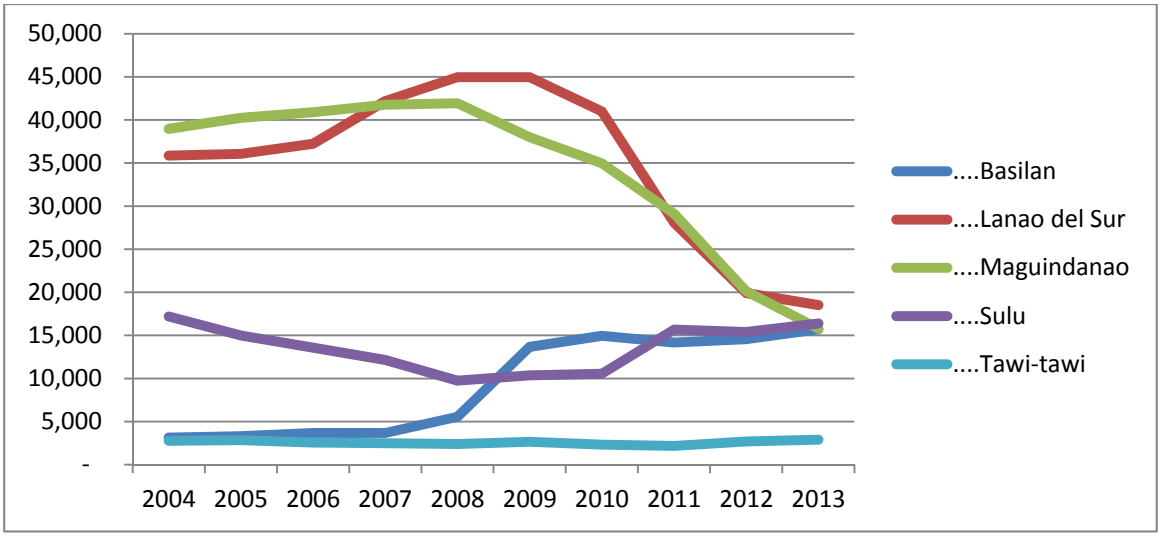


Figure 7.12 Cattle Inventory in Bangsamoro by Province, 2004–2013

Milk consumed in the Philippines are mostly imported. Only less than 1% of the total supply is locally produced from cattle, carabao and goat. The efforts of PCC enabled carabao milk to contribute a 0.2% to the total milk supply.[123] As part of its instruction in animal husbandry, the MSU main campus operates

[123]The Philippine Dairy Cattle Farming Sector: A Briefing for Canadian Genetic Suppliers, Agriculture and Agri-Food Canada. ww5.agr.gc.ca

a dairy farm (Photo 7.12) through the assistance of the government of New Zealand, which provided the total package of technology for raising dairy cattle and milk processing from pasteurization to cheese and butter making.

Photo 7.12 Dairy Cattle Grazing at MSU Main Campus Dairy Farm

7.2.4 Goat

Goat-raising fits the small farms because it does not require large capital to start. Goats multiply fast and does not need much care because they eat leaves from the trees, grasses and agricultural by-products. Thus, goat keeping provides good livelihood and additional income to the small farmers. It can also be easily integrated into existing farm systems such as fruit trees and coconuts.

Goat inventory is only 17% of Mindanao's total inventory and only 5% of the Country's total. During the 10 years of 2004–2013, goat inventory in the Bangsamoro region (Figure 7.13) decreased at an average annual rate of 3%. This is accounted for by the continuous drop in number, particularly from 2010 to 2011 when it decreased by 17%. This was due to the drop in the inventory in Maguindanao, which had considerably more goats than the rest until 2010. After the year, the number of goats dropped sharply until 2013, when the province had the smallest inventory in Bangsamoro. On the other hand, the inventory in Sulu and Tawi-Tawi has consistently increased averaging at 6% per annum. Goat-raising in Bangsamoro like other livestock is generally on a backyard scale. Commercial-scale breeding is found in only Maguindanao and Tawi-Tawi in 2013 with 809 and 2,270 heads, respectively.

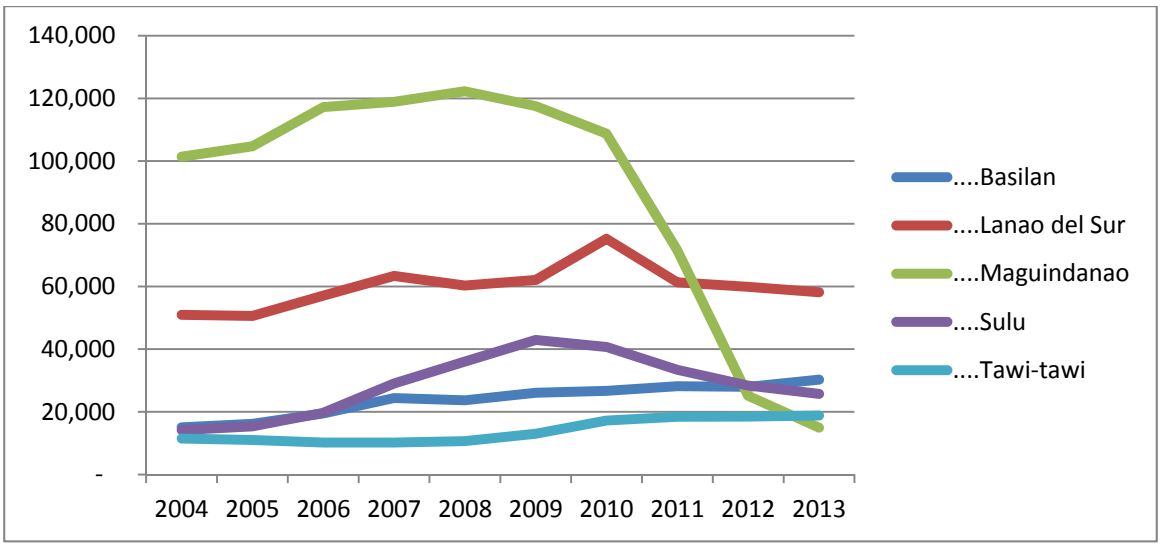


Figure 7.13 Goat Inventory in Bangsamoro by Province, 2004–2013

Goat is food usually seen in fiestas, wedding, birthdays and other celebrations. For this purpose, goats are usually sold whole and live even for low income families. Moreover, goat is one of the most popular animals to be sold as halal.[124] One reason is it can be easily integrated into organic farming systems. Because it requires low maintenance and is easy to manage, it can be a livelihood undertaking for women in farms.

Although goats can survive from grazing in the fields eating leaves and agricultural wastes, the benefit from goat raising can be optimized by good farm management practices such that proper nutrition is provided. Legume trees should be utilized to put more protein in the food intake. These trees can serve as fence while goats are supplied with protein-rich leaves. Goat housing technologies which are already being showcased in USM should be disseminated to avoid diseases.

7.2.5 Hogs

It is not surprising that hogs raised in Bangsamoro accounts for only 3.7% of the total hogs in Mindanao and only 1% in the Country. In Bangsamoro, there is no commercial hog raising; all hogs are raised on a backyard scale. There are more hogs in Basilan and Maguindanao where more non-Muslim people live. Despite the Bangsamoro's predominantly Muslim population, hog inventory actually grew during the past 10 years from 2004–2013 (Figure 7.14) at an average annual rate of 2%. This is due to the growth in Basilan and Tawi-Tawi at an annual average rate of 11% and 27%, respectively. The inventory generally increased from 2004 to 2008. There is no commercial hog raising in Bangsamoro. Marked decreases were shown from 2008 to 2013 at an average of 30% annually mainly coming decreases in Maguindanao.

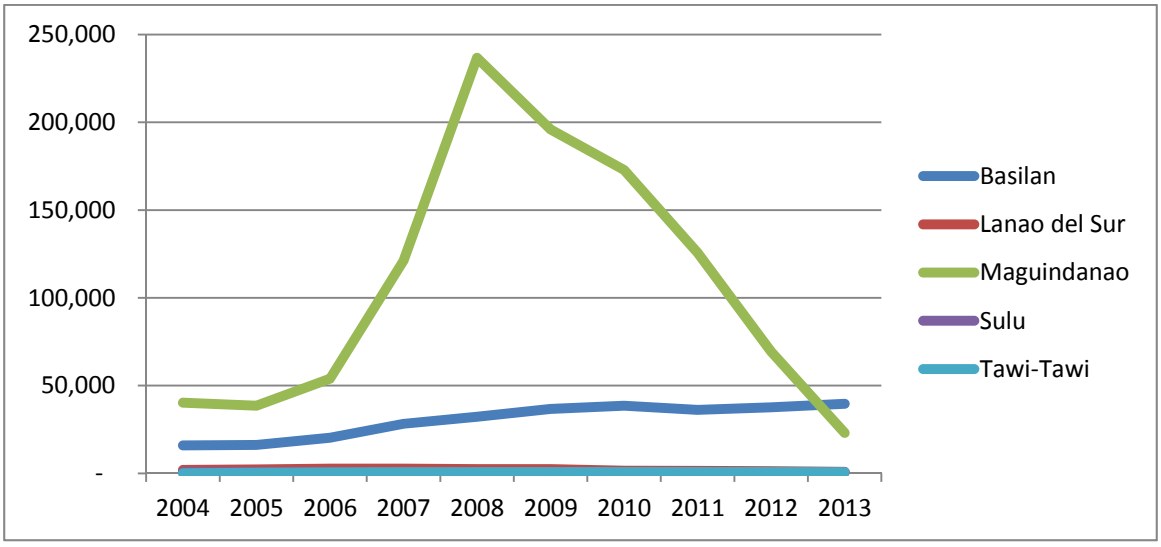


Figure 7.14 Hog Inventory in Bangsamoro by Province, 2004–2013

7.2.6 Poultry

Poultry in Bangsamoro mostly consists of chicken and duck. For 2004–2013, the average chicken inventory is 1.5% of the Country's inventory and 5% of the whole Mindanao's inventory. Almost 100% of the chickens grown in Bangsamoro are native varieties. As shown in Figure 7.15, the largest inventory is in Lanao del Sur accounting for 34% of the regional total, but each province contributes to the total inventory. Inventory in Lanao del Sur started to rise in 2009 and sustained until 2012 breaking away from the other provinces. On the other hand, chicken inventory in Maguindanao started to drop in 2009 and continued to drop. By 2013, the province's inventory was the second smallest in Bangsamoro. BaSulTa's inventory consistently increased during the period.

In Bangsamoro, Maguindanao has by far the largest number of ducks with its inventory accounting for 87% of the regional total. As shown in Figure 7.16, the province's inventory dwindled from about

[124]ARMM-Local Industry Promotion, 2011

400,000 in 2004 to 200,000 in 2010, picked up in 2011, and then increased to over 400,000 again (404,162) in 2013. As in chicken, ducks are raised mainly in the backyard (96% in 2013). In the region, production of native ducks or *pateros* ducks has been successful as additional income for the farmers.[125]

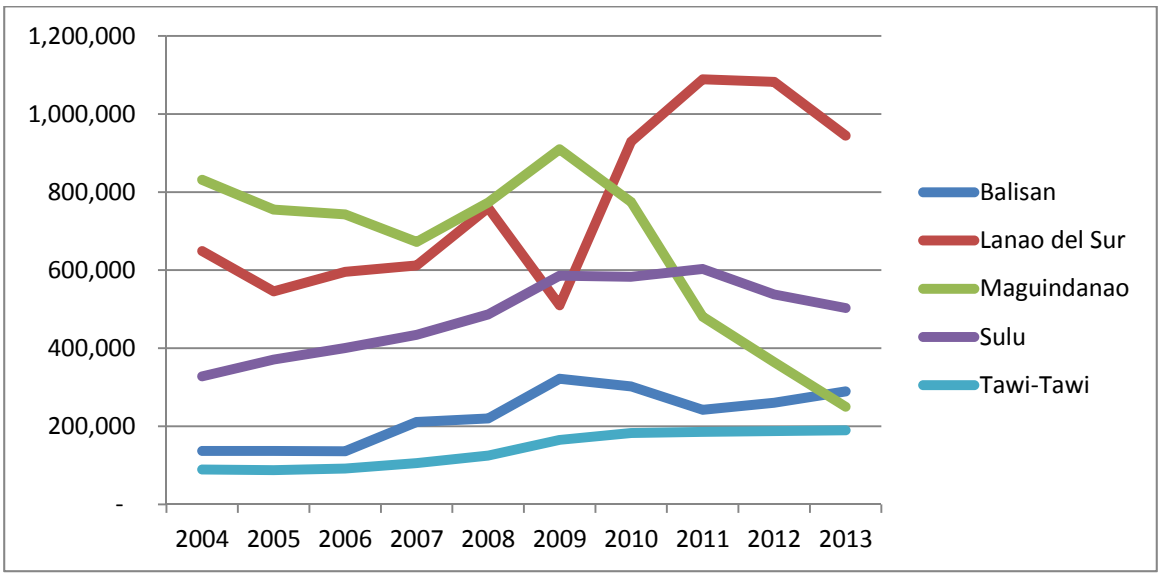


Figure 7.15 Native Chicken Inventory in Bangsamoro by Province, 2004–2013

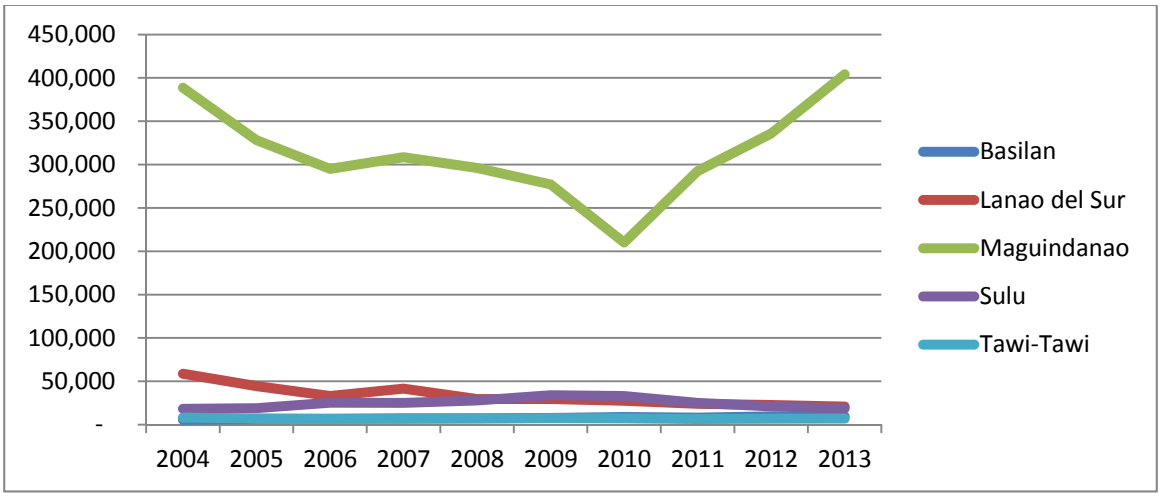


Figure 7.16 Duck Inventory in Bangsamoro by Province, 2004–2013

Photo 7.13 Ducks and chickens in free range at organic farm in Koronadal City

[125]Interview with Provincial Agriculturist by JICA Study Team Researcher

Egg production in Bangsamoro is among the lowest three regions in Mindanao although production is much higher than Caraga. Egg production over the last 10 years averaged 5,611 ton. About 63% are chicken eggs and 47% duck eggs. Production barely changed from 2004 to 2013 although it slightly decreased due to the reduced production of duck eggs.

Native chickens and ducks are good to raise in an integrated organic way. Aside from additional earnings from their eggs and meat, ducks help the farmers in providing natural fertilizer and act as pest control by eating insects and snails, in the rice fields. For this reason, duck raising is best integrated in an organic farming system. Picture below shows ducks in a highly intensive organic farm in Koronadal of South Cotabato.

7.2.7 Meat production and egg production

The main source of meat production in Bangsamoro consists of livestock such as carabao, cattle, hog and goat and poultry, including chicken and duck. Poultry production data in Bangsamoro consist of chicken and duck. Average production of all meats from 2004 to 2013 is about 38,941 ton with highest in 2011 at almost 50,000 ton. Carabeef and pork are the major meat produced in Bangsamoro. Pork production, which accounts for an average of about 24% of the total production is high considering that about 90%[126]of the total population in Bangsamoro are Muslims.

The Bangsamoro area has cities, such as Cotabato City in Maguindanao and Isabela City in Basilan, that have higher percentages of non-Muslims. Meat production in Bangsamoro barely increased (0.38% AAGR) over the 10 years from 2004 to 2013 (Table 7.5). Annual growth rates of chicken, duck, beef, and chevon were slightly declining. These mitigated the overall growth, which was due to the increase in carabao meat or carabeef and pork at the rate of 2.7% and 5.8% AAGR, respectively. By 2013, the major meat supply are pork, beef and carabeef.

Table 7.5 Meat Production in Bangsamoro by Type of Animal, 2004–2013

(Unit: kg)

Type	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Carabao	6,074	4,839	5,573	6,798	8,436	8,497	9,226	9,569	8,051	7,764
Beef	10,713	9,099	9,596	10,734	10,006	10,917	13,548	13,535	10,620	10,440
Pork	6,884	7,341	7,754	9,599	10,738	12,364	11,972	13,566	12,446	11,424
Goat	5,255	5,000	5,570	5,972	5,697	5,836	6,210	5,438	4,548	4,495
Chicken	8,673	8,151	8,266	8,623	7,371	6,168	6,448	6,463	5,817	5,851
Duck	2,206	1,878	1,640	1,486	1,420	1,344	1,094	1,177	1,106	1,021
Total	39,805	36,308	38,399	43,212	43,668	45,126	48,498	49,748	42,588	40,995

Source: CountryStat (http://countrystat.psa.gov.ph/).

Chicken eggs are obtained from native chicken and broiler layers. As shown in Figure 7.17, duck eggs continuously decreased from 2004 to 2010. This is consistent with the declining population of duck in Bangsamoro. Following the same trend as duck population, duck egg production also started to increase in 2011.

Native chicken command higher prices than broiler chicken due to superior taste. In the same way, eggs of native chicken although smaller in sizes have higher premium prices than broiler/layers' eggs. Chicken eggs are the usual table eggs and also used in various food preparations. Duck eggs are usually processed into salted eggs. It is also the egg used to produce *balut*, a native delicacy produced by allowing a fertilized egg to grow into an embryo for a number of days. After which, it is harvested and boiled in water.

[126] 2010 Census of Population, Philippine Statistics Authority, http://web0.psa.gov.ph

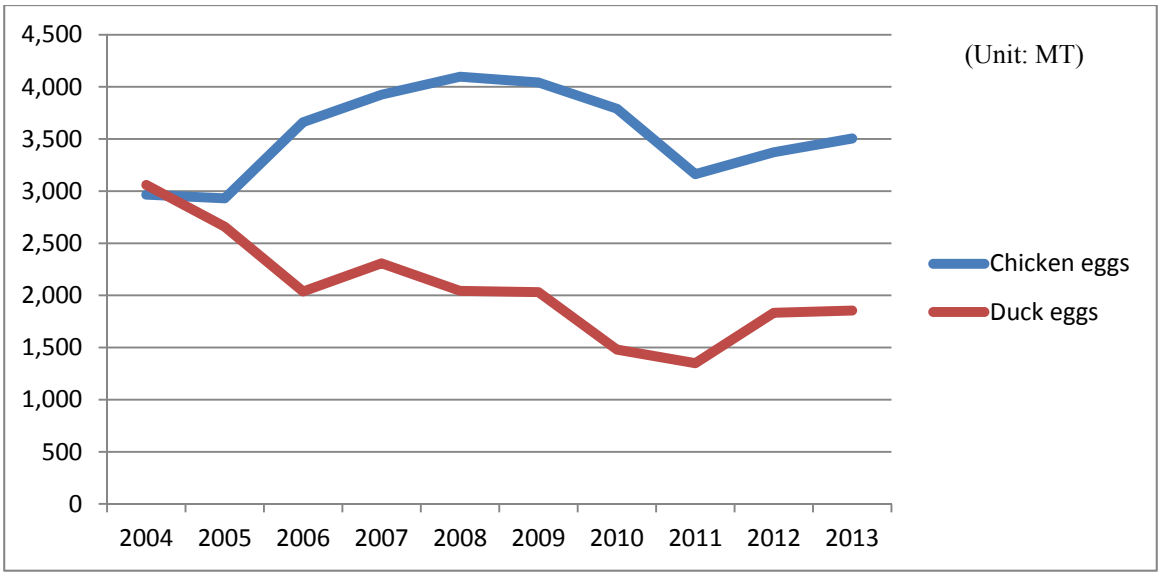


Figure 7.17 Chicken and Duck Egg Production in Bangsamoro, 2004–2013[127]

7.3 Food Consumption and Sufficiency Levels in Primary Food Commodities

Primordial to the Country's food security is the availability of rice as it is the Filipino's staple food. Every administration performance in the country is measured on the stability of supply and prices of rice in the market. Thus, rice is a very political commodity in the Philippines, to say the least.

Table 7.6 shows the comparative annual per capita consumption in rice among Mindanao regions. Bangsamoro's per capita consumption in 2012 is 118.77 kg, which is higher than the national average and many regions in Mindanao (except SOCCSKSARGEN). Overall, per capita consumption of rice is already an improvement from 2008 to 2009. All Philippines reduced in consumption from the previous years and particularly true for all regions in Mindanao. For Bangsamoro, reduction in per capita consumption is about 8% for 2009–2012. These significant reductions should not mean deficiency in the carbohydrate requirement of the residents/people in the localities but rather diversified consumption of carbohydrate-containing food commodities.

Table 7.6 Annual Per-Capita Rice Consumption

Country/Province/Region	1999–2000 (kg)	2008–2009 (kg)	2012 (kg)
Philippines	105.77	119.08	114.27
Zamboanga Peninsula		109.10	105.49
Northern Mindanao	90.69	115.70	107.94
Southern Mindanao	108.26		
Davao Region		113.15	105.80
Central Mindanao	103.32		
SOCCSKSARGEN		136.50	125.50
Caraga	113.62	128.13	118.16
ARMM		144.66	118.77

Source: CountryStat (http://countrystat.psa.gov.ph/).

Comparing rice consumption in Bangsamoro at the provincial level, the people in the mainland, Lanao del Sur and Maguindanao consume more rice than those in the island provinces (Table 7.7). Both provinces are rice producing provinces. Besides, being in the mainland, the flow of commodities is fluid. Even with high cassava production in Lanao del Sur, it looks like people have preference for rice. Cassava produced in Lanao del Sur are mainly processed by Matling Corporation. As it is for the whole Country, for both Maguindanao and Lanao del Sur provinces, other sources of carbohydrates like root

[127]Based on data from CountryStat (http://countrystat.psa.gov.ph/)

crops (cassava, ube, and sweet potato) and bananas are not direct substitutes of rice.

Table 7.7 Per Capita Rice Consumption in Bangsamoro

Region/Province	1995	1999–2000	2008–2009	2012
ARMM	116	122	145	119
Basilan	119	93	125	125
Lanao del Sur	--	126	181	130
Maguindanao	140	135	140	122
Sulu	97	121	123	111
Tawi-Tawi	92	91	107	106

Source: Food Consumption Statistics, Philippines CountryStat (http://countrystat.psa.gov.ph/).

White corn, which is produced at competitive yield nationwide, is also not direct rice substitute because it is not a staple for the locals of Lanao del Sur and Maguindanao. Sulu and Tawi-Tawi are lowest in per capita consumption. Perhaps, due to the small rice production capability and some degree of isolation, the people developed the taste for cassava, the production of which has comparative advantage in terms of yield. Cassava is a staple food for the people of Tawi-Tawi and Sulu. The most common food preparations of cassava are locally called *piyuto*, *siyanglag*, or *biyamban*. Lanao del Sur consumption is quite high in 2008–2009, increasing by 44% from 10 years before. However, per capita consumption have gone down in 2012 by 28%. All other provinces' per capita consumption also declined marginally in 2012 and made the whole region per capita go down from 145 to 119 kg.

Contrary to the common notion that rural areas consume more rice due to farming activities (which require more physical exertion), urban consumption of rice in Maguindanao is higher than rural consumption (Table 7.8). This was very pronounced particularly in 2008–2009 when urban consumption increased by 35% while rural consumption decreased by 9%. In Lanao del Sur, consumption does not have distinction between rural and urban consumers. Both are high although rural is slightly higher. For Sulu and Tawi-Tawi, per capita consumption in rural areas is higher than in urban areas. Although cassava is considered direct substitute of rice in Sulu and Tawi-Tawi, per capita consumption of rice is increasing in both urban and rural consumers.

Table 7.8 Urban/Rural Per Capita Consumption of Rice by Province

Region/Province	Urban			Rural		
	1999–2000	2008–2009	% Change	1999–2000	2008–2009	% Change
ARMM	124	150	21	122	143	17
Basilan	106	139	31	85	122	44
Lanao del Sur	122	176	44	130	183	41
Maguindanao	133	180	35	137	125	-9
Sulu	127	108	-15	117	134	15
Tawi-Tawi	94	101	7	91	111	22

Source: DAF-ARMM (www.daf.armm.gov.ph).

On the basis of availability of rice, utilization per capita ranges from a high of 128 kg/year to a low of 115 kg/year from 2004 to 2013.[128] With reference to the national rice supply, it can be said that rice is made available for every consumer in the country. However, rice supply is not totally produced in the Country. The Philippine Government was able to manage food security in rice properly during the period 2004 to 2013 by resorting to importation. As shown in Table 7.9, the Government imported 3% to 19% or an average of 12% of the total volume of rice consumed in the Country. Over the last 10 years, the Government imported rice under the label of "cereals and cereal preparations." Importation under the category was at an annual average of 4.35 million ton valued at US$1.65 million (on a CIF basis). The highest importation was in 2009 at 5.4 million ton and the lowest 2004 at 3.4 million ton.[129]

[128] Rice Supply/Utilization Account, CountryStat (http://countrystat.psa.gov.ph/)
[129] Calculated based on data from Trade Statistics of CountryStat (http://countrystat.psa.gov.ph/)

Table 7.9 National Rice Supply

	Production		Import		Total	
Year	(MT)	(%)	(MT)	(%)	(MT)	(%)
2004	9,481	90	1,001	10	10,482	100
2005	9,550	84	1,822	16	11,372	100
2006	10,024	85	1,716	15	11,740	100
2007	10,621	85	1,805	15	12,426	100
2008	10,997	82	2,432	18	13,429	100
2009	10,633	86	1,755	14	12,388	100
2010	10,315	81	2,378	19	12,693	100
2011	10,911	94	707	6	11,618	100
2012	11,793	92	1,041	8	12,834	100
2013	12,059	97	398	3	12,457	100
Overall	106,384	88	15,055	12	121,439	

Source: Data from Rice Supply/Utilization Accounts, CountryStat (http://countrystat.psa.gov.ph/).

Self-sufficiency is the ability of local production to meet the total domestic requirement. In rice, self-sufficiency has been elusive in the Country as shown in Table 6.9. From 2004 to 2013, rice sufficiency still seesawed from 81% to 96.8%. The year 2013 is an improvement from all the years in terms rice self-sufficiency as production was highest during the last 10-year period. Production of rice is still concentrated in Central Luzon and other large producing regions that are vulnerable to typhoons and droughts. Thus, the development of areas for production of palay crop less frequented by typhoons and drought would help improve if not attain 100% rice food self-sufficiency level.

The self-sufficiency ratio in rice for Bangsamoro was computed using production, net food disposable ratio and population for 2012 as shown Table 7.10. Maguindanao and Lanao del Sur are both rice self-sufficient while the three island provinces could barely provide for its consumption with Basilan, Lanao del Sur and Tawi-Tawi production meeting on 7%, 3% and 1% of their requirements, respectively. Maguindanao is a large rice producing province having a huge surplus of 89% from its total food requirement. Due to this surplus, the self-sufficiency of the whole region in 2012 averaged at 92%.

Table 7.10 Self-Sufficiency Ratio by Province, 2012

Province	Per-capita consumption (kg)	Population*	Consumption (MT)	Production (MT)	Net food disposable† (MT)	Self-sufficiency (%)
Bangsamoro	118.77	3,675,755	436,562	542,760	401,642	92
Basilan	124.91	333,445	41,650	4,116	3,046	7
Lanao Del Sur	129.55	1,046,594	135,586	186,680	138,143	102
Maguindanao	122.11	1,115,725	136,238	348,123	257,611	189
Sulu	110.64	760,651	84,157	2,945	2,179	3
Tawi-Tawi	106.29	419,341	44,573	896	663	1

*Calculated based on 1.73% AAGR; †Calculated using National Food Disposable ratio

Figure 7.18 shows the per capita consumption of carbohydrate-bearing crops in the whole Country, the Mindanao regions and Bangsamoro. Consumption of these crops are very low in Bangsamoro and its provinces, in particular. Corn is a rice substitute in many areas, but not in the Bangsamoro region even as white corn is the main corn produce. Compared to the regions in Mindanao and the Country's average, consumption of corn is very much lower in Bangsamoro. It is only 3% of the national per capita consumption and less than 1% of the other regions in Mindanao. Despite being large producers of corn, Maguindanao and Lanao del Sur have very low per capita consumption. White corn produced in these provinces are mostly processed by Lamsan Corporation into starch. Consumption of cassava per capita is highest in BaSulTa. As earlier noted, BaSulTa particularly Tawi-Tawi and Sulu are large consumers of cassava as food. Basilan shows large consumption of Saba banana, which can more likely substitute rice compared to other varieties.

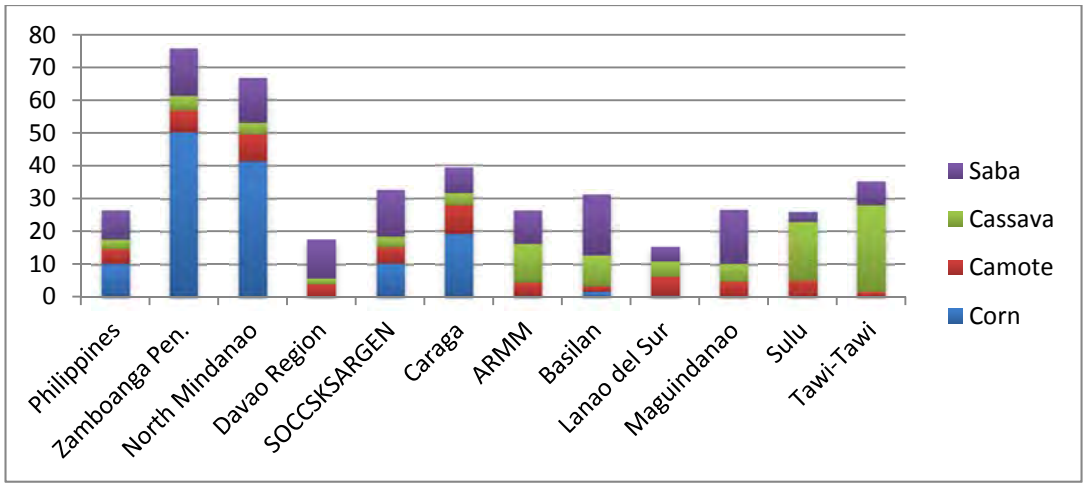


Figure 7.18 Per-Capita Consumption of Selected Carbohydrate-Bearing Crops[130]

Figure 7.19 shows the per capita consumption of meat from various sources in the whole Country, Mindanao regions and Bangsamoro. Bangsamoro is lowest in consumption of meat among all Mindanao regions and only about half of Zamboanga's consumption, which is the second lowest. Notably, pork and chicken are consistently the main source of protein and other animal-based food nutrients for the Country and Mindanao regions. For the obvious reason, pork has very low per capita consumption in Bangsamoro. For the entire Bangsamoro as it is for all over the Country, consumption of beef is low. Among the Bangsamoro provinces, however, Maguindanao has the highest combined per-capita consumption of meat.

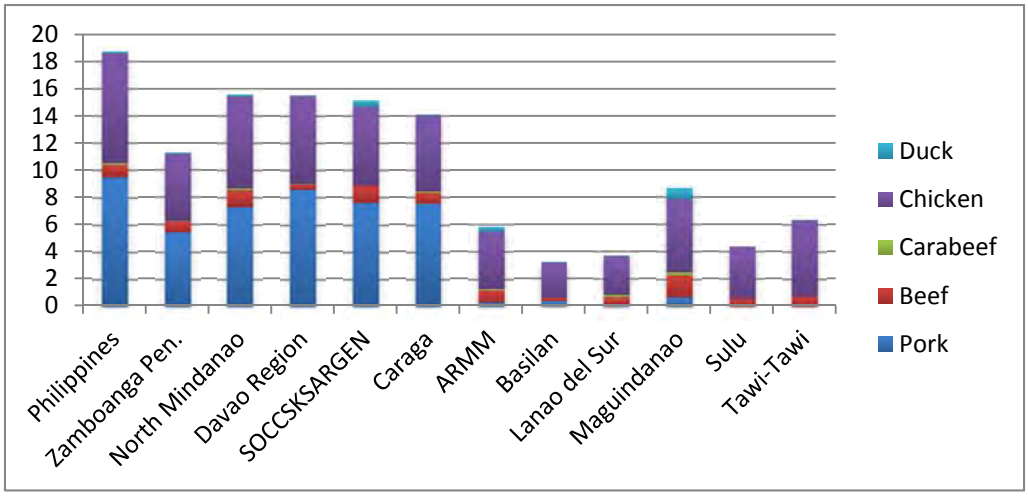


Figure 7.19 Annual Per-Capita Meat Consumption[131]

Consumption of vegetables in Bangsamoro is at par with those of the other regions in Mindanao. Except for Basilan, all provinces have high per capita consumption (Figure 7.20). However, per capita consumption is largely affected by availability in the area. For example, per capita consumption of chayote is highest in Lanao del Sur as it is available in the area. Lanao del Sur, especially the surrounding areas of Lake Lanao, have very high productivity in chayote, which grow well in the highlands. A sprouted chayote can be left on the roadside and it will grow and bear fruits. On the other hand, *ampalaya* (bitter gourd) and eggplant grow well in any part of the Philippines, making available everywhere for consumption. Tawi-Tawi is the largest in per capita consumption of vegetables.

[130]Based on Food Supply and Utilization Acount Data, CountryStat (http://countrystat.psa.gov.ph/)
[131]ibid.

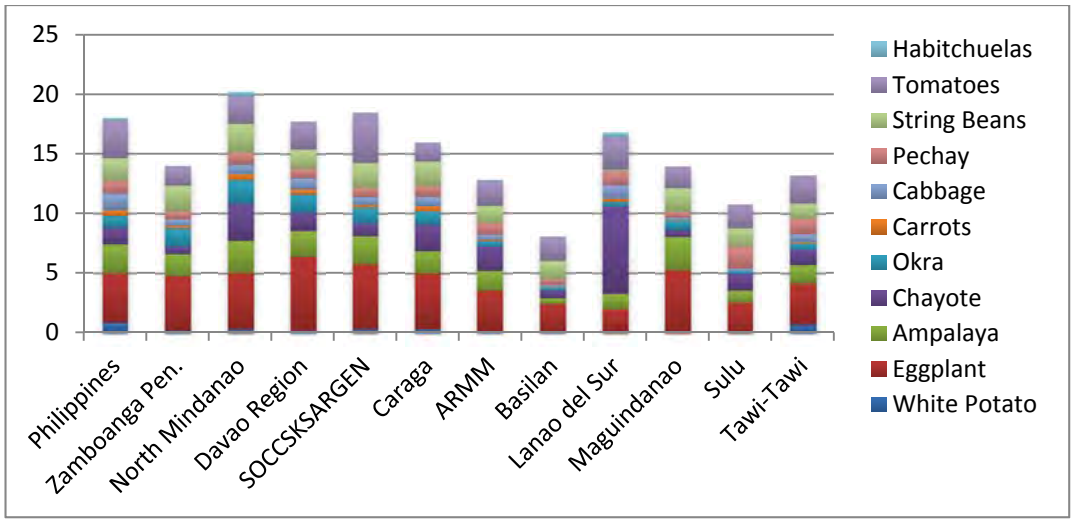


Figure 7.20 Per-Capita Consumption of Various Vegetables[132]

Consumption of fruits is the lowest in Basilan and Lanao del Sur (Figure 7.21). On the other hand, Sulu and Tawi-Tawi have the highest consumption of fruits generally represented by consumption of papaya.

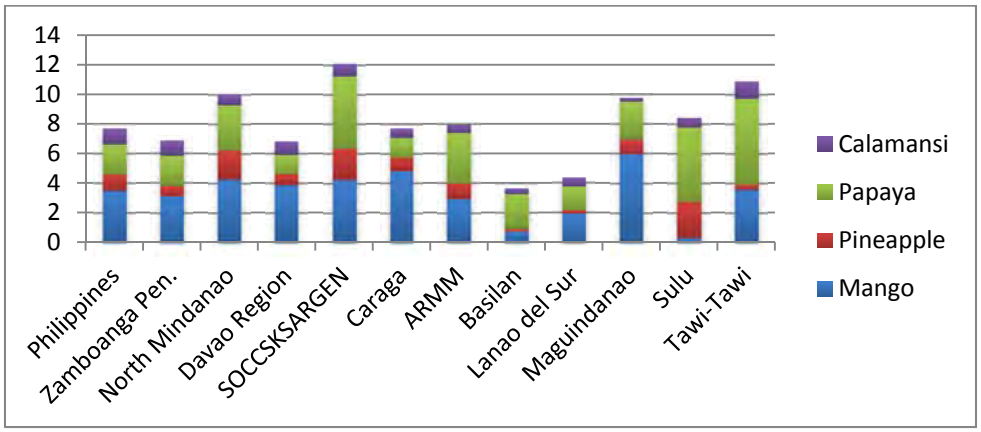


Figure 7.21 Per-Capita Consumption of Fruits[133]

As calculated and shown above, rice self-sufficiency level in Bangsamoro in 2012 is about the same as the national level of 92% as shown in Table 7.11. Bangsamoro has the capacity to be self-sufficient and to positively affect the national sufficiency level in rice. Improving productivity and expansion of rice areas by increasing irrigation intensities would bring surpluses in the provinces of Lanao del Sur and Maguindanao where service areas under the NIS and the CIS have combined irrigated area of only 34%. BaSulTa provinces could increase in levels of sufficiency with the further development of CIS and small scale irrigation systems. BaSulTa are almost isolated provinces and producing rice for their consumption is the best way to manage food supply.

Although data are not available to calculate food sufficiency for corn in Bangsamoro, it is almost certain that the region is self-sufficient due to its low per-capita consumption. It is also hardly used as feeds because chicken and duck are mostly raised in backyard or free range conditions.

Bangsamoro's generally low consumption of meat could mean that sufficiency level is high particularly for chicken. Again, consumption is influenced by availability of supply.

[132] ibid.
[133] ibid.

Table 7.11 Self-Sufficiency on Selected Commodities

(Unit: %)

Commodity	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Rice	90.45	83.98	85.38	85.47	81.90	85.83	81.27	93.91	92.13	96.81
Corn	99.58	98.67	95.21	97.79	99.70	95.88	98.64	99.06	98.20	95.57
Beef	79.31	84.86	83.25	79.91	78.32	82.02	79.55	80.14	79.79	79.70
Carabeef	54.94	54.58	58.27	63.95	61.56	68.33	68.24	72.67	73.38	78.21
Pork	97.56	97.83	97.78	96.87	95.08	94.21	91.54	92.08	93.30	91.72
Chicken (dressed)	97.18	96.50	95.20	95.55	95.25	93.56	90.38	90.00	90.67	91.78

Source: CountryStat (http://countrystat.psa.gov.ph/).

7.4 Income from Agricultural Production

Income from agricultural production is a function of costs and selling prices of products. The farmers can leverage their production activities in two ways: minimizing the cost of production and maximizing the prices of their produce, that is, selling their produce to the market that offers the highest prices. The following section describes the market of agricultural products and the farmers' position in the market.

7.4.1 Marketing of agricultural products

(1) Trading of agricultural commodities

Major agricultural products in Bangsamoro are traded as commodities since these are raw materials for processing. These include paddy, corn, coconut as copra, rubber as cup lumps, sugar, abaca and some fruits. The existence of traders in the market and distribution system of agricultural commodities is found due to the small landholdings and farm sizes. Transport of agricultural commodities requires large quantities in order to minimize on cost per unit volume. Large farms are usually able to sell their products directly to processors. With their large scale of production, they can take advantage of economies of scale in transport and get higher prices at the processor's scale.

On the other hand, farmers with small farms would prefer selling to traders whose agents come to the farms during harvest. These agents come to the farms with trucks, weighing scales and ready cash for payment of whatever volume is loaded. Otherwise, traders have buying stations in strategic areas where they can capture volume quota. Prices hardly differ at the buying station and at the farm. Under this kind of market, the producers are usually price takers especially when there are few traders who often collude in setting prices. Moreover, transport cost is shouldered by the farmers. Traders usually own delivery trucks and charge farmers transport cost readily added to the price of commodity and deducted from the proceeds.

Based on interviews with some traders and farmers, transport cost for coconut is one peso to 1.20 pesos/kg copra. Road conditions particularly, FMRs largely account for the high transport cost of agricultural products. Transport of products takes longer and wear and tear of cargo trucks are faster due to poor road conditions.

In general, quality of agricultural commodities is based on moisture content (MC). This is used for palay, corn, copra and abaca. Buying of these commodities at the farm level does not have reliable measurement of moisture content. This is based on assessment of the trader and the weight as assessed is deducted on the basis of MC. As much as 5.0 kg is deducted for every 50 kg bag delivery.[134]

For copra, traders put a premium on sun-dried copra. The traders ensure that they gain from their buying operations. When they sell to the processors, actual moisture content is determined and their deliveries are also deducted based on MC. Similar system is practiced in the trading of palay, corn and abaca. Processors remove moisture from the product prior to further processing. This justifies the deduction in weight. However, the lack of reliable measurement at the farm level puts the farmers in a disadvantage position. More often, the weight deducted due to MC is over estimated.

[134]Interview with farmer in Balabagan, Lanao del Sur

Some traders enter into informal contracts with producers on various schemes. One common scheme is traders finance production in exchange for assured delivery of product upon harvest. Sometimes, farmers turn to traders for all their cash requirements with their produce as mortgage. Under these schemes, the farmers are more often at a losing end and usually get very low prices for their produce.

The succeeding paragraphs are discussions on marketing issues of each commodity. These are rice, coconut, rubber, and abaca.

Palay

Rice and corn are 3- to 4-month crops. Farmers operating more than 10 ha and have capital are usually in the advantage position in marketing. They have the volume and have the capability to trade their produce. With an economic volume, they are also able bring produce to the rice mills who buy palay. Additionally, farmers of this scale go into supply contract with rice retailers and institutional users.

For small farmers, marketing is often tied up with crop production financing. Farmers borrow money from traders to buy inputs and to pay for farm labor and use of machinery like hand tractors or carabao. Some traders supply inputs like fertilizers and chemicals. Traders loan money to farmers with a promise that the farmer will sell the produce to the lending trader. Under this scheme, farmers have no leverage and taken advantaged of in two ways; first prices of inputs are about 50% higher than prices elsewhere; second, the traders buys the produce at very low prices. Figure 7.22 shows an illustration of this financing/marketing scheme.

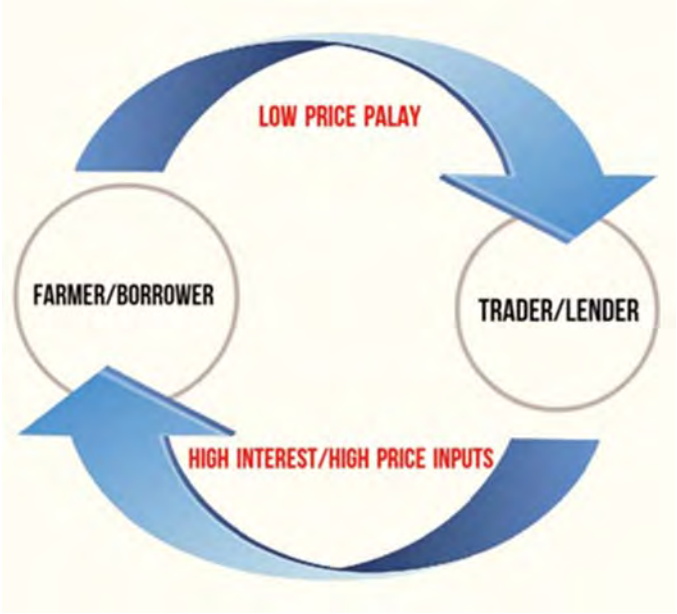


Figure 7.22 Disadvantaged Farmer Relationship to Trader

According to the paddy farmers in Sultan Mastura, prices of paddy are high during planting season but gradually drops as the harvest nears. Although some unscrupulous traders may take advantage seeing that farmers have no price information, it is actually supply and demand phenomenon. Farmers plant all together during rainy season and harvest at the same time. Such timing of planting leads to market glut. Price support of NFA for paddy is at PHP 17.00/kg. During harvest, prices go down to as low as PHP 12/kg. During lean months, it can go as high as PHP 21/kg.[135] Yet, according to NFA-Region 12, prices of paddy has already stabilized that the agency has very minimal participation rate in farm level buying.

Coconut

Coconuts are sold either as young coconut, fresh mature coconut or copra. Young coconuts are purchased by wholesalers or retailers and sold in the market or fruit stands. Fresh mature coconuts

[135]Interview with paddy farmers at Sultan Kudarat Seed Growers Cooperative, October 5, 2015.

(dehusked) and copra go through a trading system where buyers come to farms and pick up the products and pay in cash. Most coconut farmers have long relationships with traders, with whom they can advance cash.

There are many buyers of fresh mature coconut at the farm level but the destination is only one, Franklin Baker Company located in Sta. Cruz, Davao del Sur. It processes fresh coconut into desiccated coconut. The quality of fresh coconut accepted by the processor is strictly observed by the traders since the company rejects products that are not up to quality standards. On the other hand, copra is bought by many oil mills in Davao City and Iligan City. There is no imposed quality standards. Traders buy any quality of copra at the same price except for copra with high moisture content. High moisture content copra are priced much lower since these are also priced lower by processors. However, at the processors use moisture meters with accurate moisture content of copra. At the farm level, traders do not use moisture meter but rely only on estimates. Fresh young coconut and fresh mature coconut occupies a small portion of the coconut market. Coconut market is still largely copra market.

Photo 7.14 Fresh Coconut and Copra at Trader's Buying Station

Abaca

In Lanao del Sur, the current prices of traders who buy abaca fibers on the farms are low compared to several years ago when prices were as high as PHP 100/kg. In the interviews at the farms in Balabagan and Kapatagan, farmers said that traders buy unclassified abaca fibers at PHP 43–45/kg. According to them, these prices have been kept within this range since 2010. As per statistics from the Country Statistics of PSA, farmgate prices of abaca in Bangsamoro in the seven years of 2004–2014 are in the range of PHP 30–45/kg. These are shown in Figure 7.23. These prices are about 30–50% higher than the prices at the GBE level, which range from PHP 45 to 60/kg depending on the grade.

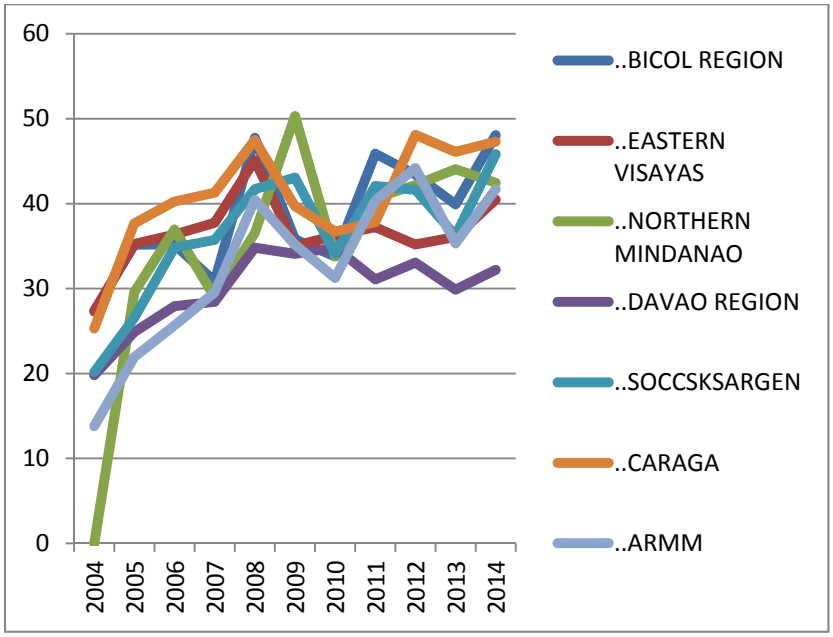


Figure 7.23 Average Annual Farmgate Prices of Abaca

Rubber

The same trading system is observed in buying of rubber cup lumps and latex. Although there are standards and grading for crude rubber (crumb and sheets), there is none for buying of cup lumps and latex. According to producers of crude rubber, they face problems with manipulative farmers who add sand and pebbles in the sack of cup lumps to add weight and get extra money. Like copra and other products, there are no quality standards imposed on buying of cup lumps and latex. At the farm level, the market has no price incentive for quality.

Traders buy cup lumps from the farmers at a single price regardless of quality through a practice called *all in*. To cover for lost weight, traders' farmgate prices are considerably low. In effect, even honest farmers who want to deliver good quality loses interest for quality and join the bandwagon. Transport of cup lumps is one reason that small farmers would rather sell to traders who come to the farms to collect as transport is expensive when there is no sufficient volume.

The same as all other commodities, transport always require economies of scale. Poor quality of rubber makes them inappropriate for manufacturing into rubber tires for vehicles, which demand utmost quality. Importation is usually resorted to by tire manufacturers, which are the largest users. On the other hand, small users are also encouraged to smuggle from other countries.

Faced with tough competition from Malaysia, Indonesia and Myanmar, the crude rubber producers send their products for testing at PRTC located in the USM campus. Standards and grades of rubber in the Philippines are already harmonized with the ASEAN countries since PRTC uses the same parameters and limits for designated grades and test methods as other ASEAN countries.

Rubber produced in the Philippines are mostly exported. Exports occupy about 85% of the total production and mostly cup lumps. The remaining 15% is being processed as rubber crumbs and crepe for domestic market. Due to the large export destination of local production, domestic prices follows international trends, which is largely influenced by supply and demand situation. Figure 7.24 shows the average annual farmgate prices of rubber cup lumps in six rubber producing regions in the country. As shown, prices in each region are almost the same. Over the years 2004 to 2009, prices are within the range of PHP 20/kg to a little bit higher than PHP 40/kg. Prices started to rise in the later part of 2010 and reached its peak in 2011. In Basilan, it reached as high as PHP 80/kg. Prices started to taper down in the last quarter of 2011 down to its lowest in 2014 at prices ranging from PHP 20/kg to PHP 22/kg.

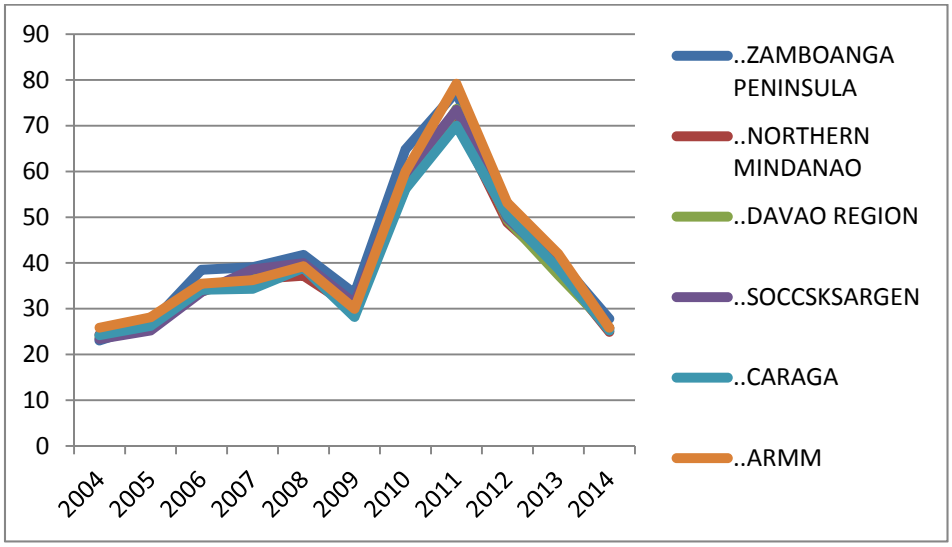


Figure 7.24 Average Annual Farmgate Prices of Cup Lumps in Six Regions[136]

Prices in the international market declined following the decline in demand for vehicles in Europe and U.S. About 75% of the total world production of rubber is used for manufacturing tires. The International Rubber Supply Group (IRSG), a consortium of Thailand, Malaysia, and Indonesia,

[136]Based on data on annual average farmgate prices of abaca taken from CountryStat (http://countrystat.psa.gov.ph/)

forecasted that decline in rubber prices would be likely to continue until the end of the decade. The consortium is trying to manage prices by agreeing not to sell at low current prices. However, without the participation of Vietnam, a large producer and non-member of the consortium, the efforts of the IRSG to revive prices could be fruitless.[137] In effect, the supply and demand of rubber in the international market is determined by the four great players.

The domestic market for rubber is not fully supplied with locally produced rubber due to poor quality. It is inappropriate to use poor quality rubber in manufacturing rubber tires for vehicles, which demand utmost quality. Importation is usually resorted to by tire manufacturers, which are the largest users. There are three large tire manufacturers that buy dry rubber: Dunlop, Bridgestone, and Yokohama. The requirements of these companies are mostly for import. Yokohama, which has been continuously expanding its business, imports 94% of its rubber from Thailand and Indonesia.[138] Small users, however, smuggle tires from other countries.

(2) Small market distribution

Agricultural products directly sold to consumers are brought to the wholesale market, locally called bagsakan either by the farmers themselves or wholesale buyers for the farms. In urban areas like Cotabato City, there are designated bagsakans for agricultural products such as vegetables, green corn, young coconut, fruits, chickens, and goats. There is no auction market for large animals as that which Batangas Province in Luzon has.

Retailers, institutional buyers (hotels and restaurants), and consumers come to this market and take advantage of wholesale prices (expectedly lower than retail prices at consumer wet markets) from the producers or bulk buyers from farms. The market gives farmers leverage on the prices of their agricultural products. Under the PAMANA of OPAPP, bagsakans have been established in several municipalities with facilities like structures, scales, lighting fixtures, cold storage, and others as necessary. These bagsakans are operated by cooperatives.

A bagsakan provides farmers with opportunities to earn higher income, compared to selling their produce directly to traders at their farm. However, farmers without sufficient production volume to justify transport cost would rather sell to traders than transport their produce to the bagsakan. Bad road conditions affect the marketing of perishable agricultural products like most vegetables and fruits.

7.4.2 Cost-benefit ratios

Table 7.12 presents a summary of cost and net profit ratios of various crops in Bangsamoro. The costs and revenues were calculated based on surveys. Application of inputs is also based on the common practice rather than recommendations of agriculture technicians.

People in micro to small-scale business generally consider earning 20% of income from an economic activity as acceptable. If the cost of money is 10%, there is another 10% to pay for the cost of the entrepreneurial skills in managing the enterprise. If the cost-benefit principle is applied to farming as a business, some crops will be considered as unworthy. As indicated in Table 7.12, farming is a profitable business undertaking except for rainfed palay crop, which showed negative profit ratios for both wet and dry season crops in 2011 and 2012 although this might be temporary or maybe due to the deteriorating conditions of the rainfed palay farms.

Corn is grown under rainfed condition and is definitely more profitable than rainfed Palay. This makes cultivation of corn in this circumstance more logical than cultivation of palay. Mongo crop is more than double the profitability of rice although demand for mongo cannot be as stable as demand for palay. However, mongo is best planted as rotation crop for palay and corn in order to return nitrogen in the soil. Mongo crop, particularly when rotated with palay, has little requirement for fertilizer. This explains the

[137]Value Chain Analysis & Competitiveness Strategy of Crumb Rubber-Zamboanga Sibuguey, Philippine Rural Development Project, www.drive.daprdp.net
[138]Value Chain Analysis & Competitiveness Strategy of Crumb Rubber-Zamboanga Sibuguey, Philippine Rural Development Project, www.drive.daprdp.net

high profit-cost ratio of mongo.

Cassava has the highest net profit ratio among the crops as shown in Table 7.12. It requires about half the fertilizer requirement of palay and less tended. Although cassava can be harvested in 6 to 8 months, cassava is a one-year crop and cannot easily respond to the cash flow needed by the farmers. It is also considered to be one of the best feedstock for ethanol production in terms of yield per metric ton. It could be well to look into this market to increase production.

Coffee has rather high net profit ratio even with many imputed cost such as cost of family labor included in the cost of production. Coffee in Bangsamoro is high yielding and prices are good. It is good for farm households to have stands of coffee in the backyard or intercropped with coconuts for additional income.

Table 7.13 underscores the importance of irrigation service for palay farmers. The evidence shows that the high net profit-cost is often influenced by high productivity of the crop rather than increased farmgate prices. The price support for palay is PHP 17.00/kg although the farmgate prices used in the determination of the ratios is PHP 15.00/kg. Thus, if the government price support is effective in influencing palay farmgate prices, the ratios should be better and the farmers earn more. According to NFA, the buying prices even during harvest seasons are much higher than the government support price, the reason for the low NFA buying participation rate in the recent years.

Table 7.12 Net Cost-Profit Ratio of Various Crops

Crops	2009	2010	2011	2012
Palay Irrigated - Dry	0.3	0.65	0.31	0.71
Palay Irrigated – Wet	0.43	0.67	0.38	0.44
Palay Rainfed – Dry	0.41	0.18	-0.05	-0.03
Palay Rainfed – Wet	0.27	0.11	-0.08	-0.01
Corn	0.54	0.52	0.3	0.44
Coffee	0.66	0.67	0.72	0.65
Cassava	2.05	1.99	2.32	2.51
Mango	1.00	1.38	1.51	1.08

Source: CountryStat (http://countrystat.psa.gov.ph/).

Table 7.13 Cost and Return for Irrigated and Non-Irrigated Palay, 2012

	Irrigated		Non-irrigated	
Item	Dry	Wet	Dry	Wet
Total cost (PHP/ha)	38,777	40,357	34,876	40,641
Gross return (PHP/ha)	45,555	58,254	33,772	40,128
Return above cash cost (PHP/ha)	33,196	47,282	24,238	31,739
Return above cash and non-cash cost (PHP/ha)	18,679	33,388	13,477	21,236
Net return (PHP/ha)	6,778	17,897	-1,104	-513
Net profit-cost ratio	0.17	0.44	-0.03	-0.01
Cost/kg (PHP)	12.76	10.45	15.48	15.27
Yield/ha (kg)	3,039	3,863	2,253	2,661
Farmgate price (PHP/kg)	14.99	15.08	14.99	15.08

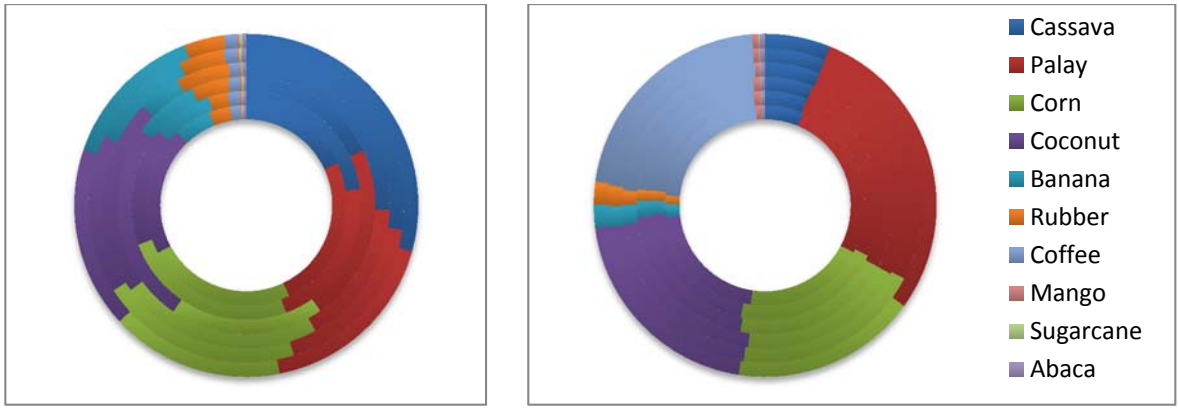
Source: ibid.

7.5 Economic Efficiency of Agricultural Production

The natural conditions of the Bangsamoro region show suitability for growing various types of crops. Each province has specific suitability to crops due to climate, soil characteristics and practices of the farmers. The Bangsamoro agricultural production profile is dominated by six major crops: cassava, rubber, banana, rice, corn, and coconut, the last three being traditional crops in Bangsamoro as well as the entire Philippines. Cassava has developed due to the establishment of Matling Corporation that process cassava into starch. Banana used to be low production but increased tremendously with the establishment of La Frutera in the municipality of Datu Paglas in the later 1980s. Other crops, mostly

high value crops are small portion of the total regional output. Figure 7.24 shows the shares of top 10 crops by value and area harvested grown in Bangsamoro from 2008 to 2013.[139]

The left graph in Figure 7.25 represents values of production and area harvested for 10 major crops. The circles represent the years, with the inner most representing 2008 and the outer most 2013. Colors represent the crops indicated in the legend. Graph shows that cassava is the most economically efficient crop to grow giving the most value per unit hectare planted or harvested despite being a one-year crop. Value keeps increasing despite the minimal increases in harvested area through the years. Coffee is the most inefficient.



Value of Production Harvested Area

Figure 7.25 Value of Production and Harvested Area for Top 10 Crops, 2008–2013

Table 7.14 shows the harvested area of the 10 major crops in Bangsamoro from 2004 to 2013; a graphical representation is shown in Figure 7.26. Palay, coffee, coconut, and corn occupy the largest areas of agricultural lands. Cassava is the fifth largest. Harvested area of these four crops even grew substantially over the last 10 years: coconut (15%), palay (21.8%), rubber (321%), and cassava (5.6%). The substantial increase in rubber areas was in 2006 to 2007 when demand for rubber increased dramatically due to demand in the export market accompanied by high prices. Price of rubber were record high during these years.[140] Other three (banana, coffee, and abaca) slightly increased. Corn areas had been fluctuating over the years although it did not fall below 265,000 ha. Corn areas easily shift to other crops when prices fall. Cassava maintained harvested area during the period.

Table 7.14 Area Harvested for 10 Crops with Highest Contribution to Agricultural Output

(Unit: ha)

Crop	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Palay	372,290	399,470	393,022	398,718	401,008	409,520	415,264	399,048	405,602	453,400
Coffee	298,872	298,786	331,905	332,032	332,091	333,183	333,339	332,133	333,650	340,273
Corn	289,977	265,328	277,541	312,164	295,922	332,065	312,329	284,128	298,812	275,964
Coconut	281,347	281,257	314,372	314,376	314,415	315,490	315,645	314,418	315,940	322,677
Cassava	92,315	92,392	92,399	93,415	94,071	94,091	94,029	94,171	95,777	97,486
Banana	31,029	31,008	30,874	30,913	30,988	31,570	31,552	32,237	32,488	32,728
Rubber	8,102	8,100	8,305	21,193	21,144	21,934	22,034	24,575	32,079	34,115
Mango	15,698	16,922	17,735	18,849	13,847	17,094	14,359	8,426	9,703	9,837
Abaca	7,599	7,930	7,927	7,902	7,914	7,914	7,913	8,020	8,057	8,067
Sugarcane	959	1,124	539	1,164	949	899	968	901	1,494	1,531

Source: CountryStat (http://countrystat.psa.gov.ph/).

Figure 7.27 shows the production values of 10 major contributors to the agricultural output in Bangsamoro: cassava, palay (paddy), corn, coconut, banana, rubber, coffee, mango, sugarcane, and abaca. The graph is based on current prices, indicating fluctuating values of production in terms of both prices and production volume. In 2013, cassava had the highest production value with a continuous

[139]The Bureau of Agricultural Statistics only started to report value of production data from 2008.
[140]Natural Rubber prices in London and New York, 1990–2007, www.therubbereconomy.com

upward trend due to increasing prices and production volume. The same is the case of banana, mainly due to increasing prices of the Cavendish variety, which is mostly exported.

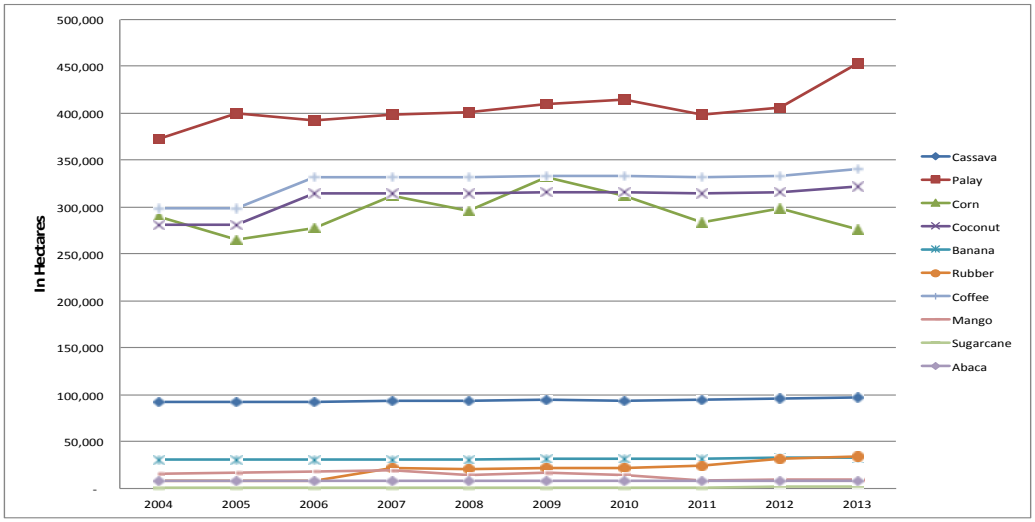


Figure 7.26 Harvested Area[141] of 10 Major Crops, 2004–2013

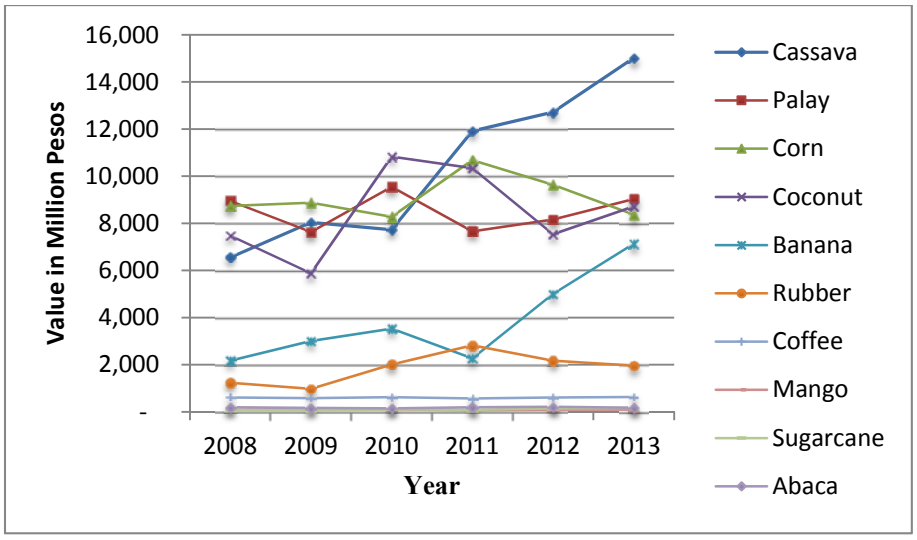


Figure 7.27 Production Values of 10 Major Crops[142], 2008–2013

The production values of coconut and rubber have increased since 2004 although their farmgate prices are volatile. On the other hand, the production values of corn and palay have risen and fallen over the years due to their fluctuating production and farmgate prices. Coffee has modestly increased due to increasing prices but modest increases in production volume. From 2008 to 2013, winner crops in terms of agricultural value-added were cassava, palay, corn, coconut, and banana. Cassava looks promising due to the high prices of its fresh tubers in Maguindanao, Sulu, and Tawi-Tawi, where they are sold directly to consumers. Banana is largely produced in commercial farm operations with increasing production efficiency.

Efficiency of land is defined as value of production per hectare and a function of productivity and price index of commodities. Figure 7.28 shows the efficiency of crops produced per hectare in terms of value from 2008 to 2013. Banana is the most efficient crop, and cassava comes in second. Rubber was the second most efficient crop in 2011; however, its production value per hectare dropped from 2011 to 2013 due to drastic decrease in farmgate prices.

[141]Graph data from CountryStat (http://countrystat.psa.gov.ph/)
[142] Graph data based on current price data from CountryStat (http://countrystat.psa.gov.ph/)

Rubber harvested area increased from 8,305 ha in 2006 to 21,193 ha in 2007. Coconut efficiency is not very encouraging in terms of value of agricultural output per hectare due to low prices and low production resulting from low productivity. Many trees are old and infestation is still a problem especially in Basilan, where production has been declining since 2009. Coconut areas are suitable for intercropping, which could increase cropping intensity and value of production per ha.

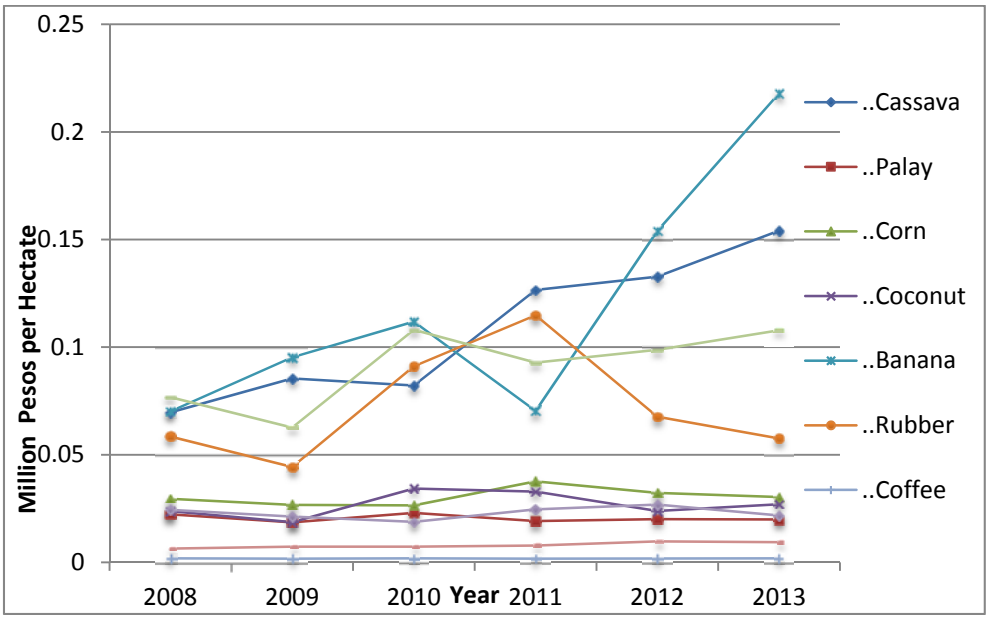


Figure 7.28 Per-Hectare Value of 10 Major and Prospective Crops[143]

7.6 Agriculture in Bangsamoro Economy

In 2013, the Bangsamoro agriculture economy mainly consisted of crop production output. It is about 92% of the total, increasing from 90% three years before (Table 7.15). Livestock and poultry are 9%. The total agriculture output declined from 2011 to 2013. The modest increase in the share of crops is due to the decline in the value of livestock over the last three years. In terms of output, increase is nil.

Table 7.15 Gross Value-Added of Crops, Livestock, and Poultry[144]

	2011		2012		2013	
Sub-sector/ Commodity	Value (PHP 10^6)	% of Total	Value (PHP 10^6)	% of Total	Value (PHP 10^6)	% of Total
Crops	22,315.51	90	22,154.93	91	22,375.85	92
Livestock	1,739.50	7	1,473.72	6	1,406.81	6
Poultry	645.21	3	638.95	3	646.68	3
Total	24,700.22	100	24,267.60	100	24,429.34	100

Source: Basic Data from CountryStat (http://countrystat.psa.gov.ph/).

From 2011 to 2013, the contribution of agriculture (without fisheries) to the total output of the Bangsamoro region or the gross regional production (GRDP), is about 45%, which indicates the importance of the sector (Table 7.16). The industry sector, which includes manufacturing is only about 5% of the region's GRDP. The region was not able to take the advantage of producing agricultural products with high value chains (such as coconut, rubber and abaca) due to the absence of investments in manufacturing and processing plants. These would have largely contributed to the size of the industry sector.

The gross value added (GVA) in agriculture, hunting, forestry, and fishery (AHFF) of the Country in 2013 is PHP 1.3 billion. Bangsamoro contributed a measly 4% of this national output, although it is

[143]Based on 2000 Current Prices
[144] In Constant Prices

only the seventh smallest contributor. This, despite the fact that AHFF is the largest economic sector of Bangsamoro accounting for more than 60% of the GRDP in 2011–2013. Agriculture and forestry alone constitute close to a half (47%) of the GRDP during the period.

Bangsamoro has the smallest economy of all the regions in the Country. Its GRDP in 2013 is estimated at about PHP 50 billion. This is only less than 1% of the Country's GDP, the lowest share among all regions. This has been its position in the Country's economy since 2011. From 2011 to 2012, the economy grew by a modest 1.1% although it improved in the following year growing by 3.6%. Still, Bangsamoro's growth is among the slowest region in the Country. Table 7.17 shows the comparison of the 15 regions in the Philippines.

Table 7.16 Bangsamoro Gross Value-Added in Agriculture and Other Sectors[145]

Sector	2011	2012	2013
I. Agriculture, Hunting, Forestry & Fishing	30,089,537	29,744,765	30,476,386
a. Agriculture and Forestry	22,574,847	22,578,089	23,134,458
b. Fishing	7,514,690	7,166,676	7,341,927
Ii. Industry	2,580,829	2,592,188	2,538,339
Iii. Service	14,806,330	15,680,663	16,717,569
GDP	47,476,696	48,017,617	49,732,294

Source: GRDP 2011-2013, Philippine Statistics Authority, ISSN-0119-4518 As of July 2014.

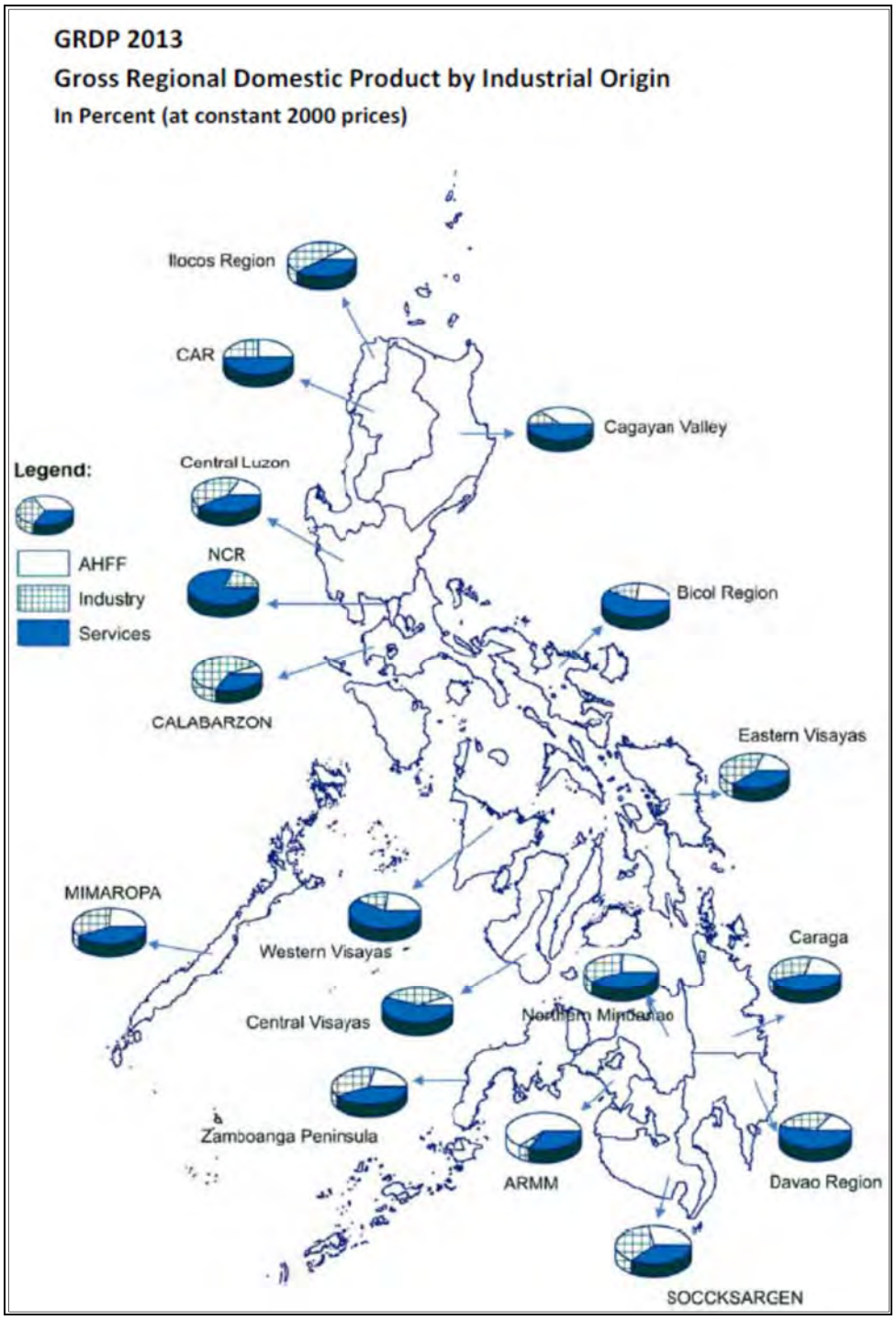
Table 7.17 Gross Regional Domestic Product, 2011–2013 Constant Prices[146]

Country/Region		2011	2012	2013
Philippines		5,910,201,357	6,312,173,692	6,765,458,577
NCR	Metro Manila	2,102,867,146	2,250,591,272	2,455,306,204
I	Ilocos	184,361,548	194,023,032	209,037,281
II	Cagayan Valley	105,494,400	114,007,429	121,541,791
II	Central Luzon	546,756,621	582,482,718	607,545,151
IVA	CALABARZON	1,025,925,324	1,100,652,987	1,174,749,593
IVB	MIMAROPA	104,997,401	110,035,097	111,886,292
V	Bicol	116,250,752	124,269,150	135,923,753
VI	Western Visayas	241,401,054	259,923,329	270,562,900
VII	Central Visayas	363,826,007	398,004,041	427,614,410
VIII	Eastern Visayas	153,900,653	144,030,044	152,194,142
IX	Zamboanga Peninsula	117,192,723	132,262,817	137,949,751
X	Northern Mindanao	223,230,074	239,272,849	252,645,030
XI	Davao Region	225,431,679	242,070,406	258,485,862
XII	SOCCSKARGEN	159,315,513	172,032,903	186,407,600
XIII	Caraga	70,033,593	77,517,606	83,550,716
ARMM	Muslim Mindanao	47,476,696	48,017,617	49,732,294

Source: GRDP 2011–2013, PSA, ISSN-0119-4518 (as of July 2014).

Figure 7.29 is the graphic presentation of comparison of the economy of the 15 regions in the Philippines. The white portion of the pie represents the AHFF of the region. Looking and comparing all the pies, the size of the white portion of the Bangsamoro's pie is very noticeable. Bangsamoro is a small economy that constitute largely of products from agricultural activities and gathering from nature (hunting and forestry). The small size of the sector is indicative of the lack of agro-processing in the region.

[145] Unit in Thousand Pesos, In constant prices
[146] In Thousand Pesos, In 2000 Constant Prices



Source: 2011–2013 GRDP, PSA.

Figure 7.29 Comparison of Regional Economies

CHAPTER 8 DEVELOPMENT DIRECTIONS OF BANGSAMORO AGRICULTURE

8.1 Framework

Of the Bangsamoro economy in transition, the agricultural sector is the largest sector with great potential for development and to substantially contribute to the economic growth. It is naturally endowed with favorable climate and land resources that could sustain a growing agriculture-based economy. There are theoretical and empirical evidence to suggest that agricultural growth has powerful leverage effects on the rest of the economy, especially in the early stages of economic transformation, when it accounts for large shares of regional income and employment. Through its linkages to the rest of the economy, agriculture can generate patterns of development that are employment intensive and favorable for the poor.

High growths in agricultural value added are fostered dramatically by commercial scale production such as plantations and agro-processing due to value-addition; however, agricultural development is better achieved through inclusive strategies where smallholder farmers play key roles, particularly on production of staple foods. The empirical analysis in the various country case studies finds that the pro-growth and pro-poor performance of agriculture will continue to depend on the broad participation of smallholder farmers, and that food staple growth generates more poverty reduction than other agricultural subsectors do[147].

Notwithstanding, the ability of small farmers to find pathways out of poverty and to contribute actively to the growth process depends on improving infrastructure and education, distributing key technologies and inputs, and promoting producer and marketing organizations that link small farmers to new market chains. Science-based technology adapted to a country's ecological conditions is fundamental for agricultural growth. Indeed, advances in mechanical and biological technology helped overcome endowment constraints, particularly in regard to land and labor. Bangsamoro farmers cannot overcome these constraints on their own, and there is a need in the short term for greater public sector involvement. The challenge is therefore to develop new institutional arrangements between the public and the private sector that foster private sector development without leaving smallholder farmers isolated during the transition.

8.2 Setting Grounds for Agricultural Development

No efforts would amount to development without putting an end to the long running armed conflict in Bangsamoro. Land conflict in Bangsamoro has been the major cause of armed struggle that spanned more than half a century. Several factors including government sponsored settlement program during the Commonwealth era where Christian families from all over Luzon and Visayas were brought to Mindanao, which brought about legalized confiscation of lands of the Moros.148 This was later aggravated by the fragmented nature of land governance, rigid formal land markets that gave rise to informal markets based on verbal agreements, absence of titles, etc. and absence of actual boundaries due to slow cadastral surveys.

Abandonment of lands due to skirmishes among clans in rido and government and secessionist groups has added to the precarious land ownership state of affairs. Restoration of ownership to rightful owners and compensation of investment to those who will be evicted will have to be administered with the objective of achieving social justice.

[147]Xinshen Diao, et al, The Role of Agriculture in Development : Implications for Sub-Saharan Africa (Research report / International Food Policy Research Institute ; 153) Washington DC, http://www.ifpri.org/sites/default/files/pubs/pubs/abstract/153/rr153.pdf

[148]Knack, P.D. 2013 Legal frameworks and land issues in Muslim Mindanao. In land and post peace building, ed. J. Unruh and R.C. Williams. London: Earthscan

8.2.1 Addressing land conflict for productive land use via effective institutional arrangements

FAB recognizes the resolution of land conflicts as a condition to lasting peace. Under the Part IV, 2 & 3, the FAB provides for measures on addressing the land issues stating among others the recognition of grievances and the restoration of rights over properties unjustly taken away. This FAB provision is an important measure to take towards development of the Bangsamoro area by way of putting vast tracts of land under productive use.

The Bangsamoro development should effectively utilize local resources as much as possible. This would inevitably require introduction of additional resources to fully realize the development potentials. Typically, technology necessary for new agribusinesses as well as capital would be introduced from outside. The introduction of technology and capital associated with foreign investors may involve risk of land conflicts and violation of rights of indigenous people.

Thus, putting an end to old land conflict and preventing future conflict are imperative. The present set up of governance even under ARMM does not adequately provide for the mechanism to address protracted land tenure problems that grew over decades of marginalizing policies taken advantage of by unscrupulous leaders and those who wield power. Land tenure improvement policy should be established by the Bangsamoro legislature at the onset. The policy should address inconsistencies in land-related laws and regulations, the ineffectiveness of multiple land-related agencies and tailor-fit to the requirements of resolving the land tenure problems of Bangsamoro.

The Bangsamoro Land Commission is being recommended for creation to establish the framework for land governance that will address complex and fragmented nature of the existing institutional set up, informal land markets, tenure, support services for small farmers and conflict adjudication.[149] The framework should accommodate customary institutions in governing customary land arrangements, which still persist and may continue to persist particularly among IPs. The framework should recognize to the extent of adopting customary laws, which continue to be used in settling land-related disputes.

To hasten the implementation of policies, the following are recommended:

1) Merger of NCIP and OSCC operating in Bangsamoro under the Bangsamoro government.
2) Harmonization of policies, delineation of area coverage, and improvement in coordination between DENR and NCIP. DENR continues to issue CBFM and IFMA in forestlands and homestead and free patents in the alienable and disposal lands while NCIP issues CADT/CALT to IPs. Without coordination in the procedures of both agencies, their issuances result in multiple claimants on the same area.
3) Completion of land distribution under the LAD Program of CARP/CARPER.

Current procedure of original titling lands emanate from DENR and NCIP. Both process applications by undertaking investigations and survey of the areas being applied for, basically to establish the appropriateness of the applicant to receive the patents or CADT/CALT and the availability and legitimacy of areas being applied for. These are submitted to the Registry of Deeds of municipalities that have the jurisdiction over the areas for issuance of the original certificates of title (OCTs).

On the other hand, DAR issues CLOA and CLT to the identified ARB. The duplicate copies are held by the Registry of Deeds. This looks like a simple procedure, but actually the process within DENR and NCIP is tedious and prone to corruption and therefore expensive at times.[150] The procedure sometimes requires the expertise of lawyers. The system of settling conflicts in Bangsamoro can be carried out in this current system with innovations suited to the circumstances of Bangsamoro. This system can be

[149]Gulane, Judy T., Land Governance in Bangsamoro-Policy Brief, International Alert. April 20, 2014 www.international-alert.or/sites/default/files/Philippines_PolicyBreifLandGovernance_EN_2014.pdf

[150] In the forum with IPs conducted for the ESA-BFF in Cotabato City dated January 12, 2015, one IP participant told her story of long how it took her to get the DENR to survey her land to get a homestead patent and had to pay PHP 30,000.00.

innovated by taking advantage of institutions nearest to the claimants, namely, the respective LGUs.

Settling of local conflicts associated with land such as land confiscation and conflicting land boundaries may be resolved at the local level by the municipal and barangay LGUs working with local landowners and residents. For conflicts that arise, LGUs can establish an adjudication process. A high level institution like a Bangsamoro Land Commission may also be established for ultimate resolution of all the disputes.

Beyond an effective institutional arrangement, the Bangsamoro government will have to work on these immediate priorities; completing cadastral surveys in the shortest possible period prioritizing areas with multiple claimants, developing a just compensation formula and looking out for parcels of land that can be immediately distributed to surrendered armed groups for purposes of integration and the landless.[151]

8.2.2 Smallholder farmers holding a key to agricultural development in Bangsamoro

RA 7607, better known as "the Magna Carta of Small Farmers" defines small farmers as natural persons dependent on small-scale subsistence farming as their primary source of income and whose sale, barter or exchange of agricultural products do not exceed a gross annual value of PHP 180,000 based on 1992 constant prices.[152] At 2012 current prices, such an income level would be about PHP 295,000 per annum. Table 8.1 shows the estimated net returns from farming various crops and the corresponding farm size needed to be able to earn PHP 295,000 per annum. Assuming that a farmer has no other source of income, a paddy farmer in an irrigated farm in Bangsamoro with 16 ha to 43 ha is still considered smallholder. Cassava, which showed the highest net return, would need more than 5.0 ha.

Table 8.1 Net Returns from Various Crops

	Type of Expenditure (PHP '000)			
Country/Region	Total	Food	Recurring	Non-recurring
Philippines	62,542.35	40,186.77	9,726.12	12,629.46
Zamboanga Peninsula	54,189.40	35,593.31	9,290.50	9,305.59
Northern Mindanao	41,825.00	30,457.54	5,737.55	5,629.91
Davao Region	48,372.00	31,191.25	6,415.21	10,765.54
SOCCSKSARGEN	68,158.74	39,391.41	16,726.17	12,041.16
Caraga	44,711.00	31,384.62	4,940.71	8,385.67
ARMM	52,956.00	37,439.13	6,161.47	9,355.40

Source: CountryStat (http://countrystat.psa.gov.ph/).

By the scale of returns from farming in Bangsamoro, it can be said that farmers are smallholders operating small farms. The 2002 Census of PSA[153] reported 248,528 farms with a total area of 533,410 ha. Figure 8.1 shows the breakdown of this total area of farms into various size categories. Although there is no definition, small farm maybe identified comparatively. If a small farm is defined as less than 3.0 ha, then about 44% of all farms are small. The average size of farms under this category is 1.21 ha, which means that more farms within this range tend to be smaller than 1.5 ha and fewer are near 3.0 ha sizes. If small farm size category is defined as less than 5.0 ha, the share of small farms to the total area is 67%. This category has an average farm size of 1.55 ha.

That the percentage of owned farms is rather high makes a sound assumption that in Bangsamoro the farmers or tillers of the land are owners. In the same Census of Agriculture, owned farms are 162,429, or 65% of the total (Table 4.4). Owned and partly owned[154] constitute almost 80% of the total. Only

[151] Partly coming from Judy Gulane,

[152] RA 7607 further provides that such An inter-agency committee composed of the Department of Agrarian Reform, the Department of Trade and Industry, the Department of Finance and the National Economic and Development Authority and headed by the Department of Agriculture may conduct periodic review and adjustments of the income level to take into account the effects of changes in inflation, devaluation and consumer price index

[153] Formerly, National Statistics Office (NSO)

[154] Definition of partly owned lands by PSA

12% are tenanted and leased farms comprise less than 3% of the total area reported.

Small farms (considered here as 3.0 ha or 5.0 ha and below) are substantial in number and more importantly as a percentage of the total area of farms in Bangsamoro. Available data are about 12 years old.[155] Given the continued land acquisition and distribution under CARP and CARPER until June 30, 2014, the number and corresponding land area of owned farms would have already increased greatly.

The large portion of land area by small farm-holders should be operated efficiently, in both production per hectare and cost per hectare, which is a two-pronged approach to development of Bangsamoro. First, it adds to small farmer income, hence a rural poverty alleviation measure, which is primordial for development of Bangsamoro. Second, it adds to the regional output and eventually to the national output. However, small farmers are commonly faced with challenges and cannot overcome these constraints on their own. Thus, there is a need in the short term for greater public sector involvement. In fact, the Magna Carta for Small Farmers has already mandated all related government agencies to provide the support for farming entrepreneurship.

Unlike commercial farms operated by corporations, small farmers will need continuous assistance in acquiring updated technology, adequate financing and profitable markets. With various assistance, small farmers would be able to optimize land use and make farm operations financially viable.

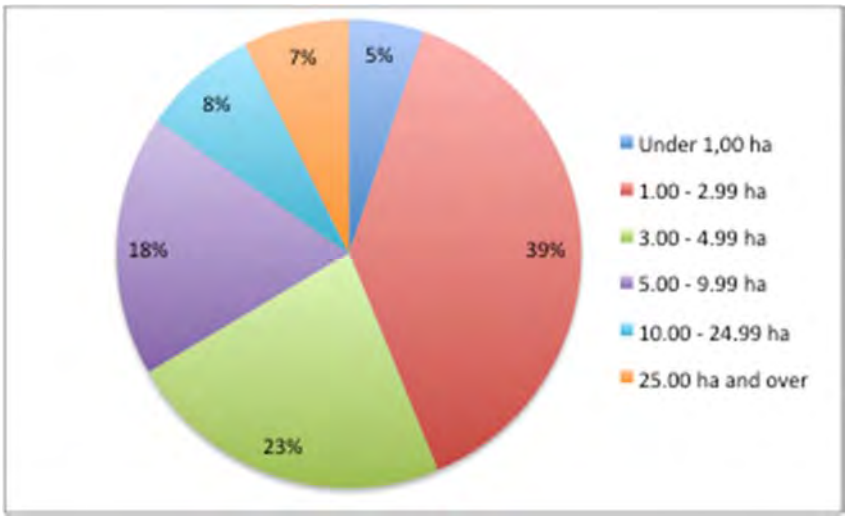


Figure 8.1 Proportion of Farms in Bangsamoro by Size

8.3 Enhancing Effectiveness of Support Services

8.3.1 Budget for agricultural development

The difficulty of the current ARMM set-up lies in the inadequacy of budget support to develop the region. Fund releases for ARMM from DBM are only meant to pay for personal services and MOOE. Projects and programs are funded through the implementing agencies of the national government. The agencies propose projects and work for funding by the Congress. Projects of national scope such as banner agriculture program, irrigation development and road construction, generally include ARMM.

Recently, projects have become increasingly participatory, applying bottoms-up approaches as opposed to top-down models. In this way, ARG is able to include projects in some programs of national government agencies. Obviously, the projects that develop ARMM are within the framework of the national government. In one way or another, the autonomy of ARMM is defeated. Like a child dependent to the parent, so is the relationship of ARMM to the national government.

With the enhanced fiscal independence under BBL, the Bangsamoro government is imbued with the power to chart the region's development. While cultural value system is an important consideration in

[155]Census on Agriculture is being conducted by PSA every 10 years; data processing for 2012 Census is still underway.

charting development, the Bangsamoro government should not lose sight of the macro and international economic environment characterized by shifting preferences, consumerism, trade competition, and climate change. These are challenges or opportunities underlying the conceptualization of every development project and program in agriculture. It should be always kept in mind that the development of the agricultural sector is the key to the socio-economic upliftment of the local people as a majority of the population is in rural areas, engaged in agricultural endeavors.

8.3.2 Institutional arrangement for agricultural support services

In order to have a well-coordinated programming and support services delivery and monitoring to the farmers, all the Bangsamoro government agencies should be placed under the umbrella of the main agriculture-related entities like DAF. This will ensure comprehensive planning thereby avoiding administrative duplication. Such an organizational structure will facilitate cost-effective delivery of support services. An example of such interdependence is shown in Table 8.2.

Table 8.2 Interdependence Matrix of Agricultural Input

Efficient Functioning Of / Depends upon	Agricultural Research	Agricultural Extension	Rural Finance	Seed Supply	Fertiliser Supply	Irrigation	Farm to Market Road	Livestock Services	Agricultural Marketing
Agricultural Research		X	(X)	X		X			X
Agricultural Extension	X		(X)	(X)					X
Rural Finance		(X)		(X)	(X)	X		(X)	X
Seed Supply	X		X		(X)	X			X
Fertiliser Supply	X	X	X	X		X			X
Irrigation	X	X		(X)	(X)				X
Farm to Market Road	X	X	X	X	X			X	X
Livestock Services	X	(X)	(X)	(X)					X
Agricultural Marketing	(X)	(X)	(X)	X		X		(X)	

Notes: X- interdependent, (X)-moderate level of interdependence

Cross-cutting programs of other agencies likened to DPWH, DENR, DAR, CDA, and other agencies with DAF are better planned through convergence initiatives. Development of infrastructure such as roads, ports and airports is a function of DPWH, which should support the development directions of agriculture. The same should be taken into consideration for programs of environment protection and natural resources, agrarian reform and economic development programs. Inter-agency development programs/projects will continue to be a strategy for comprehensive delivery of support services. Implementation will necessarily have a separate office managed by a consortium headed by DAF as the lead implementing agency.

R&D plays a pivotal role in economies in transition like the Bangsamoro region. Unleashing the strength of state universities will give a boost to the agricultural potential of the region. The MSU system has at least four campuses within the Bangsamoro region with strong agriculture and fisheries program. To strengthen the agricultural programs of these campuses, adequate funding and a well-managed research agenda that respond to the requirements of the region should be established.

The main campus should be able to support technology appropriate for upland agriculture. Root crops and salad vegetables, which are high value cash crops are very promising in the province of Lanao del Sur. To support R&D, DAF should provide funds to the R&D of state universities through an award system similar to that which has been undertaken by BAR of the national government's DA. Alternatively, the MSU system can work out research agenda with DAF to ensure that all research items in the agenda supports the agricultural development program of the Bangsamoro region.

A very important aspect of the institutional arrangement is the provision for monitoring of programs and projects during implementation and post evaluation. Monitoring and evaluation saves resources from ineffective projects or badly implemented projects.

8.3.3 Rural institutions playing an indispensable role in attaining social and economic justice for small farmers

Associations and cooperatives of agricultural producers, especially small farmers, would benefit their members for many reasons. Delivery of support services by government, non-government organizations and donor organizations and individuals could be facilitated to benefit a group of farmers. In the Philippines where farms are generally of small-scale, production cost tends to be higher, as agricultural production and marketing are generally adapted to economies of scale; the larger the farming operation the more cost-effective.

Farmers associations have shown various success around the country. Organizing Irrigators' Associations (IA) has been considered by NIA to be its most significant initiative in the development and operation and maintenance of irrigation systems. Farmers' associations have also shown successes in sharing of common service facilities like operating a pool of farm equipment as common service facilities of the member-farmers. Farmers' organizations can also beat the economies of scale in marketing of agricultural products. If farmers are organized, they can displace traders who rake in profits twice from them: (1) buy products not only at low prices but also putting large discounts on quality, and (2) high cost of transport of products[156].

Although associations are legal institutions being required to be registered with the Securities and Exchange Commission (SEC), associations cannot grow into businesses since they are not allowed by law to have earnings that can be distributed to members. Thus, associations can only function as self-help organizations good channels of assistance from or collaborations efforts with government programs and other institutions.

On the other hand, cooperatives have certain privileges that are not given to other organizations. These privileges enshrined in the Cooperative Development Code include engaging in business for profit with transactions exempted from various taxes imposed by government on business transactions. In return, cooperatives are expected to religiously follow regulations and are subject to regular audit by CDA.

Cooperatives should be very suited to farmers or agricultural producers in the Philippine setting since most Filipino farmers are small producers without entrepreneurial skills. Many farmers have the same economic undertakings that when collectively pursued will provide more benefits under a cooperative system. Farmers grow the same crop in the same geo-locational characteristics due to suitability factor. For example, paddy farmers operating small farms can be in a number that would justify a reasonable cooperative that could integrate activities from production to marketing of paddy.

Under a cooperative, small adjacent farms can be operated as a single unit (e.g., block farm). Cooperatives can also be organized from a group of farmers under one or more CLOAs, especially those farms that were originally plantations. Under this scheme, economies of scale may lower cost of production. The cooperative structure enables members to share information about production plans, sales volumes, prices, and other market information as well as to formulate pricing strategy.

While farmers are producers, they also engage in marketing their products, making the whole production and product distribution a business enterprise. Marketing of paddy by the cooperative creates a direct link between the farmers and consumers, eliminating brokers. By this direct marketing, the cooperative will benefit from not only the farmers but also the consumers: buying paddy at low farmgate prices and selling it at high prices to consumers. Even if the cooperative act as brokers for its members, part of its profit will be returned to them, as they are producers themselves. Cooperatives can also go into processing of the members' products into higher value products.

This collaboration increases the growers' market power. For cooperatives to grow, enterprise model should be market-driven, owned and governed by members and is designed to create value for members. Although, cooperatives operate for the benefit of their members, they still must recognize the competitiveness and risks of the business. The success of cooperatives relies on their ability to compete

[156]Buying prices of products are on-farm and farmers pay for the transport. Such payment is deducted from the proceeds of the farmers' sales. Farmers in Parang and Balabagan pay at least PHP 1.00/kg for transport. It is about 20% of the price of copra.

and survive within a given market as well as being driven by serving member interests.

Despite the seeming failure of cooperative development in the Bangsamoro region, the potential of cooperatives cannot be belittled. It is the only clear option that farmers have in order to rise from the current unjust agricultural system, which is made worse by unscrupulous traders.

8.4 Enhancing Production Performance and Land Utilization Efficiency

8.4.1 Irrigated paddy production as a way to improve profitability

Self-sufficiency in rice has been elusive in the Country. From 2004 to 2013, rice sufficiency still fluctuated from a low of 81% to 97%. The year 2013 is an improvement from all the years in terms rice self-sufficiency as production was highest during the last 10-year period. Production of rice is still concentrated in Central Luzon and other large producing regions that are vulnerable to typhoons and droughts. Thus, the development of areas for production of palay crop less frequented by typhoons and drought would help improve if not attain 100% rice food self-sufficiency level.

Irrigation development in Bangsamoro has been delayed and slow as seen earlier. Looking at the cost-profit ratios of crops including corn, irrigated and non-irrigated rice, figures show that farming is a profitable business undertaking, ensuring some 20% profit considered adequate for micro and small business operation. Exception is rainfed paddy production, showing negative profit ratios for both wet and dry season crops. Irrigation provides dramatic effects in profitability transforming negative to positive profit ratios. Irrigation carries a social development function with a large portion of paddy farmers being operators of small subsistence land holdings and subsistence. Providing irrigation to rainfed paddies would improve the socio-economic condition of a large number of farmers in Bangsamoro.

8.4.2 Integrated farm systems to be undertaken on commercial scale

Integrated farming system is a means of increasing land productivity. The prevalence of backyard scale economic endeavors in Bangsamoro accounts for the small and sluggish growth of the livestock and poultry industry. Backyard scale may be low-investment production scheme but inefficiency is deterrent to building opportunities to improve farmers' income, achieve food sufficiency and grow the region's economy as a whole. Current production levels render the whole region is insufficient and inefficient. On the other hand some mono-cropping system practices provide opportunities to increase land productivity through integration of livestock/poultry and perennials, which necessarily keep large spaces in between (e.g., coconut, rubber and fruit trees).

Bangsamoro has a wide and variety of opportunities for integrated farming combining crop cultivation and livestock/poultry. The practice of spacing in cultivation of trees and other crops in plantations are intended to provide as much sunlight needed by the trees/crops. For example, recommended coconut tree crop spacing are 10 m x 10 m, 10 m x 8.5 m, and 8.5 m x 8.5 m, for intercropping, double-stand tree and mono-cropping, respectively. With this spacing, all coconut plantations are suited for integration with small and large animals like goat and cattle. Goat-keeping under coconut plantation is promising, and other combinations of plantation crops and livestock may also be introduced.

Integration of farming systems has already been introduced in the Philippines as well as many developing countries around the world for small farm holders as poverty alleviation measure and has proven workable and effective in increasing income of small farmers.[157] Integration of rice farming and fresh water fish like tilapia and catfish systems is an existing practice in other regions in the Philippines. Duck keeping in paddy fields is another form of integrated farming already practiced successfully in Maguindanao.

These practices are generally labor intensive, and generate higher value-added. Thus, they fit well to the alternative socio-economy model. To contribute to the Bangsamoro development in a significant

[157]FAO Corporate Document Repository, www.fao.or/docrep…/x686e07.htm

way, business models for commercial operation of integrated farming should be pursued. Large commercial coconut farms and other plantations still intact under private commercial farms or distributed to ARBs but operated by cooperatives may be viable undertakings. As a model, cooperatives may be re-vitalized or strengthened for the purpose. Contract farming is already practiced for plantation crops, and introduction of livestock and/or poultry should be examined.

8.4.3 Mixed farming of various kinds to be further developed

Despite the favorable soil and climatic conditions allowing year round crop production, cropping intensity at present is relatively low. Mixed farming of various kinds should be promoted to increase cropping intensity and overall land productivity. Several farm systems increase land productivity by enhancing land utilization and productivity in terms of yield per unit land area. Right crop combinations grown in the same area can mutually benefit crops in terms protection from pests and diseases and provision of needed nutrients. This is also true for combinations of poultry and crops. Duck raising in rice fields is one example. Rice fields that are water logged for most of the growing period can provide ducks the needed water. Ducks reciprocate by providing rice growth with nutrients from the droppings.

Plantation crops may be combined with field crops such as corn, fodder and cassava, or industrial crops such as coffee, cacao, pineapple and exotic vegetables. These crops can be grown in multi-level combinations to take advantage of the spaces in tree crop plantations without necessarily depriving each other with the needed sunlight. Some plantations are good to raise native chickens as well. The free-range system of raising native chicken is fit to integrate with orchards of mangoes and other fruit trees. Chickens eat the insects that destroy fruits and their droppings fertilize the soil. Simultaneously, the trees provide the chickens with branches to perch on.

When productive reforestation is undertaken on slope land, tree crops may be combined with shade crops such as coffee and cacao. Other models may also be conceived to support the farmers under the respective CBFM agreement.

8.4.4 Responsive system of financing to increase farm yields and agricultural production

The Bangsamoro area is endowed with natural characteristics such as climate and land resources suitable for growing many types of crops. The popular saying, "you throw any seed, it will grow," certainly applies to the Bangsamoro region. However, the fat of the land should be harnessed in order to optimize the seeds it could give back. Low productivity in many types of crops is largely due to inability of farms to acquire the needed inputs for production: fertilizer and good seeds primarily. To realize the optimal productivity, the right levels of inputs such as good planting materials, fertilizers, pest control, and labor should be applied, but all these need capital.

Development and operation of commercial farms can be financed from regular loan programs of LBP, DBP and commercial banks. Agri-business companies have capability to source financing from banks and other financing institutions in the Philippines and abroad. It is the opposite for small farm holders who cannot access financing from regular sources like banks. Although LBP is tasked to support agriculture by providing credit, it has to operate as a regular bank regulated by the Central Bank and earn a decent income. It has to protect its loan fund by requiring collaterals and impose competitive interest rates from all borrowers including agricultural producers. Presenting collaterals is a major problem among small farmers.

Among the ARBs, lands distributed are mostly under CLOA, which cannot be used by individual farmer to borrow from banks. Knowing the vulnerability of agricultural production themselves, farmers whose farms are acceptable collaterals would not risk it. On the other hand, commercial banks do not prioritize agricultural production loans due to the risk attached to agriculture. Risk-averse banks are even more apprehensive to lend to farmers in Bangsamoro due to poor repayment rates in LBP. Thus, lending from commercial banks to the agricultural producers in Bangsamoro is nil. Farmers resort to borrowing from informal sources, such as relatives working abroad, traders who finance production, local lenders, etc. These cases are not too many in Bangsamoro. Even from informal sources, credit is inadequate and because of the high risk, lending often carries high interest rates. The inadequacy and inaccessibility of credit result to low investment in agricultural production.

The absence of suitable credit mechanism or the lack of access to it has proliferated very low productivity of crops in the region. Farmers suffer from a vicious cycle of low income-low production from low productivity due to the absence of financing. In view of these, the Bangsamoro agriculture financing needs an alternative credit mechanism.

The alternative credit mechanism would necessitate a fund from the Government to provide agriculture project financing and production loans to individual farmers and cooperative farms producing crops or livestock under an agriculture finance program of the government for small farms and cooperatives. The Government may stop programs on direct distribution of inputs and farm machineries to farmers and divert the allocations to this fund. These programs had been subject of corruption cases filed against government officials of DA that may have substantially robbed the farmers of needed production support. The main features of this program are (1) provision of loans with low to zero cost loans for the borrowers, (2) limited to small farmers and cooperatives whose members have less than 5.0 ha, which is the retention limit of land ownership, (3) accessible (may take from the models of informal lending).

8.5 Developing Markets for Agricultural Products

Production is always driven by demand, which is either present or created. Demand for agricultural products are usually existing as they are food, medicine or input materials for processing. The function of markets is to provide link between the producers and users. Current markets need to be responsive to the requirements of the players with efficiency and reliable information.

Currently, marketing of agricultural products are dichotomized. Large commercial agribusiness farms like La Frutera and Agumil are highly self-contained with their own marketing system to sell their produce to their own established network of buyers. On the other hand, small farmers sell to market integrators with collecting agents buying directly in the farms where they pay and collect the produce. These are especially seen as the system for marketing paddy, corn, copra and rubber.

8.5.1 Establishment of standards and grading systems for traded agricultural commodities as first step toward industrial cluster development

Although Bangsamoro is a significant producer of some industrial crops, yields are not necessarily high as compared to performance of other regions in Mindanao. More importantly, the quality of agricultural products after postharvest processing is not the ideal, resulting in low prices dictated by traders. The current system does not give the farmers incentive to improve the quality of products since traders does not consider quality in pricing.

For copra, the only classification is MC. Copra is paid a lower price per weight if its MC is higher than *resicada* [appropriate moisture]. Also, some copra evidently contains high percentages of burnt copra or molds that influence the quality of oil produced, but this has not been given due recognition in pricing. In the case of rubber, some farmers go to the extent of putting sand or stones in the sacks of cup lumps to increase their weight before selling to traders since the weight is the only basis for payment. Other such practices to lower rubber quality (e.g., use of battery solutions instead of acids) are common.[158] The processors, privy to these machinations, tend to buy their raw materials collectively at very low prices.

The market itself should require quality of products. However, in the case of primary agricultural products used as raw materials in manufacturing, the processors cannot impose quality for many reasons. Among these is a situation where manufacturers are trying to catch up with volume requirement to reach a level of viable operating capacity. Having standards and grading systems for primary products that goes through a trading distribution system would tend to address the problem of quality particularly when these are related to pricing of commodities being traded. The system would encourage quality through fair pricing.

Standards and grading system should be established particularly for crops such as rubber, abaca, copra and cassava. This system may be used as a market tool to impose quality rather than imposed as

[158]Based on interview with Philippine Rubber Technology Center by JST Agriculture Expert

regulation, although there is a need for government to establish testing centers along with the standards and grading system.

This may be the first step to make these crops a basis for industrial clusters based on primary products. The quality of primary products is a determining factor to establish successful industrial clusters with final products that are competitive in the export markets. Some of the primary products and export goods may eventually establish fame internationally.

8.5.2 Promotion of balanced diet helping to increase domestic demand for agro-products

Per capita consumption of rice in Bangsamoro at 118 kg/person/year. It contributes to the elusive self-sufficiency in rice over decades and remains the same in the last 10 years. Corn is a rice substitute in many areas. Probably, the same is true in the Bangsamoro region in particular as white corn is the main corn produce. The level of self-sufficiency has always been high in the last 10 years, although it has consistently declined over the years. In 2013, self-sufficiency in corn is lower than rice due to decline in production. Other carbohydrate substitutes include cassava, ube, and camote, which all have high productivity especially in Lanao del Sur and Maguindanao.

As discussed in previous sections, the domestic production to support the protein requirements of consumers is currently limited in Bangsamoro. Pork and chicken have consistently been the main source of protein and other animal-based food nutrients while carabeef has been the least.

Promotion of balanced diet not only contributes to people's health especially in rural areas but may also expand opportunities to diversify agricultural production by small farmers. Rice and corn may be combined with root crops to attain carbohydrate self-sufficiency. Vegetable production is easy to respond to market demand, and thus should be encouraged as it contributes to farmers' income and economy as well. Meat production should also be diversified with livestock promotion.

8.5.3 Market infrastructure development to help local farmers become demand sensitive

Access to markets is a key for the expansion of agricultural production, while potential agricultural productivity is inherently high in Bangsamoro. Major agribusinesses tend to develop a self-contained system encompassing primary production, processing, packing, and transport of their products. They should be guided to establish open markets to allow local farmers to sell their products along with part of their own products. It is a good corporate social responsibility (CSR) undertaking that helps small farmers and processors to sell and source raw materials. For instance, local farmers may sell fresh vegetables there. This will provide major agribusinesses with small but reliable local outlets for their products and also opportunities to learn local demand.

Such open markets will give incentives for local farmers to produce for local sales. Moreover, it may help to make local farmers demand sensitive in making their decisions for agricultural production. Some of more active farmers may start producing new crops as well possibly in cooperation with the associated agribusiness.

The vicinity of an agribusiness company location is appropriate for establishing an open market since it tends to be the converging point of people in the community with buying capacity. Agribusinesses are labor intensive and employ a large number of people. In addition, upstream and downstream businesses will be created and eventually add to employment. Reputation of the market is expected to increase the buyers and sellers and transactions.

As a CSR undertaking, an agribusiness company may establish the market and operate it for a period until a viable market organization, either a cooperative or an association, has been established and capable of continuing the operation. The importance of having the market initially operated by the agribusiness company is modeling an appropriate management with future managers having an on-the-job training. Future market operator can continue or build on from the management model. The factor that separates CSR endeavors from each other is the depth of involvement. Ideally, CSRs should uphold sustainability. Should the company leaves the program for whatever reason, the beneficiaries should be able to continue the operation and management. While CSR earns the company good image, it is also able to reduce tax due as expenses on CSR undertakings can be converted into tax credits.

Comprehensive Capacity Development Project for the Bangsamoro

Development Plan for the Bangsamoro

Final Report

Sector Report 1-2: Agroindustry

Table of Contents

List of Tables

List of Figures

Abbreviations, Unit of Measurement, and Currency

(Refer to Sector Report 1-1: Agriculture, pp. 1-vi through 1-xi.)

CHAPTER 1 CURRENT SITUATION AND GROWTH POTENTIALITY OF MAJOR AGRICULTURAL PRODUCTS IN BANGSAMORO

Mindanao is referred to as the Country's food basket due to its abundance of agricultural and fishery resources. In the Mindanao Strategic Development Framework 2010–2020, the National Economic and Development Authority (NEDA) estimated that Mindanao accounts for at least 40% of the Country's food requirements and 30% of national food trade.

Bangsamoro represented 0.7% of the Country's gross domestic product in 2013 with the agriculture, forestry and fisheries sector being the biggest contributor to the region's economy, accounting for 61% of the region's total domestic output and 68% of its employment in 2012.[1] While a wide range of agricultural products are grown in Bangsamoro, the growth potential of these resources has not been fully exploited. This chapter presents the current situation and growth potentiality of major agricultural products within Bangsamoro. The issues to be considered when promoting investment in agroindustry in Bangsamoro are discussed in Chapter 2.

1.1 Banana-based Agri-business

Banana is one of the largest earners of foreign currency among agricultural commodities in the Philippines. The Country, the second largest exporter after Ecuador,[2] exported over 2.0 million tons of bananas and earned US$471 million in 2011.[3] Banana production is already an established industry with significant investments having been made in Bangsamoro. Japan accounts for half of the Philippines' total banana exports; most of which are of the Cavendish variety sold under brand names such as Chiquita, Dole, and Del Monte.[4] The production of all varieties of banana in Bangsamoro totaled 459,605 tons in 2013, representing 5.3% of the country's total banana production (8.6 million tons) or 6.6% of Mindanao's total banana production. Mindanao dominates the Country's production of the Cavendish variety (over 99% of 4.2 million tons) while Bangsamoro's share is 3.5%, concentrated in Maguindanao.

The supply chains for the Cavendish variety have already been developed. Commercial farms in Bangsamoro are equipped with packing houses where the produce is packed in plastic bags and cartons, and then shipped to ports in refrigerated transportation. Unifrutti, which operates banana plantations in Bumbaran, Lanao del Sur (over 500 ha) and Datu Paglas and Buluan, Maguindanao (over 1,000 ha), is planning to invest in new plantations in Talayan, Maguindanao. As banana plantations are labor intensive, requiring two workers per ha, expansion of Cavendish banana plantations would contribute to creating employment in the ARMM area.[5]

There is also potential for expansion of markets for banana products and byproducts. For example, processing of banana chips and fried bananas by small-scale processors for domestic consumption could be promoted. There could also be a focus on bananas other than the Cavendish variety, such as Lacatan or Saba bananas. Lacatan bananas are used in various types of food and there is potential room for growth of this market as the Bangsamoro currently accounts for 11% (102,443 tons) of the national production,[6] with 60% being produced in Maguindanao and 40% in Lanao del Sur. According to the

[1] Philippine Statistics Authority CountrySTAT Regional Profile
[2] None of the Asian countries except the Philippines exports a large volume of bananas, although the productions in India (30 million tons; the world's largest) and China (10 million tons) are larger than the Philippines. Out of the total world exports (18 million tons or 12% of the total world production) in 2012, the top five countries accounted for two-thirds of this amount (Ecuador over 5 million tons, followed by the Philippines with over 2 million tons, and three other Latin American countries at 1.5 to 2 million tons each.)
[3] FAOSTAT; the largest importer of the Philippines' bananas is Japan (1 million tons), followed by China (0.5 million tons), Korea, UAE (0.3 million tons each), Iran and Saudi Arabia (0.1 million tons each).
[4] According to FAO, most bananas that Japan imports are from the Philippines.
[5] For example, in 2009, the cultivation of Cavendish bananas (harvested in 3.7% of the total agricultural land) accounted for 38% of the total employment in the sector of agriculture, forestry and fisheries. (Source: Philippine Statistics Authority)
[6] Philippine Statistics Authority CountrySTAT

Development Study on Local Industry Promotion in ARMM (JICA 2011), most processing activities in Bangsamoro are conducted at the household level while packaging and trading are conducted by small-scale entrepreneurs. Indigenous Saba variety bananas are also processed into a variety of products including chips, ketchup, puree, jam, jelly, flour and cakes, and so there is demand for this variety of banana as well.[7] One byproduct of bananas that has market value is a fiber from unused trees, which has a silky texture and is used for formal dress clothing, similar to the Barong Tagalog made from pineapple fibers. La Frutera, a subsidiary of Unifrutti, exported 30 tons of banana fiber from unused trees to Japan in 2008. Although export of banana fiber to Japan has since been suspended due to a disease among the banana trees, a market does exist for this material. Edwin, a Japanese jeans brand, sells eco-friendly bottoms developed by Toyobo Textile that are made from such banana fiber.

Box 1: Banana investment by Dole and Unifrutti

The Philippines' banana production is still recovering from the typhoon in 2012 that battered major banana plantations in Mindanao. Dole's banana exports were decreased by 16 by the typhoon, which mainly hit Northern Mindanao.[8] Itochu Corporation, the owner of Dole International Holdings, Inc., estimated in 2012 that the growth rate of banana consumption in Asia and the Middle East in the next five years would be over 7% per annum. Dole wishes to increase the purchase of bananas from Bangsamoro since it is located at the center of the typhoon-free zone.

Unifrutti, an exporter of Chiquita banana brand, supplies highland bananas (over 500 ha in Bumbaran, Lanao del Sur) for Dole's Sweetio brand. The highland banana, containing higher nutritional value brought about by a longer growing period, is regarded as a high value banana.[9] Unifrutti has been enhancing its market position as a socially- and environmentally-responsible supplier by obtaining certifications, such as ISO (International Organization for Standardization), GlobalGAP (Good Agricultural Practices), and Rainforest Alliance, on its own and also promoting the obtaining of certifications by contract farmers.[10] Unifrutti also successfully established a banana farm of over 1,000 ha in the post-conflict zone in Datu Paglas, Maguindanao. In both cases of Bumbaran and Datu Paglas, the achievement of a partnership with community leaders and farmers was one of the keys to success.

Unifrutti recently commenced land preparation for 2,600 ha of banana plantations in Talayan and other municipalities in Maguindanao, in partnership with locally incorporated companies. Talayan was also chosen as the location of a pilot project for a farm-to-market road (12 km) under the Philippine Rural Development Program (PRDP) financed by the World Bank. The new plantations are expected to produce 160 tons of bananas per week. Establishing a handling facility at the Port of Polloc[11] adjacent to Cotabato City would lead to a more profitable model of export (both for Unifrutti and Bangsamoro), rather than transporting them to the port in Davao.

(Source: interviews with Dole, Unifrutti and La Frutera.)

1.2 Pineapple-based Agri-business

The Philippines is one of the world's biggest pineapple producers with its production rising from 1.7 million tons in 2003 to 2.5 million tons in 2013.[12] Mindanao has been consistently producing about

[7] Banana products in Buluan, Maguindanao are promoted in the framework of the Department of Trade and Industry-ARMM (DTI-ARMM)'s One Town One Product (OTOP) program. In Buluan, La Frutera Inc. has a 1,000 ha plantation (to be expanded by 300 ha) solely for Chiquita bananas (Cavendish variety), of which the rejections (270–400 tons of oversized or undersized bunches per annum, acconting for 2–3% of its producion) are also given to local traders to be processed.

[8] According to Dole International Holdings, the annual export of bananas decreased from 226 million boxes (13kg each) to 190 million boxes due to the loss of cultivation areas (approximately 2,000 ha). Half of the damaged areas were not yet recovered as of end 2014.

[9] Sumifru exports highland bananas produced in the vicinity of Davao as *Kanjuku-oh* for the Japanese market.

[10] According to an International Finance Corporataion (IFC) report, highland farmers receive 25% higher prices for their bananas as a result of Rainforest Alliance certification and meeting other premium market requirements. With support from IFC from 2008 to 2010, Unifrutti provided 1,000 growers with technical training that helped them maintain soil quality, recycle water, and produce high-quality crops, as well as business training that enabled them to increase efficiency in farm management. (IFC, 2013, *Stories of Impact: Supporting Smallholder Farmers in Meeting International Certification Standards and Adopting Sustainable Agricultural Practices in the Philippines*)

[11] Ownership was transferred from the Philippine Ports Authority to the Government.

[12] Philippine Statistics Authority CountrySTAT. The statistics of Japan's Ministry of Agriculture, Forestry and Fisheries

90% of the Country's pineapples during the past decade. In 2013, Northern Mindanao contributed 55% of national production, followed by SOCCSKSARGEN (33%). However, pineapple production in Bangsamoro is still small (1,064 tons in 2013).[13] Pineapple is an important export product for the Philippines with the Country exporting 263,019 tons of fresh pineapples (US$68 million), 205,153 tons of canned pineapple (US$194 million), and 18,621 tons of pineapple juice (US$20.7 million) in 2011.[14]

Of the 60,750 ha planted with pineapples in the Philippines,[15] four major companies commercially operate plantations on 43,000 ha.[16] Corporate plantations are preferred for the production of fresh pineapples, which requires stringent timely harvesting under unpredictable weather conditions, while pineapples under contract farming are used for canned products.[17] Some cooperatives are engaged in pineapple processing (e.g., for dehydrated pineapple, pineapple tarts or pies, jelly, juice, and jam[18]) for the local market. The Fiber Industry Development Authority (FIDA) of the Philippines has been promoting the use of pineapple leaf fiber as a material for the premium class Barong Tagalog; however, due to its high cost and unstable production, international trading of pineapple leaf fiber has not yet been realized.[19]

Bangsamoro has a high potential for pineapple production with its advantages in climatic and soil conditions. Pineapple production in Bangsamoro decreased by 30% in the past decade to 1,000 tons due to the degraded security in the region; it could be expanded either by contract-farming or direct management of export-oriented investors (domestic and foreign). Land ownership, road infrastructure, and peace and order are critical in attracting investors. Encouraging farmers to form cooperatives to collectively sell or process pineapples is also an option.

1.3 Coconut-based Agri-business

Coconut is one of the most widely cultivated plants in the Philippines; 3.6 million ha is planted with coconut out of the 13.6 million ha of total agricultural land.[20] The Country produced 15.4 million tons of coconut in 2013 of which Bangsamoro represented 8.6% (1.3 million tons). Within Bangsamoro, Maguindanao accounts for 44% of coconut production, followed by Sulu (16%), Basilan (15%), Lanao del Sur (13%), and Tawi-Tawi (12%).[21] The Country is a large exporter of coconut and its products; 826,721 tons (US$1.43 billion) of coconut oil, 108,867 tons (US$287 million) of dried coconut, and 7,605 tons (US$3.7 million) of raw coconut were exported in 2011.[22]

The use of processing technologies in Bangsamoro is relatively low with virgin coconut oil (oil extracted without heat treatment) being produced by small- to medium-scale operators, including Matling Industrial and Commercial Corporation located in Malabang, Lanao del Sur. There is no coconut oil refinery in Bangsamoro;[23] local copra traders collect dried copra to sell to large refineries outside the region.

Coconut sugar, processed from boiled saps taken from blossoms, is increasingly drawing health-conscious consumers' attention in developed countries due to its high content of vitamins, amino acids

shows exclusive trading of fresh pineapple between the two countries (most fresh pineapples from the Philippines are exported to Japan, dominating Japan's fresh pineapple market).

[13] Philippine Statistics Authority CountrySTAT

[14] FAOSTAT

[15] Philippine Statistics Authority CountrySTAT

[16] Del Monte has 23,000 ha, Dole Philippines with its subsidiary Dolefil Agrarian Reform Beneficiaries Cooperative (DARBC) has 15,000 ha, and Tiboli Agricultural Development, Inc. (TADI) has 5,000 ha (Source: companies' websites).

[17] Interview with Unifrutti

[18] For example, a few cooperatives in Camarines Norte Province, Bicol started producing a wide variety of products under a DA and DTI support program, including testing of pineapple fiber production from its leaves. (Source: Bureau of Agricultural Research, Official Quarterly Publication Digest vol 14 (2012))

[19] There are small-scale processors in Visayas. Kanebo patented the manufacturing of pineapple fiber.

[20] Philippine Statistics Authority CountrySTAT: Coconut has the second largest harvested area after rice (4.8 million ha).

[21] Philippine Statistics Authority CountrySTAT

[22] FAOSTAT

[23] There seem to be oil refineries in Iligan, Cagayan de Oro and Davao (JICA, 2011, Development Study on Local Industry Promotion in ARMM).

and minerals.[24] Small- to medium-scale processors of coconut sugar have recently emerged in Bangsamoro. Some medium-scale producers, such as the Linabu Agrarian Multi-Purpose Cooperative (LAMPCO), have started exporting their products, although Development Study on Local Industry Promotion in ARMM (JICA, 2011) observed inconsistencies in their quality and color.[25] Treelife Coco Sugar, which is the largest coconut sugar producer exporting all its products (15 tons per month),[26] has been requested to increase its monthly production to 100 tons by its customers in Europe.[27]

Another byproduct of coconut is coir fibers processed from husks (comprising one-third of the weight of the coconut) after extraction of the copra. The fiber can be turned into geotextiles, which are, once combined with natural rubber, used for mattresses, automobile seats and sofas. However, most coir fibers in the Philippines are simply processed into geo-nets used to prevent soil erosion; the products are highly demanded by the Philippines' public construction sector (further discussed in Box 2). Promotion of coir fiber would have a large economic impact in the Philippines since coconut is grown by small-scale farmers and locally available mills are used for decortication. Lamitan and Sumisip in Basilan selected coir processing in the OTOP program. A set of processing equipment was provided to a cooperative in Lamitan through DTI-ARMM's Shared Service Facility (SSF).

Box 2: Development of the coir fiber industry

The demand for handmade geo-nets for construction and mining is growing domestically and internationally. Geo-nets produced in the Philippines are, however, far more costly than those produced in India[28] and Sri Lanka, which are the leading coir processing and exporting countries. The higher cost of the Philippines-produced geo-nets is apparently due to the inefficient structure of processing; each activity (production, decortication, twining and looming) is conducted at a different location. For example, Regwill Industries Inc., a coir fiber manufacturer, decorticates at its milling plant in Davao the coconut husks collected from farmers, distributes fibers to communities for twining, and looms twined fibers into geo-nets back at its plant. Owing to the difficulties in coordinating activities in the value chain with the orders of geo-nets as well as the unpredictability of orders from construction companies, the utilization rate of its looming capacity remains at 50%. The high processing cost in the country has led to its low competitiveness in the world market. The mechanization of twining and looming would not be an option in the Philippines as the current coir production scale is small and the most demanded products are hand-loomed geo-nets.

According to PCA, about 40% of coconut husks (2.4 million tons) are readily available for decorticating and processing. Mindanao accounts for 60% of the current coconut husk supply of the country while it accounts for only 35% of coir processing capacity[29]. As there are plentiful unused husks[30] under the current structure of processing with geo-nets being increasingly demanded, Bangsamoro could be an ideal location for an integrated assembly unit for decorticating, twining, and looming with its abundant and relatively cheap labor.

Coconut peat and dust, a residual after extraction of fiber from a husk, is used as a soil additive or an ingredient to produce organic fertilizer.

(Source: Interviews with PCA, Regwill, and members of the coconut cluster in Davao under JICA/DTI.)

[24] Maimbung in Sulu chose coconut sugar in the OTOP program in response to the growing domestic demand (Source: (Status Report of Transition Investment Support Plan for ARMM (July 2014) , press releases from PCA Coconuts R&D and BAR)

[25] LAMPCO's export started with Japan, and then the U.K. (5 tons/month were exported to the U.K. in 2014). Targeting other small scale producers in the nearby area, in early 2014, the Project Formulation Survey under the Governmental Commission on the Projects for ODA Overseas Economic Cooperation was conducted to eliminate inconsistencies in color by utilizing a unique technology of a Japanese firm. The product with this technology is slightly more costly than the current production.

[26] The company has certificates for organic products from the U.S., Germany, and EU, and a certificate of Hazard Analysis and Critical Control Points (HACCP)

[27] Interview with Treelife

[28] According to the Coir Board of India, the Indian exports in 2013 were 500,000 tons(comprising coir pith (50%), fiber (33%), mats (15%), high-value geo-textile and rubberized textile (1%), etc.).

[29] According to Regwill, while most of the twining communities in Mindanao are located either in Northern Mindanao (over 300) or Davao (less than 50), most of the major mills are located in Davao.

[30] According to PCA, about 40% of coconut husks (2.4 million tons) are readily available for decorticating and processing. Mindanao accounts for 60% of the current coconut husk supply of the country while it accounts for only 35% of coir processing capacity. According to Regwill, while most of the twining communities in Mindanao are located either in Northern Mindanao (over 300) or Davao (less than 50), most of the major mills are located in Davao.

Bangsamoro's geographic and climatic advantages, including being typhoon-free with fertile soil, make it suitable for coconut cultivation.[31] Coconut is suitable for intercropping and being grown by smallholders; household-level or small-scale processing, such as the extraction of virgin oil, the sorting of husks for coir, and the production of coconut sugar, could be promoted.

1.4 Palm Oil Industry

Palm oil is widely used in household food preparation as cooking oil, as well as in the production of margarine shortening, vegetable ghee, canned goods and non-dairy creamers. It is also used as an ingredient in soaps, detergents, cosmetics and biodiesel. Palm oil (fresh fruit bunch: FFB) production has been increasing; it grew from 355,111 tons in 2003 to 473,416 tons in 2013,[32] with Mindanao, led by Caraga and SOCCSKSARGEN, accounting for over 90% of the national production. Palm oil production in Bangsamoro is relatively new with the planted area increasing from 200 ha in 2007 to 1,940 ha in 2013; the production in Bangsamoro represented 2.2% of the national production in 2013.[33]

In Bangsamoro, large-scale production techniques such as importing seeds,[34] nursing and crushing, have been practiced in the plantation of Agumil[35], a leading company in the subsector jointly formed by Philippine and Malaysian investors. After crude oil is extracted at crushing plants attached to plantations, it is shipped to Manila and India for refining.[36] According to the Mindanao Development Authority, there is a plan to establish an oil refinery in the Polloc ecozone, the only economic zone in Bangsamoro. A thorough analysis will be needed to determine whether the volume of crude oil produced in Bangsamoro can justify the investment as the establishment of a large refinery unit is required in order to be competitive.

Further expansion of palm oil production could be expected in Bangsamoro.[37] For example, Agricola, a Singaporean firm, plans to invest in a 5,000 ha plantation in Datu Odin Sinsuat, near Cotabato City. Univanich Carmen Palm Oil Corporation, a joint venture between Thai and Philippine companies, has a newly built mill in Carmen in Cotabato Province to crush oil palms purchased from its surrounding farms (over 8,000 ha), and it plans to double the processing capacity while increasing the number of contracted farmers (an additional 3,000 ha of farmlands are targeted).[38]

It should be noted, however, that the development of oil palm plantations requires consideration of its environmental impacts, including possibilities of conflicts in connection with land acquisition and degradation of the environment caused by the clearing of vast amounts of land.[39] Moreover, oil palm farming is not labor-intensive[40] but it is capital-intensive[41]. Although a corporate plantation is more suitable for high-yield production[42], a model of contract farming with a nucleus corporate plantation[43] could be promoted. Support programs for smallholders' initial costs, such as financing for planting materials and fertilizers that could be paid back within two- or three-year harvests, either by investors

[31] JICA (2011), Development Study on Local Industry Promotion in ARMM
[32] Philippine Statistics Authority CountrySTAT. The country also imports palm oil products; 41,198 tons (US$51 million) of palm oil, 25,678 tons (US$31 million) of palm kernel oil, and 39,187 tons (US$8.6 million) of kernel cake were imported in 2011 (FAOSTAT).
[33] Philippine Statistics Authority CountrySTAT
[34] As certified seeds are not available and there is no government body to conduct research and development for domestic seed production in the Philippines, seeds are imported from Malaysia and Papua New Guinea.
[35] Agumil's crushing plant at Buluan in Maguindanao (covering up to 8,000 ha) purchases oil palm (FFB) from its outgrowers.
[36] While there is a palm oil refinery in Caraga, there is no information about its operational status.
[37] Interviews with RBOI-ARMM and media report.
[38] Univanich is seeking financing (PHP 90 million) for high-yield seedlings to be distributed to farmers.
[39] Burning of forests to clear land for oil palm plantations has been internationally debated. In the Philippines, the Clean Air Act (1999) bans burning.
[40] Employment per ha in oil palm farming is 0.3 on average (e.g., 7,000 growers and 15,000 workers over 70,000 ha of land); Philippine Palm Oil Development Council, Inc. (PPDCI, 2013), "A Road to Poverty Reduction"
[41] The average cost of high-yield seedlings (20–30 years' tree life), which are unable to be produced domestically, is PHP 30,000/ha and that of fertilizers is PHP 6,000/ha per annum (from interviews with Univanich and farmers)
[42] According to Univanich, the yield under a corporate plantation is twice as much as through contract farming.
[43] According to PPDCI (2013), Indonesia could create jobs for 1.5 million farmers under this model.

or PCA,[44] would be important.

Box 3: Comparison between palm oil and coconut oil as edible oils

Coconut oil export from the Philippines has been fluctuating between 0.7 and 1.4 million tons per annum in the past decade, apparently affected by the international prices, while coconut oil production of the country has been in the range of 1.5 to 1.8 million tons per annum. National consumption of palm oil, the price of which is approximately half the price of coconut oil, has increased from 108,000 tons in 2000 to 478,000 tons in 2012, overtaking the consumption of coconut oil in 2011.[45]

PCA formulated the Philippine Palm Oil Industry Roadmap (2014–2023) aimed at overcoming the increasing shortage of edible oil in the country, accompanied by a strategic plan to develop new 300,000 ha of oil palm fields by 2023. PCA, in collaboration with the National Anti-Poverty Commission (NAPC), is also preparing the Poverty Reduction Roadmap of the Coconut Industry[46] with an aim to alleviate poverty by assisting mainly the upstream in the value chain (mapping of available coconut farms (existing and potential), enhancement of production techniques, and facilitation of access to the value chain). The coconut industry, having been protected by the government over decades, is characterized by the dominant presence of poor smallholder farmers[47] and state-owned mills with low capacity utilizations.[48]

PCA estimates that the country will face a shortage of 1 million tons of edible oil in 2024 even if the target of the Palm Oil Industry Roadmap has been met. In order not to depend too much on oil palm farming that entails a significant environmental risk, domestic coconut farming should be more promoted. Promotion of coconut farming would require an institutional arrangement that would provide more profit to farmers (e.g. reimbursement of the coconut levy to farmers, provision of technical support (high-yield seedlings, intercropping, byproducts, and post-harvest methods), and facilitation of market access for smallholders). It is also expected that the increase in coconut production will lead to the resolving of the underutilization problem of existing coconut oil mills.

(Sources: PCA, FAO, USDA, and Malaysia Palm Oil Council.)

1.5 Mango-based Agri-business

The Philippines' mango production ranges between 0.8 million and 1.0 million tons per annum. Mindanao produced 30% of the national production in 2013, with Bangsamoro contributing less than 1%.[49] During that period, Maguindanao produced 5,077 tons[50] (66% of Bangsamoro) and Sulu produced 1,804 tons (23%).

Philippine mango is internationally known for its Carabao variety with its sweetness and high nutritional value. 95% of the production is consumed locally while the rest is exported (30,565 tons in 2011, valued at US$97 million[51]). The largest foreign buyer is Japan, accounting for 40% of the mango exported from the Philippines.[52] The demand for mango is also growing in the domestic market.

About a quarter of all mangoes produced in the Philippines are processed into various forms of products:

[44] PCA as the authority in charge of the promotion of oil palm and its industry, formulated the Philippine Palm Oil Industry Roadmap (2014–2023), which aims to develop new 300,000 ha oil palm fields with an employment of 30,000 farmers and establish a total of 500 tons/hour crushing mills by 2023.

[45] Third major edible oil consumed in the country is soybean oil, which has been consumed between 13,000 and 50,000 tons per annum. The total consumption of edible oil almost doubled from 472,000 tons in 2000 to 904,000 tons in 2012. (Source: Malaysia Palm Oil Council (2013), "Oils and Fats Scenario in the Philippines"

[46] The roadmap (5 year medium-term policy with the budget of PHP 11 billion) is yet to be approved by the parliament. The roadmap comprises components of Agro-enterprise Development (40%), Agrarian Reform (5%), Social Protection (25%) and Institutional Reform (30%).

[47] According to PCA, 60% of coconut farmers live below the poverty line (normal rural smallholders with 1-ha farm has a monthly income at PHP 1,500 while the poverty threshold for a five-member family is PHP 5,500 per month).

[48] The aggregated capacity utilization rate of major oil mills (including state-owned mills) was 44% during the decade between 2000 and 2010 (from Presentation on the Poverty Reduction Roadmap of the Coconut Industry, prepared by NAPC, 2011)

[49] Philippine Statistics Authority CountrySTAT

[50] Nakashin Davao International Inc. (a Japanese food company based in Davao) purchases half of these mangoes from farmers (240 ha in total) in Talayan, Maguindanao, and processes them into frozen mangoes to be exported to Japan.

[51] FAOSTAT

[52] JICA (2011), Development Study on Local Industry Promotion in ARMM

puree, juice, dried mangoes, concentrates, frozen mangoes, etc., but there is no processor within Bangsamoro. The market for mango juice is rapidly growing, with its production being dominated by two large food manufacturing companies: San Miguel Corporation and RFM Inc. Mango puree is mostly produced in Luzon and Cebu.

While pre- and post-harvest technologies of mango production in the Philippines are widely disseminated, the actual production volume in Maguindanao is very small due to the insufficient use of chemicals for flowering, according to the JICA Study (2011). Enhanced production methodologies, such as spraying in groups, should be encouraged.

Box 4: Export of frozen mangoes to Japan

Nakashin Davao International Inc., a subsidiary of a Japanese company, has been exporting frozen mangoes to Japan since 2006, which are sold under the Ajinomoto brand. Nakashin commenced its contract farming with farmers owning a total of over 240 ha of mango farms in Talayan, Maguindanao when farmers were about to stop mango production due to the product's low prices during harvest seasons (twice a year) resulting from oversupply. Nakashin purchases mangoes at a guaranteed price while providing farmers with fertilizers and maintenance work for their farmlands; the expenses for which are subtracted upon the purchase of produce. Mangoes are processed at Nakashin's plant (300 employees) in Davao. Nakashin's entire operation in Talayan is protected by the Datu (traditional chief) since it is profitable to the datu family and is at the same time generating employment in the area. Nakashin wishes to construct a facility for sorting and cleaning of mangoes in Talayan should there be public funds available for the installation of a micro-hydro power plant and tube well.

(Source: Interview with Nakashin.)

1.6 Cassava-based Agri-business

Cassava is produced widely in Mindanao. Cassava in the Philippines is used for food (accounting for 75% of production), starch (20%), dried chips for feed (5%), and a small quantity of granules for brewery. Mindanao contributed 75% of the country's production (2.4 million tons) in 2013 (Bangsamoro contributed 44% and Northern Mindanao contributed 25%). Among the provinces, Lanao del Sur accounts for 50% of Bangsamoro's production, followed by Basilan (25%), and Sulu (17%).[53] Cassava is collected mostly by traders through two channels: one for starch and granules; and one for local consumption and feed. In Lanao del Sur, two cassava processors, Matling Industrial & Commercial Corporation in Malabang and Itil Plantation Inc. in Balabagan, process the majority of cassava harvested in the province.[54] Demand for cassava starch is growing; the Country imported 54,000 tons of starch (US$29 million) in 2011.[55] Demand for cassava as animal feed is also growing in the country.

The largest challenge in the cassava value chain is found in its post-harvest treatment. The JICA Study (2011) underscores the lack of post-harvest machinery and tools, such as graters, cassava pressers, chippers, dryers and storage for processed cassava. Household-level processing of cassava flour and chips could also be encouraged.

Box 5: Matling's profit sharing

Matling Industrial & Commercial Corporation, established in 1928 by an American foundation, has a sustainable profit sharing mechanism with farmers in the community. Matling's plant, with 1,000 employees, processes 6.7 tons of cassava starch per day from 270 tons of daily purchased raw materials (this volume represents 30% of the harvest from the 3,000 ha of farmlands in the community). 1,700 ha of farmlands are owned by the cooperative comprising community members (farmers) and the company's employees (900 members in total), while the rest of the farmlands are also leased to the cooperative. Contract farming is applied to the entire farmlands. The cooperative provides member farmers with fertilizers, seedlings and tractor services, and provides social services (water, electricity, school, hospitals, etc.) not only to its members but also to outside farmers. The cooperative distributes among its members dividends (between

[53] Philippine Statistics Authority CountrySTAT
[54] JICA (2011). Development Study on Local Industry Promotion in ARMM
[55] FAOSTAT

20% and 100%) that have mostly been generated from sales of intercropped coconut (copra).

The market for cassava starch is stable; over 90% of the produced starch is sold to Manila with a 5% premium price due to its high quality. Matling and the cooperative wish to double the processing capacity of the starch plant with a new 0.75MW hydro power plant, in addition to the existing hydro power plant.[56] The company would be able to finance the total investment cost (PHP 200 million). The new investment will enable the unused land within the complex to be cultivated for supplying raw materials to the processing unit.

(Source: Interview with Matling.)

1.7 Rubber Industry

Rubber production in the Philippines has increased from 273,979 tons in 2003 to 444,809 tons in 2013,[57] with Mindanao accounting for most of the national production. Among the production in the Philippines in 2013, Zamboanga contributed 43.9%, followed by SOCCSKSARGEN (38.9%), Bangsamoro (10.5%), Northern Mindanao (2.5%), Caraga (2.2%) and Davao (1.9%). Basilan represents 97% of the production within Bangsamoro.[58] In 2011, the Country exported 42,209 tons (US$80 million) of dry natural rubber.[59]

Most rubber growers in Bangsamoro are smallholders who cultivate 1.0 to 2.5 ha of rubber intercropped with fruits, such as lanzones, durians, rambutans, bananas and coconuts. There is no primary processing plant in Maguindanao; farmers sell their cup lumps of latex to traders, who then transport them to one of the rubber processing plants in Makilala of Cotabato Province (easily accessible from the production areas in other parts of SOCCSKSARGEN). Although rubber processing is a labor-intensive industry, dry natural rubber processing requires a certain level of investment; even a small-scale processing factory at the community level needs PHP 180,000 of initial investment.[60] Processing from natural latex to rubber goes through several stages with machines, such as coagulation, crushing, maceration, creping, drying and pressing, which makes processing within Bangsamoro technically and financially difficult.

The quick solidification of rubber sap after harvest requires an immediate conversion from sap to latex in cup lumps. Most of the major primary rubber processors that transform latex into dry natural rubber (in the form of rubber sheet and bale) are located in Zamboanga and Makilala,[61] which is located in between production areas (in SOCCSKSARGEN and Maguindanao) and the Port of Davao. Most of the dry natural rubber processed in Mindanao is shipped from either Davao or Zamboanga with 90% of its destinations being in East Asia and 10% in Cebu or Metro Manila where industrial and household goods, such as tires, belts and bushing, are produced.

Post-harvest handling of rubber is a key to the improvement of farmers' incomes. According to a rubber processor,[62] the quality of dry natural rubber depends heavily on the quality of latex; however, judging the quality of latex from its appearance is difficult once rubber is formed into cup lumps. Mixing impurities (such as sands and metals) inside the cup lumps is reported to be sometimes practiced (and rather prevalent in Bangsamoro), which makes cup lumps appear to contain highly consolidated latex (better quality) with its increased weight. Since it is too costly to introduce impurity detectors, raising farmers' awareness through Department of Agriculture (DA) extension services would be indispensable to quality improvement. DA extension services should also include the utilization of high-yield seeds, better care of trees during growing periods, and the improvement of post-harvest handling.

[56] The existing hydro power plant (1.5MW, PHP 70 million) was funded by the Development Bank of the Philippines. Matling also invested PHP 24 million in a biomass facility in 2011; Austraian AID (2012), *Braving it and making it*
[57] Philippine Statistics Authority CountrySTAT
[58] Philippine Statistics Authority CountrySTAT
[59] Philippine Statistics Authority CountrySTAT
[60] JICA (2011) "Development Study on Local Industry Promotion in ARMM"
[61] Philippine Statistics Authority, *Profile of Makilala*; Department of Agriculture, High Value Crops Development Program
[62] Interview from Farma Rubber Industries Inc.

1.8 Abaca Industry

Abaca is a species of banana native to the Philippines and the bio-fiber from its leaves is considered to be the strongest among natural fibers.[63] For export purposes, abaca is either: (a) processed into pulp and fabric to be further processed in developed countries into filter papers, banknotes, napkins, tea bags, and hospital textiles (aprons and caps); or (b) processed into final products such as handbags, hammocks and mats. For domestic consumption, abaca is processed into clothes, jeans, fishing rope and other items. The Philippines is the leading exporter of abaca to the world market. In 2011, the Country produced 68,612 tons of abaca fiber,[64] of which 10,524 tons (US$13.4 million) were exported.[65] While abaca is produced throughout the Country (138,000 ha by 90,000 smallholder farmers),[66] it is intensively cultivated in the Bicol Region and Eastern Visayas.[67] In 2013, the production in Bangsamoro was 4,974 tons, accounting for 7.7% of the Country's abaca production or 23% of Mindanao's abaca production. Within Bangsamoro, Sulu leads the production with 3,196 tons followed by Lanao del Sur with 1,696 tons.[68]

According to the analysis of the JICA Study (2011), the major constraint to the development of abaca's value chain in Bangsamoro is farmers' limited access to technical assistance from FIDA in the areas of post-harvest handling, handicraft processing and marketing. While most handicrafts produced in Bangsamoro are not sufficiently sophisticated for export, some abaca handicrafts in and around Lanao del Sur are sold outside Bangsamoro[69] with the local community's well-known skillset being utilized.

Box 6: Abaca pulp and abaca industry cluster

Most fibers processed in Lanao del Sur are currently supplied to Newtech Pulp Inc., a subsidiary of Glatfelter (a large paper manufacturing company in the U.S.) located near Marawi City, which manufactures abaca pulps to export to other Glatfelter subsidiaries in Europe. One-third of abaca fibers produced in the country are processed into pulps, and Newtech accounts for 70% of pulps manufactured in the country (there are three other mills outside Mindanao). In addition to a growing demand for abaca fibers, the quality of fibers for pulp processing is important; in order to utilize its capacity (75 tons/day) and to maintain the quality of the pulp, Newtech monthly imports 400 tons of high-grade abaca fibers produced at Glatfelter's plantations in Ecuador and Costa Rica.[70] Under the Industry Cluster Component (being implemented until 2016) of the JICA/DTI-ARMM's Comprehensive Capacity Development Project, Lanao del Sur was selected as a province where an abaca industry cluster will be developed and promoted. In order to increase abaca production, the project decided to provide a fund for a nursery in Lanao del Sur, which is the first nursery in Mindanao. To fully utilize its processing capacity, Newtech plans to buy more high quality fibers from farmers (targeted areas are over 3,000 ha) in Lanao del Sur.

(Source: interviews with Newtech, FIDA, Unifrutti, and members of the cluster.)

1.9 Cacao-based Agri-business

The cacao production of the Philippines accounts for merely 0.1% of the world's total (5 million tons in 2012).[71] The Country exports most of its cacao in semi-processed form (260 tons or US$1.0 million of cacao mass and 920 tons or US$3.1 million of cacao butter) while importing a large amount of cacao products: 17,772 tons or US$72 million of cocoa cake (solid mass after the extraction of cocoa butter); and 11,052 tons or US$31 million of chocolate in 2011.[72] The national cacao production has reduced to half of what it was in 1991; attributable to the agrarian reform in the late 1980s, the sharp rise in input prices and replacement by banana trees. In 2013, the Davao Region alone contributed 79% of national

[63] Fiber Industry Development Authority of the Philippines (FIDA)
[64] Philippine Statistics Authority CountrySTAT
[65] FAOSTAT
[66] Abaca is harvested twice a year.
[67] FAO Future Fibers: http://www.fao.org/economic/futurefibres/fibres/abaca0/en/
[68] Philippine Statistics Authority CountrySTAT
[69] Puyo Handicrafts (Cagayan de Oro) weaves abaca fibers from Bukidnon (a province adjacent to Lanao del Sur) into various abaca products (textiles, bags, and decorations) to export to U.S.
[70] Agribusiness and Marketing Assistance Division, DA Davao Region, *Commodity Profile*.
[71] FAOSTAT
[72] FAOSTAT

production (4,876 tons) while Bangsamoro's contribution was merely 1.8%.[73] Cacao production in Bangsamoro is limited to Lanao del Sur and Sulu (56 tons and 22 tons in 2013, respectively). The production in Bangsamoro has been declining after its peak in 2003 (156 tons), replaced by rapid-growing crops with high return, such as banana and coconut.

According to the JICA Study (2011), there were 13 cacao processing factories in the Philippines as of 2011 with all of them being located in or around Manila. Cacao harvested in Bangsamoro is processed into dried fermented beans to be transported to factories around Manila. As cacao processing is highly capital intensive and economies of scale are difficult to be achieved with the small volume of cacao production in the Philippines, the establishment of a large-scale cacao processing plant is not feasible. However, the Country may still be able to seek an opportunity to export semi-processed beans or to promote small-scale production of chocolate for local consumption.[74]

1.10 Coffee Industry

The Philippines produces four varieties of coffee: arabica, excelsa, liberica, and robusta. National production of all the coffee varieties was 78,634 tons in 2013; comprised of 54,560 tons of robusta, 18,594 tons of arabica, 4,917 tons of excelsa and 563 tons of liberica. Mindanao accounts for 75% of national coffee production.[75] While Arabica represents 70% of the world coffee market, the Philippines mainly produces robusta that has advantages in resistance to high temperature, less production cost, and stronger flavor. However, robusta is mainly used for low-quality blended coffee and instant coffee. Coffee production in Bangsamoro (10,491 tons in 2013) is also concentrated in robusta (70%) with arabica accounting for a minor portion (16%). The central production area in Bangsamoro is Upi, Maguindanao and Patikul, Sulu. The JICA Study (2011) points out that the yield of Robusta in Bangsamoro is far below the yield in other parts of Mindanao due to poor maintenance practices, harvest technology, and post-harvest handling methods. The coffee's distribution channel is fairly well established in the Philippines. Nestle, accounting for 85% of coffee processing in the country, has a processing plant in Cagayan de Oro.

The Philippines' coffee production decreased from 112,271 tons in 2001 to 78,634 tons in 2013 apparently due to the relatively low purchase prices given by Nestle or traders, which made farmers shift to other crops. The reduction in domestic coffee production coupled with the increase in demand has significantly increased the country's coffee import, especially from Vietnam and Indonesia; from 2001 to 2011, the value of imported unroasted coffee increased 7.7 times (US$55 million for 23,500 tons) and that of instant coffee increased 6.5 times (US$64 million for 27,600 tons).[76]

There is a possibility that the certification of organic coffee would lead to an increase in farmers' incomes. Coffee farmers' cooperatives could be formed to apply to the National Organic Agriculture Board (NOAB) established under DA in 2010, which provides support and funding. Intercropping with other products such as coconuts and cassava is also a way to increase farmers' revenues. As the international Arabica market is highly stringent in terms of the quality it accepts, export cannot be achieved through the existing market channels that have mostly been formed for instant coffee (Robusta). Therefore, establishing different distribution channels would be indispensable for export. Rocky Mountain Arabica Coffee Company (RMACC), an investment from Canada, has been purchasing Arabica coffee directly from contracted farmers and plantations at controlled elevations above 900 m in Mindanao[77] and exporting to Canada.[78]

[73] Philippine Statistics Authority CountrySTAT
[74] Commercial-based production of chocolate (Coco Dolce) using organic coconut sugar commenced in 2013 in Davao with a capital investment of PHP 10 million.
[75] Philippine Statistics Authority CountrySTAT
[76] FAOSTAT
[77] Mainly in Bukidnon Province, Northern Mindanao, and in Sarangani Province, Soccsksargen (80 tons/year from 250 ha).
[78] Coffee for Peace, a Canada-based NGO for women-led fair trade, also promotes community development through producing Arabica coffee.

1.11 Mangosteen-based Agri-business

Mangosteen is in high demand in the domestic and international markets. Bangsamoro represents most of national production, ranging from 2,000 to 5,000 tons annually.[79] Sulu dominates the production in the range of 2,000 to 4,000 tons per annum while other major producers in Mindanao are Cotabato Province (100–800 tons), Compostela Valley Province (100–400 tons), and Davao del Norte Province (100 tons). According to a DA report, a small quantity of frozen mangosteen was exported to Japan previously, and processed jam has recently been exported mainly to the U.S.[80] The DA's report and the JICA Study (2011) further explain that there is a mangosteen farm in Kidapawan in Cotabato Province which processes the raw material into jam, soap and medically approved nutritious products (capsules from fruit pulps and tea from leaves) to be exported to U.S., U.K., and Israel.[81] The farm in Kidapawan is known for its well-developed production practices.[82]

Under extensive farming with wild seeds (mostly observed in Sulu), mangosteen bears fruits in a biennial cycle: 500 to 800 fruits in an on-year and 100 fruits or less in an off-year. The requirement for agricultural machinery and equipment is minimal; plowing and harrowing are needed for land preparation while harvesting is conducted manually. Philippines' mangosteen has an advantage; harvest seasons in Thailand and Malaysia, two main producers, are from May to August and June to August respectively, while production in the Philippines is from August to November. Furthermore, when a sufficient amount of fertilizer is provided and adequate pruning and irrigation applied, a tree can bear fruits twice a year with annual yield increased to 2,000–3,000 fruits per tree.[83]

In order to promote the expansion of mangosteen production, production practices used in Kadapawan can be disseminated in high production areas such as Sulu, followed by the installation of simple processing units through DA's extension services and awareness-raising. A mechanism to increase farmers' share in the value chain could also be introduced (e.g., forming farmers' groups or cooperatives for selling a larger quantity of mangosteen, gathering market information, and finding direct buyers).

1.12 Rice (Paddy/Palay)

The Country's palay production has been constantly increasing up to 18.4 million tons in 2013 with an average annual growth rate of 3.3% during the previous five years. Of all the 4.7 million ha of rice fields, 3.3 million ha are irrigated accounting for 75% of the national production. The Country imports a certain volume of rice to meet domestic demand with its peak reaching 2.4 million tons (valued at over US$1.5 billion) in 2008 and 2010.[84] In 2013, Bangsamoro contributed 3.3% (612,000 tons) of national palay production.[85]

Of Bangsamoro's palay production in 2013, 67% was under rain-fed conditions, and the rest was under irrigation.[86] Maguindanao and Lanao del Sur are the major palay producers, accounting for approximately 70% and 30%, respectively, of the entire production in Bangsamoro.[87] According to the Bangsamoro Transitional Development Plan, none of the provinces in Bangsamoro except Maguindanao can meet the demand for rice;[88] out of the regional annual demand of 400,000 tons of milled-equivalent rice, 110,000 to 150,000 tons are purchased mainly from Bukidnon and Zamboanga.

The low yield is a major challenge to Bangsamoro's palay production. The annual rice yield in

[79] JICA Study (2011)
[80] Department of Agriculture (2009), *Commodity Situation Report: Mangosteen*
[81] The DA's report mentions that the final packaging of jam is conducted in Manila.
[82] The farm has two stable harvests a year with minimal production techniques. Factors that are important for both the volume and quality of production include: fertilizers used at appropriate times, clearing of weeds for land preparation, using of high-yield seedlings, and the dry-spell (stress) period before flowering. (Interview with the farm)
[83] Department of Agriculture (2009), *Commodity Situation Report: Mangosteen*
[84] FAOSTAT. It fluctuates; import in 2011 dropped to 0.7 million tons (US$380 million).
[85] Philippine Statistics Authority CountrySTAT
[86] Rice in the Philippines is usually harvested once a year under the rain-fed condition, and twice a year under irrigation.
[87] Philippine Statistics Authority CountrySTAT
[88] Calculated from the Bureau of Agricultural Statistics for production and the Medium-Term Regional Development Plan for population and per capita consumption. While the national average yield has been constantly increasing, the yield in Bangsamoro has been declining since 2010.

Bangsamoro has been below the national average; 3.49 tons under irrigation (national average: 4.27 tons) and 2.43 tons under rain-fed conditions (national average: 3.06 tons) in 2013.[89]

The low level of production technology including the low utilization of machinery is observed commonly in both the irrigated and rain-fed conditions in Bangsamoro. DA has been implementing the Upland Rice Development Program (2012–2017) aimed at establishing sustainable models for locally organized Community-based Seed Banks (CSB) and a viable seed production system, including the capacity development of LGUs and Upland Farmer Organizations. JICA, in collaboration with DA, is implementing Farmers Field School (FFS) and Farmer to Farmer (FTF) training programs under the Rice-Based Farming Technology Extension Project ARMM until 2017, which has thus far trained over 1,000 farmers from Maguindanao, Lanao del Sur and other areas in Bangsamoro.[90] Such technical assistance needs to be continued to overcome the constraints on Bangsamoro's palay production, namely limited irrigation on flat lands and the lack of machinery, extension services and post-harvest handling facilities.

Box 7: Rice husks for power generation

Rice husks (20% of the weight of palay) are increasingly utilized to generate power for rice mills and starch mills while surplus electricity can be sold at a high rate.[91] While only one existing plant (12.5 MW at a paper and pulp mill in Luzon, inaugurated in 2009) has been constructed among those plants that are licensed to sell its surplus electricity,[92] the second licensed power plant is being constructed by the Philippine Trade Center Inc. in Maguindanao (3MW, PHP 480 million).[93] Although there are several medium-scale stand-alone power plants (up to 3 MW) for mills, [94] they do not have a license to sell energy. According to GIZ's Study on Rice Husk Potential as Energy Source in Panay (2014) small-scale generation plants are only adaptable to gasification,[95] while medium- to large-scale direct combustion is more efficient in power generation. The existing power generation plants utilizing rice husks[96] in Bangsamoro already require most of the husks produced in the region (120,000 tons husk-equivalent) and may require a larger volume in the near future.

1.13 Corn (Maize)-based Agri-business

The Country's corn production has been constantly rising and is currently 7.4 million tons[97] (5.3 million tons of yellow corn and 2.1 million tons of white corn), which is a 64% increase from 2000 (4.5 million tons). The production of yellow corn has increased significantly faster than the production of white corn; the former doubled from 2000 while the latter increased only 13% during the same period. According to DA, white corn is the staple food for 20% of the population (next to rice) due to people's preference for its sweetness, while yellow corn, characterized by its rapid growth and high yield and nutritional value, accounts for 50% of livestock mixed feeds.

The yield of yellow corn has been constantly increasing to 4.1 tons/ha per annum in 2013 (up 46% from 2000), apparently due to the introduction of genetically modified (GM) seeds promoted through subsidies since 2002, whereas the yield of white corn has been more or less constant. Bangsamoro's share of yellow corn in the national production was 3% in 2013 while that of white corn was 24% in the

[89] Philippine Statistics Authority Crops Statistics of the Philippines (2009–2013)
[90] The number of target beneficiary farmers is 3,000.
[91] Based on the Renewable Energy Act (2008), the Energy Regulatory Commission defines the rate.
[92] The Department of Energy awarded more than 10 power plant licenses to sell surplus power generated from rice husks, including the power plant attached to a corn starch mill of Lamsan Inc, in Maguindanao (15 MW co-generation from rice husks, corn and coconut (PHP 922 million)).
[93] According to the Regional Board of Investments (RBOI), 1.3 MW will be utilized for its corn starch mill while the remaining 1.7 MW will be sold.
[94] In 2008, a feasibility study for a 2 MW (from 47,000 tons of husks per annum) standalone power plant was conducted by a Japanese foundation. The power plant was inaugurated in 2011.
[95] In Mindanao, Fengyu Corporation (China) has been operating a 1 MW plant using gasification of rice husks since 2013.
[96] 1 MW operational and 3 MW under construction (both rice husk-based) and 15 MW (mixed with corn and coconut) approved.
[97] The import of corn-related products is not significantly large in volume or value compared to national production. The import of maize (yellow and white) decreased from 450,000 tons in 2000 to 66,000 tons (US$48 million) in 2011 while the import of corn flour increased from 600 tons in 2000 to 14,500 tons (US$3.5 million) in 2011. The import of corn oil ranged between 1,500 and 2,000 tons (which was 1,640 tons, valued at US$2.9 million in 2011). (Source: FAO)

same year (59% of which was produced in Maguindanao and 40% in Lanao del Sur). While white corn production has been constant in the last decade in Bangsamoro, yellow corn production has decreased by half, apparently due to the shrinkage of the product's market in the area resulting from the larger-scale production of yellow GM corns outside Bangsamoro, as well as the absence of commercial-based animal husbandry in the area.

In contrast to the development of yellow corn production at the national level encouraged through government subsidies, indigenous varieties have continued to be used for white corn.[98] Since 2012, under the Agri-Pinoy Corn Program, DA has been implementing a sub-program for promoting white corn mainly in Mindanao and Visayas where corn is traditionally consumed as a staple food,[99] including the introduction of hybrid white corn seed to achieve food self-sufficiency through the diversification of staple foods and the reduction of imported rice. Other components include the installation of post-harvest equipment and trading centers, as well as the facilitation of corn-based agribusiness systems through the establishment of cooperative models supported by pilot irrigation.

Lamsan Inc., a corn starch factory in Maguindanao that processes 500 tons daily of corn produced in Bangsamoro, has a plan to increase its milling capacity to 1,000 tons.[100] According to Lamsan, the company's direct purchase in large volume from grouped farmers would be beneficial to farmers since middlemen, who provide farmers with fertilizers and seeds on credit, currently control farm-gate prices. Another problem the company faces in the supply of corns produced by farmers is their low quality caused by the lack of post-harvest handling facilities, such as harvesters and driers. Farmers' incomes would be increased should there be a means to financially support the purchase of such equipment.

1.14 Sugarcane Industry

The Philippines' sugar industry is more or less self-sufficient although the industry is susceptible to the fluctuation of international commodity prices. The domestic sugarcane production has been in the range of 20 million to 25 million tons per annum in the past decade.[101] The annual production of raw sugar was 2.0 million to 2.5 million tons[102] and that of refined sugar was approximately 1.0 million tons between 2000 and 2012.[103] During the same period, the country exported 200,000 to 250,000 tons annually (US$70 million to 90 million) of centrifuged raw sugar,[104] and an increasing volume of molasses (from 100,000 to 300,000 tons at US$5 to 30 million). The Philippines imports refined sugar in the years when the domestic sugarcane production goes down: it imported 230,000 tons (US$150 million) of refined sugar in 2010.[105]

All sugarcane farmers in the Philippines are allocated to *mill districts* in which farmers are required to sell all of their produce to pre-assigned sugar mills. Sugarcane is grown throughout the Country with Western Visayas being the largest producer. Northern Mindanao, the largest producer in Mindanao, contributed 14% of the national production while Bangsamoro contributed merely 0.04% in 2013. Lanao del Sur accounts for 94% of sugarcane production within Bangsamoro and Maguindanao

[98] Greenpeace (2013), "White Corn in the Philippines: Contaminated with Genetically Modified Corn Varieties"
[99] Adaptation and Dissemination of Newly Developed Improved White Corn Varieties as Alternative Source as Staple Food (2012)
[100] Accorind to Lamsan, the company's added capacity (500 tons) will be used to process imported corn due to the insufficiency in the supply of yellow corn within the country.
[101] The exception was in 2010 (28.4 million tons) when the production in major countries was very low, which caused a 60% increase in the international market price and a 76 % increase in the domestic raw sugar price. The buying price of sugarcane in the Philippines is determined based on the Quedan system; usually 70-to-30 (farmers to millers) profit sharing from the sales of sugar mills) under the Sugar Sharing Act; CountrySTAT, The Sugar Regulatory Administration (SRA) of the Philippines, and OECD
[102] 5 million tons of sugarcane is turned into 0.45 to 0.5 million tons of raw sugar.
[103] SRA (2012) presentation, "The Philippine Sugarcane Industry: Challenges & Opportunities"
[104] Exceptions are in 2009 (very low export) and 2010 (high export), related to the above mentioned footnote. In 2009, due to the high domestic sugar price, most of the raw sugar was consumed domestically. In 2010, export increased due to the sharp increase of production (sugarcane and raw sugar).
[105] Under the tariff schedule of the ASEAN Free Trade Agreement (AFTA), the import tariff on refined sugars in the Philippines has been gradually decreased from 38% in 2011 to 5% in 2015. The main refined sugar exporters to the Philippines are Malaysia and Thailand.

accounts for the rest. In Mindanao, there are two sugar mills in Bukidnon,[106] one in North Cotabato and one in Davao. Bangsamoro ranks second or third in the yield of sugarcane (60.2 tons/ha per annum in 2013) among all regions, after Western Visayas or CALABARZON, although its production volume is insignificant.[107] In general, sugar cultivation requires little labor during the 8-month growing period.

Sugar mills in North Cotabato and Davao are under-utilized due to the lack of raw materials.[108] The low purchase prices of sugarcane have caused small-scale farms to convert from sugarcane to other crops, which in turn has resulted in the unstable supply of raw materials to some of the mills.[109] Having their own plantations or dedicated out-growers would be necessary for mills to maintain a constant production volume.[110] For example, the Governor of Bukidnon facilitated the signing of the agreement between farmers, farmer associations, plantations and mills towards stable production to fill the milling capacity under the national sugar inventory allocation.

Another example is the SRA's initiative promoting *block farms* of smallholders through which necessary machinery and extension services are supported. In Talayan, Maguindanao, 500 ha of lands were experimentally cultivated in this scheme from 2013 with a long-term plan to expand to 3,500 ha.[111] The Sugarcane Development Act 2014 is expected to be enacted shortly, which includes grant schemes for block farms and mechanization for smallholders under the collaboration between SRA, DA, and the Department of Agricultural Reform (DAR).

Apart from the problems of low raw material prices and the low utilization rates of sugar mills, the Philippines' sugarcane industry will, in the near future, have to face competition with imported sugar once the tariff is reduced under the ASEAN Free Trade Agreement. Another challenge is how to increase bioethanol processing from sugarcane (described in the box below). Pedro Roxas, an investor in bio-sugar and bio-energy, is reported to have a plan to invest in a sugar mill and an ethanol plant that processes sugarcane to be produced on 5,000 ha of farmlands in Maguindanao. As the average employment for sugarcane farming is 1.5 persons/ha,[112] the investment in this industry would contribute to job creation in Bangsamoro.

Box 8: Bioethanol

The Biofuels Act made blending of bioethanol in all gasoline mandatory in the country (beginning with 5% in 2008 and increasing to 10% in 2011). The annual demand for ethanol is 500 million liters while the capacity of the existing four distilleries[113] (installed at three mills in Visayas and one mill in Luzon, among 29 sugar mills in the country) totals 133 million liters with the current estimated production being below 30 million liters.[114] Most sugar mills are operated by their own co-generators utilizing sugarcane wastes, but none of them was designed to provide surplus power for bioethanol production since the act is still new.[115] Construction of a distillery requires a large investment including an additional power plant. Moreover, a larger supply of sugarcane needs to be ensured from mill districts in order to recover the investment in a distillery.[116]

[106] One in Bukidnon (Bukidnon Sugar Milling Corporation/BUSCO) was founded by Marubeni in the 1970s. After the recent upgrade, BUSCO has the largest milling capacities (processing 18,000 tons of canes (output about 1,800 tons of raw sugar) and 900 tons of raw sugar (output about 850 tons of refined sugar) per day).
[107] Philippine Statistics Authority Crops Statistics of the Philippines (2009-2013)
[108] The statistics from The Philippine Sugar Millers Association shows that mills in Davao and North Cotabato have been utilized for less than 100 days per year in the past decade while two in Bukidnon have been utilized for more than 200 days (due to the limited harvest seasons, mills can operate usually up to 200 days a year).
[109] Interview with Cotabato Sugar Central Company (North Cotabato). It was also found that Cotabato Sugar Central adopts a 62% to 38% (farmer to miller) profit sharing ratio, which would have demotivated farmers to continue sugarcane production.
[110] The low profit of sugar mills (due to low capacity utilization from low sugarcane supply) is directly reflected in the purchase price of sugarcane.
[111] Interview with Cotabato Sugar Central Company. However, the cultivation in Talayan is not going well, due to the difficulty in negotiations with the mayor regarding profit distribution, although the land acquisition was smooth.
[112] SRA (2012) presentation, "The Philippine Sugarcane Industry: Challenges & Opportunities"
[113] Three of the four have plantations over 5,000 ha.
[114] SRA (2012) "The Philippine Sugarcane Industry: Challenges & Opportunities"
[115] Source: interview with Cotabato Sugar Central Company
[116] A large-scale plantation would be one of the solutions. For example, Itochu and Nikki (JGC: Japan Gasoline Company) invested in a plant for bioethanol production and power generation, which procures raw materials from 11,000 ha of

San Miguel Foods Inc. has a plan to start cassava ethanol production; in collaboration with DA, B-Meg (a subsidiary of San Miguel) plans to purchase cassava at high prices directly from farmers who hold over 20 ha in the vicinity of General Santos. A DA study showed that the yield of ethanol (L/ha/year) is 6,000 from sugarcane, 5,500 from cassava and 5,000 from GM yellow corn.[117]

Box 9: Buckwheat (Japanese soba) production

Nissey Delica Corporation, a Japanese noodle manufacturer, started buckwheat production in Bumbaran in Lanao del Sur to export to Japan.[118] A trial harvest and export was conducted from December 2014 to January 2015. Nissey Delica's farm is operated utilizing the same local partners as Unifrutti's (producing highland banana of a Dole brand); employment, security and transportation are provided by a logistics company owned by the governor's clan while the LGU assists Nissey Delica in finding land to grow buckwheat (i.e. facilitating contract farming).

Buckwheat, adaptable to acid soils, is a short season-crop commonly grown in high latitude area during summer time as a second-crop or cover-crop (managing soil erosion and fertility)[119]. The yield of experimental production in Bumbaran turned out to be higher than in Japan. Furthermore, it can be harvested twice a year as opposed to once in Japan. To maintain the high yield of buckwheat through nitrogen fixation, Nissey Delica plans to produce soybean (not genetically modified) in order to export to Japan. The commercial production of buckwheat in Bumbaran is scheduled to start in February 2015 on 35 ha of land.

(Sources: Interview with Nissey Delica, Manabilang Service Inc, Mayor of Bumbaran, etc.)

Box 10: Halal Industry in the Philippines and Bangsamoro

There is no statement on halal in the national-level development plans in the Philippines. The Mindanao Strategic Development Framework 2010-2020 encourages Bangsamoro to take the leading position in halal certification, which would promote product branding, joint-venture opportunities and foreign direct investments. While data on the halal industry in the Philippines do not appear in statistics or policy documents, it is reported that there are a growing number of halal certified products in the country. The objective of the promotion of the halal industry in Bangsamoro is apparently the exportation of products to the global halal market.[120]

The National Commission on Muslim Filipinos (NCMF) under the Office of the President takes a lead in the promotion and development of the national halal industry and accredits halal certifying bodies. Four government bodies are partnered with NCMF: DTI, DA, Department of Science and Technology (DOST) and Department of Tourism (DT). In February 2014, NCMF accredited the first three certifying bodies, one of which is the Muslim Mindanao Halal Certification Board (MMHCB) located in Cotabato City.[121] Once accredited by NCMF, the certifier is automatically qualified as a member of the International Halal Integrity Alliance (an NGO in Malaysia), an internationally recognized halal certifying body. On the other hand, two Philippine bodies (Ulama Conference of The Philippines and Islamic Da'wah Council of The Philippines) are accredited by the Department of Islamic Development Malaysia (JAKIM), a Malaysian government body responsible for halal certification. JAKIM certification is regarded to be solely influential in exporting halal products to the international market;[122] in other words, NCMF's certification does not facilitate the export of products. Technically, halal-certified final products must go through strict controls from feed and input to packaging. In order to be internationally recognized as authentic halal food, it may be necessary to create a segregated halal promotion zone that meets the international standard.

farmlands. The plant was inaugurated in 2012.

[117] Feasibility Study for an Integrated Anhydrous Alcohol Production Plant using Sweet Sorghum as Feedstock (2007)

[118] Japan imports 80% of the national consumption of buckwheat. China accounts for 80% of buckwheat imported to Japan, followed by the U.S. (10%). The total area planted in Japan is 61,000 ha, with 33,000 tons produced in 2013.

[119] Buckwheat also attains high yields (1 ton/ha per annum) when grown at areas of high elevation and low latitude (such as Tanzania and Nepal).

[120] Based on interviews with halal-related bodies, such as the Muslim Mindanao Halal Certification Board and a conference on halal food promotion for BIMP-EAGA.

[121] The other two are the Halal International Chamber of Commerce and Industries of the Philippines (San Juan, Metro Manila), and Mindanao Halal Authority (General Santos).

[122] Based on an interview with Muslim Mindanao Halal Certification Board, Inc. (MMHCB).

CHAPTER 2 PROMOTING INVESTMENT IN AGROINDUSTRY IN BANGSAMORO

Foreign investment in Bangsamoro has been traditionally directed toward high-value cash crops such as palm oil (Buluan in Maguindanao), banana and pineapple (Wao and Bumbaran in Lanao del Sur). Since the peace negotiation between the Philippine Government and MILF commenced in 2011, domestic investments have been on the rise, which are also focused on other crops requiring a smaller amount of capital, such as coconut, crops for starches (cassava and corn) and coffee. 22 investment projects in agroindustry (including one fishery-based) are listed at the Regional Board of Investment (RBOI)-ARMM. Table 2.1 lists major ongoing agroindustry investment projects in and around Bangsamoro.

Table 2.1 List of Ongoing Investments in and around Bangsamoro

Category	Corporate name	Origin of FDI/Partner for domestic investor	Products	Farm size (ha)
Foreign	Dole	Japan	Banana, pineapple	32,000
	Sumifru	Japan	Banana, pineapple	13,000
	Del Monte	U.S.	Banana, pineapple	3,000
	Agumill	Malaysia	Palm oil	30,000
	Univanich	Thailand	Palm oil	8,000
	Newtech	U.S.	Abaca (pulp)	n/a
Domestic	Unifrutti	-	Banana, pineapple	2,000
	La Frutera	Subsidiary of Unifrutti	Banana	1,000
	Wao Development Corporation	Subsidiary of Unifrutti	Pineapple	n/a
	Lapanday Foods	(Supplying for Del Monte)	Banana, pineapple	6,000
	Delinanas	Subsidiary of Del Monte	Banana	550
	Lamsan	-	Corn starch	n/a
	Matling	-	Cassava starch	3,000
	Philippine Trade Center	-	Corn starch, cassava starch and biomass energy (rice husk)	n/a
	Granexport	-	Coconut oil	n/a
	Treelife	-	Coconut sugar	250
	Rocky Mountain	-	Coffee	250

Source: RBOI-ARMM and Study Team.

The scale of investments in agroindustry in Bangsamoro is, however, still much limited compared to the region's potentiality. In this chapter, specific matters that need to be taken into consideration when promoting agroindustry in Bangsamoro, namely, land, environment, access to finance and agro-based infrastructure, and the mechanisms that are have been utilized by existing investors to realize investment, will be discussed. Afterwards, preferable faming systems by category of products and a mechanism that would enable agricultural financing in Bangsamoro will be presented.

2.1 Specific Matters to Be Considered in Promoting Agroindustry in Bangsamoro

2.1.1 Land

The delay in the implementation of the Comprehensive Agrarian Reform Program (CARP) in Bangsamoro has been a serious obstacle to agricultural investment. CARP is an ongoing program since 1988 in which the government acquired land from large landowners and distributed land parcels to landless farmers. A judiciary system was made available to settle any disputes between beneficiaries and land owners arising from the process. Among the Philippines' agricultural land totaling 18 million ha, 7.8 million ha was designated as the subject of CARP.

Although the distribution of 6.9 million ha of land was completed in the end of 2013, the process has significantly been delayed in the areas where the establishment of land tenures is difficult, such as in Bangsamoro. CARP came with many loopholes, where powerful landlords came up with shrewd ways to escape the law. Many cases of fraudulent land titles have been reported in the region, which took advantage of ordinary people's difficulty in establishing their land ownerships due to the complexity

and costliness of the procedures. Evidences have been seen where warlords, corporations or syndicates have been acquiring land titles with a fake Certificate of Land Ownership Award.[123] The ambiguity of land tenures in Bangsamoro has been aggravated by the presence of informal land markets where lands were transferred, mortgaged, traded or sold without being monitored or regulated by the Government's land agencies.[124] As a result, a number of land ownership duplications have been observed in Bangsamoro. The ambiguity in land tenure has also hindered farmers from registering collateral when applying for agricultural loans.

2.1.2 Environment

Due to its rich and abundant natural resources, Bangsamoro is faced with the obligation to manage its forests and biodiversity wisely and efficiently. Whereas the Philippines' forest cover was 80% a century ago, it decreased to 18% by 2010 due to the massive deforestation from 2003 to 2010 at the rate of 47,000 ha per annum.[125] In order to prevent further deforestation, the Government adopted environmental regulations on agricultural development, namely Executive Order (EO) 23 (sustainable forestry) and EO 26 (rehabilitation of green forest by planting 1.5 billion seedlings on 1.5 million ha public land by 2016), both of which took effect in 2011.

EO 23 declared a moratorium on the cutting and harvesting of timber in the natural and residual forests of the entire country. It underscored the Country's obligation to protect the remaining forest cover, stipulating necessary actions not only to prevent destructions by natural disasters but also to preserve biodiversity, protect threatened habitats and sanctuaries of endangered species, and promote natural regeneration of residual forests and development of plantation forests. Assisting EO 23, EO 26 stipulates a government initiative to reduce poverty, promote food security, environmental stability and biodiversity conservation, and enhance climate change mitigation and adaptation.

The initiative was materialized as the National Greening Program (NGP), which was launched in the same year as EO 26 and has been jointly implemented by the Department of Environment and Natural Resources (DENR), DA, DAR and other government bodies. NGP aims to plant 1.5 billion trees on 1.5 million ha of lands nationwide in six years, from 2011 to 2016; the targeted area for planting is more than twice the government's accomplishment in the past 25 years. Trees envisaged to be planted are coffee (90 million trees), rubber (117 million), cacao (62 million), bamboo (54 million), fruits (179 million)[126] and others (timber, fuelwood, rattan, mangrove and indigenous species). As of the end of 2014, the actual planted areas reached 1.0 million ha, while the actual number of trees planted was 593 million trees.

The planting of fruit and other high-value trees has been promoted to increase the Country's forest cover as mentioned above, but the same does not apply to oil palm plantation, an industry that has been increasingly popular in Bangsamoro in recent years. Although oil palm is often promoted to landowners with an expectation that incomes from their farmlands will significantly increase, oil palm development cannot go without environmental concerns such as soil erosions, soil nutrient depletions, water pollutions and biodiversity destructions.

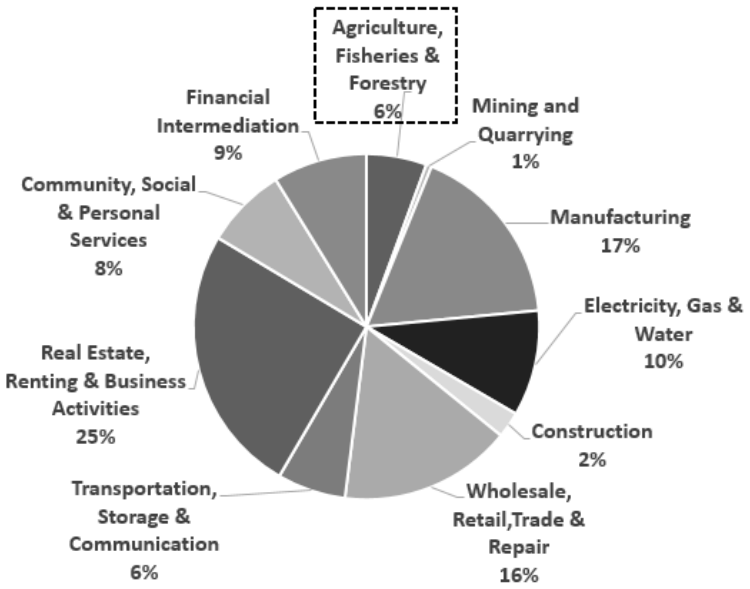
It often accompanies a large-scale conversion of land,[127] causing a loss of forest resources (some with illegal logging). Moreover, since oil palm plantation heavily depends on temporary workforce (for land preparation and initial planting), local communities, apart from landowners, are not much benefitted from the agribusiness arrangements. Nevertheless, given that the Philippines increasingly relies on import for the supply of edible oil,[128] and due to the profitability of oil palm with the versatility

[123] UNEP explains that in addition to Bangsamolo's weak institutions and governance, there was no systematic attempt to rectify land records during the conflict, as government officials often belong to warring clans.
[124] International Alert (2014), *Land Governance in the Bangsamoro*
[125] Department of Environment and Natural Resources (DENR)
[126] Fruit bearing trees include mango and mangosteen.
[127] Economies of scale demand at least 4,000 ha of land for oil palm plantation in order to feasibly operate a crude oil mill; most plantation companies in Southeast Asia manage a 10,000–25,000 ha plantation each; Friends of Earth (2005), *Greasy palms: The social and ecological impacts of large-scale oil palm plantation development in Southeast Asia*
[128] Over a decade between 2001 and 2011, the country's import of palm oil products increased as follows: palm oil from 33,000 tons (US$10 million) to 41,000 tons (US$51 million), palm kernel oil from 1,000 tons (US$350,000) to 26,000 tons

of its byproducts as well as its potential as a source of biomass energy, oil palm cultivation remains an attractive business for both foreign (e.g. Malaysian) and domestic investors. Bangsamoro must grapple with this dilemma on natural conservation and profitability taking place in its territories.

2.1.3 Access to finance

Agriculture is a critical component for Bangsamoro's development as a large population in the area is engaged in agriculture-related jobs. Yet banks in the Philippines have generally shied away from agricultural loans; the same applies to Bangsamoro. Loans to the agriculture, fisheries, and forestry sector represented only 6% of the Country's total loan outstanding in 2014, while a large portion of loans went to the burgeoning industries related to Real Estate & Bus. Services (25%), Manufacturing (17%), and Wholesale & Retail Trade (16%) sectors (Figure 2.1).



Source: BSP 2015.

Figure 2.1 Share of Bank Loans by Economic Activity in the Philippines

On top of the fact that decades of civil war and poverty suppressed the local economy, certain other barriers have prevented formal banks from readily expanding into the region to provide agricultural loans. One is that Bangsamoro farmers, having been excluded from the value chains of commercial agriculture for many years, lack the skills and knowledge to maintain and/or increase the quality and quantity of their products.

Another is that people in Bangsamoro often lack the basic knowledge on finance, confusing loans with dole-outs.[129] The LBP's lending centers covering the Bangsamoro area keenly understand the difficulty involved in agricultural lending with most of their agricultural loans in Maguindanao being overdue and the agricultural loan portfolio in Lanao del Sur having significantly shrunk over the last years as a result of accumulated overdue debts.

The majority of existing agricultural loans are held by a limited number of well-established large agribusinesses and commercial farms capable of producing a large amount of high-value agricultural products and selling them through established market channels.

Because of the high risks involved in agricultural lending, banks set strict requirements against clients, especially individual farmers. Smallholders are faced with issues of fulfilling high collateral standards and following complex and cumbersome loan procedures. The ambiguity in land tenure and the overlaps of property claims hinder the registration of property as collateral; characteristics endogenous

(US$31 million), and palm kernel oil (utilized for feed) from zero to 39,000 tons (US$8.6 million). (FAOSTAT)

[129] Interview with Land Bank Lending Centers based in Mindanao.

to Bangsamoro that have been historically formed make loan procedures more complex. Farmers' inability to prepare a financial statement, business plans and records of assets also reduce their opportunities to borrow from banks. Because of these risks, the LBP does not lend to individual farmers, but only to cooperatives.

Some donors have established funds and projects that are aimed at overcoming the low depth and breadth of agricultural financial services (Table 2.2); however, a closer assessment on these initiatives reveals the difficulty of carrying out such programs in Bangsamoro. The Growth with Equity in Mindanao Program (GEM) admits that nine out of 14 business support projects failed as peace and order was not yet in place at the time of the implementation.[130] The Rural Microenterprise Finance Project was not able to extend its operations in some parts of Bangsamoro such as Sulu, Basilan, and Tawi-Tawi due to the absence of potent microfinance institutions' (MFI) branches.[131] Although undersupply of credit in the agricultural sector is a grave reality, initiatives to link financial services and agriculture are hardly seen in Bangsamoro to date.

Table 2.2 Projects Including a Component of Agricultural Financing

Program	Key component related to financial access	Major donors	Project size (US$)
Growth with Equity in Mindanao Program (GEM)	Assist the mobilization of loans and joint venture funds for farmers and fishermen in Mindanao	USAID	22.3 million for GEM-1 (1995–2002) 82 million for GEM-2 (2002–2007) 98 million GEM-3 (2008–2012)
Microenterprise Access to Banking Services (MABS) Program	Assist rural banking industry to expand microfinance services nationwide, including the Bangsamoro	USAID	About PHP 25 million for 15 years (1988–ongoing)
Rural Microenterprise Finance Project	Strengthen nationwide rural financial institutions through application of Grameen Bank Approach (GBA) including the Bangsamoro	ADB, IFAD	PHP 163.7 million[132] for 1996–2002
Agribusiness Development Assistance for Smallholders in Mindanao	Provide Islamic credit facilities to 2,000 households through AAIIBP	Japan Fund, ADB	PHP 2.0 million as part of Japan Fund for Poverty Reduction (JFPR)[133] for 2012–2016 (plan)

Local MFIs established as early as in the 1980s and 90s operate in the provinces of Bangsamoro (Table 2.3). These institutions vary in size and type, which include rural banks, cooperative banks, cooperatives, and NGOs. The majority of micro-loans currently offered by these institutions are for entrepreneurial and commercial business purposes and not for agricultural activities.

In the Philippines, it is only recently that MFIs have started to add agricultural microfinance in their service line.[134] These MFIs are still struggling to develop a farmer-friendly microfinance which will at the same time reduce the underlying risk factors associated with agricultural lending. Agricultural microfinance is still at the phase of being tested and examined by MFIs in several areas of Mindanao including South Cotabato and General Santos, yet it has barely reached the areas of Bangsamoro for the same reasons mentioned earlier: farmers' lack of knowledge on commercial-oriented farming and on the basic concept of loans.

[130] GEM, 2003, *Assessment of the Business and Investment Climate in the ARM and Strategies to Address the Problems*
[131] Foundation for Economic Freedom 2014. "Strategic Road Maps for the Development of the Agribusiness Industry, Halal Food Industry, and Islamic Banking and Finance in the Bangsamoro"
[132] ADB "Philippines: Rural Microenterprise Finance Project in the Philippines" 2006
[133] ADB "Proposed Grant Assistance Republic of the Philippines: Agribusiness Development Assistance for Smallholders in Mindanao" 2012
[134] Three Mindanao-based MFIs, Aakay Ang Milamdec Microfiannce Foundation, Inc. (NGO), Bansalan Cooperative Society (cooperative), and Cooperative Bank of Cotabato (cooperative bank), were trained through a JICA project (2011–2014) for the designing and introducing of agricultural microfinance.

Table 2.3 MFIs Operating in Bangsamoro Provinces

MFI type	Name of institution	Mindanao office
Rural bank	Rural Bank of Cotabato	Cotabato City
	Rural Bank of Malabang	Lanao del Sur
	Rural Bank of Isulan	Isulan
	Rural Bank of Datu Paglas	Datu Paglas
	Maranao Rural Bank	Marawi City
	Bagong Bangko Rural ng Malabang	Lanao del Sur
	Koronadal Rural Bank	Koronadal City
Cooperative bank	Cooperative Bank of Cotabato	North Cotabato
NGO	Aakay ang MILAMDEC Microfinance Foundation	Cagayan de Oro
	Center for Agriculture and Rural Development, Inc.	Davao City, Cotabato City, Sulu
	Center for Community Transformation	Maguindanao
	Kabalikat para sa Maunlad na Buhay, Inc.	Davao City, Cagayan de Oro
	Kalimudan Foundation Inc.	Marawi City
	Kasanyangan Center for Community Development, Inc.	Zamboanga City
	Lumad Development Center, Inc.	Datu Odin Sinsuat
	Pagasa Pilipinas Lending	Cotabato, Davao, Sultan Kudarat, Lanao del Norte, Zamboanga, etc.
	South Cotabato Foundation	Koronadal City
	Taytay sa Kauswagan, Inc.	Iloilo City
	Tulay sa Pag-unlad, Inc.	Valencia City
	Zambowanga-Basilan Integrated Alliance	Basilan
Cooperative	Extension Farmers Multi-Purpose Cooperative	Wao, Lanao del Sur
	Federation of United Mindanawan Bangsamoro Women-MPC	Cotabato City
	King Cooperative	Davao City
	MSU Sulu MPC	Jolo, Sulu
	Sulu Provincial Cooperative Union	Jolo, Sulu
	Sulu Provincial Cooperative Union	Jolo, Sulu

Source: Mindanao Microfinance Council and JICA Study Team.

2.1.4 Agro-based infrastructure

Insufficient agro-based infrastructure in Bangsamoro, including farm-to-market roads, post-harvest facilities, collection points and storage, considerably affects the transport costs of agricultural produce. There is a growing need of agro-based infrastructure programs in Bangsamoro that facilitate the trading of agricultural produce including perishable products. For example, in the vicinity of Bangsamoro, DA and USAID under GEM supported in 2006 the Northern Mindanao Vegetable Producers' Association (Normin Veggies) to establish a bulk consolidation center that handles storage within the central market in Cagayan de Oro.

By connecting the transactions between the central market and other markets at the daily volume of 150 tons in partnerships with input suppliers, traders, buyers and processors, Normin Veggies enhanced farmers' ability to access vegetable processors, fast-food restaurants and supermarkets, through which Normin's viability and competitiveness has been consolidated. In Bangsamoro, as a pilot agro-based infrastructure project under the Philippine Rural Development Program (PRDP) financed by the World Bank (2014–2020, US$508 million)[135], Talayan in Maguindanao, where agricultural investments (including Unifrutti) are planned or ongoing, was selected for the construction of a 12 km farm-to-market road (PHP 150 million).

[135] About 70% of the total budget will be utilized for funding LGUs' infrastructure projects, including farm-to-market roads, bridges, tire tracks, communal irrigation, potable water systems, post-harvest facilities, production facilities, etc, while about 20% will be utilized for agro-fishery enterprises. (Source: World Bank and DA)

2.2 Mechanisms Utilized by Existing Investors to Realize Investment

2.2.1 Gaining trust of local communities

Support of local communities is indispensable for attaining the sustainability of agricultural investments, especially in such post-conflicts areas as Bangsamoro. A profit sharing mechanism between investors and local communities that enables the distribution of peace dividend needs to be established, as shown in Unifrutti's and other on-going investment projects. In response to consumers' growing demand for safe and environment-friendly products, companies in developing countries have become increasingly keen to acquire certificates for environment, hygiene, and product quality. For example, Unifrutti encourages its outgrowers to obtain certificates of Rainforest Alliance,[136] a comprehensive certificate for sustainable development with its main criteria comprising community development (poverty reduction, land use, and adopting farming and business practice) and environment (forestation, biodiversity, and resilience to climate changes).

These certificates add values to the produce. Unifrutti also created opportunities for smallholders to make larger incomes through producing high value bananas demanded by the premium market in Japan. Since the undergoing land reform has made investors inevitably increasingly reliant on smallholders as suppliers of produce for export, both investors and farmers are required to make efforts to comply with stringent quality requirements, including food safety and traceability, in order to access premium markets such as the Japanese market.

The introduction of a mechanism to realize transfer of wealth from landowners to farmers/workers can contribute to the increase of incomes of community people. Unifrutti could lease over 1,000 ha of land from Paglas Corp at US$70/ha (the usual price at the time was US$160/ha), which was made through a mutual trust between Unifrutti and Toto. The saved capital was used for realizing more employment and higher wages as well as building infrastructures.[137] Providing a fair share to various stakeholders built a trust to the investor.

Some of the large investments in agroindustry are accompanied by Corporate Social Responsibility (CSR) programs that provide various services, such as education and welfare, to the local communities in or adjacent to the investment sites. For example, Dole provided educational services (building a library and scholarship) as well as skill training for livelihood activities, while IBM facilitated distant learning programs at secondary schools in partnership with the Growth with Equity in Mindanao (GEM) under USAID. Unifrutti also supports the income generation and livelihood of communities surrounding its plantations through its non-profit arm, Hineleban Foundation.

2.2.2 Datu system and security

Secured access to land and the maintaining of order and security are prerequisites for any agricultural activities. Politically powerful chieftains (i.e., sultans and *datu*s) have played important roles in consolidating individual lands for large-scale investment and maintaining order and security. Establishing good relationships with such leaders and winning their support are important in determining the success of businesses, as attested by successful agricultural investments in two municipalities of Datu Paglas and Bumbaran.

Unifrutti, at the outset of the investment in its plantation in Datu Paglas, had a partnership with Datu Ibrahim "Toto" Paglas III, the Mayor of the town of Datu Paglas, who formed a consortium (the Paglas Corp) with leaders in neighboring areas to support and facilitate the investment. Toto obtained the consent of the MILF Chairman on the investment of US$27 million in this area, with some high-ranking

[136] For certifying, the Rainforest Alliance has 10 principles and 94 sub-principles (with ad-hoc sub-principles to palm oil, sugarcane, sunflower, soybean, etc). The certification has been increasingly adopted to agricultural produce: 5% of coffee, 15% of cacao, 15% of tea and 4% of banana (or 20% of exported banana) in the current world market. (Source: Rainforest Alliance and the Ministry of Environment of Japan)

[137] A maximum of 30% premium is added to the wages based on the productivity, while Unifrutti's on-farm employment was over 2 persons per ha (25% above that of other banana farms in the country), aside from packing houses workers who are mostly women. Infrastructures include roads and irrigation systems. (Source: Australian AID, 2013, and interview with Unifrutti)

or retired officials (including the General of the Military and the Chief of Staff of the Armed Forces) involved in the signing of the memorandum, and also obtained the support and endorsement of the President. Through Toto, Unifrutti successfully signed a 25-year lease contracts on over 1,000 ha of land at prices between PHP 12,000 and 15,000/ha. Paglas Corp, assisted by the MILF Chairman, mobilized soldiers to build the plantation and provided other services including logistics (trucking and gasoline stations) and security since 1997.

Likewise, to cope with the threats from kidnap gangs, which intensified after Agumil set up oil palm seedling nurseries in Bangsamoro, Agumil had a series of negotiations on security issues with MILF leaders when establishing Bangsamoro's first palm oil crushing plant in Buluan. Agumil's community development approach including construction of hospitals, mosques and other public amenities around the plant and farms, backed by the security support from the governing clan and MILF, has contributed to the uplifting of the livelihood of the local community.[138]

In order to prevent the disturbance of security at investment sites, some of which is attributed to clan conflicts, it is essential to devise at each of the investment areas a local structure led by trusted chieftains and leaders that ensures fair distribution of incomes among community constituents. The above-mentioned successful cases in Bangsamoro have been built on such structures. Given Bangsamoro's social and cultural specificity, these structures are likely to be functional in achieving a fast and large-scale economic development, attracting both foreign and domestic investment.

Large-scale agricultural investment would be difficult at the locations where the presence of a well-trusted Datu is absent, due to the larger risks of disturbance to be produced by local clans. In order to bring about agricultural development in such areas, local MFIs need to function as a conduit that channels funds to small-scale farmers. Those MFIs operating in the region for many years are often constituted of people who were born and raised in the area and are well versed in the local culture and value. Through the strengthening of the financial and technical capacity of these MFIs, the community will become able to access loans and other financial and technical services that will lead to an expansion of their farming activities.

2.3 Preferable Faming Systems by Category of Products

Large-scale commercial production of agricultural crops is commonly practiced in the world in the forms of a corporate plantation, an outgrower scheme and a nucleus estate model (the mixture of the two). Corporate plantations, which are in most cases mono-cropping, require a large capital investment. In an outgrower scheme, farmers agree in a written or verbal contract to supply produce to the buyer usually at either a pre-determined price or the market price upon delivery. A nucleus estate model is a combination of a nucleus corporate plantation and an outgrower scheme involving smallholders surrounding the plantation.

Corporate plantation is preferable for the production of distinct varieties, such as high-value or improved varieties, since it usually requires close supervision (e.g., in transplanting and harvesting) to control and achieve consistency in their quality. Whole pineapples, for example, require rigorous timings of harvesting under a direct control, as their sweetness is highly affected by short-term changes in weather, while the difference in quality cannot be detected from their appearance.[139] On the other hand, an outgrower scheme can be applied to canned pineapple since sugar can be added to the product. An outgrower scheme or a mixed model is preferable when the consolidation of farmlands is difficult for the plantation operator. It should be noted that although an outgrower scheme may provide farmers with an opportunity to realize larger incomes than a corporate plantation, it exposes farmers to larger risks to lose their incomes in case of natural disasters.

Although large-scale farms and corporate plantations outperform outgrower schemes with efficiency and profitability, certain markets prefer or appreciate smallholder solutions that comply with international (or increasingly regional or national) sustainability standards in terms of social and

[138] Austraian AID (2012), *Braving it and making it*
[139] Interview with Unifrutti.

environmental considerations.[140] Depending on the type of crops, local needs, and other regional success factors, different tactics are applied to each agricultural model. Table 2.4 presents basic indicative figures for the farming of each agricultural product in accordance with categories defined by GIZ (Category I: raw material for industrial processing, Category II: high value and labor intensive suitable for export, Category III: staple food for local markets).

Table 2.4 Basic Information on Agricultural Products

Product	Category	Use/Marketing of produce	Existing model of farming	Lead time (yrs.) to full production
Sugarcane	I	Industrial (domestic)	Plantation	1
Rubber	I	Industrial (export)	Smallholder	5
Palm oil	I	Industrial (domestic)	Plantation/mixed	3
Abaca	I	Industrial (export)	Smallholder	2
Coconut	I	Industrial (export of oil from copra)	Plantation/contract/mixed	5
		Industrial (coir for domestic)	Smallholder	*(Byproduct of copra)*
	II	Processing (coco sugar)	Smallholder (domestic)/plantation (export)	3
Banana	II	Export: fresh	Plantation/contract/mixed	2
		Domestic: fresh/ processed	Contract/smallholder	2
Pineapple	II	Export: fresh	Plantation	3
		Export/domestic: fresh/ processed	Contract/smallholder	3
Mango	II	Export: fresh/frozen/ processed	Plantation/contract	5
		Domestic: fresh/ processed	Contract/smallholder	10
Coffee	II	Domestic	Smallholder	5
		Export (high value)	Contract	4
Cacao	II	Domestic	Smallholder/contract	2
Mangosteen	II	Domestic (export exceptionally)	Smallholder	5–10
Rice	III	Domestic (staple)	Smallholder	0.5
Corn	III	Domestic (processing)	Smallholder/contract	0.5
Cassava	III	Domestic (processing)	Smallholder/contract	1

Product	Initial cost (/ha for seed/seedling)	Running cost (/ha/yr. for inputs & labor)	On-farm employment (/ha)	Revenue from land (PHP/ha/yr.)	Harvest (times/yr.)
Sugarcane	n/a	PHP 50,000	2 (seasonal)	120,000	1
Rubber	PHP 5,000	PHP 30,000	0.3	95,000	Year round
Palm oil	PHP 35,000	PHP 30,000	0.3 (year round)	90,000	20–25
Abaca	PHP 3,000	n/a	1.5 (at harvest)	35,000	2
Coconut	PHP 3,000	PHP 18,000	3 (at harvest)	35,000	10 (grown all seasons)
			Machinery	6,000	10 (grown all seasons)
	PHP 3,000	PHP 55,000	3 (at harvest)	150,000	15 (grown all seasons)
Banana	PHP 1,200,000 [1]	PHP 200,000 (FDI)	2 (year round)	800,000 (FDI) [2]	1
	PHP 55,000	n/a	Higher than Cavendish	50,000	1
Pineapple	PHP 48,000	PHP 64,000	0.3	200,000	1
	n/a	n/a	n/a	n/a	1
Mango	n/a	PHP 60,000	n/a	105,000	2
	n/a (Wild seeds)	n/a	n/a	n/a	1 or 2
Coffee	n/a [3]	n/a	Less than 1	50,000	1 or 2
	PHP 400,000 [4]	n/a	n/a	150,000	1 or 2
Cacao	PHP 400,000/ha [5]	n/a	n/a	75,000–120,000	2
Mangosteen	n/a [6]	n/a	n/a	80,000 (high-yield)	1 or 2
Rice	n/a	PHP 30,000	n/a	12,000 or 50,000 (hybrid)	1 or 2
Corn	n/a	n/a	n/a	12,000	2
Cassava	PHP 20,000/ha [7]	n/a	n/a	Up to 30,000	1 (grown all seasons)

Notes: [1] Cavendish variety; [2] PHP 120,000 for farmers; [3] Seedlings cost PHP 15,000/ha; [4] Highland abaca; [5] Seedlings cost PHP 20,000/ha; [6] High-yield seedlings cost PHP 15,000/ha; [7] Land preparation

Source: GIZ (2013) and JICA Study Team.

Category III mostly fits in with small-scale farming. Local MFIs have designed agricultural microfinance models to meet the demand of smallholders producing rice, corn, and vegetables. Cooperative Bank of Cotabato and Aakay ang Milamdec Microfinance Foundation offers agri-microfinance that obligates farmers to attend regular meetings and make regular deposits and interest payment (the loans are repaid at the time of maturity that coincides with the harvest time of each crop).

[140] GIZ (2013), *Contact Farming Handbook*. The report also states that in addition to the increasing demand for sustainability certifications (social and environmental standards) of crops (such as palm oil, rubber, coffee, tea, cocoa), the demand for certifications of specialty products (organic certification, origin labelling, etc.) is also growing despite a risk of creating unnecessary premiums for certifications.

MFIs are aware of the necessity to address the problems of entire agricultural value chains in order to improve rural livelihood, and thus endeavor to increase farmers' bargaining power by uniting them and connecting them to the market.

2.4 Linking Banking Services and Agricultural Projects in Bangsamoro

As demonstrated by the examples in above sections, appropriate local partners such as respected and influential leaders and experienced local companies bring about a number of benefits upon implementing an agricultural project. Such actors are capable of guaranteeing the efficiency and the security of the inputted resources during the life of the investment. They can also play the role of bridging farmers and financial institutions. Identifying and using such appropriate intermediaries is a key to success for dynamic and efficient agroindustry projects.

There are several possible agents that may come in between banks and farmers to enable the financing process (Figure 2.2). The nucleus estate model discussed in the previous section that are widely accepted by the communities and are well versed in local conditions may fit the Bangsamoro's context in achieving the dual objectives: increasing the volume of transactions and bridging farmers and financial institutions.

Much can be learned from the example of Agumil's palm oil plantation project. The company facilitated farmers' access to bank loans while providing them with seedlings and technical assistance in exchange for farmers' pledges to sell the pre-agreed quantity of their palm oil produce to the company. Instead of farmers applying for loans individually, Agumil was able to aggregate a number of farmlands to be registered as a guarantee upon credit application. Datu(s), regional chiefs respected by their community people, are also candidates of arbitrators between the two parties.

Many MFIs operating in the Bangsamoro region have already received funds from several government institutions and the LPB as these MFIs are commonly more familiar with local needs.[141] [142] The success of microfinance depends on the level of social cohesion, which is confirmed and consolidated by MFIs through frequent visits and meetings. The grassroots activities that MFIs provide have made them competent in offering customized microfinance services as well as building a strong monitoring and evaluation system.

In any of these scenarios, the presence of a mediator that can become a single window for banks as well as a respected advisor for local people and farmers could be a key to the success of effective financing for Bangsamoro's agricultural projects.

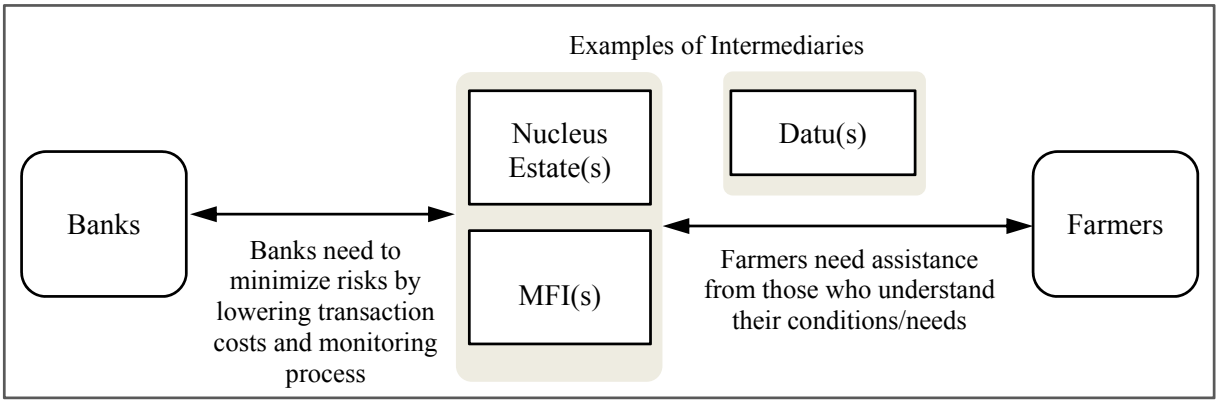


Figure 2.2 Model for Effective Financing on Agriculture in Bangsamoro

The World Bank and JICA are currently conceiving a credit line to be provided to the LBP, which will be on-lent to agro-industries and MFIs in the Bangsamoro area. Technical assistance will be

[141] Foundation for Economic Freedom, *Strategic Road Maps for the Development of the Agribusiness Industry, Halal Food Industry, and Islamic Banking and Finance in the Bangsamoro*, 2014
[142] JICA, Development Study on Local Industry Promotion in ARMM, 2011

indispensable in ensuring the effectiveness of the fund. The LBP's loan monitoring functions, especially the capacity to evaluate the economic and social impact of individual loans, need to be strengthened. Technical assistance should also be provided to microfinance NGOs that facilitate the organizing of famers' groups and conduct financial literacy training to individual farmers; these activities are the prerequisite for expanding agricultural loans for small-scale farming in the area. Figure 2.3 proposes the institutional framework for agricultural finance in the Bangsamoro area.

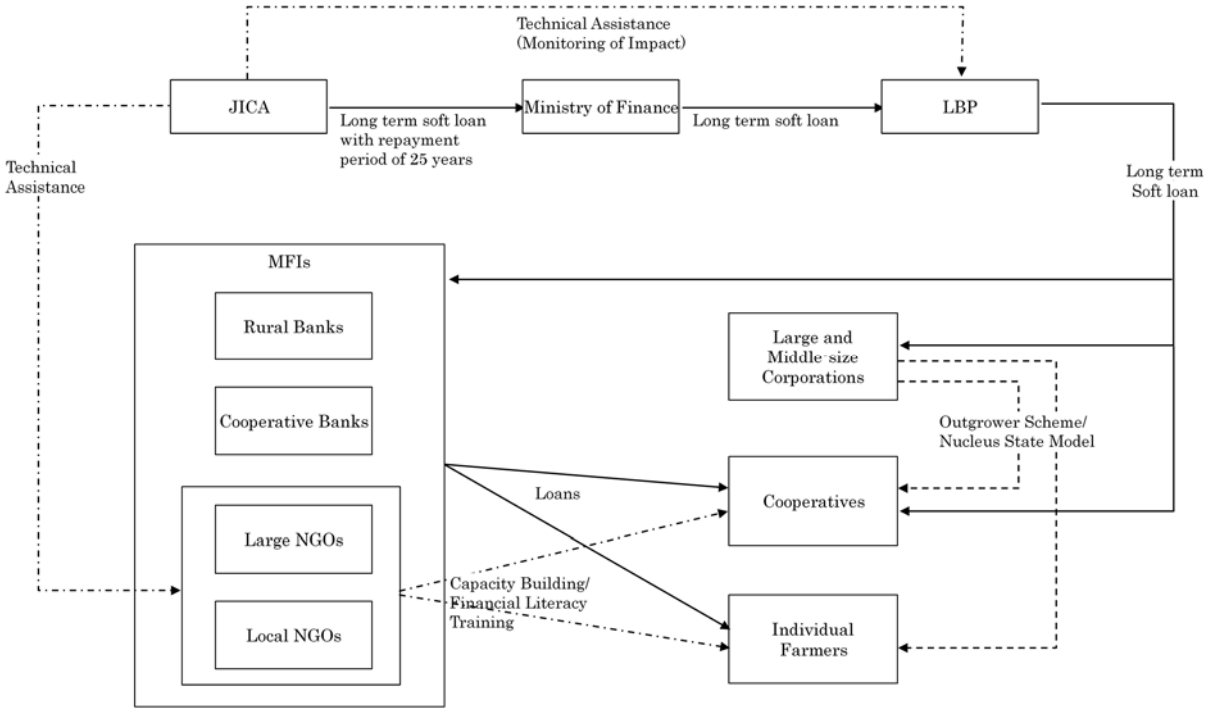


Figure 2.3 Proposed Implementation Framework of Agricultural Finance in Bangsamoro

Comprehensive Capacity Development Project for the Bangsamoro

Development Plan for the Bangsamoro

Final Report

Sector Report 1-3: Fishery

Table of Contents

List of Tables

List of Figures

Abbreviations, Unit of Measurement, and Currency

(Refer to Sector Report 1-1: Agriculture, pp. 1-vi through 1-xi.)

CHAPTER 1 EXISTING CONDITIONS OF FISHERY IN BANGSAMORO

1.1 Fishery Production in Bangsamoro

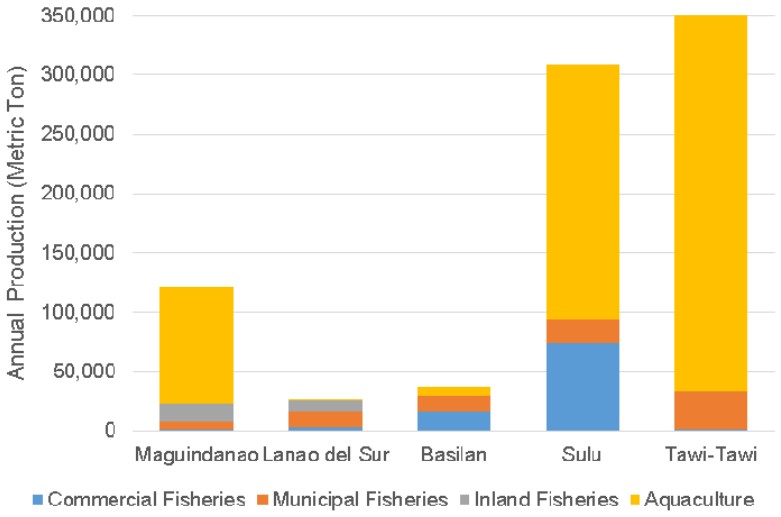
1.1.1 Overview

According to the fisheries statistics (Table 1.1 and Figure 1.1), aquaculture production is dominant in fishery activities. It accounts for about 75% in the total fisheries production in Bangsamoro. Seaweed production is more than 90% in total aquaculture production. Besides aquaculture, commercial and municipal fisheries account for about 10% in total fisheries production, respectively. The commercial fisheries are dominantly active in Sulu, compared with other provinces. In terms of municipal fisheries, Tawi-Tawi has the largest production. The production of inland fisheries accounts for only 3% of total fisheries production. The inland fisheries are commonly conducted only in Maguindanao and Lanao del Sur.

Table 1.1 Fisheries Production in Bangsamoro (2012)

Type	Maguindanao		Lanao del Sur		Basilan		Sulu		Tawi-Tawi		Total	
	Ton	%	ton	%	Ton	%	ton	%	ton	%	ton	%
Commercial	949	0.8	2,851	10.8	17,090	46.6	73,822	23.9	728	0.2	95,442	11.3
Municipal Fisheries	6,748	5.6	14,303	54.2	12,859	35.0	20,724	6.7	32,204	9.1	86,839	10.3
Inland	15,220	12.6	9,174	34.8	8	0.0	0	0.0	0	0.0	24,402	2.9
Aquaculture	98,308	81.1	61	0.2	6,748	18.4	214,258	69.4	319,177	90.6	638,553	75.5
Total	121,225		26,389		36,705		308,804		352,109		845,236	

Source: Fisheries Statistic in the Philippines.



Source: Fisheries Statistic in the Philippines.

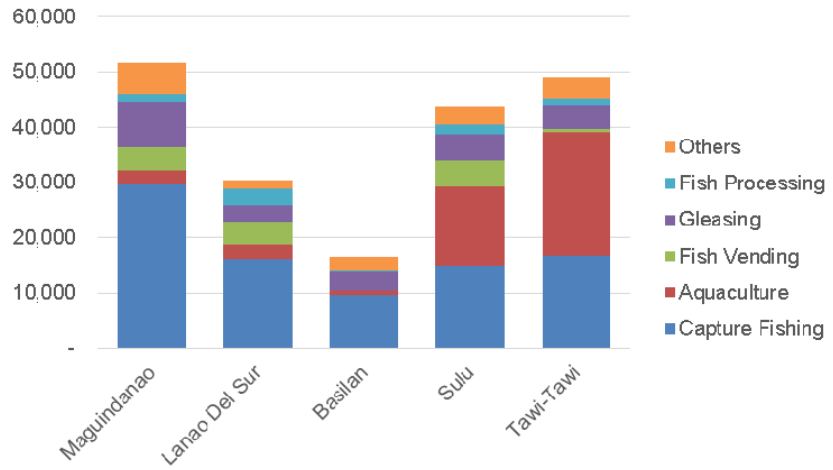
Figure 1.1 Fisheries Production and Composition in Bangsamoro (2012)

According to the Fish-R database of the fishers' registry (Table 1.2), there are about 212,000 fishers in Bangsamoro (ARMM), accounting for about 7% of the total population. The composition of work types in local fishers varies from one province to another (Figure 1.2). In Maguindanao, Lanao del Sur, and Basilan, the fishers engaged in capture fisheries are a majority in their population. The population engaged in aquaculture is larger than that of capture fishing in Sulu and Tawi-Tawi. It means that the people engaged in seaweed culture are the largest sector group in these island provinces.

Table 1.2 Registered Fishers in Bangsamoro (2014)

Province	Male	Female	Total	%
Maguindanao	39,619	18,670	58,289	27.5
Lanao Del Sur	22,655	9,621	32,276	15.3
Basilan	13,713	7,314	21,027	9.9
Sulu	26,193	21,004	47,197	22.3
Tawi-Tawi	29,825	23,053	52,878	25.0
Total	132,005	79,662	211,667	100.0

Source: Fish-R Database in BFAR-ARMM.

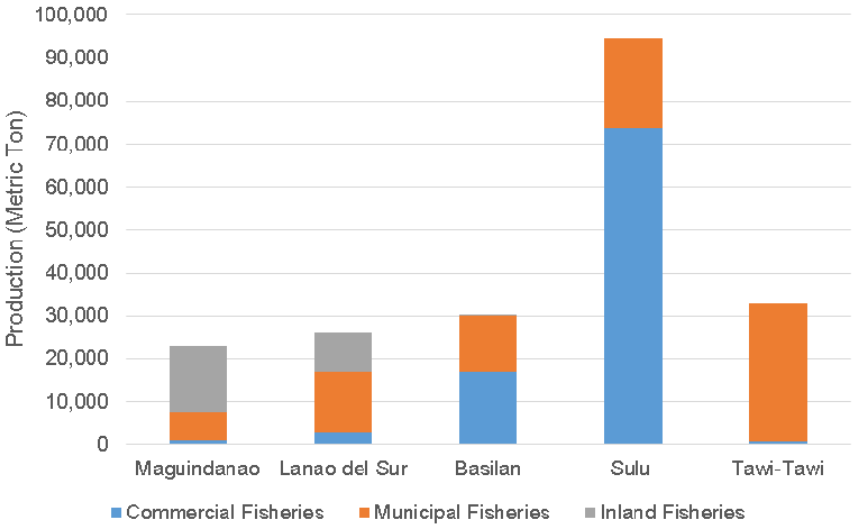


Source: ibid.

Figure 1.2 Composition of Fishers' Population by Work Types in Bangsamoro (2014)

1.1.2 Capture fisheries

In terms of capture fisheries, Sulu is the largest productive province in the Bangsamoro Region (Figure 1.2). The production of capture fisheries reaches 95,000 ton/year. Especially, in Sulu, the production of commercial fisheries is dominantly larger than that of municipal fisheries. In Tawi-Tawi, the portion of commercial fisheries is very marginal, and the municipal fisheries produce most production of capture fisheries in the province. In Maguindanao and Lanao del Sur, inland fisheries has a certain portion in the production of capture fisheries in the respective provinces.

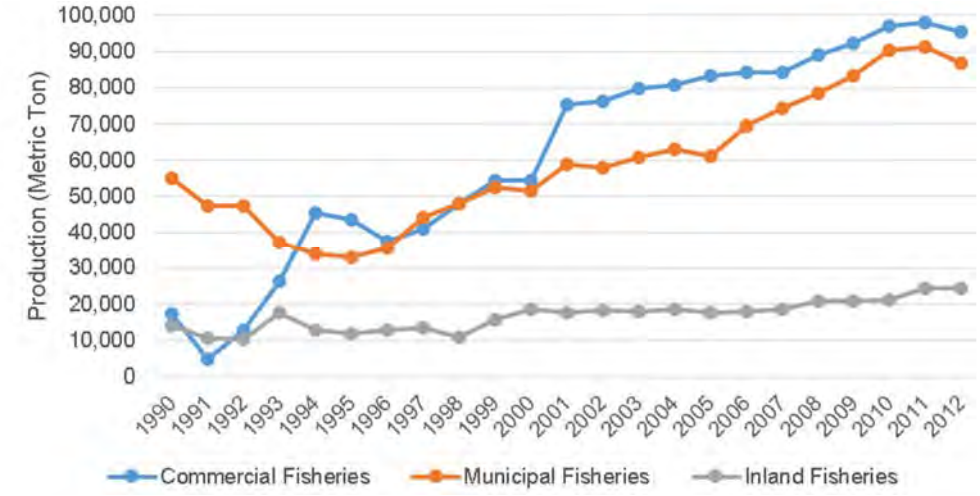


Source: Fisheries Statistic in the Philippines.

Figure 1.3 Production and Composition by Type in Capture Fisheries (2012)

The total production of marine capture fisheries has increased since the 1990s in Bangsamoro (Figure 1.4). Each production of commercial and municipal fisheries reached 100,000 tons peaking in 2010. However, due to uncontrolled activities of commercial fisheries, the production of capture fisheries has been recently declined. The production of inland fisheries reaches 25,000 tons in the region. It has been increasing gradually since 1990.

According to the fisheries profile, only 129 fishing boats are operated for commercial fisheries in the region (Table 1.3). It is a small number, though the region has a large sea territory. In case of municipal fisheries, totally 64,780 boats are operated for fishing activities in municipal and inland waters. About 40% of municipal fishing boats are equipped with engines. The remaining boats are non-motored.



Source: ibid.

Figure 1.4 Production Trend in Capture Fisheries in Bangsamoro (ARMM)

Table 1.3 Number of Fishing Boats in Bangsamoro (2013)

Boat type	Maguindanao	Lanao del Sur	Basilan	Sulu	Tawi-Tawi	Total
Commercial	8	38 (small)	26	37	20	129
Municipal	8,233	2,186	10,801	23,165	20,395	64,780
Motorized	1,346	495	2,748	10,400	10,790	25,779
Non-motorized	6,887	1,691	8,053	12,765	9,605	39,001

Source: Fisheries Profile 2013 BFAR-ARMM.

(1) Marine capture fisheries

Commercial fishing boats (larger than 3 ton) commonly use purse-sein nets, ring-nets, or bag-nets to catch pelagic fish at offshore areas. The commercial fisheries operation is commonly conducted at offshore areas farther than 15 km from a coastline. The main target fish of commercial fisheries are round scad (*galunggong* in Tagalog), frigate tuna (*tulingan*), bonito, big-eyed scad (*matang baka*), and skipjack (*gulyasan*) as indicated in Figure 1.5.

In the municipal fisheries, local fishers go fishing by small boats in coastal areas, which municipality LGUs manage within 15 km from a coastline. Some fishers use the traditional *payao* [a type of fish aggregating device (FAD)], at their fishing grounds to catch mainly tuna or skipjack. The target fish species of municipal fisheries vary in the areas: commonly, big-eyed scad, yellow-fin tuna (*tambakol*), frigate tuna, round scad, and Indian mackerel (Figure 1.6).

Since the production peak in 2010, the production of marine capture production has been on a downward trend. Because of uncontrolled catch for coastal pelagic fish national wide, the Bureau of Fisheries Aquatic Resources (BFAR) has been enforcing the close season of three months, from December to February, against commercial fishing boats since 2012. This close season in the region does not permit commercial fishing boats, operating purse-sein net, bag-net, ring-net or scoop-net, to catch six common

sardine species in the Zamboanga Peninsula, Basilan Strait, and the East Sulu Sea.

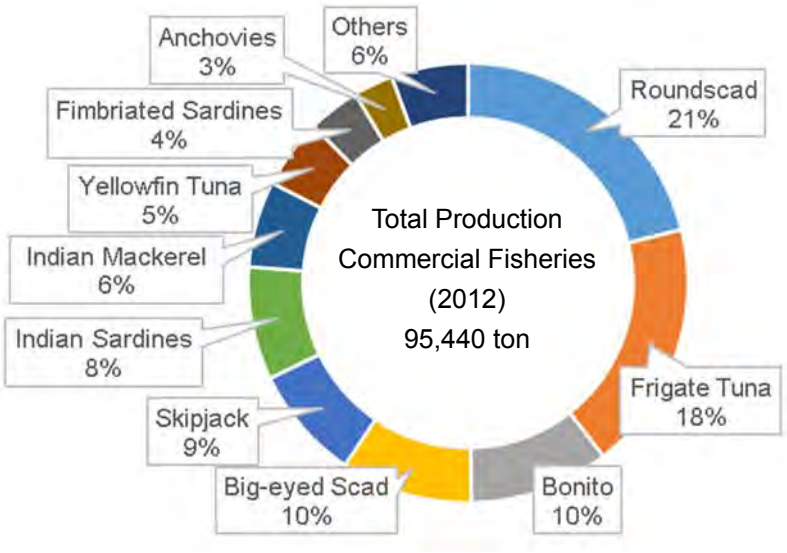


Figure 1.5 Composition of Fish Species in Commercial Fisheries in Bangsamoro (2012)

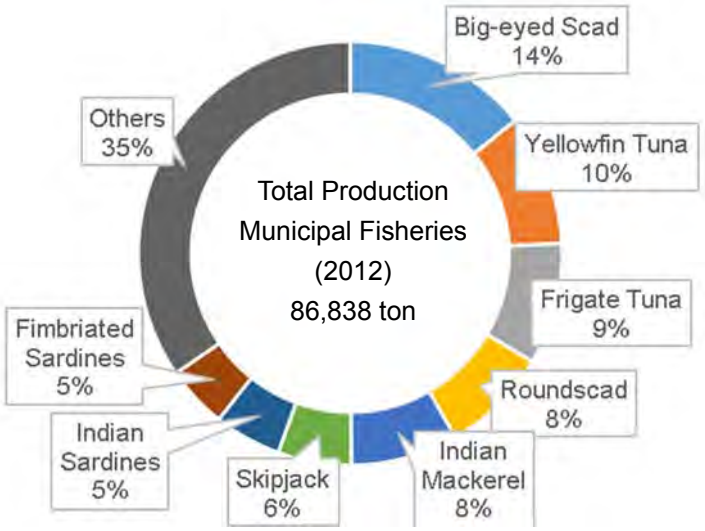


Figure 1.6 Composition of Fish Species in Municipal Fisheries in Bangsamoro (2012)

(2) Inland fisheries

Inland fisheries are widely conducted in the mainland provinces, Maguindanao and Lanao del Sur. In Maguindanao, inland fisheries activities are popular in Ligawasan Marsh, the largest marsh areas in the Philippines. In Lanao del Sur, they are also popular in Lake Lanao, the largest freshwater lake in the Philippines. Local fishers commonly use gill-nets to catch fish in rivers, lake, or marsh areas. The common target fish species of inland fisheries are tilapia, carp, mudfish, freshwater goby, and freshwater shrimp (Figure 1.7).

1.1.3 Aquaculture

Of aquaculture activities, seaweed culture is dominant in the region. It accounts for 98% in the total aquaculture production (Table 1.4). Freshwater and brackish-water aquaculture is popular only in Maguindanao. There is few aquaculture activity in Lanao del Sur.

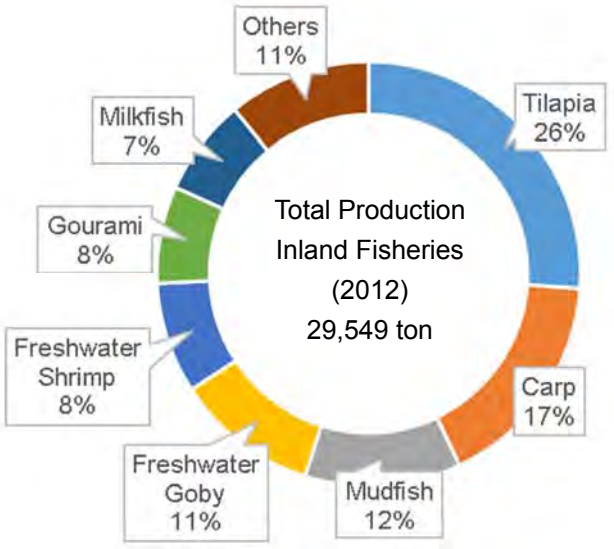


Figure 1.7 Composition of Fish Species in Inland Fisheries in Bangsamoro (2012)

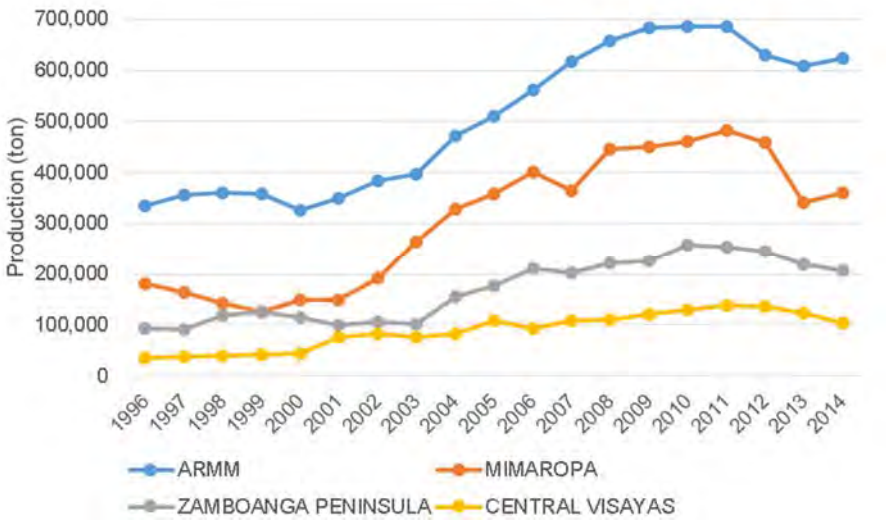
Table 1.4 Aquaculture Production by Type in Province (2012)

Type	Maguindanao	Lanao del Sur	Basilan	Sulu	Tawi-Tawi	Total	%
Marine culture	0	0	6	0	0	6	0.001
Brackish-water culture	3,399	4	265	0	0	3,667	0.6
Fresh-water culture	6,793	16	0.3	0	0	6,809	1.1
Seaweed culture	90,928	0	6,629	220,440	305,000	622,996	98.3
Total	101,120	20	6,900	220,440	305,000	633,477	100.00

Source: Fisheries Statistics in the Philippines.

(1) Seaweed

There are four main production areas of seaweed culture in the Philippines: ARMM, Mimaropa (Palawan), the Zamboanga Peninsula, and Central Visayas (Cebu and Bohol). As shown in Figure 1.8, Bangsamoro (ARMM) has the largest production of seaweed culture in the Philippines. The seaweed production in the region reaches 600,000 to 700,000 ton/year in recent years. During the 2000s, the seaweed production had been on upward trend. Especially, the seaweed production in Bangsamoro in 2010 was twice as much as that in 2000. However, due to the nationwide outbreak of ice-ice disease, the seaweed production has suddenly dropped in the 2010s.

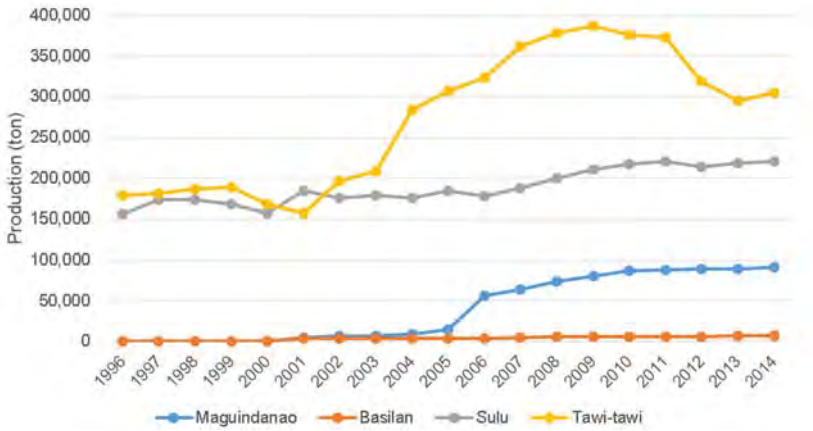


Source: ibid.

Figure 1.8 Production Trends of Major Regions in Seaweed Culture in the Philippines

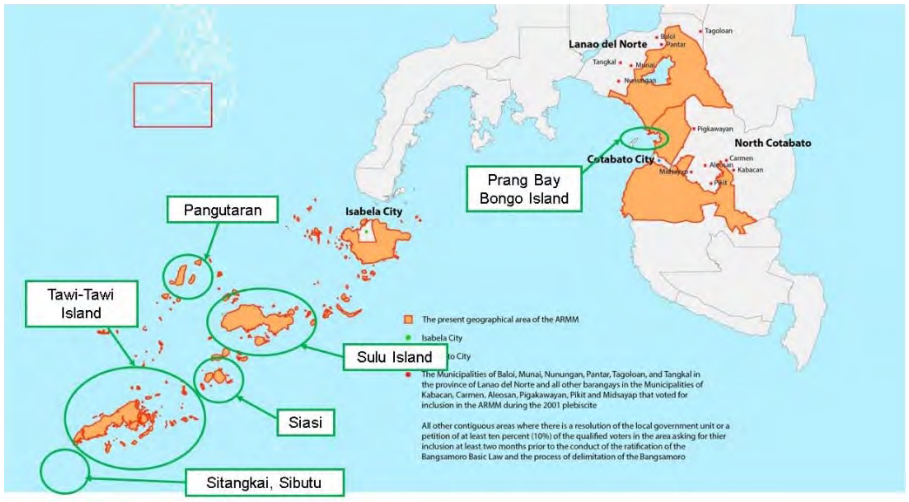
In the Bangsamoro region, Tawi-Tawi is the largest productive province in seaweed culture (Figure 1.9). Tawi-Tawi takes about a half of seaweed production in the region. Especially, the Sitangkai and Sibutu Islands are the largest seaweed culture areas. They produce about a half of seaweed in Tawi-Tawi. It means that the Sitangkai and Sibutu Islands account for one fourths in the total seaweed production in the region.

Sulu Province is the second largest in seaweed culture production in the region. Even though the seaweed production in Tawi-Tawi has largely dropped by the outbreak of ice-ice disease in the 2010s, the production in Sulu has been gradually increasing in the range between 150,000 and 250,000 ton/year since the 1990s. In Maguindanao, seaweed culture started in Parang Bay and Bongo Island (Figure 1.10) at the beginning of the 2000s. Its production has reached 100,000 ton in recent years. In Basilan, the seaweed culture activities are very limited. It is because the salinity of coastal water often fluctuates by inflow of freshwater from developed river system in the island.



Source: ibid.

Figure 1.9 Production Trend in Seaweed Culture by Province in Bangsamoro



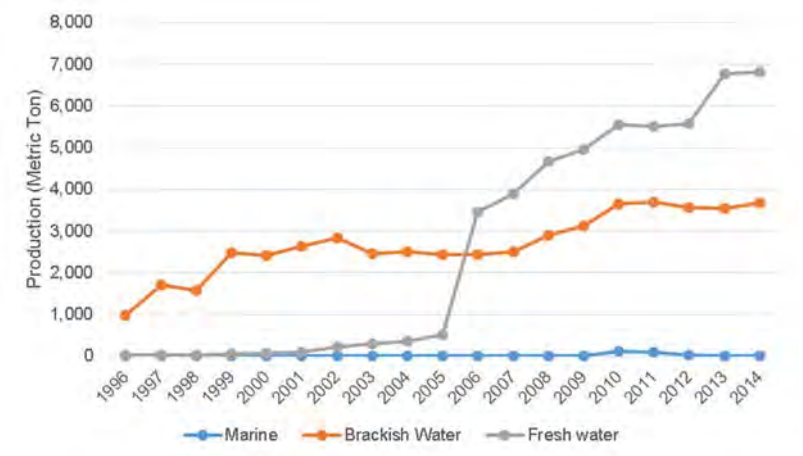
Source: Field survey in Island Provinces by JICA Study Team.

Figure 1.10 Main Production Places of Seaweed Culture in Bangsamoro

(2) Other aquaculture activities

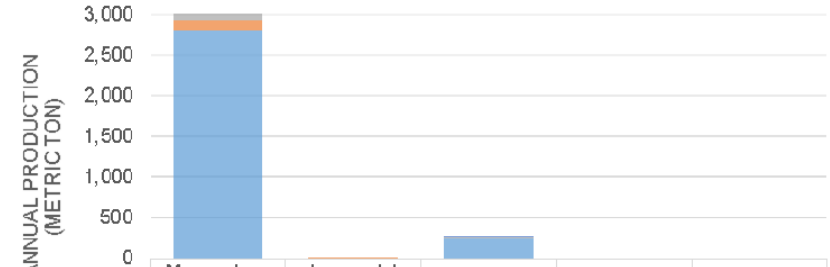
Other than seaweed culture, brackish-water and freshwater culture is popular in Bangsamoro (Figure 1.11). Both types of culture are mainly conducted in Maguindanao. Brackish-water culture is conducted at fish ponds in coastal land areas of only three municipalities: Datu Odin Sinsuat, Sultan Kudarat, and Sultan Mastura. The brackish-water ponds produces mainly milkfish (Figure 1.12). Some farmers operating brackish-water ponds also culture tilapia or tiger shrimp mixing with milkfish.

In freshwater culture, tilapia pen culture is popular (Figure 1.13) at Lake Buluan in Maguindanao, where it was introduced and expanded in the 2000s. At present, it is the largest tilapia production site in Mindanao. In the 2010s, instead of tilapia, milkfish pen culture is also introduced in Lake Buluan. The milkfish production at Lake Buluan has been increasing in recent years.



Source: Fisheries Statistics in the Philippines.

Figure 1.11 Production Trend in Aquaculture by Culture Type in Bangsamoro



	Maguindanao	Lanao del Sur	Basilan	Sulu	Tawi-Tawi
White Shrimp	143	0	2	0	0
Mud Crab	85	0	0	0	0
Tiger Prawn	244	0	20	0	0
Tilapia	120	4	1	0	0
Milkfish	2,807	0	243	0	0

Source: ibid.

Figure 1.12 Brackish-water Culture Production by Species and Province (2014)

	Maguindanao	Lanao del Sur	Basilan	Sulu	Tawi-Tawi
Catfish	136	0	0	0	0
Milkfish	1,348	0	0	0	0
Tilapia	5,309	16	0	0	0

Source: ibid.

Figure 1.13 Freshwater Culture Production by Species and Province (2014)

1.2 Fisheries Infrastructure

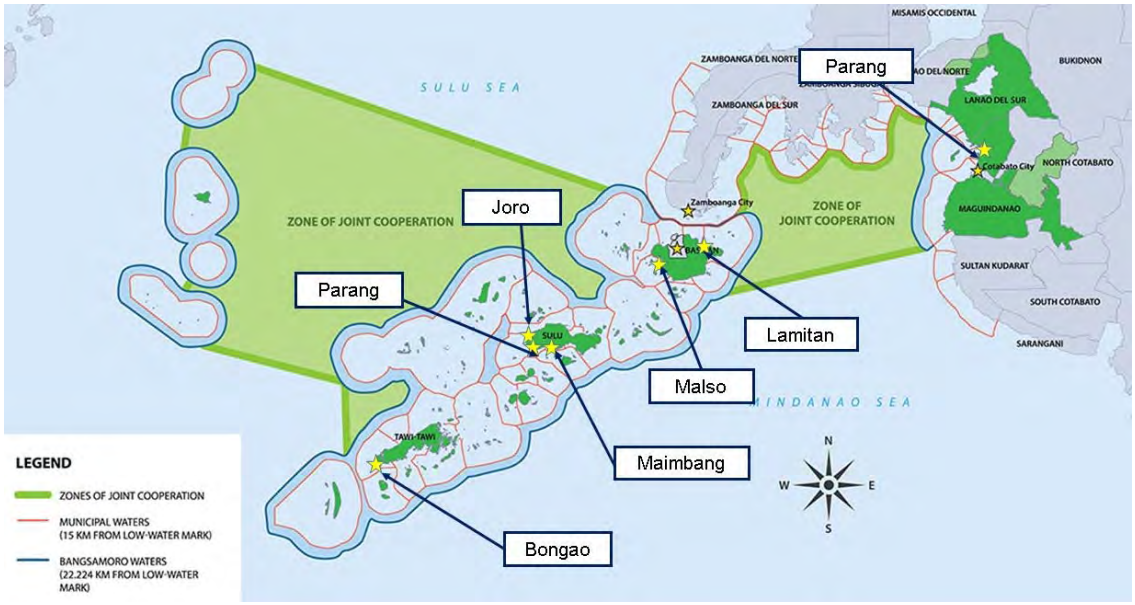
1.2.1 Existing fisheries infrastructure

At present, seven ports and landing sites are in operative conditions for commercial fisheries in ARMM (Table 1.5, Figure 1.14, and Photo 1.1 and 1.2). Those fishing ports are managed by the respective municipal LGUs. Only four fishing ports among them are equipped with ice making plants.

Table 1.5 Functioning Commercial Fishing Ports/Landing Sites in Bangsamoro (2014)

Province	Port (municipality)	Management body	Ice plant capacity
Maguindanao	Parang	Municipal LGU	2 ton/day (owned by private)
Basilan	Lamitan	Municipal LGU	10 ton/day (under construction)
	Malso	Municipal LGU	No ice plant
Sulu	Joro	Municipal LGU	5 ton/day
	Parang	Municipal LGU	No ice plant
	Maimbang	Municipal LGU	10 ton/day
Tawi-Tawi	Bongao	Municipal LGU	2 ton/day (owned by private)

Source: Field survey by JICA Study Team.



Source: ibid.

Figure 1.14 Fishing Ports/Landing Sites for Commercial Fisheries in Bangsamoro

Fish landing site in Lamitan, Basilan (Brgy. Bato)

Fish landing site in Malso, Basilan

Fish landing site in Joro, Sulu

Fish landing site in Bongao, Tawi-Tawi

Photo 1.1 Main Fish Landing Sites in Island Provinces

Ice making plant in Joro, Sulu, managed by BFAR-ARMM provincial office

Ice making plant in Maimbang, Sulu, managed by Municipal LGU

Photo 1.2 Existing Ice Plants for Fish Products in Island Provinces

In inland areas, there is only one private, functional ice plant in Buluan Municipality of Maguindanao Province. The ice produced by the plant is supplied to fish distributors dealing with tilapia cultured at fish pens in Lake Buluan.

1.2.2 Ongoing fisheries infrastructure development projects

The Philippine Fisheries Development Authority (PFDA) plans to construct or innovate seven fishing port/fish landing facilities under the Transition Investment Support Plan (TISP) for ARMM (Table 1.6 and Photo 1.3). According to the original plan, construction of all facilities would have been completed at the end of 2014. Due to the delay of procurement of construction materials, the construction work could not start as planned. The construction may be completed at the end of 2015.

Table 1.6 Construction Project for Fishing Port Complex by PFDA in Bangsamoro

Province	Municipality	Barangry	Construction cost (PHP)	Facility package
Maguindanao	Buluan	Brgy. Maslabeng	30,429,000	- landing slope - market house - ice plant - office building - access road, etc.
	Magudadatu	Brgy. Tumbao	26,546,000	
Basilan	Lamitan	Brgy. Kulay Bato	18,749,000	
	Sumisip	Brgy. Buli-Buli	35,109,000	
Sulu	Parang	Brgy. Alu Layag-Layag	27,375,000	
Tawi-Tawi	Panglima Sugala	Brgy. Bato-Bato	17,507,000	

Source: Field survey by JICA Study Team.

The Philippine Development Program and Framework for Peace and Development (PAMANA) managed by OPPAP of the Central Government supports fisheries infrastructure development in

Bangsamoro. Collaborating with municipal LGUs, BFAR-ARMM proceeds with infrastructure projects under PANAMA (Table 1.7, Photo 1.4, and Figure 1.15). In Maguindanao, construction of small-scale fish landings with cold storages is planned by the program. However, because of lack of public power supply, operation of cold storages at the target sites is difficult. In Tawi-Tawi, construction of a fishing port complex is planned, including landing slope, marketing house, ice plant, and office building at Languyan. PANAMA also funds BFAR-ARMM to carry out a development program of seaweed culture in Sulu Province in 2014 (Table 1.8).

New fishing ports in Lamitan, Basilan, constructed by PFDA Project

New fishing port in Panglima Sugala, Tawi-Tawi, constructed by PFDA Project

Photo 1.3 Fish Port Complex Construction in PFDA Project

Table 1.7 Fisheries Infrastructure Project by PANAMA Program in Bangsamoro (2014)

Province	Municipality	Barangay	Facility to be constructed (cost PHP)
Maguindanao	Datu Montawal	Brgy. Talapas	Small-scale fish landing with cold storage (PHP 16,506,000)
	Datu Pinag	Brgy. Poblacion	
	Sultan Sa Barongis	Brgy. Darampua	
	Paglat	Brgy. Sitio Adteban	
	Pagalungan	Brgy. Dalgan	
	Talitay	Brgy. Bintan	
	North Kabuntalan	Brgy. Bagumbayan	
	S. K. Pendatun	Brgy. Sadangan	
	Datu Paglas	Brgy. Palao Sa Buto	
	Datu Salibo	Brgy. Butilen	
Tawi-Tawi	Languyan	Brgy. Darul-Akram	Fish port complex (PHP 33,005,000)

Source: Material of BFAR-ARMM and Annual Report of PANAMA Program.

Construction site of fish port complex at Languyan, Tawi-Tawi, by PANAMA program (construction yet to be started)

Small-scale fish landing place at Kabuntalan, Maguindanao, by PANAMA program

Photo 1.4 Fish Landing Construction by PANAMA Program

Sources: BFAR-ARMM materials and field survey by JICA Study Team.

Figure 1.15 Planned Fishing Port/Fish Landing Site Construction Projects by PFDA and PANAMA Program

Table 1.8 Seaweed Culture Development Programs in Sulu Province Funded by PANAMA Program (2014)

Target municipality	Seaweed development programs	Budget (PHP)
Hadji Panglima Tahil Parang Panglima Estiso	Establishment of seaweed banks	1,000,000
	Construction of seaweed dryers	5,000,000
	Establishment of marine protected area	5,000,000
	Procurement of postharvest facilities and equipment	3,000,000

Source: Reports by BFAR-ARMM and PANAMA Program.

1.3 Fisheries Distribution

1.3.1 Local demand and supply of fishery products

According to FAO Fisheries Profile, the consumption of fishery products per capita in the Philippines is estimated to be 28.8 kg/year/person. Based on the figure, a local demand of fishery products is estimated in each province (Table 1.9). In Sulu and Tawi-Tawi, there are large amount of excess fishery products in marine capture fisheries. Those excess products can be exported to other local markets. In Maguindanao, there are also a large amount of excess fishery products, originally from brackish and fresh water aquaculture production. In Lanao del Sur, the fisheries production does not satisfy the local demand in the province.

At the regional level, 120,000 ton of fishery products is estimated to be the excess fisheries production in one year. If the excess fishery products are sold at PHP 40–50/kg in fresh or frozen fish, the total market sale should reach PHP 5–6 billion per year, excluding seaweed sale. It makes a great economic effect in the region. However, especially in the island provinces, due to lack of establishment of distribution infrastructure for fishery products such as ice plants or cold storages, only 20–30% of fish catch may be distributed in fresh or frozen fish to other local markets. The remaining 70–80% of fish catch is mostly processed as dried fish for long-term preservation. The value of dried fish is only a half or one thirds of fresh or frozen fish at farm-gate level.

Table 1.9 Comparison between Local Demand for Fishery Products and Production at Province Level

Province	Population (2010)	Local demand for fishery products (ton)	Fishery production (ton in 2012)*	Excess/shortage of fishery products (ton)
Maguindanao	293,322	8,448	31,645	23,197
Lanao del Sur	933,260	26,878	26,389	- 489
Basilan	944,718	27,208	30,328	3,120
Sulu	718,290	20,687	94,574	73,896
Tawi-Tawi	366,550	10,557	32,932	22,375
Total	3,256,140	93,777	215,868	122,099

* Excluding seaweed production

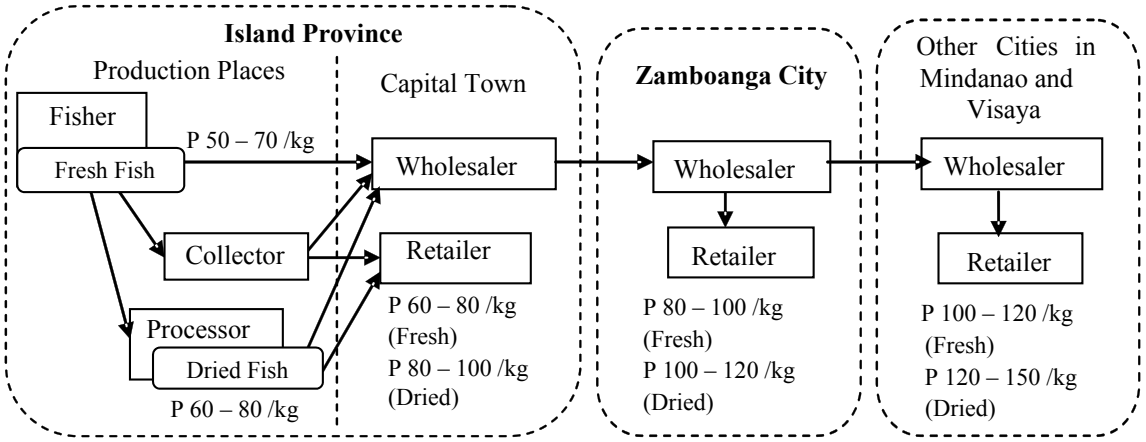
Sources: FAO Fishery Country Profile (2005), Census of Population and Housing (2010), Fisheries Statistics in the Philippines (2013).

1.3.2 Distribution and processing of fishery products

(1) Fresh fish distribution

In the island provinces of Basilan, Sulu, and Tawi-Tawi, local middlemen purchase fresh fish caught by local fishers at landing sites, and transport them to local markets in Zamboanga by sea. Due to lack of development of cold chain system for fishery products like ice production, and a limited frequency of ferry operation, local brokers' capacity to transport fresh fish to outer island markets like Zamboanga is limited. The fresh fish transported from islands are almost consumed only in Zamboanga. Little fresh fish originated from the island provinces are secondarily carried from Zamboanga to other markets. Some high-valued fish species like groupers, however, are often transported to Manila as fresh or live fish by air. It is because those fish species have higher demand for Chinese food.

Most fish catch by local fisheries in the island provinces are processed as dried fish for long-time preservation. Local middlemen also deal with processed dried fish to be sold at outer island's markets. A large amount of dried fish produced in the island provinces are distributed in Mindanao areas. The distribution of fishery products from the island provinces to Zamboanga and other cities is illustrated in Figure 1.16.



Source: Field survey by JICA Study Team.

Figure 1.16 Distribution of Fresh and Dried Fish from Island Provinces to Outer Island Markets

The fishery products produced in the mainland provinces, Maguindanao and Lanao del Sur, are distributed to local markets in the region and other urban markets in Mindanao by land (Photo 1.5). The fresh fish caught by local fishers in the mainland provinces are transported to urban markets in ARMM, Cotabato and Marawi. Tilapia cultured at Lake Buluan is distributed not only to local markets in Cotabato and Maguindanao, but also to other areas of Mindanao such as Davao and Cagayan de Oro. In addition, live mud crab produced at brackish-water ponds in Maguindanao is often transported to

Manila by air.

Fresh fish are packed in Styrofoam boxes and transported to local markets (Maimbang, Sulu).

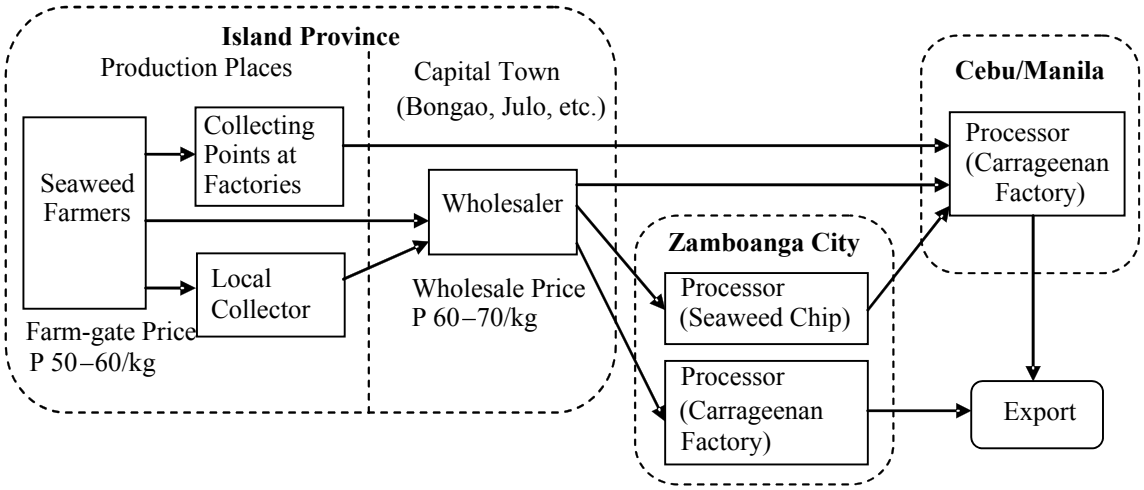
Most of fish are dried for preservation (Tawi-Tawi).

Photo 1.5 Fish Distribution and Processing in Island Provinces

(2) Distribution of seaweed products

In the island province, harvested seaweed is dried in the sun at production sites. Local brokers or cooperative associations purchase packages of dried seaweed from farmers and transport them to local factories located in Zamboanga, Cebu or Manila by sea or land (Figure 1.17 and Photo 1.6). Local factories processes dried seaweeds into carrageenan powders, which is utilized as natural binders for food, cosmetic, and etc. The carrageenan powders are exported mainly to the U.S., Canada, Germany, France, and Japan. In Maguindanao, dried seaweed produced at Parang is mainly transported to carrageenan factories in Cebu.

BFAR-ARMM constructed two local seaweed-chip processing factories at Joro in Sulu and Parang in Maguindanao. However, the seaweed factory in Joro has never been operated since its establishment. The factory in Parang is only partially operated, because of unstable supply of public power and fresh water.



Source: ibid.

Figure 1.17 Distribution of Seaweed Products from Inland Provinces to Processing Factories

Photo 1.6 Seaweed Distribution in Island Provinces

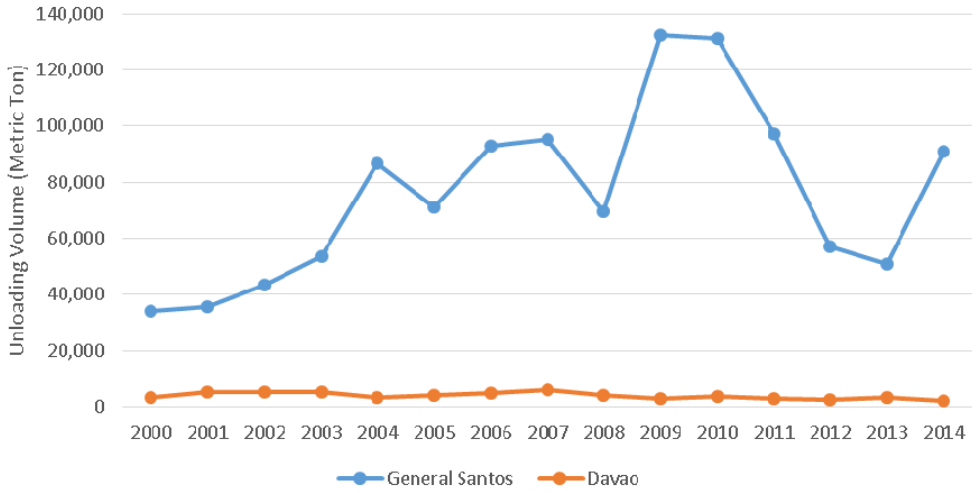
Local farmer transporting raw seaweed by *bangka* [local boat] (Sitankai, Tawi-Tawi)

Local broker transports dried seaweed from production sites to carrageenan factories (Zamboanga).

Photo 1.6 Seaweed Transport and Broker in Island Provinces

(3) Tuna fisheries industry in Mindanao

The major landing ports of tuna fishing in Mindanao are General Santos and Davao. Figure 1.18 indicates the recent trend in unloading volume of tuna fish species at both fishing ports. The local tuna fish species are yellow-fin tuna, skipjack, and frigate tuna. The unloading volume of tuna fish by local boats reached 130,000 ton in 2009 and 2010. However, in the recent few years, it has drastically dropped. It may be a sign of over-exploration of tuna resources. It seems that the tuna fishing industry in Mindanao has already entered the saturation stage.



Source: Statistics of Fishing Ports by Philippine Fisheries Development Authority.

Figure 1.18 Recent Trend in Unloading Volume of Tuna Fish Species at General Santos and Davao Fishing Ports

According to the agreement of the exclusive economic zone (EEZ) boundary between Indonesia and Philippines, officially concluded in May 2014, the offshore fishing ground of Philippine side in the Celebes Sea and the Molucca Sea practically shrank. Therefore, Philippine's fishing boats are not allowed to enter the Indonesian EEZ areas without paying for fishing permission. The control of fishing ground by the determination of the EEZ boundary is the best way for proper management of offshore fisheries resources. However, it may make a large drop of tuna catch by local fishing boats for a recent few years.

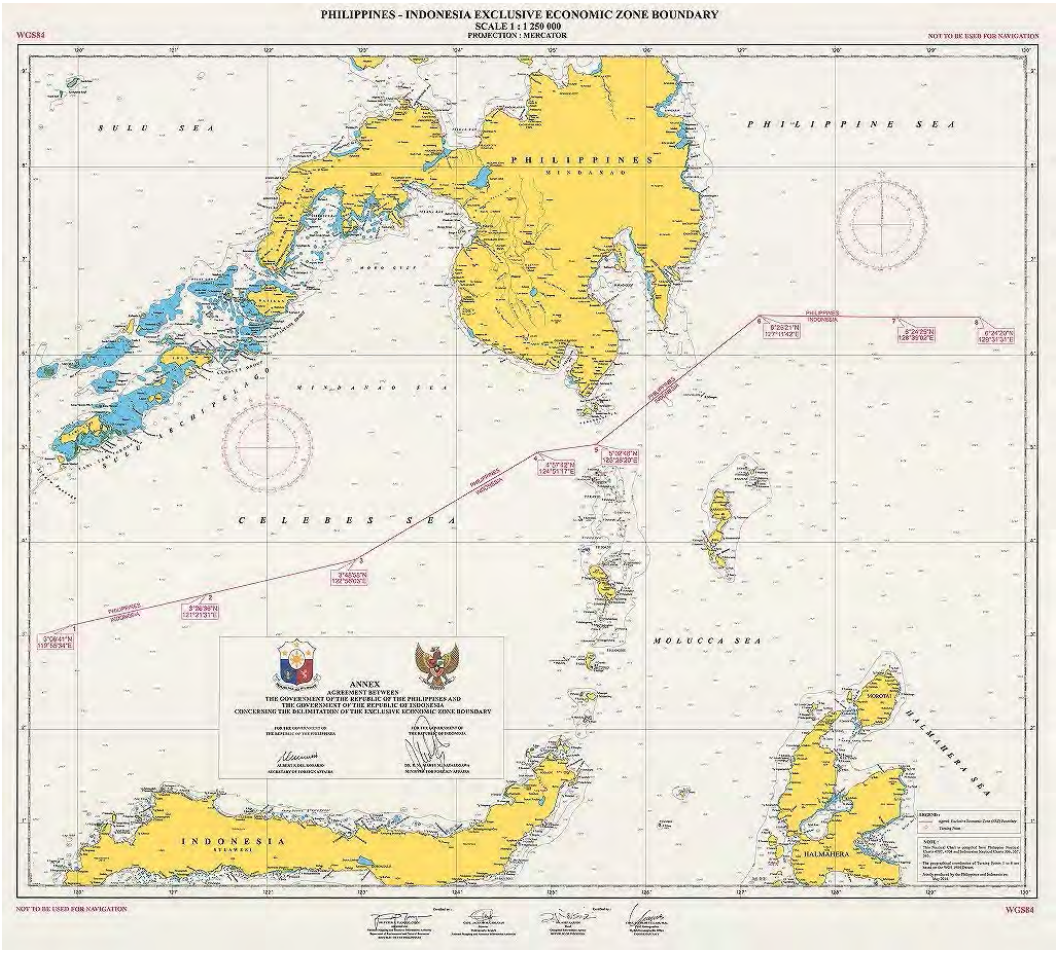


Figure 1.19 Boundary of Exclusive Economic Zone (EEZ) between Indonesia and the Philippines (Concluded in May 2014)

In the Bangsamoro region, local fishers commonly catch small-size tuna fish species, mainly frigate tuna and skipjack, in coastal and offshore areas. According to a field survey in island provinces, many juvenile yellow-fin tuna were observed at landing sites or fish markets (Photo 1.7). To develop the tuna fisheries industry in Bangsamoro in the future, it is vitally important to take account of proper management of tuna fish resources in Mindanao and the Sulu Sea.

Yellow-fin tuna landed
at General Santos Fishing Port

Juvenile yellow-fin tuna still captured by local boats (Lamitan, Basilan)

Photo 1.7 Tuna Fishing Industry in Mindanao

CHAPTER 2 POSSIBLE DIRECTIONS AND MEASURES FOR BANGSAMORO FISHERIES DEVELOPMENT

Based on the actual situation in fisheries sector in Bangsamoro the following directions and measures may be pursued for fisheries development aiming at improvement of the production and market value of local fishery products.

2.1 Improvement of Fishery Products Distribution System

To preserve fresh fish and dried seaweed in proper conditions at community level, solar-powered cold storages, solar fish dryers, and seaweed storages should be introduced at local landing sites. At the same time, the fishing port's facilities at central towns in the respective provinces should be innovated with introduction of ice making plants, cold storages, and dried seaweed storages. Local brokers and Fishermen Cooperative Association take roles for collecting fish products and dried seaweeds at local landing sites, and storing them at the fisheries facilities of central towns. Those products will be transported in bulk to other markets by sea and land. The improved distribution system for fishery products is illustrated in Figure 2.1.

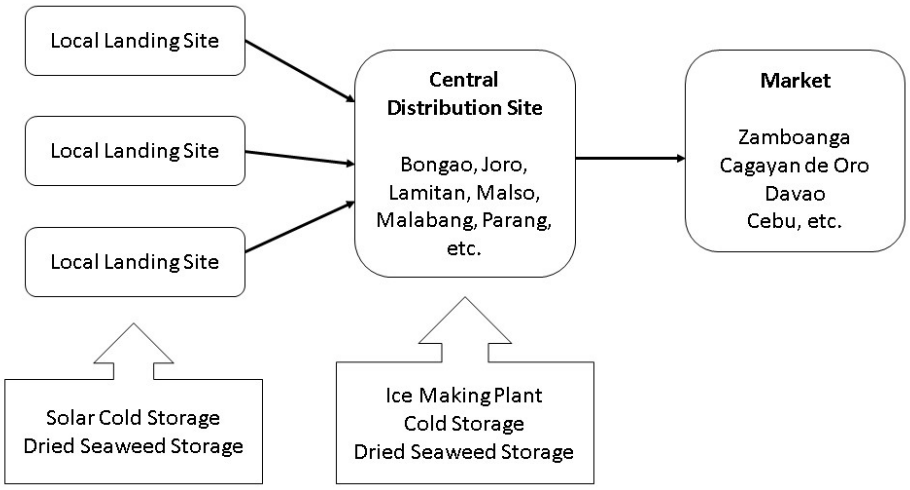


Figure 2.1 Image of Improvement of Fishery Products Distribution System

2.2 Improvement of Seaweed Production Facilities

To expand the areas of seaweed culture and improve the quality of dried seaweed, production facilities such as drying platform (Photo 2.1) and storage should be constructed at culture areas. Especially, it is important to build drying platforms over the sea to prevent sand or other impurities from mixing with dried seaweed. These facilities will be managed by local seaweed farmers' cooperatives.

2.3 Introduction of Fish Culture in Unutilized Freshwater Areas in Mainland Provinces

A fish cage or pen culture system should be introduced in unutilized natural freshwater ponds or lakes in mainland provinces, Maguindanao and Lanao del Sur (Photo 2.2). Especially, Lake Dapao at Pulas municipality, Lanao del Sur province, has ideal natural conditions for fish culture development, because of clean water sources. Lake Lanao also has a higher potential for freshwater aquaculture development. Tilapia is the most suitable fish to be cultured in those lakes. Milkfish culture can be also introduced in those lakes.

2.4 Introduction of Marine Aquaculture of High Value Species in Island Provinces

Because Bangsamoro is out of typhoon routes, there is a high potential for marine aquaculture. However, unfortunately, marine aquaculture is not popular in Bangsamoro at present, because of technical difficulty and high initial investment. In case of fish culture for high value fish like grouper or *ponpano*, local farmers need to prepare a certain amount of initial investment to construct fish cages and purchase fish feeds. On the contrary, the culture and propagation of shellfish like abalone and oyster, or sea cucumbers needs less costs than fish culture, because they feed on natural seaweed or crustaceous in coastal areas. Therefore, the sea ranching of shellfish and sea cucumbers is appropriate for promotion in island provinces (Photo 2.3).

Seaweed drying platform constructed over the water to protect seaweed from sand (Tawi-Tawi)

Bamboo (or wooden) floor to dry harvested seaweed in the sun (Davao)

Photo 2.1 Seaweed Drying Platform in Island Provinces

Floating cages for tilapia culture in Lake Sebu, South Cotabato

Fish pens for tilapia culture in Lake Buluan, Maguindanao

Photo 2.2 Fish Culture at Freshwater Lakes in Mindanao

Abalone cage culture practice in USAID FISH Program. (Panglima Sugala, Tawi-Tawi)

Abalone grows in cages by feeding on seaweed.

Photo 2.3 Abalone Culture Practice in Island Provinces

CHAPTER 3 BANGSAMORO FISHERY DEVELOPMENT PROJECTS

3.1 Fishery Products Processing and Distribution Program

3.1.1 Cold chain facilities installation project

Due to lack of cold chain facilities and system, the majority of local fish caught in the Bangsamoro region cannot be distributed to outside markets as fresh and frozen products. At present, most of locally produced fish is processed to salted and dried fish. By establishing cold chain facilities, a large amount of locally produced fish can be distributed to outside markets and processing factories as fresh and frozen fish.

The project will install cold storages and ice making plants at major fish ports to increase the distribution capacity of fresh and frozen fish. The candidates of fishing ports and fish landing places for the cold chain installation are Parang in Maguindanao, Malabang and Picong in Lanao del Sur, Lamitan, Malsu and Sumisip in Basilan, Joro, Parang and Mainbang in Sulu, and Bongao, Languyan, and Pangila-Sugala in Tawi-Tawi (Figure 3.1 and Table 3.1). Because Malabang and Picong do not have any plans of fishing port construction at present, the project will establish new fish port facilities at both places. In other candidate municipalities, local fishing port facilities already exist or will be constructed (Photo 3.1) until 2016 in the plan. The project will introduce additional cold storages and ice making plants to expand the capacity of fresh fish distribution at target places.

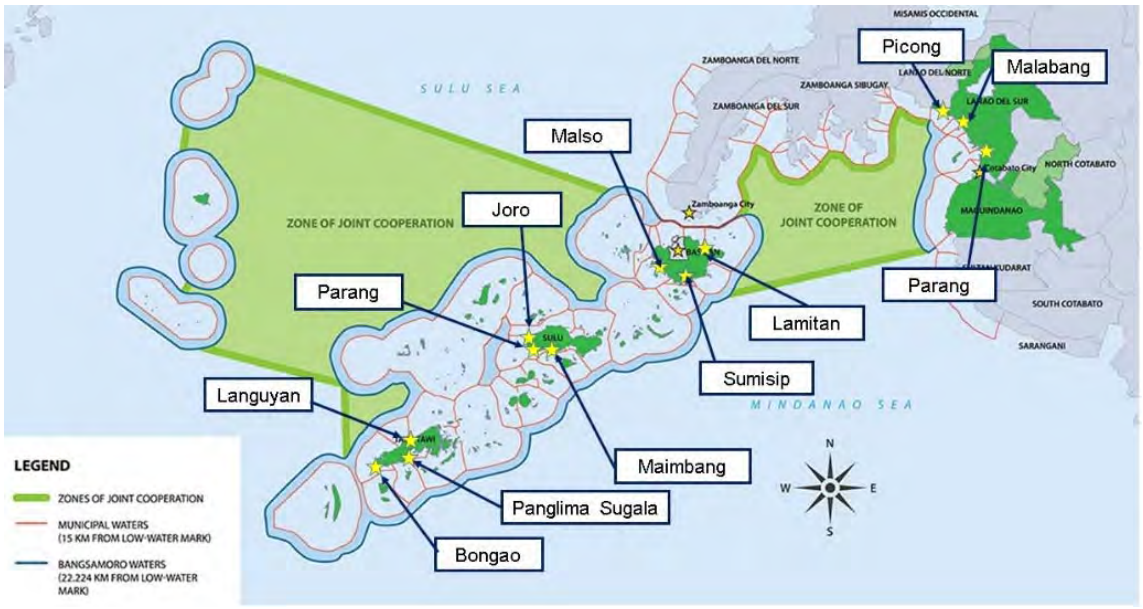


Figure 3.1 Target Sites of Construction and Renovation of Major Fishing Ports in Bangsamoro

Table 3.1 Present Conditions and Necessary Measures for Major Fishing Ports and Landing Places in Bangsamoro

Province	Target municipality	Present condition (2015)	Necessary measure
Maguindanao	Parang	Landing pier and fish market (by USAID)	Renovation of fish landing facility and installation of ice plant and cold storage
Lanao del Sur	Malabang	Small fish landing hut (by ARMM social fund)	Construction of new fish landing complex with ice plant
	Picong	Small landing pier (by Municipal LGU)	Construction of new fish landing complex with ice plant
Basilan	Lamitan	Under-construction of fish landing, market and ice plant (by PFDA)	Introduction of additional ice plant and cold storage
	Malso	Fish landing and market (by PFDA)	Renovation of fish landing and cold chain facilities

Province	Target municipality	Present condition (2015)	Necessary measure
	Sumsip	Under-construction of fish landing and market (by PFDA)	Renovation of fish landing facility and installation of ice plant and cold storage
Sulu	Joro	Old fish landing and market (by provincial LGU), and ice plant (by BFAR)	Renovation of fish landing facility and installation of additional ice plant and cold storage
	Mainbang	Fish landing, market and ice plant (by Municipal LGU)	Installation of additional ice plant and cold storage
	Parang	Under-construction of fish landing, market and ice plant (by PFDA)	Installation of additional ice plant and cold storage
Tawi-Tawi	Bongao	Old fish landing and market (by Provincial LGU) and ice plant (by private)	Renovation of fish landing facility and installation of additional ice plant and cold storage
	Pangila Sugama	Under-construction of fish landing, market and ice plant (by PFDA)	Installation of additional ice plant and cold storage
	Languyan	Under-construction of fish landing, market and ice plant (by PANAMA)	Installation of additional ice plant and cold storage

Ice making plant at Cotabato City (operated by Cotabato Light Co.)

Star-style piers adapting for local fishing boats/canoes at Karamasing, Sultan Kudarat Province

Fish landing and market facilities at General Santos Fishing Port

Photo 3.1 Construction and Renovation of Fishing Port Facilities

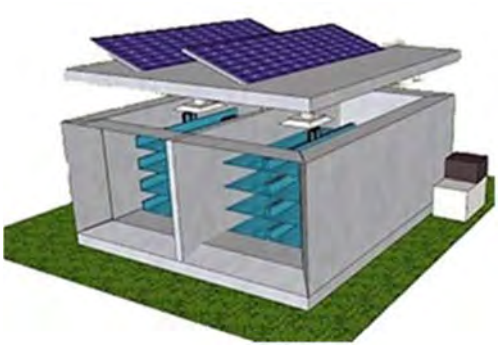
The project costs are summarized in Table 3.2.

Table 3.2 Project Cost Estimate for Construction and Renovation of Fishing Port Facilities

Program Programs	Unit cost (PHP)	Unit	Subtotal (PHP)
Feasibility Study for Construction and Innovation of Fishing Port Facilities	100,000,000	1	100,000,000
Construction of new fish landing center with ice plant/cold storage (Malabang, Picong)	80,000,000	2	160,000,000
Renovation of existing fish landing facilities with ice plant/cold storage (Parang-Maguindanao, Malso, Sumsip)	60,000,000	3	180,000,000
Installation/upgrade of ice plant/cold storage (Lamitan, Mainbang, Parang-Sulu, Bongao, Pangima Sugala, Languyan)	40,000,000	6	240,000,000
Total			680,000,000

3.1.2 Solar-powered fish market development project

The project will install small-scale fish market facilities (cf. an existing market and facility in Photo 3.3) at local fish landing sites as local focal points of fish distribution to major fishing ports mentioned above. In principal, a fish market facility will be established at each coastal municipality. Due to lack of public electricity supply in rural areas, a solar power unit should be installed to operate small cold storages for temporal preservation of fresh fish and ice making. Local fisher associations and cooperatives will also be organized to manage the fish market facilities and the solar-powered cold storages. The fish market facilities can be also utilized for fish processing activities at local communities.



Source: https://www.robotix.in/

Source: http://www.ecozensolutions.com/

Photo 3.2 Image of Installation of Solar-powered Cold Storage

Fish market and processing facility in Matium of Sarangani Province, managed by local fisher women group: a good model of local fish market facility in Bangsamoro region.

Fish processing facility in the market building.

Local fisher's women sell processed fish products to local people and visitors at the market.

Photo 3.3 Small-scale Fish Market and Processing Facility (Matium Municipality, Sarangani Province)

The project costs are summarized in Table 3.3.

Table 3.3 Project Cost Estimate for Installation of Solar-powered Cold Storage

Main programs	Unit cost (PHP)	Unit	Subtotal (PHP)
Feasibility study on construction of local fish market facilities	50,000,000	1	50,000,000
Construction of solar-powered fish market facilities at local landing sites (52 coastal municipalities)	5,000,000	52*	260,000,000
Total			310,000,000

*including 6 in Maguindanao, 4 in Lanao del Sur, 12 in Basilan, 19 in Sulu, and 12 in Tawi-Tawi

3.2 Aquaculture Development Program

3.2.1 Freshwater aquaculture development project

The main island provinces, Maguindanao and Lanao del Sur, have a lot of natural lakes (e.g., Lake Lanao and Lake Dapao) and wide marsh lands (e.g., Ligawasan Marsh). However, those natural lakes and marsh lands are only utilized for small-scale fishing activities, but not for aquaculture activities. Especially, two major lakes, Lake Lanao and Lake Dapao have high potentials for cage culture of freshwater fish and prawn, because their water qualities are suitable for aquaculture activities. The supply of compounded feeds for fish and prawn culture will be improved by the renovation of a national road between those lakes and Cotabato City. It will take only a half day to transport fish or prawn feeds from commercial feed plants located in General Santos by land.

(1) Component 1: Establishment and renovation of freshwater fish and prawn hatcheries

In order to produce and supply a sufficient amount of freshwater fish and prawn seeds, local freshwater aquaculture centers should be established in target areas. The two existing freshwater fish hatcheries operated by BFAR-ARMM (Datu Odin Sinsuat in Maguindanao and Marantaro in Lanao del Sur) will be renovated to increase the capacity of fish seed production. Additionally, a new freshwater fish hatchery should be also established in the eastern side of Lake Lanao. Masui is a proper site of a new freshwater fish hatchery. The hatcheries of freshwater prawn should be established at coastal areas, because, sea water is necessary to produce the prawn seeds. The coastal areas of Datu Odin Sinsuat in Maguindanao and Malabang in Lanao del Sur are the proper places for the construction of freshwater prawn hatcheries. These freshwater prawn hatcheries can be utilized for seed production of brackish-water species, such milkfish or mud crab.

Establishment and renovation of freshwater fish/prawn hatcheries in Maguindanao and Lanao del Sur

Table 3.4 Construction and Renovation Plan of Existing and New Hatcheries for Freshwater Aquaculture

Existing/planned hatcheries	Place (municipality, province)	Program content	Target species
BFAR-ARMM Freshwater Fish Farm (existing)	Datu Odin Sinsuat Maguindanao	Innovation/expansion of existing facilities	Tilapia
BFAR-ARMM Freshwater Fish Farm (existing)	Marantao Lanao del Sur	Innovation/expansion of existing facilities	Tilapia, common carp
Freshwater Fish Farm and Hatchery (newly planned)	Masiu Lanao del Sur	New construction of fish ponds and hatchery	Tilapia
MSU-Maguindanao Marine Multi-Species Hatchery (existing)	Datu Odin Sinsuat Maguindanao	Innovation/expansion of existing facilities	Freshwater prawn Other marine species (milkfish, mud crab)
Marine Multi-species Hatchery (newly planned)	Malabang Lanao del Sur	New construction of ponds and hatchery	Freshwater prawn Other marine species


BFAR-ARMM Freshwater fish hatchery at Datu Odin Sinsuat, Maguindanao. It is placed in the campus of MSU-Manguindanao. It produces only tilapia seeds.


BFAR-ARMM Freshwater fish hatchery at Marantaro, Lanao del Sur. The hatchery facilities are old and outmoded. It produces tilapia and common carp seeds.


MSU-Maguindanao Community-based multi-species hatchery at the coastal area of Datu Odin Sinsuat. This place can be innovated for a freshwater prawn hatchery in future.

Photo 3.4 Existing Hatcheries Possibly Renovated for Freshwater Aquaculture Development

Table 3.5 Potential Species for Freshwater Aquaculture in Bangsamoro

Tilapia	Tilapia is the most popularly consumed freshwater fish in the Philippine. The basic technique of tilapia culture is simple for local farmers. The white meat of tilapia is highly valued in EU and U.S., because a shortage of a supply of local white fish meat. Tilapia filets will possibly be one of promising commodities exported from the Bangsamoro region.
Freshwater prawn	Freshwater prawn is one of high-valued species in domestic market. The basic technique of freshwater prawn culture is not so difficult for local farmers, comparing with marine shrimp. It is possible to transport them alive to local major markets, like Davao, Cebu, and Manila by land or air.

Table 3.6 Project Cost Estimate for Construction and Renovation of Hatcheries for Freshwater Aquaculture

Main programs	Unit cost (PHP)	Unit	Subtotal (PHP)
Feasibility study on construction and innovation of freshwater species hatcheries	50,000,000	1	100,000,000
Construction of new freshwater fish and prawn hatcheries (Masiu, Malabang)	80,000,000	2	160,000,000
Innovation and expansion of existing freshwater fish hatchery facilities (Datu Odin Sinsuat, Marantao)	60,000,000	2	120,000,000
Innovation and expansion of existing marine hatchery facilities for freshwater prawn (Datu Odin Sinsuat)	60,000,000	1	60,000,000
Total			440,000,000

(2) Component 2: Technical cooperation and extension of freshwater fish and prawn culture

The technical cooperation project for the extension of freshwater aquaculture will be carried out in collaboration with local academic resources such as Mindanao State University at Maguindanao and Marawi, which has the Faculty of Fisheries. The project will train Bangsamoro government and LGU's officials and local community leaders for extension personnel, and create the extension structure and system on freshwater aquaculture development in the region. Additionally, the project will also introduce and advise the processing activities of tilapia and freshwater prawn to be marketed at outside market. Especially, tilapia filet is a lucrative commodity to be exported to overseas market.

Pontential areas for freshwater aquaculture development in Bangsamoro region

Lake Dapao at Pualas, Lanao de Sur. It is highly potential for cage culture development.

Experimental fish cage culture is underway in Lake Lanao at Masiu, Lanao del Sur.

Fish ponds for tilapia culture have been introduced recently at Sultan Mastura, Maguindanao.

Photo 3.5 Potential Areas for Freshwater Aquaculture Development in Bangsamoro

Table 3.7 Project Cost Estimate for Freshwater Fish and Prawn Culture

Main program	Unit cost (PHP)	Unit	Subtotal (PHP)
Technical cooperation project for freshwater aquaculture extension (5 years)	150,000,000	1	150,000,000
Total			150,000,000

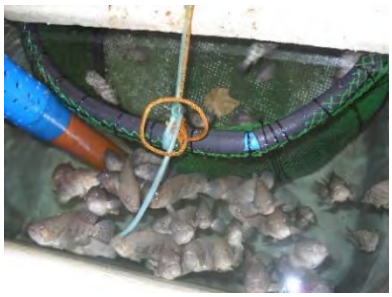
3.2.2 Marine aquaculture development project

The production of marine culture in the Bangsamoro region heavily depends on seaweed culture. To utilize the coastal areas for marine culture efficiently, it is necessary to diversify local marine culture activities in the region. However, at present, the supply of marine species is not sufficient to promote marine culture regionally, because only one marine multi-species hatchery is operated at Tawi-Tawi in the whole region. First of all, the project will renovate the existing marine multi-species hatchery at Tawi-Tawi, and construct new marine hatcheries at Sulu and Basilan (Component 1). Utilizing these local marine hatcheries in island province, the project will develop local stable technique on artificial seed production for target marine culture species, such as groupers, abalone, and sea cucumber, at and supply locally produced seeds to local people with technical advises and monitoring (Component 2).

(1) Component 1: Establishment and renovation of multi-purpose marine hatcheries

In order to produce and supply a sufficient amount of fish, abalone, and sea cucumber seeds, a multi-purpose marine hatchery should be established in each island province. At present, BFAR-ARMM has only one multi-purpose marine hatchery at Lato-Lato, Bongao in Tawi-Tawi to produce grouper and abalone seeds. The facilities and equipment of the existing marine hatchery will be renovated to increase the capacity of seed production and handle other species for seed production. The similar marine multi-purpose hatcheries should be also established in other island provinces, Sulu and Basilan. Joro in Sulu and Lamitan in Basilan may be the proper sites of new marine hatcheries in collaboration of Mindanao State University at Sulu and Basilan.

BFAR-ARMM Tawi-Tawi Multi-Species Hatchery at Bongao, Tawi-Tawi



The Tawi-Tawi hatchery can produce green grouper seeds.

The Tawi-Tawi hatchery also can produce abalone seeds regularly.

Photo 3.6 Activities of BFAR-ARMM Tawi-Tawi Marine Multi-Species Hatchery

Broodstock tanks

Water reserve tank

Seed rearing tanks

Photo 3.7 Image of Marine Multi-species Hatchery Facilities (newly constructed hatchery of Mega Fishing Corporation in Zamboanga, 2015)

Table 3.8 Potential Species for Marine Aquaculture in Bangsamoro

Grouper	Grouper is one of most high-valued fish at local and regional markets. Many local people have already started cage culture of groupers at coastal areas; however, they collect and grow their wild seeds. The collection of wild seeds affects the grouper natural stock seriously. At present, the BFAR-ARMM Tawi-Tawi Hatchery is able to produce only green grouper (*Epinephelus coioides*) seeds artificially.
Abalone	Local abalone (*Haliotis asinine*) is a high-valued shellfish at local and regional markets. Even though the BFAR-ARMM Tawi-Tawi Hatchery is able to produce abalone seeds regularly, its culture skill has not been extended well in island provinces. Only small numbers of local people conduct abalone culture in cage. There is a difficulty in harvesting a sufficient amount of naturally grown seaweed for feeding abalone (*Gracilaria spp.*) in island provinces.
Sea cucumber	Recently, a lot of trials and pilot projects of sea cucumber propagation have been conducted in the Philippines. In terms of a local species of sea cucumber (*Holuthuria scabra*), the artificial technique of seed production has been already established. In case of sea cucumber, the seeds are ranched at protected areas, and naturally propagated under a monitoring and surveillance by local communities.

Table 3.9 Project Cost Estimate for Marine Multi-species Hatchery Facilities

Main programs	Unit cost (PHP)	Unit	Subtotal (PHP)
Feasibility study on construction and renovation of marine multi-species hatcheries	50,000,000	1	50,000,000
Construction and renovation of marine multi-species hatcheries (Bongao in Tawi-Tawi, Joro in Sulu, Lamitan in Basilan)	150,000,000	3	450,000,000
Total			500,000,000

(2) Component 2: Technical cooperation and extension of marine aquaculture

The technical cooperation project for local extension of marine aquaculture will be carried out in collaboration with the Faculty of Fisheries at Mindanao State University at Tawi-Tawi, Sulu, and Basilan. The project will introduce and develop the seed production methods of high-value marine species such as grouper, abalone, and sea cucumber, and train Bangsamoro officials and local community leaders for extension personnel to create the extension structure and system on marine culture in the region. Additionally, the project will also introduce and develop the processing activities of abalone and sea cucumber to be marketed at outside market. Especially, dried abalone and sea cucumber are lucrative commodities to be exported to overseas market.

Cage culture for groupers and lobsters in Parang, Maguindanao: Local farmers collect wild seeds, and grow them in cages.

Cage culture for abalone at Samal island, Davao, with *Glacilaria* seaweeds as feed for abalone in cages

Artificially produced sea cucumber seeds at MSU-Naawan, Misamis Oriental, ranched in coastal areas and naturally propagated

Photo 3.8 Marine Aquaculture Development Programs in Mindanao

Table 3.10 Project Cost Estimate for Technical Cooperation and Extension of Marine Aquaculture

Main programs	Unit cost (PHP)	Unit	Subtotal (PHP)
Technical cooperation project for marine aquaculture extension (3 years) Phase I: Development of seed production technologies	100,000,000	1	100,000,000
Technical cooperation project for marine aquaculture extension (5 years) Phase II: Extension of marine aquaculture	150,000,000	1	150,000,000
Total			250,000,000

3.2.3 Seaweed culture development project

The ARMM makes the largest production of seaweed in the Philippines. Large potential areas for seaweed culture still remain in the island provinces. The project will promote to extend seaweed culture at new potential areas in the island provinces, Tawi-Tawi, Sulu, and Basilan.

(1) Component 1: Installation of seaweed drying platforms and storages at potential sites

To increase seaweed production and improve the quality of dried seaweed, drying platforms and storages for dried seaweed will be installed at potential sites in coastal areas. It is ideal that each seaweed grower group will manage a drying platform on the sea and a seaweed storage at a landing site. In addition, local farmers may also culture fish and abalone in net cages under drying platforms. About 100 to 200 platforms and storages for seaweed culture will be installed at appropriate sites in each island province.

Seaweed drying platforms constructed on the sea to prevent mixing dried seaweed with sands. (Sitangkai, Tawi-Tawi)

Seaweed drying platform and storage built on the coast (Parang, Sulu)

Harvested seaweed on drying platform on the sea (Samal Island, Davao)

Photo 3.9 Seaweed Drying Platforms in Mindanao

Table 3.11 Project Cost Estimate for Installation of Seaweed Drying Platforms and Storages

Main programs	Unit cost (PHP)	Unit	Subtotal (PHP)
Feasibility study on construction of seaweed drying platforms	50,000,000	1	50,000,000
Construction of seaweed drying platforms	1,500,000	200	300,000,000
Total			350,000,000

(2) Component 2: Technical cooperation and extension of seaweed culture

A technical cooperation project for the extension of seaweed culture will be conducted in collaboration with local universities, Mindanao State University at Tawi-Tawi, Sulu, and Basilan. The project will introduce and develop seed nursing skills to maintain healthy and strong strains of seaweed for culture purpose, and train Bangsamoro government officials and local community leaders for extension personnel to make an extension structure and system on seaweed culture in the island provinces. Additionally, the project will also introduce the processing activities of dried seaweed in higher quality

to be marketed to local carrageenan factories or exported to overseas. In the project, small-scale model plants of seaweed dried chips will be operated at the pilot basis to verify the technical and economic sustainability of those plants' operation. Those pilot seaweed processing plants should be developed, after the necessary infrastructures for seaweed processing, electricity and fresh tap water, are equipped at the island provinces.

Seaweed tissue culture laboratory at BFAR-ARMM (Cotabato City). It maintains high quality strains of seaweeds.

BFAR-ARMM processing plant for dried seaweed chips in Parang, Maguindanao. It does not worked for a long time, because of a high processing cost.

Dried seaweed chip sample produced at BFAR-ARMM processing plant. Sufficient supply of electricity and fresh water is necessary to produce dried seaweed chips.

Photo 3.10 Seaweed Tissue Culture Laboratory and Dried Seaweed Chips Processing Plant

Table 3.12 Project Cost Estimate for Technical Cooperation and Extension of Seaweed Culture

Main programs	Unit cost (PHP)	Unit	Subtotal (PHP)
Technical cooperation project for seaweed culture development (5 years)	150,000,000	1	150,000,000
Technical cooperation project for value-added seaweed processing (5 years), including renovation of existing facilities	150,000,000	1	150,000,000
Total			300,000,000

3.3 Marine Resources Management Program

3.3.1 Community-based coastal resources management project

In order to control and preserve natural resources at coastal areas properly, marine protected areas (MPAs) will be registered by the Bangsamoro government and LGUs. Basically, local communities manage MPA activities with provincial and municipal LGUs. The project will train local community leaders and LGU officers for community-based costal resource management (CBCRM) activities, and support local communities to make their CBCRM regulations in participative ways.

The project will also introduce and develop some alternative activities for income generation to mitigate a fishing pressure at coastal areas by regular fishing activities. The eco-tourism program in MPAs is one of possible activities for income generation other than fishing. Therefore, the project will support to establish visitor centers of MPA areas, and organize eco-tour programs by local communities.

BFAR promotes the establishment of marine culture parks to develop marine culture activities as alternative income sources in collaboration with coastal resource management. Referring to the success cases of marine culture parks in Mindanao (Panabo in Davao del Norte or Balingasag in Misamis Oriental), the project will apply the approach of marine culture park program to promote coastal resource management activities in coastal communities in the Bangsamoro region.

The area plan of marine-culture park at Panabo City in Davao del Norte. The areas of aquaculture activities are strictly controlled under the zoning plan.

Sea cucumber ranching and propagation is one of promising resource management activities with income generation for local communities (Laguindingan, Misamis Oriental Province)

In the sea cucumber project at Laguindingan, target community people regularly watch a protected area for sea cucumber propagation at a surveillance hut.

Photo 3.11 Coastal Resource Management Programs in Other Areas of Mindanao

Local women group process boneless milkfish filets as value-added product at a local workshop.

Local women group also produce bottled marinade milkfish by utilizing small-size fish.

Local community association manages direct sale activities, such as local fish food restaurant, or fish processed food store.

Photo 3.12 Local Communities' Income Generation Activities at Panabo Marine-culture Park

Table 3.13 Project Cost Estimate for Community-based Coastal Resources Management

Main program	Unit cost (PHP)	Unit	Subtotal (PHP)
Technical cooperation project for coastal resource management (Phase 1: 5 years; Phase 2: 5 years)	150,000,000	2	300,000,000
Total			300,000,000

3.3.2 Marine surveillance reinforcement project

BFAR-ARMM currently conducts the training programs of illegal fishing control to organize local marine surveillance groups, *Bantay Dagat*, at coastal municipalities in the Bangsamoro region. However, most of local Bantay Dagat groups have only small canoes with small power engines for regular monitoring at the municipal sea areas (from coastal line to 15 km). They cannot chase and catch illegal fishing boats in spite of their regular surveillance activities. In order to strengthen the monitoring activities by local communities, the project will equip local Bantay Dagat groups in coastal municipalities with speed boats to control illegal fishing activities in their municipal sea areas. In addition, the project will support to build Bantay Dagat offices with local fish market facilities in coastal municipalities.

A local office of Bantay Dagat is located on the pier of fishing port at Parang, Maguindanao. It is necessary to renovate the office building.

Fisheries Resource Management Unit Office at Banay-Banay, Davao Oriental. The community members work for monitoring and surveillance activities in collaboration of municipal LGU.

Coastal community members at Banay-Banay regularly meet at the fisheries resource management office to discuss the current and planned activities in fishing control and surveillance.

Photo 3.13 Marine Surveillance Activities in Mindanao

Table 3.14 Project Cost Estimate for Marine Surveillance Reinforcement

Main program	Unit cost (PHP)	Unit	Subtotal (PHP)
Construction/renovation of Pantai-Dagat offices and introduction of seed boats for surveillance activities at all 52 coastal municipalities	5,000,000	52	260,000,000
Total			260,000,000

Note: There are 52 coastal municipalities (Maguindanao 6, Lanao del Sur 4, Basilan 12, Sulu 19, Tawi-Tawi 12).

Comprehensive Capacity Development Project for the Bangsamoro

Development Plan for the Bangsamoro

Final Report

Sector Report 1-4: Investment Promotion

Table of Contents

List of Tables

List of Figures

Abbreviations, Unit of Measurement, and Currency

(Refer to Sector Report 1-1: Agriculture, pp. 1-vi through 1-xi.)

CHAPTER 1 PRESENT SITUATION OF INVESTMENT PROMOTION IN BANGSAMORO

1.1 Present Situation of Investment Activities

1.1.1 Overview of investments in the Philippines and Bangsamoro

(1) Investments in the Philippines

The total investment to the Philippines by foreign and Filipino investors amounted to PHP 754 billion in 2013, increased by 8% from PHP 698 billion in the previous year. According to the projection by BOI, it is expected that the 2014 investment was likely to increase more favorably by over 10%. The investment by Filipino investors is increasing year by year, accounting for more or less 70% of the total in recent years (Table 1.1 and Figure 1.1).

Table 1.1 Total Approved Investments from Foreign Nationals by Sector, 2008–2013

(Unit: PHP million)

Industry	2008	2009	2010	2011	2012	2013	Accumulation 2008-2013	Growth Rate (S1 2013 - S1 2014)
A. Agriculture, Forestry and Fishing	91.2	2,405.5	1,217.7	1,264.6	4,514.3	2,678.8	12,172.1	608.40
B. Mining and Quarrying	3,360.2	630.8	6,074.5	544.7	229.6	1,976.7	12,816.5	(100.00)
C. Manufacturing	48,356.8	86,132.6	162,903.2	142,917.9	169,531.2	77,557.6	687,399.3	216.60
D. Electricity, Gas, Steam and Air Conditioning Supply	81,278.7	4,839.2	8,467.2	30,467.5	5,716.5	74,497.3	205,266.4	(96.00)
E. Water Supply; Sewerage, Waste Management and Remediation Activities	-	-	-	390.6	1,087.4	132.2	1,610.2	500.40
F. Construction	32.8	93.3	181.9	33.2	3,931.9	8.7	4,281.8	1,341.20
G. Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	322.2	152.7	202.2	71.8	280.5	155.0	1,184.4	446.30
H. Transportation and Storage	1,580.0	237.6	812.6	1,140.5	53,032.8	55,468.1	112,271.6	34.50
I. Accomodation and Food Service	-	-	2,180.0	1,014.3	8,049.0	25,380.8	36,624.1	(73.40)
J. Information and Communication	92.0	-	1,174.5	3,381.1	15,441.2	3,560.8	23,649.6	(49.10)
K. Financial and Insurance Activities	-	-	692.5	91.0	80.7	48.6	912.8	(31.80)
L. Real Estate Activities	11,557.3	16,433.0	4,273.7	61,716.3	9,997.0	6,434.7	110,412.0	124.90
M. Professional, Scientific and Technical Activities	-	-	437.7	263.1	182.8	632.0	1,515.6	376.20
N. Administrave and Support Service Activities	-	-	7,316.0	13,060.7	16,313.6	24,567.6	61,257.9	26.50
O. Public Administration and Defense; Compulsory Social Security	-	-	-	166.7	164.0	31.6	362.3	107.50
P. Education	-	-	10.1	23.3	540.1	254.7	828.2	(76.70)
Q. Human Health and Social Work Activities	-	-	80.0	-	0.8	1.2	82.0	100.00
R. Arts, Entertainment and Recreation	-	-	17.4	1,668.3	414.5	579.6	2,679.8	(99.20)
S. Other Service Activities	36,009.7	10,891.1	22.2	15.7	36.4	47.8	47,022.9	(100.00)
Total	**182,680.9**	**121,815.8**	**196,063.4**	**258,231.3**	**289,544.3**	**274,013.8**	**1,322,349.5**	**(32.70)**

Details may not add up to totals due to rounding.

In 2008 and 2009 under "Other Service Activities Sector", this industry includes hotel/restaurant/business, computer software development, health care program services, renting and leasing of water sport equipment, training services, protection/security training course, college education and other services.

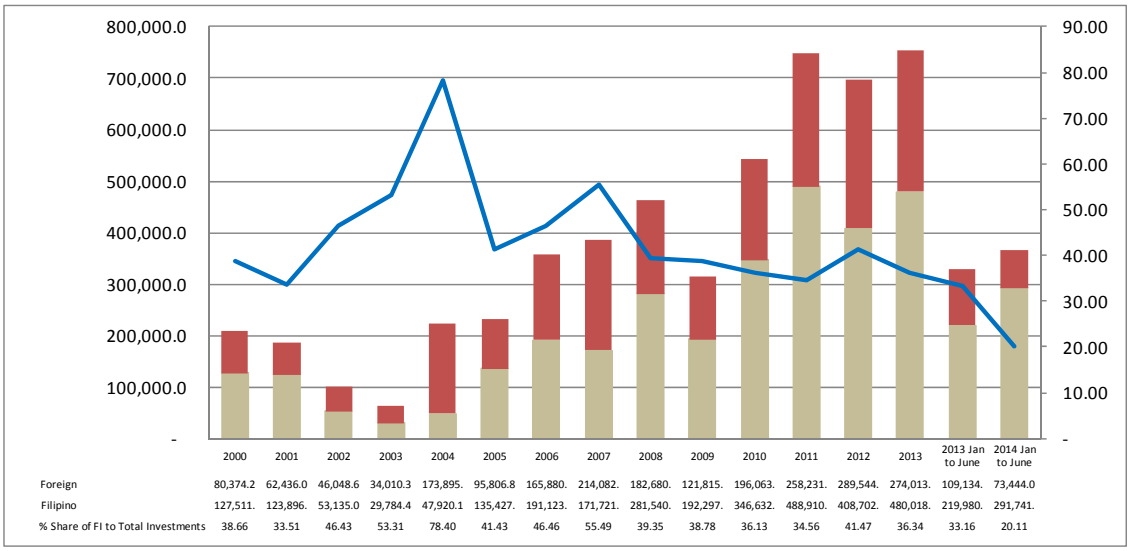
Source: Philippine Statistics Authority (PSA)

Of the entire investment, foreign direct investment (FDI) is expected to increase from US$3.9 billion in 2013 to US$4.4 billion in 2014 in prospect of the political and economic stability in the Philippines and the investors' readiness toward "China plus one" and "post China". The number of investments approved by the authority is stable at about 300 annually. However, due to the stable Philippine economy and the stagnant EU's and Chinese economies, the investment amount will be projected to increase steadily for years to come.

As presented in Table 1.2, the FDI from Japan is predominant after 2008 amounting to PHP 337 billion

(US$7.95 billion) or about 25% of the total FDI to the Philippines. The Netherlands and the U.S. follow, and these three countries together account for about 60% of the total. As for the comparison of FDI between the first semester of 2013 and 2014, it is observed that Germany, Singapore, and China increased FDI, and on the contrary, the U.S. and the Virgin Islands reduced the amount. The investment from China has once reduced when territorial issues on Spratly Islands emerged in 2011, but it shows some sign of picking up in recent years.

Cumulative investment by industrial sector from 2008 to 2013 shows that four sectors, namely, (i) manufacturing, (ii) electricity, gas steam, and air conditioning supply, (iii) transportation and storage, and (iv) real estate activities, have larger shares accounting for 84% of the total investment. Investment by real estate-related industries such as construction, utility, wholesale/retail trade greatly increased for the last two years. It is considered to be the result of increasing domestic demand backed by economic growth in the Philippines.



Source: BOI.

Figure 1.1 Total Investment by Foreign and Filipino Investors, 2000–2013

Table 1.2 Inward Foreign Direct Investment to the Philippines

Unit Php million

	Country	2008	2009	2010	2011	2012	2013	Sum	Share	2013 1st Sem	2014 1st Sem	Growth Rate (S1 2013 - S1 2014)
1	Japan	16,115.6	70,737.1	58,333.1	78,321.2	69,037.0	44,784.4	337,328	25.5%	9,463.7	11,097.8	117%
2	USA	19,721.4	12,947.1	13,143.6	79,854.5	39,996.7	55,343.6	221,007	16.7%	44,294.7	4,865.6	11%
3	Korea	39,953.6	9,623.6	31,182.4	13,235.1	9,795.0	8,527.3	112,317	8.5%	1,727.9	1,501.4	87%
4	Gemany	3,765.3	1,001.0	1,096.7	980.0	1,911.8	3,046.3	11,801	0.9%	17.9	2,883.9	16111%
5	Netherlands	45,354.3	2,070.0	36,784.1	28,303.3	104,743.3	24,807.7	242,063	18.3%	5,994.1	5,384.9	90%
6	Singapore	6,564.6	3,468.0	7,283.0	2,217.1	12,951.6	9,242.1	41,726	3.2%	1,450.3	12,037.6	830%
7	UK	25,272.5	3,439.4	1,065.0	1,719.3	6,768.8	1,471.5	39,737	3.0%	617.0	1,505.4	244%
8	Taiwan	1,287.6	222.6	1,505.8	3,130.0	2,472.1	3,140.3	11,758	0.9%	1,096.3	916.4	84%
9	PROC	2,307.1	2,391.8	5,657.1	20,657.4	1,988.3	1,240.9	34,243	2.6%	245.5	9,621.3	3919%
10	Cayman Is	3,615.7	-	10,638.3	8,443.0	7,018.8	7,298.5	37,014	2.8%	-	9,978.8	NA
11	Vergin Is.	2,110.6	1,176.0	7,653.8	2,324.2	3,721.7	92,780.9	109,767	8.3%	36,344.3	5,784.6	16%
	Others	16,613	14,739	21,720	19,046	29,139	22,330	123,588	12.9%	7,883	7,866	100%
	Total	182,681	121,816	196,063	258,231	289,544	274,014	1,322,349	104%	109134.2	73443.9	-32.7%

Data: BOI

(2) Investments in Bangsamoro

At present 46 companies are registered and doing business in Bangsamoro. The investors who had invested to the Region before 2000 were only 13. Table 1.3 indicates the investment amount by Investment Promotion Agency (IPA). Investment amount to Bangsamoro is recorded by R-BOI. The table indicates that the investment to Bangsamoro was rather small in the past and it started practically after 2012. Invested amount is the least among 15 IPAs in the Philippines. The cumulative invested amount during the period from 2008 to the 1st semester of 2014 accounts for 0.05% of the total.

Although invested amount is still small, some early investments are observed after the signing to the Framework Agreement on the Bangsamoro (FAB) in December 2012.

Table 1.3 Total Approved Investments from Foreign Nationals by Promotion Agency

(Unit: PHP million)

Agency	2008	2009	2010	2011	2012	2013	1st Qr. 2013	Growth (%) Q1 2013–Q1 2014
AFAB	0	0	0	86.0	390.6	2,120.7	0	0
BOI	93,551.6	10,396.9	22,328.5	23,234.9	74,064.8	120,646.3	62,805.8	(81.70)
BOI ARMM	0	0	0	0	426.8	322.0	0	0
CDC	9,243.0	4,535.5	26,249.8	18,805.9	4,504.4	1,986.0	799.7	893.0
CEZA	0	0	0	233.5	128.9	599.8	114.9	(55.50)
PEZA	70,355.1	103,421.3	142,167.4	195,534.1	209,376.6	147,670.8	45,239.8	(7.00)
SBMA	9,531.2	3,462.2	5,317.7	20,336.9	652.3	668.0	174.1	6,509.4
Total	182,680.8	121,815.9	196,063.4	258,231.3	289,544.4	274,013.6	109,134.3	(32.70)

Sources: Authority of the Freeport Area of Bataan (AFAB), Board of Investments (BOI), Board of Investments ARMM (BOI ARMM), Clark Development Corporation (CDC), Philippine Economic Zone Authority (PEZA), Subic Bay Metropolitan Authority (SBMA).

The latest investment data (January–September 2014) of Bangsamoro show that the industries related to power generation, banana plantation, palm oil production and mining share more than 50% of investment (Table 1.4). According to RBOI, two other investment projects will be added to the 2014 list. It is considered that the investment aiming to grab earliest opportunities through establishing a joint venture with powerful partner in Bangsamoro will be carried out and such movements will increase before passing of the Bangsamoro Basic Law (BBL).

Table 1.4 RBOI-ARMM Registered Firms as of Third Quarter (January–September) 2014

No.	Name of firm	Project/Activity	Capacity	Investment cost (PHP)	No. of jobs created
1	Lamsan Power Corporation, Sultan Kudarat, Maguindanao	Biomass renewable energy	15 MW	921 mil.	310
2	ABSCOR Multi Trading Company, Maluso, Basilan	Import and export trading	Per activity	10 mil.	153
3	S.R. Languyan Mining Corp., Tawi-Tawi	Nickel ore mining and quarrying	1,000,000 MT/annum	520 mil.	650
4	Agumil Phil. Inc., Buluan, Maguindanao	Palm kernel oil and copra	40-80 tons/hr.	170 mil.	554
5	Green Earth Enersource Corporation, Buluan, Maguindanao	Biomass renewable energy	4.5 MW	366 mil.	54
6	Philippine Trade Center, Sultan Kudarat, Maguindanao	Biomass renewable energy	3 MW	486 mil.	30
7	Powerup Ventures Incorporated, Parang, Maguindanao	Distribution of petroleum products	50 mil. L/year	50 mil.	33
8.	Darussalam Mining Corporation, Languyan, Tawi-Tawi	Mining and quarrying operation of nickel ore for export to China	830,000 WMT/year	193 mil.	310
9.	Bangsamoro Oil and Fuels Corporation, Parang, Maguindanao	Importation, distribution, and sales of petroleum products	9 million L/year	86 mil.	33
10.	Al Mujahidun Agro-Resources and Development, Inc., Ampatuan, Maguindanao	Cavendish bananas plantation (550 ha)	2 M boxes/year	570 mil.	867
	Total			3.372 bn	2,994

Source: R-BOI.

According to R-BOI, the field of investment is quite limited to agriculture and agri-business related areas, and investment destination from 1992 to the present is clustered mainly in the mainland provinces of Maguindanao and Lanao del Sur. However, out of 46 nominal companies, some of 21 investors

were officially registered in R-BOI, including those that have expanded operations. Maguindanao investors account for 70% followed by that from Lanao del Sur at 19% and from islands at 11%. Seven out of 21 are engaged in agriculture production (Cavendish banana production).

Looking back the history, some FDI from Malaysia and Middle East was recorded in the second half of the 1990s when ARMM was relatively peaceful but they were few and fewer succeeded as peace was frittered away.

In the mid of 2015, ARMM-BOI accepted provisionally registration of the investment by Iron Blaze Petroleum, Inc. for building of 90 million liters of oil depot in Polloc Port. Also, the investment of 300 ha of expansion of banana plantation in Pandag by La Frutera was newly accepted. It is a welcomed event in the sense that a reform-oriented administration was favored by the investor, but the investment amount of oil depot was still small and the investment by La Frutera was not greenfield investment anymore.

According to the 2015 February 5 news of the ARMM's official website, the incident in Mamasapano Maguindanao failed to weaken the interests of the investors over pouring investments in the region. The copper-nickel mining and oil depot projects have been approved. Chan C Mining Inc. in Panglima Sugala in Tawi-Tawi invested PHP 741.8 million in a copper-nickel mining project and Tawi-Tawian Petroleum Trading in Tawi-Tawi invested PHP 121.25 million in oil depot. However, these projects have already been scheduled for approval even before the Mamasapano incident.

Several news agencies reported that Mindanao could lose billions of dollars of potential investments pending the approval of the Bangsamoro Basic Law. There were reports of at least three foreign firms looking to have partnerships with local businessmen have put their investments on hold after the incident. Some foreign businessmen who are looking to build department stores and hotels, invest in banana farms have either cancelled their trips to Mindanao or have hurriedly left the country without finalizing a deal[1]. Many of the local investments in Mindanao also were postponed and investors are on a wait-and-see mode.

1.1.2 Major establishments in Bangsamoro

(1) Larger establishments

The bulk of activities in all sectors in Bangsamoro is in informal and small and medium scale activities. The 2010 ASPBI[2] counted only seven establishments in ARMM employing 20 or more persons in agriculture, forestry and fishing, all of which were involved in either growing Cavendish bananas or growing rubber trees. They had a total output of about PHP1.1 billion and value-added of PHP458 million[3].

The survey also counted only five manufacturing establishments in ARMM employing 20 or more persons. Of these, three were involved in manufacturing starches and starch products, one in manufacturing refined coconut and other vegetable oils and margarine, and one in the manufacture of veneer sheets and plywood.

(2) Banking

Bank offices are usually located in urban areas where household incomes are higher and there is a wide customer base. Almost all the banking offices operating in the ARMM (or within the vicinity of ARMM) are located in cities. In Basilan, for example, five banks have offices in Isabela City. In Lanao del Sur, three of its five banks offices are in Marawi City. All the bank offices in Sulu are found in the capital, Jolo. Cotabato City has the greatest banking presence with 13 banks and 18 offices.

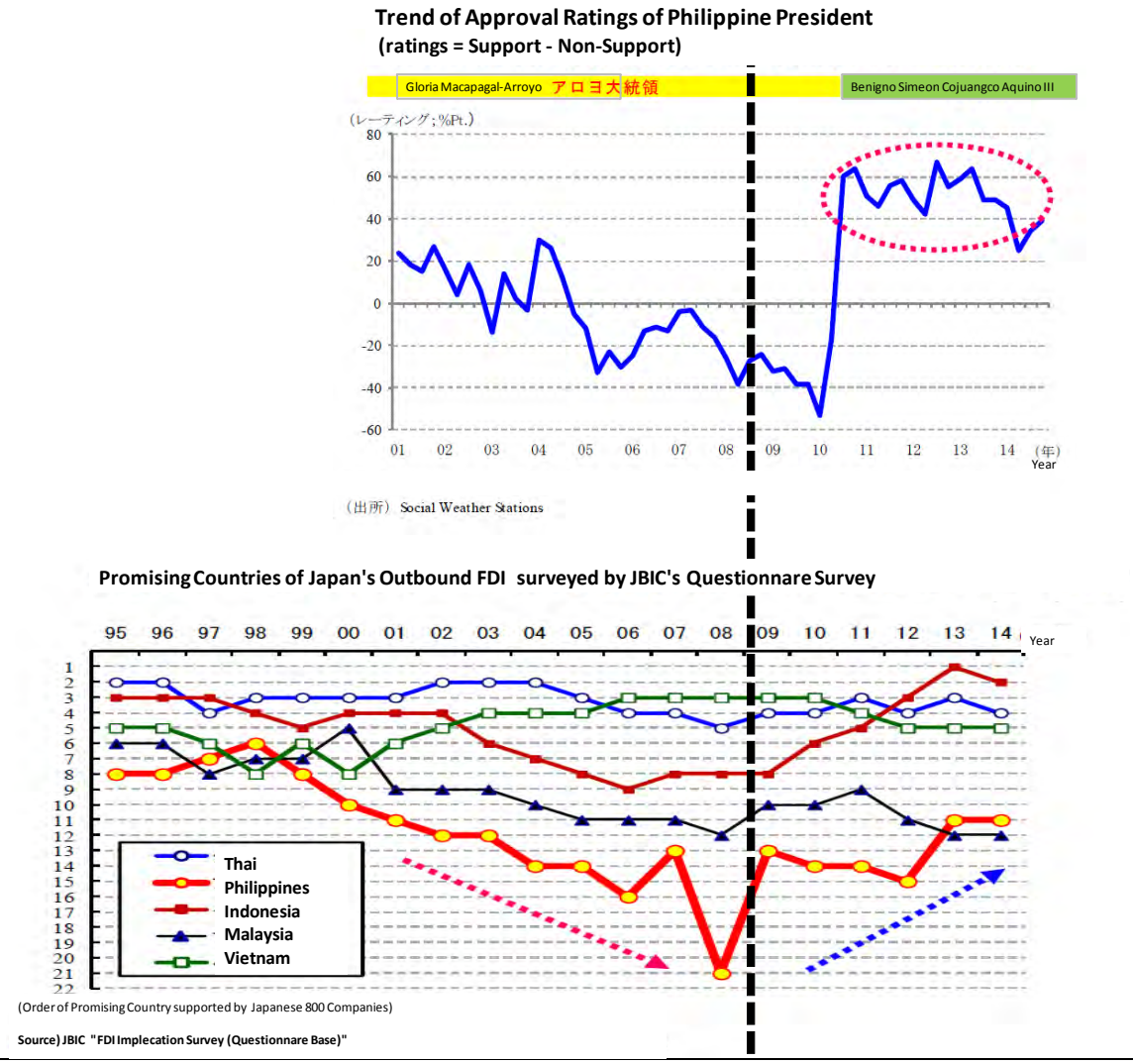
[1] Source: http://www.filipinoexpress.com/business-economy/1614-mamasapano-carnage-scaring-away-investors-business-group

[2] The Annual Survey of Philippine Business and Industry (ASPBI) conducted by the National Statistics Office.

[3] Agriculture and forestry contributed about PHP 44.6 billion (in current value) to ARMM's GDP in 2010.

Box 1: Investors' Sensitivity toward Politics

The figures below depict the relationship between political stability and investors' sentiment. After the Aquino administration, approval ratings toward the President has improved. Japanese investors are much more sensitive. As the approval ratings of President Arroyo decreases, the popularity ranking of the Philippines also decreases. Since 2009, Japanese investors might have felt some change in environment, and that might have contributed to the drop in the popularity of investment in the Philippines from 21st to 13th. In other words, those figures indicate that peace and order are the basic condition to attract FDI.



The 2011 JICA study identified 13 micro finance institutions and two rural banks that provided microfinance service in the ARMM. Together, they provided financial services to about 22,000 beneficiaries (4% of ARMM's population) and covered 34 municipalities (29% of ARMM's municipalities).

Islamic banking is yet to gain a strong foothold in Muslim Mindanao. Credit is not readily available in a manner consistent with Islamic Shari'ah principles, making it difficult for Muslims in the Bangsamoro to live in full accord with Islam. The Development Bank of the Philippines (DBP) took over 69% of the shares of Al Amanah in 2008, wishes to privatize Al-Amanah, and expects it could be fully operational and geared to effectively serve the market again by 2015.

However, it is still quite uncertain whether Bangsamoro people strongly desire a complete set of Islamic banking. Most people in rural areas in Bangsamoro lack the basic knowledge on bank credits as well as on the requirements for a Shari'ah compliant banking system. Interviewed MFIs unanimously mentioned that Muslims in Mindanao accept to pay interest, responding to the explanation that banks need to collect interest to supply loans. Many of MFIs have offered their regular services to their

Muslim clients without much difficulty, although at times phrasing *interest* in different terms such as *mark-up*, *administrative charge*, *service fee*, and the like. However, it should also be noted that there have been incidences where a village Muslim chief condemned his people of using banking services that are not Shari'ah compliant.[4] It is expected that the introduction of Islamic Banking will further facilitate the increase of bank loans in the Bangsamoro area.

The two government development banks, Land Bank of the Philippines (LBP) and Development bank of the Philippines (DBP), have a presence in Bangsamoro. LBP is more active than DBP in the region. The LBP has some 10 offices throughout the ARMM (including Isabela City and Cotabato City), while DPB has only three offices. DBP has no office in Lanao del Sur, Maguindanao, and Tawi-Tawi provinces, while LBP has five branches in these locations. Although there is only one DBP office in Cotabato City, there are three LBP offices. Neither bank has offices in Basilan outside Isabela City. Furthermore, government transactions, including handling of the employee payroll, are coursed through LBP.

DBP and LBP have provided funds to some of the larger entities. LBP, for example, provided funds to grower cooperatives for palm oil (through its Innovative Financing Scheme) production for the Agumil project in Maguindanao.

1.1.3 Perception of private sector on investment in Bangsamoro

(1) Foreign chambers of commerce

As the establishment of Bangsamoro political entity comes to a close, the implication on investment to the area seems to change as well. The JICA Study Team surveyed such change of implication through interviewing to seven international chambers of commerce, which are placing representative office in Manila[5]. The survey was conducted two times during December 2014 and October 2015, respectively, having insight on how the investor's mind was changed during this period. Further, the survey was also conducted to several tycoons belonging to the Chinese Chamber of Commerce in the Philippines (that is positioned under the umbrella of PCCI), who have storing influence to the economy of the Philippines[6] (Table 1.5).

Interest on investment toward Bangsamoro is still low among the investors in Metro Manila. The seven chambers of commerce also have little concern to Bangsamoro with the exception of Japan, Canada, U.S., and the Philippines, those which have branch office in Mindanao. However, the JICA Study Team has noticed that there are several companies finding business opportunity in Bangsamoro outside the reach of chambers of each country.

Four chambers having branch offices in Mindanao (mostly in Davao) mentioned that they will continuously watch the business environment of Bangsamoro for their member firms. The Chinese Chamber of Commerce of the Philippines and Chinese tycoons have expressed no interest of doing business at all in Bangsamoro for now.

(2) Companies based in Mindanao

In Mindanao, an interview survey was conducted from the end of 2014 to the beginning of 2015 at the Cagayan de Oro Chamber of Commerce and Industry (CDOCCI) and the Davao City Chamber of Commerce and Industry (DCCCII).

[4] Interview with Cooperative Bank of Cotabato

[5] Nationality of such chambers includes Japan (JCCIP), U.S. (Amcham), EC (ECCP), Korea, Canada, Australia, and the Philippines (PCCI). As for the PCCI, interview survey to the branch offices in Davao, Cagayan de Oro, and Cotabato was also conducted to see the difference of consciousness by region.

[6] The survey is aiming to analyze on time-series bases so that the second survey is planned after 1 year time from the first survey.

Table 1.5 Implication of Foreign/Filipino Chambers for Investment in Bangsamoro

Nationality of Chamber of Commerce	How do you see the investment to Bangsamoro after new autonomy starting after 2016?				The % of possibility to believe toward successful transactions of Bangsamoro political entity.
	The resource of Bangsamoro which attracts investors.	The country move for investing to Bangsamoro in the first place.	The moves of investors of own country toward new autonomy.	The condition to attract investors.	
Japan	Agriculture (fruits in particular)	China	Nakashin, Sumitomo Fruits (but they are formally saying "No interest".	Peace and Order	100%
USA	Agriculture, Agro-Processing	Malaysia	Wait and see. But always watching. (Delmonte is moving forward in the field.)	Polliok Port	Frankly 50% (but announcing 100%)
EU	Agriculture, Truism, Mining	USA	None so far. (No European enterprise was heard in the field.)	Peace and Order Proper legislative system to protect investors. Attractive incentives	100%
Korea	Unknown natural resources	Nearby Muslim Countries	None so far (Actually, Korea Rural Community Corp. was already approaching to ARMM-DAR for feed crops plantation)	Peace and Order Create own sources of revenue The trust from other Muslim country	50-60% Peace and Order not yet secured. Economic policies are still controlled by the Philippine Government.
Canada	Mining, Agriculture, and Truism	Malaysia and Indonesia (Canadian companies will not have strong power to do so.)	Canadian Chamber is negotiating with Central Government for easing condition on mining development.	Reconsidering of development policy on mining development of BBL.	100% But BBL will not be approved as it is.
Australia	NA				
Philippines (Manila)	Infrastructure, Agriculture, Tourism	Malaysia	Only the companies in Mindanao started to move.	Infrastructure Tax incentives	100% (members in Mindanao) 50% (members in Luzon)
Chinese	Infrastructure, Agriculture	Malaysia	None so far Most of investors have no intention to invest to Bangsamoro.	They do not know how to make business. Especially, they do not know how to deal with Muslim businessman or consumer.	No idea (depend upon next President of the Philippines)

Source: Interview by JICA Study Team

The interest of DCCCII toward Bangsamoro investment is so strong compared to the companies in Luzon Is., because there are several member companies (e.g., La Frutera and Agumil) that already have ties with Bangsamoro and they have already track record on investing there. The same result was obtained through the interview to CDOCCI. It was thought that the companies locating in Mindanao have massive interest toward Bangsamoro and a number of companies are already planning to extend their business there. In this sense, it may be considered certain that the first target of attracting investment will be the companies locating in Mindanao.

The private sector in Mindanao is already aware that good and bad relationships between local bosses is a key factor in doing successful business in Bangsamoro. Sometimes there is the run up case prior to the future investment to Bangsamoro that a private company invests with a tycoon in Bangsamoro toward the business in Davao and Cagayan de Oro.

(3) Neighboring countries

Neighboring countries such as Malaysia, Indonesia and Brunei are also showing strong interest to Bangsamoro (Table 1.6). Malaysia already organized reconnaissance missions several times for the future investment with potential investors in Bangsamoro.

As of the end of 2014, media coverage of Indonesia and Brunei for Bangsamoro-related matters is small compared to Malaysia. However, major newspapers report that neighboring three countries are aiming to establish strong ties with Bangsamoro and that some neighboring countries are proposing bilateral cooperation for institutional support and capacity development of Bangsamoro. It seems to be a notable point that support for establishment of Islamic banking system may take effect by the support of Malaysia because such development has not been going so smoothly in Bangsamoro so far.

Table 1.6 Interests of Bangsamoro by Malaysia, Indonesia, and Brunei

Country	Date Reported	News Source	Interest in Bangsamoro
Malaysia	28 February 2014	The Sun Daily (M'sia keen to offer expertise to Philippines: Najib)	Malaysia will offer capacity building to have new skills for the Bangsamoro people to handle (or manage) the future government.
BIMP-EAGA	19 June 2014	The Brunei Times (Bangsamoro region bullish on investments from EAGA)	The RBOI of ARMM expected the governments of Brunei, Malaysia and Indonesia to help in ensuring the peace process and to support the economic development of the new Bangsamoro region through the investments that they or their nationals will pour in the area.
Malaysia	24 October 2014	MindaNews (Malaysians eye Bangsamoro investment)	MindaNews noted that "a joint Filipino-Malaysian venture in the palm oil industry has existed in Mindanao through the Agumil Philippines Inc."
Indonesia	13 September 2014	Manila Bulletin (Indon palm oil producer seeks investment security)	PT. Musim Mas, the second largest palm oil producer in Indonesia, was seeking assurance from the government as it was exploring possible palm plantation and refinery investments in Mindanao.
Malaysia	13 September 2014	Manila Bulletin (Indon palm oil producer seeks investment security)	Manila Bulletin reported that Felda, Malaysian government's cooperative for small palm oil growers, visited to explore investments in palm oil production in Mindanao.
Malaysia	26 September 2014	Philippine Daily Inquirer (Malaysian investment bankers exploring business prospects in PH)	Headed by MIDF Amanah Investment Bank, Malaysian investment bankers visited the Philippines. MIDF Amanah Investment Bank noted that the group was also considering the "massive untapped potential of Mindanao, mainly in agriculture supply chain."
Malaysia	3 November 2014	Gen San Times (Malaysians Bullish over Bangsamoro)	Malaysian businessmen are looking for possible joint venture with local corporations for oil palm and rubber plantations in the Mindanao.

Source: Major newspapers in the Philippines, Malaysia, Indonesia and Brunei.

1.2 Issues and Challenges on Investment in Bangsamoro

1.2.1 Infrastructure

(1) Transportation infrastructure

Lack of infrastructure is a major issue to attract investment to Bangsamoro. Water, land and air transport facilities need substantial improvement, with more conscious effort to integrate them into logistical network between production area and market. High cost of inter-island shipping is a major constraint to the competitiveness of producers in all of Mindanao. It is caused by the inefficiencies and poor freight handling facilities in most of the ports, and the lack of competitiveness in inter-shipping operations. The repeal of the coastal shipping act and enhancement of road transportation will increase transportation power. The road network needs urgent upgrading.

The importance of construction of farm-to-market roads at previously neglected areas will be eyed from the viewpoint of agricultural development. Rehabilitation of national roads is less prioritized because the paved ratio in Bangsamoro is higher than other part of the Philippines, although the road density is considerably lower for national roads in Bangsamoro than in other regions. Secondary and tertiary roads (F-M road) may need more attention to develop/rehabilitate by the Bangsamoro government.

(2) Electricity

Power outages are common, because the bulk of power supply is running short in Mindanao. At the retail level, system losses by rural cooperative distributers are very high due largely to poor management. Many communities do not have access to electricity or cannot obtain needed volume.

(3) Other infrastructure

A similar structural problem can be seen in the provision of water supply to urban areas. Water supply in urban areas is suffering from awful management problems brought about from low level of fee collection and high percentage of water leakage. Infrastructures related to water and environmental management, erosion, drainage and flood control are insufficient in watershed and river basin areas. Irrigation facilities also need urgent rehabilitation.

1.2.2 Institutional issues

(1) Banking system

A healthy banking system is not in place in Bangsamoro. Unless stable conventional banking and finance and Islamic banking system are fit in, it is difficult for investors to gain sustainable foothold in this area.

Physical issues

ARMM is the least banked region in the Country. The number of banks and automated teller machines (ATMS) in the ARMM is far less than in any other region of the Philippines. From 2006 to 2013, the number of banks declined from 26 to 20. Moreover, as of 2013, of the more than 12,000 ATMs in the Philippines, only 25 are located in the ARMM (Table 1.7).

Table 1.7 Distribution of Banks and ATM[7] by Region

		Distribution of Banks			Distribution of ATM		
Region		6-Dec	13-Mar	Cange (%)	2009	2012	Change (%)
	NCR	2,649	3,016	14	3,867	5,324	38
	CAR	110	148	35	114	162	42
I	Ilocos	379	419	11	241	356	48
II	Cagayan Valley	231	290	26	112	165	47
III	Central Luzon	812	982	21	681	1,066	57
IV-A	CALABARZON	1,170	1,417	21	1,133	1,748	54
IV-B	MIMAROPA	86	207	141	69	140	103
V	Bicol	219	318	45	178	261	47
VI	Weatewrn Visayas	439	547	25	400	518	30
VII	Central Visayas	503	632	26	605	921	52
VIII	Eastern Visayas	133	176	32	122	181	48
IX	Zamboanga Peninsula	122	190	56	129	176	36
X	Northern Mindanao	252	327	30	238	327	37
XI	Davao Region	253	360	42	301	480	59
XII	SOCCSKSARGEN	168	195	16	168	259	54
XIII	Caraga	114	198	74	77	115	49
	ARMM	26	20	-23	23	25	9
	Universal and Commercial Banks	21	17	-19			
	Thrift Banks	1	1	0			
	Rural Banks	4	2	-50			
TOTAL		7,666	9,442	23	8,458	12,224	45
Source: BSP (as of Apr.2008)							

On a per capita basis, there were only 0.1 banks and 0.1 ATMs per 10,000 adults in the Bangsamoro region in 2011. On an average, each bank office served, 200,000 persons, far more than any other region in the Country. Almost all the banks operating in the ARMM are branch offices of universal and commercial banks. There is one thrift bank in addition to two rural/cooperative banks. Further, about 93% of municipalities in the ARMM have no banking presence (Table 1.8).

The minimal presence of banking offices in the region could be attributed to the following reasons:

[7] Three tables in this section were referred from WB "Working Paper No. 7 Banking and Finance in the ARMM"

- Low level of household income[8],
- Inaccessibility to the banks due to the poor state of Barangay or farm-to-market roads[9], and
- Investors to banking sector are hesitant to expand the banking network in ARMM due to security reasons.

Table 1.8 Availability of Banking Service by Region

Region		Banking Services Coverage			Municipal Banking Presence(%)		
		2011		2013			
		Banks per 10,000 adults	ATMs per 10,000 adults	# of persons served by a banking office	No banking presence	No banks but with alternative access points	No access points at all
	NCR	3.5	5.1	4,066	0	0	0
	CAR	1.3	1.1	11,840	65	5	60
I	Ilocos	1.1	0.8	13,170	27	11	18
II	Cagayan Valley	1.2	0.6	12,339	27	5	22
III	Central Luzon	1.3	1.1	10,985	8	7	2
IV-A	CALABARZON	1.6	1.6	8,979	6	5	3
IV-B	MIMAROPA	1.0	0.4	16,212	37	21	8
V	Bicol	0.7	0.5	20,198	36	22	17
VI	Weatewrn Visayas	0.0	0.8	14,718	21	25	2
VII	Central Visayas	1.2	1.4	12,231	37	37	9
VIII	Eastern Visayas	0.6	0.5	26,324	70	44	39
IX	Zamboanga Peninsula	0.8	0.7	19,102	63	25	28
X	Northern Mindanao	1.1	0.8	13,401	35	6	29
XI	Davao Region	1.1	1.0	12,971	20	4	12
XII	SOCCSKSARGEN	0.7	0.7	21,835	34	10	15
XIII	Caraga	1.2	0.5	13,381	27	3	25
	ARMM	0.1	0.1	195,174	93	8	86

Source: BSP

Other issues

The conventional banking practices do not conform to the social and religious norms of the people of ARMM. It is sure that the needs are there to respect Islamic Shari'ah principles, but the attempt to have Islamic banking system such as Al-Amanah Islamic Investment Bank failed due to the inadequate expertise in Islamic banking and the lack of a coherent legal and a regulatory framework that can support such banks.

Also, the ARMM has the lowest levels of bank deposits and loan portfolio in the Country. ARMM's basic loan-deposit ratio of just over 11% is the lowest of all the regions. The low loan deposit ratio also indicates that there are not many opportunities for lending, and/or banks are hesitant to lend (Table 1.9).

Banking regulation is also a critical issue. The General Banking Law of 2000 (RA 8791) mandates the major lead taken by Bangko Sentral in regional financial operation. It is very obvious that without BSP, no proactive operation by other banking institutions is expected.

For opening a BSP regional office, the following criteria are sought and it seems too much for Bangsamoro operation.

- The area must have significant economic activity. It must have at least 15 bank branches, at least 20 non-bank financial institutions, and at least PHP 5 billion deposit base.
- The regional government has to have proper business development plan for the region.
- There has to be infrastructure support - such as regular land, air or water transport facilities, and

[8] The 2009 Family Income and Expenditure Survey (FIES) results tag the ARMM as the poorest region in terms of average household income, some 80% lower than the country average.

[9] According to 2011 JICA's "Development Study on Local Industry Promotion in ARMM", it is revealed that 32 percent of ARMM business-owners kept their money in banks while 78 percent kept their cash at home or in the business office. Among the reasons cited by respondents for not opening a bank account was the distance from a bank.

reliable telecommunications facilities - and the absence of significant security risks.

- The area should not be in the catchment area of an existing BSP regional or branch office.

As for Islamic banking, the lack of a legislative base and regulatory framework is one of the main obstacles for the development of Islamic banking in the Country. RA 6864 is specific to Al-Amanah, and no other law provides for the setting up and regulation of Islamic banking, whether government or privately owned.

Table 1.9 Regional Distribution of Deposit and Loan Amounts

Region		Distribution of Deposit and Loans (million pesos)		
		Deposit Liabilities	Loan Portfolio	Loan Deposit Ratio(%)
	NCR	3,581.2	2,908.3	81.2
	CAR	52.2	7.1	13.5
I	Ilocos	101.4	20.7	20.4
II	Cagayan Valley	59.6	20.1	33.7
III	Central Luzon	272.4	71.8	26.4
IV-A	CALABARZON	379.6	67.1	17.7
IV-B	MIMAROPA	30.5	8.8	28.8
V	Bicol	64.0	19.8	31.0
VI	Weatewrn Visayas	149.8	38.6	25.8
VII	Central Visayas	264.5	69.0	26.1
VIII	Eastern Visayas	47.4	12.3	25.9
IX	Zamboanga Peninsula	50.3	14.6	28.9
X	Northern Mindanao	78.9	23.3	29.6
XI	Davao Region	106.4	33.8	31.8
XII	SOCCSKSARGEN	55.5	17.3	31.1
XIII	Caraga	31.1	9.7	31.2
	ARMM	3.9	0.4	11.2
TOTAL		5,329	3,343	62.7
Source: BSP				

(2) Land and property rights

Land and property rights pose the root constraint to Bangsamoro. Migration and settlement of vast tracks of Mindanao further confound the land issues among settlers, Muslims and indigenous peoples. Dynamics of movement toward Bangsamoro autonomy is also originated from this issue. The government agencies in charge of land registration and dispute are presented in Table 1.10.

Various laws and regulations introduced over the years by the Philippine Government made things more complex, causing conflicts between the property rights based on conventional rules and ownership based on the Philippine law. Competing claims over land ownership was a principal cause of conflict in Bangsamoro for a long time. Uncertainty of land ownership will weaken the development power of the Bangsamoro authority, which will constrain investment activities in many localities toward the large-scale development such as agricultural plantation[10] and mining.

JICA[11] found that a plan to operate a large-scale palm oil plantation in Lanao del Sur was suspended due to issues with land titles. According to this study, even many microfinance institutions (MFIs) limit agricultural loans to those with proper land titles.

Without solving land issues, Bangsamoro cannot collect proper land property tax and vulnerable financial situation will not improve. Further, the way people think *Goberno a Saruang* Syndrome (i.e.,

[10] When investors need finance, banks normally ask for collateral and land readily comes in handy for the purpose. Agumil Investments Inc. (see 3-2 of this report), a palm oil manufacturer in Maguindanao, was turned down for a loan by the Development Bank of the Philippines (DBP) because of concerns over land titles.

[11] "Development Study on Local Industry Promotion in ARMM", JICA,2011

"It is a foreign government and we are obliged to neither contribute to it nor take care of it") never changes.

Table 1.10 Government Agencies Tasked for Land Registration and Dispute Resolution

Agency	Role
Land Registration Authority (LRA), Department of Justice(DOJ)	LRA endorses the commonest land title. It is most well known registering agency in the Philippines. The official registration is based on a Torrens title system for land ownership.
Land Management Bureau (LMB), Department of Environment and Natural Resources (DENR)	LMB administers the distribution of public alienable and disposable lands using patents of various forms. It also maintains technical information on land records based on cadastral surveys.
Forest Management Bureau (FMB) under DENR	FMB issues an instrument of land rights for inalienable public lands, such as uplands, to communities and private entities.
Department of Agrarian Reform (DAR)	DAR implements the Comprehensive Agrarian Reform Program (CARP), and issues the Certificate of Land Ownership Award (CLOA) as proof of land transfer. This is registered with LRA with encumbrances, i.e. a ten-year proscription period, and amortization over a thirty-year period.
National Commission on Indigenous Peoples (NCIP), Presidential Office (PO)	NCIP issues instruments over lands in the ancestral domain, i.e. Certificate of Ancestral Domain Title, and Certificate of Ancestral Domain Claim.
Court (Barangay Court, Civil Court, Shari'ah Court)	The courts have the power to settle ownership claims which are then reflected in the registered title. In Bangsamoro, Philippine law recognizes three justice systems to resolve land conflicts. In addition to Barangay and Civil court systems, Shari'ah system is also admitted in case where both claimant and defendant are Muslim.
Local government units (LGUs)	LGU collects real property taxes and enforce land use laws and ordinances. In the absence of formal title, a tax certificate is a key document to establish possession.

Source: JICA Study Team

1.2.3 Issues on human resources

Bangsamoro fares poorly by all social indicators, including education achievements. The ARMM for example, has the lowest completion rates of elementary and high schools in the Philippines. More than one-third of the workforce is illiterate. It is rather tough for investors to find highly skilled staff such as lawyer, architect and engineer from local Muslim workforce. Those high skilled personnel have usually blood relationships with local strongmen. This fact underpins to the investor's partnership, that it is, the necessity to tie up with a local strongman.

Related literature on labor and employment in ARMM mentioned a lack of formal employment opportunities for the people, due to the limited number of formal business establishments in the region. For instance, established companies are mostly in agriculture, such as La Frutera, Matling Industrial Corporation, and Agumil Philippines, Inc. The type of work might not also require professional services; these companies will require more labor than professional services for daily operations.

In addition, formal education is a struggle in the region, as there are less number of established higher educational institutions and most families have financial constraints to send their children to school. Those richer families in ARMM will send their children in educational institutions in Metro Manila or other urban centers in the Country. They will have better employment prospects in Metro Manila than in ARMM.

With the lack of quality formal education and dearth of jobs in the formal sector in ARMM, three possible employment options are left as follows:

- *Seek employment in nearby urban centers in Mindanao*. Since most of the job seekers would be the out-of-school youth or those with lower educational attainment, they would be hired on part-time jobs, or low-paying services-oriented jobs.[12]

[12] *Jobs for the 21st Century: Philippines/Autonomous Region of Muslim Mindanao (ARMM) Assessment*. USAID. December

- *Seek employment in Metro Manila*. Similar with the job opportunities in urban centers in Mindanao, employment in Metro Manila would be in low-paying services sector, possibly in retail industries.
- *Seek employment in other countries, such as Malaysia and those in the Middle East*. Last option for the labor pool—for both the youth and the adults—would be seek for work in Muslim countries.[13] Due to low educational attainment, overseas contract workers from ARMM will be employed in labor intensive jobs, such as construction workers and domestic helpers.

Employment options for Bangsamoro people are limited due to structural issues in labor and education. The type of work within and outside ARMM will be the same. The only difference is the salary that they may be able to get when they work in Metro Manila or in other countries.

To bridge the gap in the human resources issues in ARMM, both the level of education and type of employment should be improved. Currently, various scholarships and technical-vocational trainings are offered; it will be ideal if these initiatives are continued. In terms of employment, entrepreneurships are also encouraged, so that people will be self-employed in small, productive industries. More importantly, to encourage gainful employment in the Bangsamoro area, there should be more investments in formal industries from potential locators (both local and foreign).

2005.

[13] Feature Stories. MDG F Joint Programme on Youth Employment and Migration, International Labor Organization.

CHAPTER 2 INVESTMENT POTENTIALS

2.1 Existing Promotion-Related Laws

2.1.1 Governing laws at present

Three legislative set ups namely, RA 9054, Muslim Mindanao Authority Act (MMAA) 25, and MMAA 154 (and Cotabato City Investment Code) will affect the investors' business in Bangsamoro. Also, RA 9054 is recognized as environment regulation. The gist of these laws is presented in the subsequent pages (Table 2.1). As mentioned in the subsequent pages, these laws should be modified into more simplified and investor friendly ones.

2.1.2 Investment incentives

According to Republic Act No. 6734, the ARG is tasked to oversee, regulate, and "exercise authority over the foreign investments within its jurisdiction in accordance with its goal and priorities, subject, however, to the Constitution and National policies".

Box 2: Incentives Offered by the Regional Board of Investments in the ARMM

Fiscal incentives available to ARMM-RBOI-registered firms include:

a) income tax holiday (six years for non-pioneer and pioneer enterprises alike);
b) tax credits (on domestic capital equipment, on duty portion of genetic materials and breeding stocks, and for duties and taxes on raw materials);
c) further deduction from taxable income; reduced duty on the importation of capital equipment;
d) tax exemption on breeding stocks and genetic materials;
e) exemption from wharfage dues and export tax, duty, impost and fee; exemption from taxes and duties on imported spare parts; and
f) incentives for necessary and major infrastructure and public utilities.

Non-fiscal incentives that ARMM-RBOI-is authorized to grant consist of:

a) employment of foreign nationals;
b) simplification of customs procedures;
c) importation of consigned equipment; and
d) privilege to operate a bonded manufacturing warehouse

Registration with RBOI-ARMM is limited to business entities that are engaged in activities or have products that are listed in the annual Investment Priorities Plan prepared by the National Board of Investments, especially those belonging to the list pertaining to the ARMM. This list encompasses priority activities that have been determined by the ARMM-RBOI, such as those shown below.

Box 3: Priority Investment Activities

Priority Investment Activities

a) export activities;
b) agriculture, agribusiness/aquaculture, and fishery;
c) basic industries (e.g. textile production);
d) consumer manufactures; infrastructure and services;
e) industrial service facilities;
f) engineering industries;
g) logistics;
h) Brunei Darussalam–Indonesia–Malaysia–Philippines East ASEAN Growth Area (BIMP-EAGA) trade and investment enterprises;
i) tourism; and
j) health

Table 2.1 Investment Governing Laws Effective at Present

Governing law	Summary	Notes
Republic Act (RA) No. 9054—amending RA 6734, ARMM Organic Law	Regulations for operation of businesses and placing of investments within the autonomous region. ARMM government regulates and exercises authority over foreign investments within the region. The national government may only intervene in matters concerning national security.	- Business entities whose main, central, or head offices are situated outside the region but doing business within the ARMM's jurisdiction should pay income taxes corresponding to income realized from their operations within ARMM to the respective municipalities or cities. - Investors in the autonomous region can avail of incentives granted by the Regional Legislative Assembly (RLA) of the ARMM - RLA has the authority to grant incentives inclusive of tax rebates and holidays for investors in industries. - Cooperatives that reinvest no less than 10% of their surplus and firms that reinvest at least 50% of their net profits in socially-oriented projects can also be given the same incentives - Traditional barter trade and counter-trade with Brunei, Malaysia, and Indonesia are subject to regulation by the regional government. However, this law states that items or goods bartered or counter-traded with these countries cannot be sold in other parts of the Philippines without the payment of appropriate customs or import duties.
Muslim Mindanao Autonomy Act (MMAA) No. 25	Authorities of ARMM provinces to impose tax to business entities.	- Local governments of Sulu, Tawi-Tawi, Basilan, Lanao Del Sur, and Maguindanao have the authority to levy taxes on businesses engaged in the printing, publication of books, posters, cards, leaflets, certificates, handbills, pamphlets, receipts, and others of comparable nature. - The provincial governments of ARMM may also impose franchise and amusement taxes within their respective territorial bounds, the examples are lessees, operators, or proprietors of cinemas, theaters, circuses, concert halls, and boxing stadia. - The provinces have the power to impose an annual fixed tax for every van, truck, or any vehicle used by producers, manufacturers, dealers, wholesalers, or retailers in the distribution or delivery of cigars and cigarettes, fermented liquors, distilled spirits, soft drinks, as determined by the Sangguniang Panlalawigan, to consumers, sales outlets within the territories in an amount not more than PHP 500,000. - ARMM provinces can levy and collect taxes on sand, ordinary stones, gravel, and other quarry resources extracted from the beds of seas, rivers, lakes, creeks, stream, and other public waters, or from public lands situated within their respective territorial domains. The provincial governor exclusively issues permits to extract such quarry resources. - The power to grant fishery privileges in municipal waters and impose appropriate rentals, charges, and fees lies within ARMM municipalities.
Muslim Mindanao Autonomy Act No. 154 or ARMM Special Economic Zone Act of 2003	Trading mechanism offering both local and foreign businesses tariff and tax incentives. Similar to Special Economic Zone Act of 1995.	- 2010, Polloc Port was declared a free port/zone, making it a non-Customs territory. - Investors are granted tax exemptions, as well as duty free importations.
Local Investments and Incentives Code (LIIC)	Investment policies of Economic Zone (now Polloc Port Zone only). The LIIC of Cotabato City is entrenched in Ordinance No. 1756 Series of 2000, or the Revised Cotabato City Investment Code of 2000	- Investment policy includes, i) Programs of a local government unit (LGU), ii) Investment Priority Areas (IPAs), iii) Incentives (fiscal, real property, green, and non-fiscal incentives) , iv) Procedure, v) Composition, functions, and roles of Investments Promotion Center (IPC) and the Local Investments/Incentives Board (LIIB). - Incentives that are available for registered enterprises in the city include exemptions from payment of; i)building permit fees and other charges, ii) mayor's permit fees, business sales taxes, and other fees and iii) basic real property tax on land and building improvements machinery. - Depending on category investment belong to, firms may enjoy these incentives for different number of years.
Republic Act No. 9054	Laws for protection, rehabilitation, and the sustainable development of forests, coastal, and marine resources, including the	- Control, regulation, and supervision over the "exploration, utilization, development, and protection of the mines and minerals and other natural resources within the autonomous region" are vested in ARMM government with the exception of strategic minerals. - ARMM assembly has the power to give concessions and franchises and the regional governor can grant licenses, permits, and leases over

Governing law	Summary	Notes
	adoption of projects to ensure "maintenance of ecological balance" covering environmental regulations, policies, and institutional arrangements.	agricultural, mineral, and forest lands - Exploration, utilization, and development of natural resources—are allowed to "all citizens and to private enterprises, including corporations, associations, cooperatives with at least sixty percent (60%) of their capital investment or capital stocks directly controlled or owned by citizens. - The regional government is in charge of prohibiting "the use, importation, deposit, disposal, and dumping of toxic or hazardous substances within the autonomous region". - ARMM and the National Capital Region (NCR) are the only regions in the country that prohibit mining operations.

2.2 Investment Opportunities in Bangsamoro

Businesses are encouraged to position themselves in the ARMM or the Bangsamoro region as it still has huge potential for business because there is less market competition. Based on the website of the Regional Board of Investments of ARMM, the investment priority areas in the region are the following: 1) business process outsourcing (BPO), 2) agri-aqua industry, 3) builders/woodworks industry, 4) garments industry, 5) tourism industry and 6) halal industry.

2.2.1 Business process outsourcing

According to the IT Business Processing Association of the Philippines, the signing of the framework agreement with the Moro Islamic Liberation Front (MILF) to end the four decade armed conflict between the Country's military forces and Muslim secessionists in Mindanao in year 2012 made the area potential to be the next IT BPO hub[14].

It is expected that there will be increased investment in the educational and communications infrastructure in the region with the approval of the Bangsamoro Basic Law. The National Government has disclosed plans in 2012 to invest PHP 21 billion for the improvement of the basic services in the region that includes infrastructures and education. The region then can potentially offer new talent pool to support the growth of the IT-BPO industry.

In the next five years, the IT-BPO industry of the Philippines is expected to grow at 20% annually. Davao is already successful in attracting numerous IT-BPO operations that they are now rank 69 among the top 100 outsourcing destinations in Southeast Asia (from rank 70 in 2013)[15]. There is certainly great possibility that the Bangsamoro area can also attract many IT BPO operations in the future.

The Bangsamoro region is one of the best places in the Country to establish agricultural business. According to the socio-economic planning secretary of the National Economic Development Authority (NEDA), Mr. Arsenio Basilacan, the region can be a food basket because of its highly productive land[16]. It boasts of abundant marine, agricultural and forest resources that includes banana, coconut, mangosteen, lanzones, durian, fish, seaweeds, and abaca among others.

2.2.2 Agricultural production[17]

The climate and soil in Bangsamoro are largely suitable for agriculture. The climate is conducive to year round crop production due to moderate and even distribution of rainfall throughout the year and is generally spared from typhoons.

The region has vast tracts of uncultivated lands. The arable land is estimated at 34,000 km^2 and there are 500,000 ha of available land for oil palm, coconut, corn, banana, rubber and other crops (Table 2.2).

The Bangsamoro region also hosts the two biggest irrigation systems (Kabulnan and Maridagao-

[14] Source: http://www.bpohotjobs.com/index.php/explore/page-1/134-bangsamoro-next-it-bpo-hub
[15] Source: http://www.wallacebusinessforum.com/wp-content/uploads/2014/03/I-MARBUS14.pdf
[16] Source: http://www.gmanetwork.com/news/story/420000/economy/business/mamasapano-clash-raises-uncertainty-for-investments-in-bangsamoro-area-says-neda-chief
[17] From the website of the Regional Board of Investments ARMM

Malitubog) in Mindanao capable of supporting 45,000 ha of farms. The Country's second biggest lake, the Lanao Lake, can also allow to irrigate vast land and provide the whole of Mindanao mainland with hydroelectric power.

Maguindanao's marshy and fertile flatlands are suitable for rice, corn, vegetables and other crops. It has a wide coconut and cassava plantations for commercial or industrial purposes and also hosts the biggest banana plantation in the region.

Table 2.2 Selected Crops in the Philippines and ARMM[18]

Top crops by contribution to national production		2009	2010	2011	2012	2013
Mangosteen	Philippines (ton)	1,567	5,552	683	3,209	3,303
	ARMM (ton)	558	2,558	15	1,995	2,047
	% of national production	36	46	2	62	62
	Growth in ARMM (%)		358	-99	13,030	3
Cassava	Philippines (ton)	2,043,719	2,101,454	2,209,684	2,223,144	2,361,527
	ARMM (ton)	1,012,330	1,008,86	1,007,453	1,018,968	1,035,107
	% of national production	50	48	46	46	44
	Growth in ARMM (%)		-0.3	-0.1	1.1	1.6
Oil palm (fresh fruit bunch)	Philippines (ton)	516,114	565,459	540,913	531,294	473,416
	ARMM (ton)	288	664	18,795	60,426	106,527
	% of national production	0.1	0.1	3.5	11.4	22.5
	Growth in ARMM (%)		131	2731	222	76
Durian	Philippines (ton)	55,726	77,548	58,968	85,960	91,211
	ARMM (ton)	5,660	13,785	258	9,033	11,866
	% of national production	10	18	0.4	11	13
	Growth in ARMM (%)		144	-98	3390	31
Corn	Philippines (ton)	7,034,033	6,376,796	6,971,221	7,407,068	7,377,293
	ARMM (ton)	950,429	855,666	796,661	764,774	667,104
	% of national production	13.5	13.4	11.4	10.3	9.0
	Growth in ARMM (%)		-10	-7	-4	-13
Coconut (with husk)	Philippines (ton)	15,667,564	15,510,282	15,244,609	15,862,385	15,353,199
	ARMM (ton)	1,250,971	1,254,755	1,269,268	1,311,218	1,327,298
	% of national production	8.0	8.1	8.3	8.3	8.6
	Growth in ARMM (%)		0.3	1.2	3.3	1.2
Banana cavendish	Philippines (ton)	4,497,722	4,600,616	4,685,997	4,694,639	4,230,073
	ARMM (ton)	100,508	105,911	119,273	138,486	146,876
	% of national production	2.2	2.3	2.5	2.9	3.5
	Growth in ARMM (%)		5.4	12.6	16.1	6.1
Rice (palay)	Philippines (ton)	16,266,416	15,772,319	16,684,062	18,032,525	18,439,419
	ARMM (ton)	579,747	623,343	576,873	542,760	612,083
	% of national production	3.6	4.0	3.5	3.0	3.3
	Growth in ARMM (%)		7.5	-7.5	-5.9	12.8
Mango	Philippines (ton)	771,441	825,676	788,073	768,234	816,199
	ARMM (ton)	14,751	12,137	8,226	7,431	7,680
	% of national production	1.9	1.5	1.0	1.0	0.9
	Growth in ARMM (%)		-17.7	-32.2	-9.7	3.3

(1) High valued crops

Most of the production of Mangosteen in the Country and almost half of the cassava are produced in the ARMM. The region has plans of expanding its production of coconut, durian, mango, mangosteen, jackfruit, banana, oil palm, cassava and cut flowers. The region is also strengthening its effort in establishing fruit nurseries to meet the demands for seedlings.

The Philippines is the world's second largest producer of coconut products, after Indonesia. Almost half of the total hectare for coconut plantation in the Country is planted in Mindanao and about 14% of that is in the ARMM.

[18] From the CountryStats Philippines of the Philippine Statistics Authority

During the second Brunei Darussalam, Indonesia, Malaysia, Philippines East ASEA Growth Area (BIMP-EAGA) and the Indonesia Malaysia Thailand Growth Area (IMT-GT) Trade Fair and Business Leader's Conference both in 2014 in Davao City, an investment on oil palm plantation in North Cotabato was sealed, amounting to PHP1.5 billion[19]. Al Mujahidun Agro Resources and Development Inc. (AMARDI) invested PHP 570 million for the 500 ha Cavendish banana plantation in Ampatuan, Maguindanao[20].

(2) Corn

The region is ranked as one of the five leading corn producers in the Country. Even at the time of drought, hectares of wetlands and swamps that dries up are used for corn farming. However, selling the corns poses as a challenge to the farmers especially during seasonal surge of production as major producers are located near Metro Manila and the cost of shipping makes it uncompetitive to the market.

(3) Rice

Rice may not be the top producing crop in the region and the production has been increasing and decreasing in the past five years. However, it is expected that the farmers would be able to produce extra output so it can supply to other nearby regions due to the following developments or programs: 1) there will be additional hectares to be irrigated by the Malmar irrigation project; 2) more areas in Sulu and Tawi-Tawi are being considered for irrigated rice farming; and 3) the *Gintong Ani* program provides loans to farmers in Maguindanao and Lanao del Sur.

2.2.3 Aquaculture production

The region is the leader in the seaweeds production contributing 40% to the total national output in 2014. Most of the production is coming from Tawi-Tawi. However, there were reports of problems with the marketing and monopoly of processing of seaweeds. Efforts are directed to find alternative markets and product handling support[21] (Table 2.3).

Other marine potentials are culture of pearl, mussels, oysters, lobsters, and groupers. The Sulu Sea is one of the richest fishing grounds in the world. The much sought after yellow fin tuna and deep sea pearls come from the Sulu Sea.

Table 2.3 Seaweeds Production in the Philippines and ARMM[22]

Seaweed production	2010	2011	2012	2013	2014
Philippines (ton)	1,801,271	1,840,832	1,751,070	1,558,377	1,549,575
ARMM (ton)	686,397	686,450	629,363	609,164	622,995
% of national production	38	37.	36	39	40
Growth in ARMM (%)		0.01	-8.3	-3.2	2.3

2.2.4 Builders and woodworks industry

Based on the report of the Forest Management Bureau (FMB), the ARMM has a total of 42,756 ha of established forest reserve and 483,837 ha of established timberland in 2013. The ARMM also has 43,064 ha of land (as of 2013) from the Integrated Forest Management Agreement of DENR, where they can "develop, manage, protect and utilize a specified area of forestland and forest resources therein for a period of 25 years and may be renewed for another 25-year period"[23].

In 2012, the Department of Environment and Natural Resources (DENR) reported that 52% of the forest in the ARMM is already denuded due to rampant illegal cutting of trees. As a response, the local

[19] Source: http://www.minda.gov.ph/index.php/news/104-international-trade-fair-and-business-gab-clinch-p8-9-billion-in-sales-and-investments
[20] "More ARMM Investments seen in 2015" http://www.rboi.armm.gov.ph/news
[21] From the website of the Regional Board of Investments ARMM
[22] From the CountryStats Philippines of the Philippine Statistics Authority
[23] 2013 Philippine Forestry Statistics

government agencies have issued policies to create the Provincial Anti-illegal Logging[24]. In addition, the ARMM has also embarked on the National Greening Program (NGP) wherein trees were planted in 1,810 ha of the ARMM land in 2013[25]. Mahogany seedlings were reproduced in many nurseries in the various ARMM provinces to help raise mahogany specie to be planted in the denuded areas of the forest.

The Advisory Committee on Paper and Wood Products of the Food and Agriculture Organization of the United Nations reported in 2007 that there is a huge potential for the industry as the average growth rate of international trade of forest is 6.6% annually (based on a 20 year period of up to 2007)[26]. The Philippines was reported to have exported only 0.1% of round wood, 7.9% of sawn wood, 2.3% of veneer and 0.2% of plywood of the total worldwide exports in 2013[27]. The large world market for builders' woodworks presents a good opportunity for the development of the industry, not just for the entire Philippines but also for the ARMM region as well given the resources. However, increasing the export volume of the Philippines is hampered due to the low level of skills of workers in the micro and small sector of the industry[28].

2.2.5 Garments industry

The garments and textile industry in the Country is underdeveloped and has been declining in the past years. The year on year value of exports based on the Philippine Statistics Authority has declined from US$1.57 billion in 2011 to US$170 million in 2012[29]. The Board of Investments has created a Manufacturing Industry Roadmap with a long term plan to resuscitate the industry[30]. Several buyers have already expressed interests in the textile and clothing products in Davao during the 2nd BIMP-EAGA and IMT-GT Trade Fair and Business Leader's Conference last year which was attended by 25,000 local and international visitors from all over the globe[31].

The Garments and Textile Industry Development Office and the Center for International Trade Expositions and Missions have identified the art of t'nalak weaving from South Cotabato and T'boli women of Lake Sebu whose traditional cloth weaves are made with abaca-woven fiber as few of the weaves that shows potential of global marketability[32].

2.2.6 Tourism industry

The Department of Tourism (DOT) is confident that Mindanao will be one of the major tourism areas in the Country with the Bangsamoro peace deal agreement. They expect that there will be more local and foreign visitors who would stay longer in Mindanao. In 2013, about 5.0 million tourists has visited Mindanao, up by 5% from 2012, majority of which goes to Davao City[33]. According to DOT, Bangsamoro will have their own Tourism Department and will conduct their own marketing communications program.

Some of the interesting tourist sites in the Bangsamoro region include Punta Beach, Tumingay Lake and Bogo Diving Spot in Maguindanao; Lake Lanano, Sumpitan Falls and Barurao Springs in Lanao del Sur; the Walled City of Jolo, as well as its white beaches, and Jikiri Cave in Sulu province; the tomb and

[24] Source: http://www.zamboangatoday.ph/index.php/news/13-top-stories/12050-denr-52-of-forest-in-armm-is-denuded.html
[25] 2013 Philippine Forestry Statistics
[26] From the Global Wood and Wood Products Flow: Trends and Perspectives by the Advisory Committee on Paper and Wood Products of the Food and Agriculture Organization of the United Nations http://www.fao.org/forestry/12711-0e94fe2a7dae258fbb8bc48e5cc09b0d8.pdf
[27] From the International Tropical Timber Organization Statistics Database http://www.itto.int/annual_review_output/?mode=searchdata
[28] From the "Training Needs Analysis for the Builder's Woodworks Industry in the Philippines" by the Forest Products Research and Development Institute source) http://www.itto.int/files/itto_project_db_input/2881/Competition/PPD-133-07-R1-I-Completion-Report.pdf
[29] Source: http://issuu.com/sudaria_publications/docs/westmin_91fff737793fe5
[30] Manufacturing Industry Roadmap: Addressing the Jobs Challenge Toward Inclusive Growth by the Bureau of Investment September 2014 Source: http://dirp4.pids.gov.ph/webportal/CDN/EVENTS/04_DTI_Dichosa.pdf
[31] Source: http://www.minda.gov.ph/index.php/news/104-international-trade-fair-and-business-gab-clinch-p8-9-billion-in-sales-and-investments
[32] Source: http://www.manilatimes.net/weaving-the-philippines-local-textures-and-fabrics/108502/
[33] Source: http://dot.armm.gov.ph/agreement-boon-to-mindanao-tourism/

mosque of Sheik Makhdum, Sibutu Natural Wildlife Sanctuary and Pearl Farm in Tawi-Tawi; white-sand Beach in Malamaui Island, Palm Beach and Balagtasan Falls in Basilan (http://tourismarmm.blogspot.com/).

There are three airports in the region (Cotabato, Jolo and Tawi-Tawi), but the tourist spots are difficult to reach due to the lack in infrastructure. Roads, tourist accommodation facilities, tourist transport facilities and development of retirement villages which includes health and medical facilities and amenities required by the Philippine Retirement Agency (PRA) are all included in the 2012 proposed investment priorities plan for the tourism industry in the region[34].

2.2.7 Halal industry

Part of the investment priorities plan of RBOI-ARMM is the halal industry. According to the RBOI-ARMM website, religious leaders and other stakeholders in the ARMM have approved the halal certification standards that will be observed in the region as it strives to take a share of the estimated US$580 billion[35] per year global market for halal products. Thailand is the 6th largest halal exporter in the world and earns US$73 billion in halal exports.

Malaysia is also one of the major halal players, but they do not have established standards governing what constitutes halal. In South East Asia alone, the Muslim market has a consumer base of 225 million. India, Pakistan, and China are emerging markets that has large Muslim populations.

According to the Department of Trade and Industry Export Marketing Bureau (DTI-EMB), the United Arab Emirates has expressed interests in expanding its business in the production of halal products in the Philippines as oil prices has decreased in the global market.

Based on the news report on RBOI-ARMM website, the ARMM is already being developed as the halal hub that will produce and market halal products not only in the domestic but also the ASEAN markets. The Zamboanga City economic zone is identified as the specific area to install facilities that will ensure that all steps of the production process will comply with the halal standards according to Director Senen Perlada of the DTI-EMB[36].

2.2.8 Other industries

According to the RBOI-ARMM website, PHP1.77 billion of the total generated investments are from biomass renewable energy, PHP1.2 billion in nickel mining industry and PHP146 million in petroleum product distribution and trading.

Lamsan Power Corporation was the biggest investor in 2014 which built a PHP921 million biomass power plant at Sultan Kudarat, Maguindanao. SR Languyan Mining Corp., a nickel ore mining and quarrying company, has invested PHP 520 million in Languyan, Tawi-Tawi.[37] Pax Libera Mining in Languyan, Tawi-Tawi PHP 495 million investment was also approved.

2.3 Lessons Learnt from Previous Investments

Six cases have been selected as successful investments made in Bangsamoro:

- La Frutera Inc. for fruit production in Maguindanao,
- Agumil Philippines Inc. for palm oil plantation in Agusan del Sur and others,
- BJ Coconut Mill for coconut oil extraction in Sulu,
- Matling Industrial & Commercial Corp for coconut plantation and starch manufacturing in Lanao del Sur,
- EA Trilink Corporation for telecommunications and web development in the ARMM region, and

[34] Regional Board of Investments ARMM website
[35] Source: http://www.worldoffoodasia.com/index.php?q=halal
[36] Source: http://www.bworldonline.com/weekender/content.php?id=101336
[37] "More ARMM Investments seen in 2015" http://www.rboi.armm.gov.ph/news

- Air21/FedEx for Logistics in Marawi City.

These cases have been examined as summarized in Appendix to this section. Based on the cases, success factors have been extracted as summarized below[38].

Investment strategies derived from these case studies are the following seven. Further discussions will be provided based on the experiences found in case studies of these pioneer projects.

1) Find a partner who is influential enough to advocate, educate and convince local leaders.
2) Invest not only money but also time and efforts to gain trust from the local business partners, local leaders and residents.
3) Respect cultures and working styles of Bangsamoro and transform them into the positive drivers of the company.
4) Introduce adequate incentives in order to achieve higher productivity and loyalty of employees.
5) Implement well planned method/approach to motivate workers and to improve discipline and cooperative work behaviors.
6) Maximize the use of corporate resources by running complementary businesses that could contribute to reduce the cost of the primary business.
7) If possible, secure self-sustaining power supply by utilizing locally available reusable energy.

Each of the above seven factors of investment strategy is further discussed.

(1) Find a partner who is influential enough to advocate, educate and convince local leaders

Having a local partner is mandatory especially for projects that need to use the land for a long period of time. Even if the investing company has a partner who has a legitimate land title/land certificate document and certificate of tax return, that would not be sufficient[39] in doing business in Bangsamoro.

It is necessary that the leader has established trusted relationship with the political leaders such as MILF and MNLF. Another role of the partner is to act as an instructor and advisor who help improve the morals of the local employees and also to help them understand the employment contracts.

(2) Invest not only money but also time and efforts to gain trust from the local business partners, local leaders and residents

Most of the successful investment cases have a common factor. That is to exert efforts to gain the trust of local leaders and employees by living under the same roof with them. It is not only for the business owners/managers but measures are needed to foster mutual understanding between the Catholics and the Muslims. To attain it, at times, employee rules will have to respect Muslim culture even more than usual employee rules used in the Philippines. Many companies pointed out such needs.

It is notable that Agumil is being able to purchase the palm at better price than competitors because they have made the purchasing price transparent and gained trust from the farmers. As shown in this example, transparency in business is an important factor in wining trust. CARD Inc., an NGO-based MFI, believes that earning the trust of the community is a prerequisite to expanding its operation in a new region. Before starting micro-finance operations, CARD Inc. first provides health and education services to the community so as to avoid arousing suspicion among people.[40] However, it cannot be established quickly. It requires sustained efforts for long time.

(3) Respect cultures and working styles of Bangsamoro and transform them into the positive drivers of the company

Many attempts to make employees follow the usual company rules have failed. In many companies,

[38] Such special investment factors need to be emphasized because of the culture and human relationships that are unique to Bangsamoro economies. Examples include the following. Reporting to office/work at a certain time (same time) every day is not common in the area (local people are not familiar with such concept). Many companies in the case study are facing this challenge. In the case study of Air 21, the company experienced a difficulty that despite they had a market with higher profitability in the nearby area (Iligan City), they did not have choice but to do business in Marawi City which had lower profitability.

[39] *Braving It and Making It*, Cielito F. Habito, Australian Aid. 2012.

[40] Interview with CARD Inc.

the local partners are playing the role to handle employee management with better understanding of local culture and historical practices. At La Frutera, for example, they hire employees using locally practiced work sharing system called *Sumpat*. Their employee management system also follows the local hierarchy. On the other hand, there are companies such as EA Trilink who persistently believes that the emphasis should be on building trust with local partner. They say that by raising the sense of business ownership of the local partners, the company will be naturally advertized in the Muslim society and will become known widely.

(4) Introduce adequate incentives in order to achieve higher productivity and loyalty of employees

Successful investment projects included in the case study use various incentives effectively to improve productivity and to maintain peace and order. For example, La Frutera gives incentives to achievement that surpasses quota while Agumil provides incentives to leased land providers through event participation. Other examples of incentives include making purchasing price transparent to the local farmers and/or offering more advantageous price than competitors.

(5) Implement well planned method/approach to motivate workers and to improve discipline and cooperative work behaviors

Conducting training and company events such as sports event are the specific examples of this strategy. Promotion scheme in the company, as part of the employee management to be handled by the local partner, needs to include a system that drives motivation of the employees. However, the company must constantly pay attention to make sure that the motivation scheme adjusted to Muslim style does not violate the labor code of the Philippines.

Among the case studies mentioned in this report, Matling can transfer employees to another job function if he/she does not find the current certain job attractive/interesting. In Agumil, they believe that it is most important not to differentiate the benefit of employees working in a same place. In Air21, their salary is lower than legal minimum wage but they offer emergency loans to 80 employees and also pay their 13th month pay at Ramadan time instead of Christmas time. At BJ Coconut Oil, the ranking of employees is aligned with the social hierarchy.

(6) Maximize the use of corporate resources by running complementary businesses that could contribute to reduce the cost of the primary business

For example, at BJ Coconut, they operate transport ship business in order to reduce the cost of transporting palm oil and diesel (fuel). Further, they are trying to maximize the use of business resources by utilizing the by-product of their primary business (coconut active-carbon) and also planting and processing abaca in the unused land. Agumil is self-supplying the seedlings of oil palm. Air 21 utilizes the trucks in the area for various transportation purposes. EA Trilink offers services to the ARMM by integrating international gateway to a call center in Makati.

(7) If possible, secure self-sustaining power supply by utilizing locally available reusable energy

It is safer not to rely on the power supply from the local power company. BJ Coconut Oil who needs quality power supply uses self-generated power. Due to increased cost of fuel oil and also to environment considerations, some companies have started biomass and/or hydroelectric power generation in recent years (BJ Coconut Oil[41], Agumil).

[41] However, BJ Coconut Oil does not use coconut shells for power generation. Biomass power generation is not always economically viable. Coconut shells are left on the field after harvesting copra. Collecting coconut shells is very costly and power generation using coconut shells does not make sense economically.

Case 1: La Frutera

Key Factor: Partnership with economically and politically influential figure

Company Name: La Frutera	(1) About the Company: Joint venture of major banana exporter Unifrutti and local property (land) owner company Paglas Corporation. Exports 44 million boxes of bananas annually to Japan, South Korea, Iran, and Middle East. (2) Place of Investment (Datu Paglas, Maguindanao: 1,251 ha) (3) Year of Investment (1977 (during the time when kidnapping and ambush were rampant)) (4) Amount of Investment (US$27 million) (5) Nationalities of Investors (Philippines, Saudi Arabia, Israel, and Italy)	
	Success Factors	Description
	1. Relationship of mutual trust with the local leader	Having relationship of mutual trust with Datu Toto, the head of Paglas Corporation, has helped procuring land, safety measures, employee management, and earning of trust from the local community. Particularly in the procurement of lands, Datu Toto provided not only the land of his own but also the land of nearby farmers by making the best use of his influence.
	2. Isolated/Independent corporate management that enabled the employment in accordance with the Muslim culture possible	Imposing employment practices from different culture to local employees leads to instability. The company has implemented the following based on Muslim culture: (1) Allowed job sharing (*Sumpat*); (2) Respect Muslim belief (even when it is superstitious); and (3) Pay salaries in accordance with stability of the company and productivity of employees.
	3. Incentives to employees and lessor of the land	Employment style with the payment on a per-piece basis is quite effective. With this style, La Frutera achieved higher productivity and that allowed the company to pay their employees higher than minimum wage. The company also provides incentives to its land lessors by giving away raffle prizes at special occasions, such as parties.
	4. Nurturing motivation among employees	Their employees have a chance to be promoted to managerial positions depending on their motivation. The company was able to raise the motivation of their employees while respecting the Muslim culture by using Paglas Corp. when notifying and enforcing punitive actions.
	5. Among company members, create a sense that they are all in the same boat	The contribution of Paglas Corporation is that they made investors, other local companies, and their employees share the sense that they are all members of the family who are in the same boat.

Case 2: Agumil Philippines Inc.

Key Factor: Funding/financing and disclosure of information

<table>
<tr><td rowspan="7">Company Name: Agumil Philippines Inc.</td><td colspan="2">(1) About the Company
- In the 1980s, Malaysian company Guthrie started palm oil plantation business in Mindanao. Agumil inherited their capital and expanded their business in Tacuron and Buluan since the early 2000s.
- Presently operating 26,000ha oil palm plantation in Agusan del Sur, Sultan Kudarat, Magindanao, and Bohol
- The company owns seed and seedling facility in Kabacan, Cotabato, Tacurong, and Buluan.
(2) Place of Investment (Agusan del Sur, Sultan Kudarat, Magindanao, Bohol)
(3) Year of Investment (1980's–present)
(4) Amount of Investment (Cumulative total is unknown)
(5) Nationalities of Investors (Philippines and Malaysia)</td></tr>
<tr><td>Success Factors</td><td>Description</td></tr>
<tr><td>1. Owner (Mr. Chang) has adapted himself with the local community</td><td>He had adapted himself to the area and local residents by living together with his employees in the seed and seedling facility of Agumil.</td></tr>
<tr><td>2. Effective application of the tripartite contract of Land Bank</td><td>Aside from Innovative Financing Scheme of Land Bank, Agumil provided a direct loan with the interest rate of 14% (utilized On-lending Scheme of Land Bank) even to individual farmers who are not the member of the cooperative.</td></tr>
<tr><td>3. Established a cooperative by organizing recipients of direct loan. Built a system that can receive government support (Land Bank loan) easier.</td><td>Initially grouped 664 individuals into 9 cooperatives. Currently the number has increased to more than 30 cooperatives.</td></tr>
<tr><td>4. Escrow type of contract with oil palm farmers</td><td>Agumil receives loan from Land Bank and loan it to cooperatives. Cooperatives, on the other hand, pay back the interest to Land Bank while Agumil manages this repayment by the cooperatives and at the same time, purchases products. Agumil is serving as a sort of escrow.</td></tr>
<tr><td>5. Information Disclosure to Farmers</td><td>Oil extractors are usually hesitant in disclosing the information because they want to keep the price lower. Agumil, however, discloses their purchase price and the international price as benchmark on a monthly basis in order to be transparent with farmers so that they can understand and accept the price.</td></tr>
</table>

Case 3: BJ Coconut Oil Mill

Key Factor: Business development in islands area

Company Name: BJ Coconut Oil Mill		
	(1) About the Company - The largest coconut oil milling company in Sulu. The only coconut oil mill facility in Sulu Islands with the coconut forest of approximately 40,000 ha. - Established in 1997, the company had 10 local employees from Sulu Islands with the legal minimum wage before they cease its operation in 2009 due to the impact of recession. - Negotiation with the potential partner is presently ongoing for the resumption of their business. (2) Place of Investment (Idanan, Sulu Islands) (3) Years of Investment (1997-2009) (4) Amount of Investment (Cumulative total is unknown) (5) Nationality of Investors (Philippines)	
	Success Factors	Description
	1. Reduced cost by having a power generator in islands area	The company was able to cut the cost of diesel fuel by PHP 2.00/L and was able to use the saved amount to adjust the purchase price of materials. However, it should be reminded that in islands area, biomass energy is still not profitable.
	2. In islands area, key staffs of engineering department should be hired from outside the island.	Finding and hiring good engineering personnel in islands area is difficult. It is necessary to provide attractive offers and good HR management in order to retain them in the workplace in the island.
	3. Importance of having a partner who can exercise influence	In islands area, it is necessary to partner with someone who can support you in assuring the sustainable right to use the land and maintaining the morale of employees.
	4. Pay respect to the unique culture	For example, never assign an employee under any employee whose cultural position is lower than him/her.
	5. Utilize the government support	Should leverage/utilize government schemes that give favorable treatment to investment to a certain regions as well as investment incentives. The support from the government for the dispute resolution must be utilized as well.
	6. Utilize every possible resources	In order to cut down the cost of energy, the company took various measures, such as utilizing the vacant space in the barter ship and using free coconut shells and abaca as the energy source.

Case 4: Matling Industrial and Commercial Corp. (MICC)

Key Factor: Fairness and justice based on a devout faith in Christianity

<table>
<tr><td rowspan="5">Company Name: Matling Industrial and Commercial Corp. (MICC)</td><td colspan="2">(1) About the Company
- Foundation of its business is a coconut plantation in Malabang that was founded by Spencer Family who had migrated from U.S. At present, the company has grown into a prominent plantation enterprise that owns a total of 3,000ha nationwide. The company is also famous as a top-class starch manufacturer.
- While maintaining a good relationship with local ARC and barangays, the company is managing their employees with strict rules and regulations--a style that is quite different from that of La Frutera in <Case 1> above. It has a firm attitude to fight against ambush and kidnapping by organizing its own private army.
- Such activities are supported by the devout faith of the founder in Christianity.
(2) Place of Investment (Malabang, Lanao del Sur)
(3) Years of Investment (Since the establishment of the company in 1928)
(4) Amount of Investment (Cumulative total is unknown)
(5) Nationality of Investors (Philippines: Founder is a *Thomasite*, an immigrant from U.S.)</td></tr>
<tr><td>Success Factors</td><td>Description</td></tr>
<tr><td>1. Company's stance to provide business opportunities to the local community</td><td>Advised local farmers to purchase trucks, then the company outsourced their transportation business to the buyers of the trucks. Such activities provided business opportunities to the local economy.</td></tr>
<tr><td>2. Pay respect to local ARC and farmers who are not members of cooperative</td><td>Promoted the trust relationship with the local community while directly/indirectly trained ARC and farmers who did not belong to any cooperative. ARCs trained by them have become prominent income earners in their province.
For example, the company offers the preparation for cassava plantation (provision of farming materials) at a price lower than the regular price even to farmers who are not the member of any cooperative. The company also supports farmers who wish to expand their business by leasing company-owned lands.</td></tr>
<tr><td>3. Strong local cooperative organized by ARC</td><td>Cooperative provides support to lower the burden of initial investment of the farmers. Production materials are first provided to the farmer by the cooperative and the cost of the materials are paid (back to the cooperative) by adjusting the proportion of revenue sharing. This cooperative is also known for full payment of loan from the Land Bank and high profitability. MICC being able to keep the common pace with this cooperative has led both of them to success.</td></tr>
<tr><td>4. Determination to carry out justice</td><td>The company firmly stands for justice, no matter how powerful the pressure is (this is the major difference between this company and La Frutera) and has a firm attitude to fight the evil. Devout faith to Christianity is behind it.</td></tr>
</table>

Case 5: EA Trilink Corp.

Key Factor: Business development that follows current trends

<table>
<tr><td rowspan="6">Company Name: EA Trilink Corp.</td><td colspan="2">(1) About the Company
- As the commitment of the Philippines to BIMP-EAGA economic corridor with Malaysia and Indonesia gets stronger, the role telecommunication sector plays is becoming more important.
- The company was established in 1996 as a joint venture with Malaysia. They have been taking various business opportunities inside and outside the Philippines as ARMM became safer and economic corridor shaped up.
- As of present, the company has four business domains: (1) International gateway facility (IGF); (2) Information and communication technology (ICT); (3) Broadband; and (4) Wireless landline.
- The company has started a full-scale investment from 2012 onward. As for the broadband service, the company is aiming to have franchises in the entire ARMM region (targeting to have one franchise in every 2,400 villages) under E-Kiosk project.
(2) Place of Investment (ARMM and its vicinity, Cebu and Manila as information hub, and beneficiary areas of BIMP-EAGA, such as Brunei)
(3) Years of Investment (Since the establishment of the company in 1996)
(4) Amount of Investment (Cumulative total is unknown)
(5) Nationalities of Investors (Philippines and Malaysia - Current capital shares are 60% Philippines and 40% other foreign countries)</td></tr>
<tr><td>Success Factors</td><td>Description</td></tr>
<tr><td>1. Advantages and disadvantages of the cooperation with BIMP-EAGA economic corridor project</td><td>An advantage is that it can get the commitment from the government and therefore, the reliability of the business increases. A disadvantage, on the other hand, is that the decision making takes time since the agreement from other countries is necessary.</td></tr>
<tr><td>2. A government official is the founder and shareholder of the company. The company can seek for better business opportunity by making the best use of his/her network.</td><td>Since the company has better foresight about the telecommunication industry/business and also is well-communicating with the governor, they were able to establish both company and business areas within the region smoothly. It also seems that they were able to take advantage of the same factors in knowing the moves of government agencies concerning the economic corridor as well as in negotiating with foreign governments.
There was once a movement to invite a competing investment in order to prevent a monopoly but then the competing investor had given up on entering the market. There is a possibility that it was the company's advantageous shareholder composition that created entry barrier for the competing investors.</td></tr>
<tr><td>3. Advantageous shareholder composition</td><td>Initially, the company was equal joint venture of Malaysia and the Philippines. However, the Philippine eventually increased its stake to 60 (Philippine capital):40 (foreign capital).</td></tr>
<tr><td>4. Timing with foreign and domestic policies of the Philippine government</td><td>The company was able to expand their business at the right time. Factors such as the active involvement of the Philippine government in the economic corridor, peace talk with MILF, and Bangsamoro autonomous government’s desire to have their own telecommunication company in the region, worked positively.</td></tr>
</table>

Case 6: Air 21–Malawi City

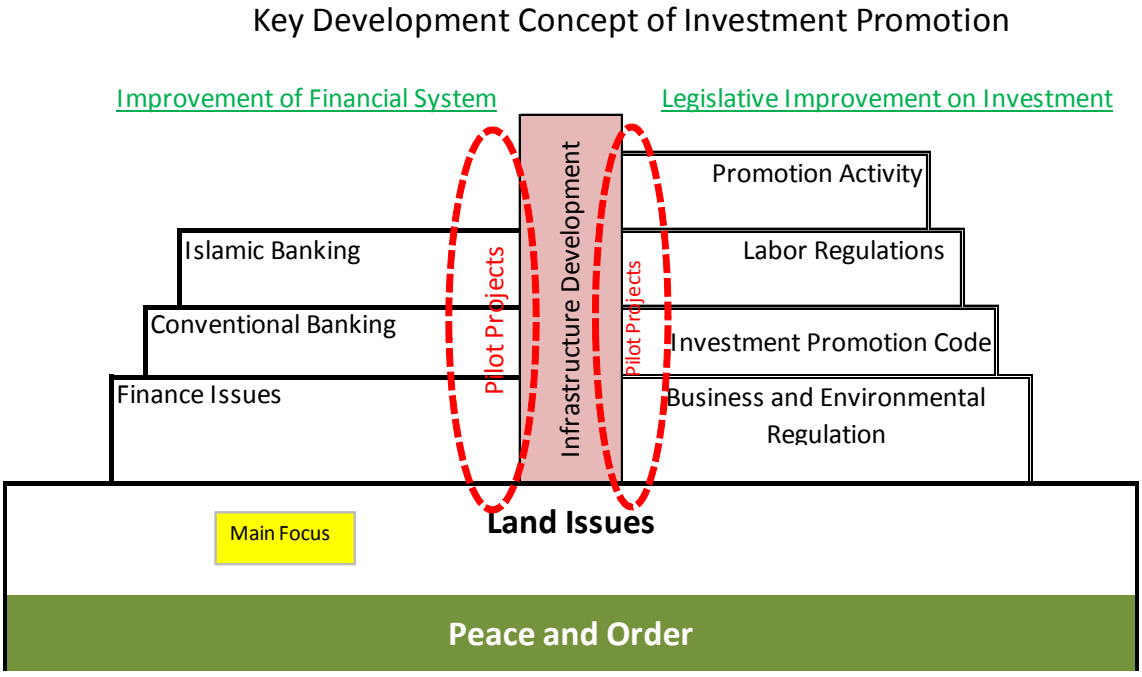
Key Factor: Start small then expand business as you gain trust

<table>
<tr><td rowspan="7">Company Name: Air 2100/Fedex–Malawi City</td><td colspan="2">(1) Introduction
- Delivery business started by Mr. Elian Malaca, who was successful in agriculture, aiming to revitalize the economy of Malawi City
- Large players such as LBP and FedEx seemed shrinking their business in ARMM.
- Mr. Elwin started as local delivery outlet of FedEx.
- Later, while large players continued shrinking, his company dominated the entire ARMM market.
- As Mr. Elwin’s name became widely known, fear emerged among local politicians with speculation that Mr. Elwin might become a politician. And then he started experiencing disturbance to his business. Datu Toto who also supported La Frutela became his partner. He served as guarantor of local recipients and shippers. Datu Toto played a role in curbing the opposition elements.
(2) Place of Investment (Marawi City)
(3) Year of Investment (Dec. 2002)
(4) Amount Invested (Total amount is unknown)
(5) Nationalities of Investors (ARMM)</td></tr>
<tr><td>Success Factors</td><td>Description</td></tr>
<tr><td>1. Partnership with a local leader (influential person)</td><td>Datu Toto Pagras supported the business. (Same person as the case of La Frutela). Datu certified the identity of shippers and recipients because most of them did not have any ID.</td></tr>
<tr><td>2. Deep understanding of the local residents’ needs and business challenges.</td><td>LBP was in the market ahead of Air 21. But they were very strict about checking identification (ID) of the customers. Because of that, they could not capture the potential customers enough. Hiring employees was difficult because the work of messenger performed by delivery service is seen as a job of very low status in Muslim culture. The company hires Christian employees as messengers.</td></tr>
<tr><td>3. Employee management know-how</td><td>Paid bonus at Ramadan time instead of Christmas time because Muslims do not celebrate Christmas.
Base salary was kept at low level but implemented systems that allow employees to borrow from company upon emergency, adjusting the local culture.</td></tr>
<tr><td>4. DTI ARMM as Contact Point</td><td>Local chamber of commerce is not always well organized. Many have gone out of control. ARMM Business Council is expected to demonstrate its administrative capacity and it is desirable they lead the chambers of commerce but they have not progressed that far yet.</td></tr>
<tr><td>5.Start Small and Expand as You Gain Trust</td><td>Cases of operating small businesses in diverse fields have more successes.</td></tr>
</table>

CHAPTER 3 DIRECTION OF INVESTMENT PROMOTION

3.1 Development Domains

The cognitions obtained through data analysis provide stage-wise development structure of investment promotion for Bangsamoro. Nevertheless, solving land issue which will be realized above peace and order condition is the base of development. As for attracting investors, it is necessary to develop two wheeled stage developments; one is financial development and the other is legislative development. These stage-wise developments below should be synergized with infrastructure development (Figure 3.1).



Source: JICA Study Team

Figure 3.1 Key Development Concept of Investment Promotion

3.2 Stage-wise Development

Taking into consideration the target year (2016–2022) of the present JICA Study, the main focus should be on land issues and several pilot projects for both financial and legislative sides should be planned and implemented (Figure 3.2).

After the passage of BBL, it is recommended to start immediately tackling with land issues which are composed of three development domains, viz. i) establishment of the Bangsamoro Land Management Office (BLMO), ii) strengthening Local Court System, and iii) strengthening functions of LGU (Figure 3.2). The BLMO will be newly formed from different five land management organizations and act as consolidated land management office, which will handle land use and property rights). Subsequently, the Barangay court system will be strengthened through introduction of the Barangay Shari'ah Court in order to settle ownership claim in a customary Islamic manner. Also, LGUs' functions will be strengthened in order to enforce land use laws and audiences as well as to obtain real property tax from land owners.

Investment rests on the proper land use and property management. Therefore development domain on investment promotion starts after the functioning of land management system (Figure 3.2). Three domains of i) improvement of financial system, ii) legislative improvement on investment, and iii) promotion activities are to be considered. As for the financial system, expansion of conventional banking system will be immediately necessary in order that investors can start business at the site. Also

introduction of Islamic Banking system will be needed for the Muslim workers because credit is not readily available in a manner consistent with Islamic Shari'ah principles, making it difficult for Muslim employee to live in full accord with Islam. Necessary investment related laws are also established, which includes business and environmental regulations, investment promotion code (incentives etc.) and labor code. After those laws are set down, actual promotion activity starts.

Table 3.1 shows the direction of measures (upper) and major output (lower) to be taken in each stage. Since the most of institutional development are Shari'ah related matters and those seems to be implemented through the initiative of the Bangsamoro autonomous government supported by neighboring Muslim countries.

From this point, BDA needs to request Turkey and Malaysia to focus spotlight more on Bangsamoro, because international donors including JICA's bilateral assistance are not specialized in Shari'ah know-how.

Several preceding pilot projects to accelerate kick-starting this domain are needed. The result of pilot projects is monitored and the lessons learnt were reflected to succeeding legalizing activity. The JICA Study Team proposes one pilot project for each sub-domain in this category.

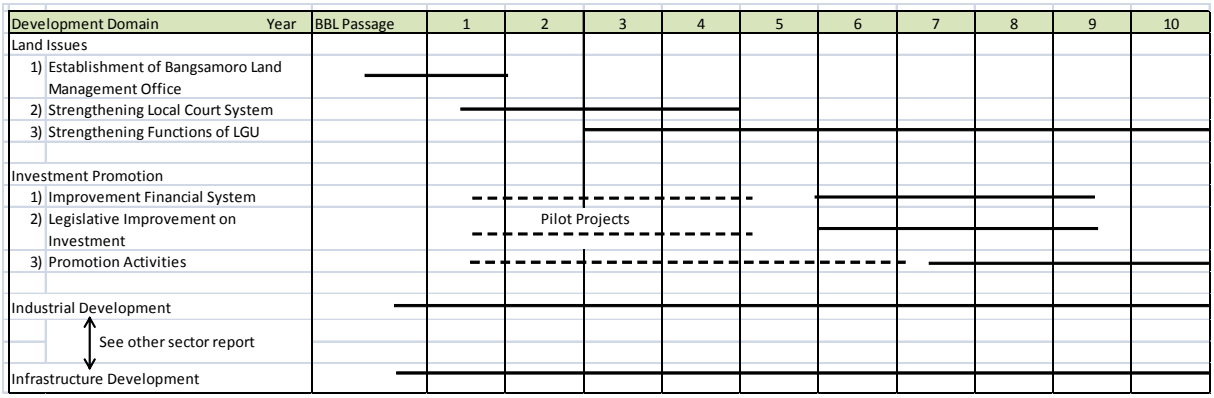


Figure 3.2 Roadmap of Development Domain on Investment Promotion

Table 3.1 Measures and Main Output

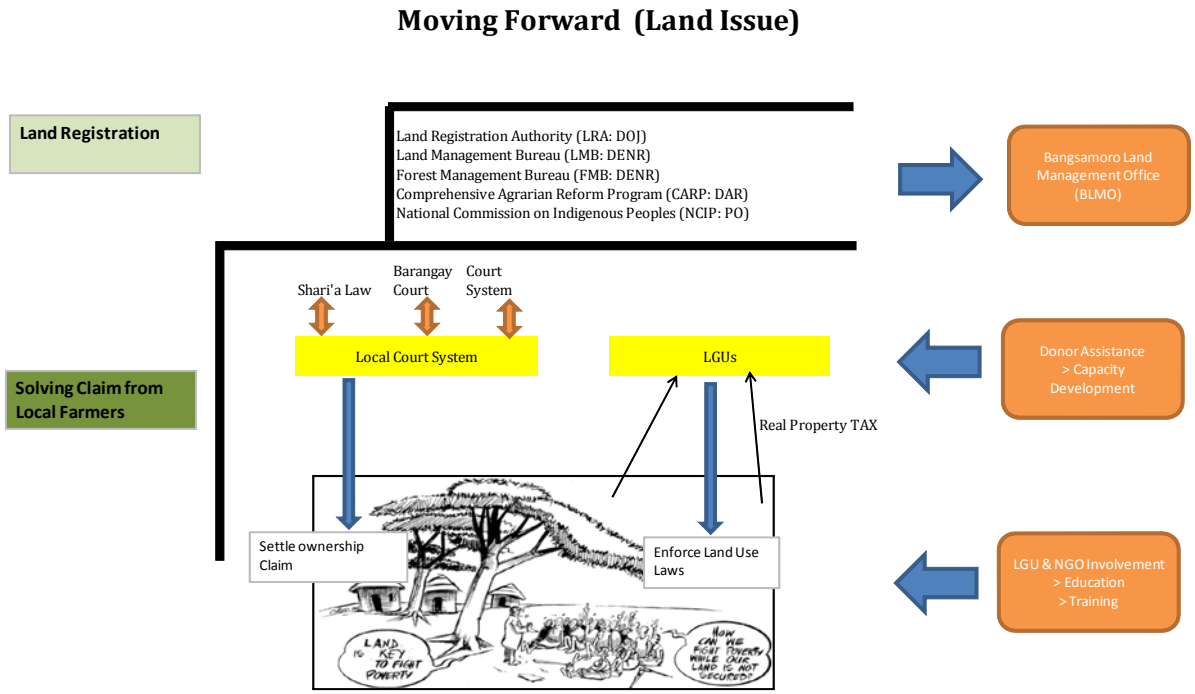
Immediately Start (2016)	Target Period (2016–2022)	After Target period (2022–)
<Land Issue> Streamline and Consolidate existing land management agencies <Pilot Project> Plan and authorize pilot project	<Land Issue> - Develop legal system toward existing problems (referred in the succeeding page). - Develop and standardize Shari'ah court system <Pilot Project> Implement pilot projects	<Land Issue> - Enforcement of land use laws by LGUs - Fictionalization of local court system <Financial system> Institutionalization of financial system incl. of Islamic Banking <Investment Promotion> Institutionalization of stage-wise investment
<Output> Established Bangsamoro Land Management Office (BLMO)	<Output> - New administration framework prepared by BLMO - Standardized Guideline on Shari'ah court system - The result of monitoring on pilot project	<Output> - FDI - Established local court system - Established land & property registration system - Established investment related law - Functionalized Islamic banking system

3.3 Asymmetric Development for Investment Promotion

3.3.1 Land issue

(1) Establishing the Land Management Office

As discussed in many reports and workshops, there are several *multiple* issues in the Bangsamoro region. To address to land issues, three steps needs to be followed in an orderly manner. First, multiple powers on land administration system should be streamlined and consolidated. This cannot be realized anymore in the main land, due to political complexity as many reports say, but only Bangsamoro remains the possibility. The multiple administration system committed by LRA, LMB, FMB, DAR, and NCIP is the firstly issue to be tackled. Those individual land management systems should be integrated into one, which should be managed by the Bangsamoro Land Management Office (BLMO) as shown in Figure 3.3.



Source: JICA Study Team

Figure 3.3 Moving Forward (Land Issue): Steps to Be Taken to Consolidate Land Management System in Bangsamoro

Consolidation of five land management agencies is quite a political issue, so that BDA should proceed this activity under the Chief Minister of Bangsamoro Parliament, and to secure neutrality, international and bilateral donors should act as observers.

Established BLMO should tackle the following existing problems[42] on land and property rights in the area:

a) Multiple laws

Land management being conducted by five different agencies rests in individual governing law of the Philippine Central Government. Among diversified laws, CARP should be recognized as main stream of integrated law although there are several deficiencies reported on this program.

[42] Those are referred from the workshop, the Overview of the Business and Investment Climate in Bangsamoro, a forum on the Business and Investment Climate of the Bangsamoro, organized by the Foundation for Economic Freedom, Philippine Center for Islam and Democracy and the Australian Aid on November 26-27, 2013, at the Waterfront Hotel, Davao City.

For instance, the Commission on Audit (COA) reported (2004) that compulsory acquisition in the ARMM holds for just 1% because of loopholes of VLT and VOT, so that the land registered under those titles should be reviewed under the integrated law.

b) Multiple land titling process

As mentioned above, since lands are managed by different law, land titling process is not the same as well. BLMO needs to develop consolidated process on land titling and registration and simplify the titling process and documentation. It is recommended that the land already put for multiple titles should be listed up by BLMO for future discussion.

c) Multiple ownership

There are many cases that land is owned by multiple owners. Background to this is explained as i) forced displacement of earlier claimants, followed by titling by a new set of occupants, ii) local elite actors titling land that belonged to poor people, many by means of the land reform program, iii) acquisition of land under duress, etc. The cases should be listed up by BLMO and brought to local courts, respectively. BLMO also define the guidelines on how to solve the issue and it is recommended that the property right of absent owner or unused land should be lesser.

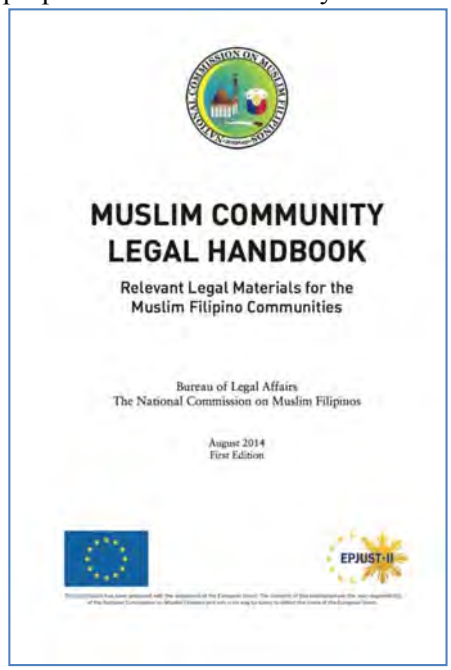
d) Multiple land valuation

Based on the discussion and consultation with the Central Government, land valuation criteria should be newly developed. Simplified valuation method should be newly applied to all stakeholders uniformly. It is an important concept that BLMO do not consider the valuation method which has been applied so far.

It is recommended that the all developed output above should be compiled into *Land Management Guideline for Bangsamoro*, which will be used as the sole guidelines for land management of Bangsamoro in the future.

(2) Strengthening of barangay court system

Second, local court system composed of barangay court, Shari'ah law and court system should be established in order to settle existing ownership claim in the area (Figure 3.3). As proposed above, the new power-sharing arrangement in relation to land administration is yet to be defined. However the resulting system will certainly build on current practices. In Bangsamoro, the Philippine law recognizes three justice systems to resolve land conflicts, namely: barangay, Shari'ah, and civil court systems. The Shari'ah system has original jurisdiction over cases of inheritance and communal properties. It is effectively limited to cases where both parties are Muslim, does not apply to criminal cases or commercial law, and remains under the Supreme Court. In some cases, a Shari'ah court may constitute an Agama Arbitration Council to settle disputes amicably.



Since the Central Government does not have know-how on Shari'ah court system, BDA needs to establish a steering committee on Shari'ah court system composed of specialists from Muslim society. As the output of research and discussion by committee members, Shari'ah court operation manual will be prepared and promulgated to barangays in Bangsamoro.

For the training of judges of local court system, a variety of trainings will be provided. At present the National Commission on Muslim Filipinos (NCMF) tying up with Turkey spearheaded a Shari'ah Training for the Judges in the Philippine Shari'ah Courts. *Muslim Community Legal Handbook* prepared by NCMF on August 2014 will be used as training manual.

It is recommended that BDA in cooperation with NCMF should

request to Turkish Cooperation and Coordination Agency (TIKA) Pilot Project on Strengthening Judicial System for Land Issues, which should be composed of the following components:

- Development of model barangay in which barangay, Shari'ah, and modern court systems are introduced,
- Training of Shari'ah court judges,
- Supervising actual court operation, and
- Development of training materials on related issues.

(3) Strengthening functions of LGUs

Third, the functions of LGU, implementation arm of enforcing land law, should be strengthened (Figure 3.3). The function covers not only law enforcement but also collecting real property taxes levied on the possession of land. There are many cases that no formal land title exists but a tax certificate is a key document to establish possession. Due to lack of resources, facilities, trained personnel, failure to achieve or preserve documents, and faulty of systems, most of LGUs could not manage the land record so far and that causes non taxation to land and/or no revenue to LGU. Strengthening functions of LGU secures sustainable land tenure and property rights of the investors.

To recruit capable administrative officers, some drastic ways are also considered to breakthrough human resource issues. Proactive recruitment of such officers from neighboring countries as well as hiring community development specialist from Muslim countries may contribute to this idea. According to the interview to bi-lateral donor from Turkey and Malaysia, it was found that their support scheme is not pinpointing Bangsamoro but targeting the entire Philippines. To attract deeper concern, BDA needs to conduct intensive lobbying activities.

As for tax administration, the contribution by the Philippine Government is essential. According to BBL, "the National Government will assist the Bangsamoro Government in the matters of tax administration and fiscal management. This assistance shall include capacity building and training programs, in accordance with a needs assessment and capacity building plan developed by the Bangsamoro Government in consultation with the National Government" (Section 4).

BBL also states regarding Bangsamoro's right of increasing tax items as "apart from the taxes that were granted previously to the ARMM, the Bangsamoro Government can now impose and collect four national taxes - capital gains tax, donor's tax, estate tax and documentary stamp taxes provided that all the taxable elements are within the Bangsamoro" (Section 9), and "the Bangsamoro Government may create its own tax office to collect taxes in the Bangsamoro" (Section 11).

The investors expect that "the Bangsamoro Government may extend the same fiscal incentives to locators in its economic zones/industrial estates/free ports, as those in areas outside the Bangsamoro" (Section 26).

3.3.2 Investment promotion

(1) Improvement of financial system

<u>Solving financial issues</u>

Several financial loan projects are available in Bangsamoro, which support business activities directly or indirectly. Some loan projects are focusing on conflict affected areas and others are the project for entire Mindanao or nationwide. ADB, co-financed by Japan, is providing agribusiness supporting loans with Islamic finance mode such as non-interest bearing facility covering 2,000 households in the beneficial area. DBP and Al Amanah banks are providing this loan. ADB also renders microfinance for SMEs in 20 provinces through the Rural Microenterprise Finance project but the Project does not benefit Sulu, Basilan and Tawi-Tawi because of no qualified service outlet covering these areas. The Growth with Equity in Mindanao Program (GEM) by USAID is also supporting joint venture investment but borrowers are quite limited.

Although limited, two development banks - LBP and DBP - have a presence in Bangsamoro. LBP with

10 branches is more active than DBP with three branches, but their service are yet to be provided throughout Bangsamoro. The latter has no branch in Lanao del Sur, Maguindanao and Tawi-Tawi, and neither bank has branch in Basilan. They are providing funds for business but the loan eligibility is limited to relatively large entities.

It is necessary for both banks to step in and have a stronger and visible presence in Bangsamoro. At least, LBP needs to cover their services at uncharted area and DBP also needs to pilot-test the finance to smaller entities.

International and bi-lateral donors needs more specific pinpointing to Bangsamoro for the financing project. The boosting activity for this scheme should be conducted by BDP through lobbying activities. Japan for example needs to establish a special financing project, which should be through on pilot basis, tying up with microfinance renders from the private sector. This pilot project intends to utilize them as the finance outlet in the field instead of DBP. This scheme is new to JICA so that internal discussion as well as a feasibility study is firstly necessary.

Conventional banking

According to the interview from Malaysia Embassy, Muslim people use conventional banking system even after introduction of Islamic banking to look for higher profit. Also, the interview clarified that even non-Muslim people utilize Islamic bank based on their needs. Likewise, both conventional and Islamic banks are necessary after successful transition to new entity. Judging from this viewpoint, conventional banking system is also necessary to be strengthened in Bangsamoro.

Toward the lack of financial window in the area, BDA needs to work with commercial banks for the countermeasure. Allowing for the security risk of the area, small vehicle carrying ATM may be applicable because it is being utilized in remote areas of Japan. It will be a good trial for commercial banks to introduce movable-bank wagons (ATM-towed vehicle) in Bangsamoro. Since it is the first experimental trial in the Philippines, BDA needs to take proper permit from concerned agencies.

To improve the conventional banking system, it is also necessary to cope with microfinance (MF) for smaller financial needs. One of the ideas is attracting MFI such as Center for Agricultural and Rural Development, known as CARD (Table 3.2).

Table 3.2 Outreach of Major MF Organization

Name of MF organization	Type of organization	No. of Client	Loan Amount (US$)	Per Head Loan (US$)
Center for Agriculture and rural Development Inc. (CARD NGO)	NGO	606,488	66,808,378	110
ASA Philippines	NGO	299,433	24,452,395	82
TSPI Development Corporation (TSPI)	NGO	282,920	34,338,508	121
CARD Bank Inc.	Rural Bank	267,282	44,713,331	167
Life Bank Foundation	NGO	236,917	19,829,145	84
Kabalikat para sa Maunlad na Bahay, Inc. (KMBI)	NGO	235,482	14,724,279	63
Taytay Sa Kauswagan Inc. (TSKI)	NGO	194,660	23,594,156	121
Pagasa Philippines Lending Company International	NGO	136,959	13,271,369	97
Negros Woman for Tomorrow Foundation, Inc. (NWTF)	NGO	85,808	11,135,340	130
1st Valley Bank	Rural Bank	63,676	66,351,843	1,042

Source) New Business Model on MF Industry, Monthly Report Aug. 2012, The Japan Economic Reserch Institute
Note: 2010 data

The CARD group has training school cultivating MF operators. Also they are running CARD Bank

Inc. for SMEs. Like their experience in Vietnam, they are already accustomed to work as a part of ODA among different culture. BDA under the guidance of MOF and PNG of Central Government should proceed negotiation with the candidates.

It would be interesting to explore whether the current informal land market could be extended/formalized into more reliable sources of asset collateral, whether credit support can be secured from the patronage of powerful local individuals and entities, and whether the religious and moral strictures available from Islamic banking can be utilized to encourage voluntary credit compliance by faith-based borrowers.

Islamic banking

Regulatory amendments will be required to provide a legal platform for alternative forms of Islamic financing, which could include the possibility of Islamic banking windows in commercial banks, *sukuk*s (cf. the subsection 4.5.3 (2)) for financing infrastructures and commercial ventures and enhanced microfinance facilities based on Islamic principles.

Judging from the experienced project so far, it seems that international donors or major bi-lateral donors to the Philippines do not have enough technical know-how on Shari'ah development or Islamic Banking. It is therefore the support from same Muslim countries which will be essential in this field. According to the interviews from Malaysia Embassy and TIKA, both in the Philippines, they are recognizing the importance of Bangsamoro, but their country support programs are not necessarily heading for it. Both interviewees replied that their programs are covering entire Philippines but not pinpointing Bangsamoro.

Without any support from Muslim allies it may be difficult to establish Islamic banking. The Al Amanah Bank placed under DBP is struggling for future operation in Bangsamoro but Islamic banking system run by quasi-government is allegedly so vulnerable and unstable. In this aspect, Embassy of Malaysia mentioned that a few Islamic banking organizations would invest to Bangsamoro once proper infrastructure (especially road network) is provided.

(2) Legislative improvement on investment

Business and environmental regulation

It is important to study business rules and investment promotion policies. In the Philippines, the procedure of establishing and operating businesses is highly regulated. Its rules are significantly more complex than many other nations in south-east Asia. Under the current rules there are rooms for corruption.

There are much to be improved in how business registration is done in the Philippines including simplifying the processes and reducing its cost. Especially in Bangsamoro, where majority of businesses are illegitimate and business practices and models are different from what the National Government may expect, establishing proper business registration system is a serious challenge. The Bangsamoro government should further simplify the systems for business, eliminate unnecessary/inadequate systems and establish a flexible business system.

A PPP Law, accompanying guidelines, and a PPP agency exclusive for Bangsamoro should be considered by the Bangsamoro government. This could be based on the national model, modified to take account of learned lessons to date in the implementation of the current national law and the special conditions which prevail in the Bangsamoro. In particular, PPPs lend themselves to Islamic financing tools, and this should be factored into the law and guidelines.

It makes sense for the government and the private sector of Bangsamoro to establish a Regional Competitiveness Council in Bangsamoro, by accepting the proposal from the National Competitiveness Council[43] under the National Government of the Philippines.

It should be this council which reviews the existing rules and then design and implement competitive and productive programs. Bureaucratic red tapes and inefficient government works should be changed for the better, by simplifying the procedure through delegation of the authority to approve business

[43] ARMM is the only region in the Philippines where there is no RCC.

registration to the autonomous government.

Investment promotion code

The Bangsamoro government should have a system and structure to be able to flexibly establish rules and procedures of investment promotion by offering attractive incentives and assurances. The emphasis should be on simplifying the procedures and incentives for investment promotion.

What is important is the broad-based approach in which incentives are granted automatically to all companies investing in Bangsamoro, either local market oriented or export oriented, as long as they satisfy the conditions with limitations defined by the autonomous government.

If it is difficult to adopt such a broad-based approach, the possibility of creating special economic zones should be discussed. If zoned approach is adopted and the establishment of special economic zones (SEZ) can be decided at the provincial level, the Bangsamoro government will have to build an institutional framework that define conditions for creating SEZ and its incentives.

For the strategic areas that have good security and adequate infrastructures, possibilities of creating industrial estates and industrial zones should be studied. The design should be made to expand the zone as security situation of the surrounding areas improves. Incentives and simplified procedures should be defined with due consideration to agricultural companies which are commonly located in remote areas far away from human habitation. Such agricultural businesses should also be able to enjoy the incentives and simplified procedures.

For longer term, it would be desirable to consider the entire Bangsamoro as an SEZ of PEZA. If some of the conditions to qualify as SEZ cannot be met (e.g. inability to control smuggling and/or delayed infrastructure development), at least, some of the regions within Bangsamoro should be certified as SEZ. Further, the Bangsamoro authority should define relatively wider corporate categories (e.g. agricultural processing and/or halal food manufacturing) as investment priority areas and grant them limited and favorable incentives.

The investment incentives of typical Muslim countries are summarized as attached in the succeeding pages (Table 3.3). The conditions to obtain incentives are clearly defined in most of the countries. However, the JICA Study Team recommends the Bangsamoro government to adopt much simpler and competitive conditions; to just define incentives by invested area and by invested amount and not to take industry type or field into consideration. As presented in Table 3.3, Turkey has adopted an incentive system similar to this principle.

Labor regulations

Ideally, the Bangsamoro government would have the power to formulate its own regulation relating to labor and wages, moving towards simplified regulations and more flexible wage setting. Failing that, the relevance of proposals for labor employment zones, which aim to exempt enterprises from the application of minimum wage and other selected regulations, should also be reviewed.

Rules and regulations of the Philippine Labor Code are so complicated that many companies feel it is impossible to comply with.[44] The Bangsamoro government should validate the relevance of applying employment-related regulations being implemented by the National Government of the Philippines. Within the authority of the Bangsamoro government, it should study alternative options concerning worker protection and wage level definition that fits the conditions in Bangsamoro.

[44]Philippine Development Report by the World Bank points out that: a) large proportion of companies do not comply with the employment standards, b) standard cost of retaining employees is high, c) employment in formal sectors are not increasing. High minimum wage in the Philippines contributes to the deterioration of competitiveness in labor intensive manufacturing industry.

Table 3.3 Comparison of Investment Incentives by Selected Country

Country	Philippines Investment Incentives		Indonesia Investment Incentives	Malaysia Investment Incentives	Turkey Investment Incentives
Category	Special Economic Zone (SEZ)	BOI registered	MoF approved	MINDA and HDC approved	Investment Support and Promotion Agency approved
Eligibility of Tenant	Domestic & Foreign Company	Domestic & Foreign Company	Outbound Investment	Domestic and Foreign Company	Domestic and Foreign Company
Beneficially of Incentive	Foreign invested-firm that has established in PEZA designated zone	Foreign and Domestic Invested-farm under the authorization of IPAs.	Foreign and Domestic invested-farm under the authorization of Indonesian investment policy	Foreign and Domestic invested-farm under the authorization of Malaysian investment policy	Foreign and Domestic invested-firm under the authorization of the Turkish investment policy
Condition of Tax Holiday	Eligible activities include export manufacturing, information technology (IT) service export, tourism, medical tourism, agro-industrial export manufacturing.	Firms in any of the activities that are listed in the Investment Priorities Plan (IPP), which identifies the country's priority investment areas. For non-pioneer industries, with foreign ownership is 40% and below need export sales of at least 70% of their total sales.	Eligible farms constituting a pioneer industry (Basic metal industries, Oil refinery industries and/or basic organic chemicals originating from oil and natural gas, Machinery industries, Industries in the field of renewable resources, Communication devices industries) and having a new investment plan having obtained the approval of competent authorities in a minimum amount of IDR 1 trillion (USD 100 million).	Company which invest in Halal food production and have already obtained Halal certification from JAKIM are eligible for the investment tax allowance (ITA) of 100% of qualifying capital expenditure incurred within a period of 5 years. The allowance can be set-off against 100% of statutory income in the year of assessment. Any unutilized allowance can be carried forward to subsequent years until the whole amount has been fully utilized.	The new investment incentives scheme is specifically designed to encourage investments with the potential to reduce dependency on the importation of intermediate goods vital to the country's strategic sectors. Investment incentives are just simply defined by invested area and by invested amount. Total of 16 industrial sectors are chosen and "Strategic Investment" probably admitted by Investment Support and Promotion Agency of Turkey can obtain highest grade of investment incentives.
State and Local Tax	In general, enterprises located in ecozones are entitled to incentives that include: An Income Tax Holiday (ITH) of 4 years for non-pioneer projects and 6 years for pioneer projects. After the ITH expires, a 5% Special Tax on Gross Income and exemption from all national taxes is applicable. It causes nominal Corporate tax at 15-16%. Zero taxes and duties in the importation of capital equipment, raw materials, machineries, and spare parts. An exemption on wharfage duties and export tax is applicable as well. Zero VAT on local purchases and an exemption for all local government imposts, fees, licenses, or taxes. Zero expanded withholding tax. Non-fiscal incentives such as simplified import-export procedures, employment of non-resident foreign nationals, special visas for foreign employees in certain positions, and more.	Among the incentives that BOI-registered companies enjoy are the following: An Income Tax Holiday (ITH) of 4years for non-pioneer status, 6 years for pioneer-status new projects, 3 years for expansion projects, 6 years for new or expansion projects in less developed areas. and 3 years for modernization projects. Enterprises that meet certain requirements can also take advantage of a bonus ITH year. Taxes and duties exemption on imported spare parts as well as an exemption on wharfage dues and export tax. Reduced duty rates on capital equipment, spare parts, and accessories. Tax credits on domestic breeding stocks, genetic material, raw materials, and supplies. Additional deductions from taxable income on labor expense as well as necessary and major infrastructure work. Non-fiscal incentives such as the employment of foreign nationals, streamlined customs procedures, the importation of consigned equipment, and more.	Alt.1 Corporate Income Tax (CIT) exemption or reduction for a period of 5-10 years. After the end of the CIT exemption, the company will receive a 50% CIT reduction for 2 years. For economically depreciated area, the following incentives may be provided. i) Non-collection of VAT and sales tax on certain luxury goods transactions. ii) Exemption from prepaid income tax on the importation of capital goods and other equipment directly relating to production activities. iii) Postponement of import duty on capital goods and equipment and goods and materials for processing. iv) Exemption from import duty for 4 years on machinery and certain spare parts. --- Alt.2 The investors who obtain the following tax concession cannot use the 1% final tax on turnover or other tax facilities for Integrated Economic Development Zones and the tax holiday specified above. i) A reduction in net income of up to 30% of the amount invested (generally amount spent on assets), prorated at 5% for six years from commercial production date, and provided that the assets invested are not transferred out within six years. ii) Acceleration of fiscal depreciation deductions. iii) Extension of tax loss carry forwards for up to ten years. iv) A reduction of the WHT rate on dividends paid to non-residents to 10%.	Halal Park Operator i) Pioneer status with income tax exemption of 100% of statutory income for a period of 10 years. Unabsorbed capital allowances and accumulated losses during the pioneer period can be carried forward and deducted from the post pioneer income of the company, or ii) Investment tax allowance of 100% on the qualifying capital expenditure incurred within a period of 5 years. The allowance can be offset against 100% of the statutory income for each year of assessment. Any unutilized allowances can be carried forward to subsequent years until fully utilized. Halal Industry Player (for the companies in the designated Halal parks) i) Investment tax allowance of 100% on the qualifying capital expenditure incurred within a period of 5 years. The allowance can be offset against 100% of the statutory income for each year of assessment. Any unutilized allowances can be carried forward to subsequent years until fully utilized. ii) Income tax exemption on export sales for a period of 5 years. * Industry sector should be a) specialty processed food, b) Pharmaceuticals, cosmetics and personal care products, c) Livestock and meat products, and d) Halal ingredients. Halal Logistics Operator (viz. forwarding, warehousing and transportation) i) Income tax exemption of 100% of statutory income for a period of 10 years. Unabsorbed capital allowances as well as accumulated losses incurred during the pioneer period can be carried forward and deducted from the post pioneer income of the company, or ii) Investment tax allowance of 100% on the qualifying capital expenditure incurred within a period of 5 years. The allowance can be offset against 100% of the statutory income for each year of assessment. Any unutilized allowances can be carried forward to subsequent years until fully utilized. iii) Double deduction for expenses to obtain Halal Certification and Quality Systems and Standard Certification	Effective as of January 1, 2012, the new investment incentives system has been comprised of four different schemes. Local and foreign investors have equal access to: 1- General Investment Incentives Scheme 2- Regional Investment Incentives Scheme 3- Large-Scale Investment Incentives Scheme 4- Strategic Investment Incentives Scheme The support instruments to be provided within the framework of the various investment incentives schemes are shown in the following table:

Source: JICA Study Team.

It is ideally recommended that Bangsamoro should simplify the labor regulations of the Philippines and also use more flexible wage setting mechanism.[45] Also it is suggested that the Bangsamoro government and the private sector divide responsibilities, and Bangsamoro prepares humane employee administration district/area where employment insurance, social security and other provisions for desirable employee protection are practiced. On the other hand, the role of the private sector is to undertake the construction of the industrial employment zone and allow them to modify many of the provisions of PEZA laws regarding customs and other regulatory requirements.

For example, the private sector can adopt its own rules on accessing to the labor, including the import of foreign technical labor, so that these areas can achieve the highest level of labor supply. By allowing this, the areas with industrial employment zone could become a hub of high-level industrial human resource supply. That is to say that the special employment zone to be established by the private sector serves effectively as a certain training center. The scenario the JICA Study envisions is that employees who aspire to be employed in the SEZ are recognized by the government in the future, develop skills and characters while working in the special employment zone.

If establishing such a special employment zone could be approved all over Bangsamoro in a certain time limit, and also if the locators could be exempted from applying regular rules implemented elsewhere in the Philippines by using the simplified employee regulation/rules and wage setting processes, investing to special employment zones in Bangsamoro will become more attractive to investors than any other incentive or assurance offered in other regular SEZs.

(3) Promotion activities

Information on development potentials of Bangsamoro is not disseminated effectively to prospective investors. Therefore, effective promotion campaign is necessary. Such campaign includes following activities:

- Domestic/overseas seminar[46] and symposium of investment;
- Establishing the Bangsamoro investment window for information provision, one-stop registering, etc.;
- Preparation of investment promotion tools (e.g., brochure, leaflet, promotion video, and website); and
- Business matching of sellers-buyers, investors-Bangsamoro people, REZA, Mayors, Datu, investor-tenant, etc.

According to the interview survey to the Filipino investors held in late 2014, it had the tendency that investment implication gets stronger as the distance from Bangsamoro becomes closer. For the time

[45] For example, Gerardo Sicat, an economist of PhilippineStar newspaper, proposes the creation of "special employment zone" that is not bound by the employment regulations and minimum wage rules of the Philippines in order to develop manufacturing and agricultural industries in Bangsamoro. In "special employment zone", regulations on regular employment, probationary period, and other rules on employee protection will be suspended.

[46] According to the ASEAN Promotion Center on Trade, Investment and Tourism (ASEAN-JAPAN CENTRE) in Tokyo, Japan, investment promotion seminar of gathering Japan's 150 business person will cost around PHP1.5 million (a half-day session) on average.

being, it is considered that the investment to Bangsamoro will be triggered by nearby investors like from Davao or Cagayan de Oro. There are several promising overseas investors among which include oil palm plantation operators and Islamic banks from Malaysia. Some speculative investments are also expected in banana and cacao plantation from Korea and Japan.

3.3.3 Other domains

(1) Industrial development

As is proposed in other sector reports, a various industrial development will be taken place in the development period. Although most of them are primary industry, those developments will absorb considerable number of employees and contributing to peace and order situation of Bangsamoro. Among them, higher priority should be placed to economic zone development and investment attraction to large plantations because these create huge number of job opportunity, which stabilizes the economy of Bangsamoro. The policy and project on nurturing SMEs, spurring high-tech industry or protecting patent/copy right should be put on the back-burner because necessary conditions/inputs are yet to be prepared for some time to come.

Promoting business development in the region is not solely the responsibility of DTI. Rather, it involves various line agencies, depending on their respective functions (Table 3.4).

Table 3.4 Current Roles of Line Agencies in Local Industry Promotion

	Major Roles for Local Industry Promotion
DTI-ARMM	Promote, regulate, and coordinate trade and industry activities
DAF-ARMM (including BFAR-ARMM)	Develop agriculture, forestry, and fisheries in the region
DOST-ARMM	Processing technologies
DILG-ARMM	Supervise LGUs in the region, support in preparing and evaluating development plans
RBOI-ARMM	Promote, assess, and develop local and foreign investment opportunities
CDA-ARMM	Register, supervise, train, and assist in the direction of cooperatives in the ARMM

Source: Development Study on Local Industry Promotion in ARMM (JICA, 2011).

Investment to economic zone

Economic zone development is being proposed in line with the Polloc port development and earmarked as one of prioritized projects in the Study. The zone is secured with safety by the Bangsamoro government and REZA will be in charge of administrating and managing infrastructure. The economic zone will be expandable based on the demand of tenants. The economic zone may attract the export oriented tenants aiming especially at the East Asian Growth Area of Brunei, Indonesia and Malaysia in line with the BIMP-EAGA initiative.

The Bangsamoro government can expect or explore the investment to the economic zone as presented in Table 3.5. The economic zone should be divided further into sub-zones based on the nature of tenants located. By so doing, mutual communication between same industries will be accelerated.

Investment to plantation

Attracting investment toward large plantations should be encouraged. The Bangsamoro government should start introduction of suitable land for plantations from the land bank where the land is free from conflict and the ownership is clear. As is reported in a series of workshops, many of Datu (they are usually influential strongman both politically and economically) are waiting for such opportunities from the investors outside Bangsamoro. It is expected that at least three to four investments for plantations are brought about during the target period (2016–22), and a number of investments will follow afterwards once a foothold is built by initial projects recognized by the public. Before such investments gain momentum, the Bangsamoro government should prepare proper over-the-counter for investment, which may be called the Bangsamoro investment window.

Table 3.5 Promising Investment Products of Bangsamoro

Products	Potential
Banana	A consistent top dollar earner in the top 10 export commodities from Mindanao.
Rubber	All of rubber production in the Philippines comes from Mindanao
Palm Oil/Cacao	Mindanao is counted as main production area. Palm oil is reusable and cheaper than coconut oil plantations. Cacao demand can be prospected mushrooming by 2020.
Poultry	A growing Halal industry can be seen in Mindanao. Growing market of Halal poultry products for export to the Middle East.
ICT/Business Process Outsourcing	A sunshine industry given the competitive advantage of Mindanao's labor force.
Real Estate	Big potentials in urban area due to OFW remittance and construction of large-scale malls
Mining	Copper, nickel, etc.
Fishing	Fish processing plant and canning facilities

Source: MedCo.

(2) Infrastructure development

The primary objectives of the Bangsamoro Development Plan are the rehabilitation and expansion of infrastructure facilities. Accordingly, investments are needed for the infrastructure development[47] as well. The Bangsamoro government should consider making minimum investment without spending too much time in planning.

The infrastructure development here covers from upper side of the value chain such as power, water supply and irrigation to the lower side of the value chain such as logistics, telecommunication and storage. Because of the nature of private investments that tend to be attracted to low wage areas, the private sector investments can function as the driver of poverty reduction. The infrastructure development projects therefore, should be implemented, in a phased manner, in the areas surrounding the site of private investment.

BDA says that infrastructure development must be done with the holistic perspective, having the direction for the entire Mindanao in mind (Table 3.6).

Table 3.6 Holistic Approach Necessary for Infrastructure Development

Infrastructure	Major Consideration
Power	- Link with Mindanao Transmission Grid - (Especially in Sulu) Collaboration with small-scale hydroelectric power generation and renewable energy resources48.
Road and Port	- Mindanao-wide and even wider regional perspectives. - Holistic economic indices. - (Polloc Port development) secondary and tertiary roads and bridges for forwarding commodities
Watershed	- (Pulangi River Basin) influence over vast agricultural land in lower Bangsamoro regions. - (Ligawasan Marsh) a spiritual home for Muslims in Mindanao. - Environmental changes - Soil erosion and siltation in Pulangi Dam - Illegal logging and flood damage of Maguindanao - Agricultural development by small-scale farmers and tree planting projects - Sustainable aquaculture projects in Ligawasan Marsh

[47] JICA has finished an extensive review of the region's physical infrastructure, and the MINDA has been engaged in formulating programs addressing Mindanao-wide infrastructure needs, especially for the various development corridors and river basins.

[48] When large plantation and mining companies start operations, it is common that they setup back-up or secondary power supply. If more power could be generated, it could contribute to the development of agricultural product processing and other industries. In order for it to happen, it is important to have good governance of power cooperatives through reducing power system loss and improving the efficiency of power supply.

Infrastructure	Major Consideration
Education	Lowest rate in the Philippines of entering and graduating elementary & high school. 1/3 of labor population is illiterate. Character development (discipline, trust, curiosity) needed for Muslim culture and social adaptability to pluralism Informal sector education especially poor youth and retired militant

CHAPTER 4 PRIORITY PROJECTS

4.1 Special Employment Zone Development Project (after 2022)

Employee rules/office regulations of the Philippines are so complicated that many companies feel it is impossible to comply with. Bangsamoro should simplify the labor regulations of the Philippines and also use a more flexible wage setting mechanism.

The Philippine labor regulations, and consequently, the business regulations, are deemed to be complex. It is important for the Bangsamoro government to assess the relevance of national laws for the region. Labor protection and wage setting should also consider the culture and the traditions of the people, and businesses should be aware of the possible differences from the rest of the Philippines. Some criticisms on the national Labor Code and its effects are described below[49].

- It is too complex. The Labor Code has conflicting or overlapping aspects, which make it hard for companies to properly comply with. The complexity also encourages the informal sector
- It is out of date. The Labor Code was formally signed in 1974 and was patterned with those of developed countries. To date, there are no comprehensive reviews or revisions on the Labor Code to check its relevance to the current labor situation.
- It is lopsided to favor workers than businesses. The Labor Code centers on the welfare of those already employed in the formal sector, rather than setting good labor benchmarks to bring more businesses and investors. However, the Labor Code has powers over those employed in the formal sector and not on those working in the informal sector. This might bring issues particularly in Bangsamoro since the informal sector is considered as the norm.
- The implementing agency, the Department of Labor and Employment (DOLE), may not have the appropriate focus. DOLE is clustered with social branch of the executive arm of the government. With this, the focus is more on providing social protection than setting labor regulations to enhance economic development.
- The entire worker perspective is not well-recorded and recognized by legislators. The informal sector is guided by social relations and kinship that formal employment contracts may not be necessary. Geared towards the formal sector, the Labor Code may not have any considerations for such cultural dynamics.
- The Labor Code has too much intervention. Compared to the labor regulations of other Asian neighbors, the Labor Code in the Philippines is too restrictive and empowers the Government to intervene in the labor market. The extent of the government regulation may explain why some businesses prefer to be part of the informal sector.
- It is also heavily influenced by politics. DOLE has adopted a tripartite mechanism (a dialogue among DOLE, labor groups, and private sector) to address labor issues. Though this may appear to be promoting a democratic arrangement, this method has been found to be very political.

In effect, formal regulations on labor may not have a huge effect in Bangsamoro. For instance, some agricultural companies in the region have been able to negotiate their workers with a lower minimum wage rate. In some cases, these lower minimum wages are supplemented with productivity bonuses and/or other benefits according to Bangsamoro's culture. These businesses have argued and explained the importance of their enterprise to the local economy.

It is recommended that the Bangsamoro government and the private sector divide responsibilities for labor and employment related functions. The Bangsamoro government could prepare humane employee administration district/area where employment insurance, social security and other provisions for desirable employee protection are practiced. On the other hand, the role of private sector is to undertake the construction of an industrial employment zone, where many of the provisions of PEZA

[49] Institute for Development and Econometric Analysis, Inc. *Working Paper No. 5 Labor Regulations in the ARMM*.

laws regarding customs and other regulatory requirements are allowed to be modified.

For example, the private sector can adopt its own rules on accessing to the labor market, including the import of foreign technical labor, so that these areas can achieve the highest level of quality labor supply. By allowing this, the areas with industrial employment zone could become a hub of high-level industrial human resource supply. That is, the special employment zone to be established by the private sector serves as a certain training center.

The desirable scenario is that employees who aspire to be employed in the special economic zone (SEZ) designated by the government in the future develop skills and characters while working in the special employment zone. If establishing such special employment zones may be approved throughout Bangsamoro with a certain time limit, and also if locators in the zone could be exempted from applying regular rules implemented elsewhere in the Philippines by using the simplified employee regulation/rules and wage setting processes, investing to special employment zones in Bangsamoro will become more attractive for investors than any other incentives and assurance systems offered in other regular SEZs.

4.2 Pilot Investment Promotion (2016–2022)

This pilot project is composed of two contents: (1) pilot project of buyers-sellers matching and (2) pilot plantation investment support. The former intends to provide the opportunity of business matching between sellers (e.g., Chamber of Commerce in Bangsamoro[50] and agricultural cooperatives) and buyers from outside Bangsamoro. While the latter intends to conduct a series of investment support in line with the PDCA process and obtain the lesson to reflect the actual legislation.

4.2.1 Pilot project of buyers-sellers matching

There are already efforts underway to facilitate bringing together Bangsamoro entrepreneurs with potential business partners from other parts of the Philippines and nearby countries. These match-making efforts should be further encouraged, with the business councils and chambers taking a lead role in facilitating the introductions and follow through.

The Bangsamoro government needs to cooperate with DTI of the Central Government and create opportunities to host a trade fair and invite buyer from mainland to see the products of Bangsamoro. Also to call international buyer, the Bangsamoro government needs to discuss with embassies and international chamber and commerce locating in Manila. Neighboring countries, Muslim countries and those countries placing chamber of commerce in the Philippines may have more possibility. Also like the Middle Eastern countries, where many of OFWs work, have good chance.

As for Japan, there are several events planned and implemented. The following organizations have experience in holding trade fairs to introduce Filipino sellers to Japanese buyers in 2015:

- ASEAN-Japan Center (ASEAN Promotion Centre on Trade, Investment and Tourism)
- JETRO
- Major Japanese accounting firms
- Organization for Small & Medium Enterprises and Regional Innovation, Japan
- Japan's large LGU (e.g., Osaka City)

4.2.2 Pilot plantation investment support

The Bangsamoro authorities, led perhaps by the ARMM- Regional Board of Investments (RBOI), will have to take special actions to encourage the early establishment of some (e.g., two or three) large agro-based plantations. These could include the significant expansion of existing plantations for existing or new crops. In promoting these projects, the emphasis should be “transaction-oriented”, seeking out

[50] At present the ARMM Business Council (ABC) is organized by 11 member entities. It is umbrella organization of all Chamber of Commerce and Industry operating in ARMM

the entrepreneurs who are most likely to deliver, and help in linking them to potential local partners.

The authorities should be fairly flexible on the models for these projects, which would be driven by the nature of the crops, their location, the amount of land needed to make the operations viable, and the way land access can be readily obtained and security assured. The models could be along the lines of La Frutera or Agumil, or some variation. Aside from suitability of land and access, the ability to mobilize the required landholdings and assure security of assets and personnel will be the principal factors in determining the most appropriate locations for these projects. As well as local labor, demobilized MILF forces and returnees could be employed. Hopefully, these projects could be underway when the new Bangsamoro government is in place.

4.3 Establishment of Quality Standards and Criteria for Export Products

The food business operators should be encouraged to implement a hazard analysis and critical control points (HACCP)-based system for food safety assurance in their operations (Republic Act No. 10611 in the Philippines). As of 2013, the companies coping with HACCP are 92 factories in the Philippines and none in Bangsamoro, but this is far behind from the number of Indonesia at 215 in 2009.

Promotion of HACCP will also be necessary for the development of halal industry in Bangsamoro. Halal requires food safety elements, good manufacturing practices and good hygiene practices, which are already included in HACCP.[51] The ARMM Regional Government (ARMM-RG) has pursued the development of halal industry, and this is supported by the National Government with the identification of halal as a priority development strategy for the ARMM in the Philippine Development Plan.

Together with DAF-ARMM and DTI-ARMM, ARMM-RG has taken some steps to promote halal industry in the region,[52] which include the following:[53]

- Formation of a halal certification body and creation of certification standards;
- Enactment into law of the Muslim Mindanao Autonomy Act No. 254 or the Halal Labeling Act of 2009;
- Provision of support services, which can be tapped and further strengthened at all levels of the government, such as agricultural extension and technology transfer;
- Creation of halal-compliant training programs in crops and livestock, for which the modules are still to be developed; and
- Implementation of pilot projects for halal feed and organic halal vegetables, among others, in some localities.

Recent development include the creation of Mindanao Halal Industry Task Force under the Mindanao Business Council and the creation of Halal Certification and Accreditation Board in the private sector. In fact, the Framework Agreement on the Bangsamoro provides for the Bangsamoro Basic Law that enables the Bangsamoro government to accredit halal-certifying bodies in Bangsamoro.

However, HACCP implementation and certification—and consequently halal industry development—is hindered by common issues/problems such as limited financial capability, lack of prerequisite program such as hygiene and sanitation in factories, limited HACCP knowledge and technical competence, management problems such as lack of commitment, motivation, and lack of government infrastructure and support.

For example, quality control in sanitation has been a problem in the ARMM. Most of the food-related enterprises in the region are family-based and use traditional methods. These enterprises may not know modern product preparation practices which are needed for compliance to HACCP. As these business do not comply with such internationally accepted standards, their scope of operations would

[51] Black, Rob. *Halal, Food Safety and HACCP (Presentation Material)*. Central Asia Regional Cooperation Program. Workshop on SPS Measures, 25-26 July 2012. Bangkok, Thailand.

[52] The initiative was funded and assisted by the Canadian International Development Agency's Local Government Support Program in ARMM (2005-2010), and later on by other funding agencies such as Japan International Cooperation Agency (JICA).

[53] Barandino, Rizalino. *Working Paper No. 11 Indicative Business and Investment Opportunities in the ARMM.*

also be limited to the domestic market[54].

HACCP implementation in Bangsamoro and their adjustment to EU and US legal regulations concerning food hygiene, safety and quality will give the producer/exporter stronger market orientation leading to product quality improvement. It will ensure consumer protection and increase in production profit.

The project aims to strengthen capacity of good manufacturing practice (GMP) and HACCP through provision of classroom and on-the-job training to SME beneficiaries. A technical cooperation between the government (DTI) and the food industry to meet international standards for GMP and HACCP through an accreditation program will be promoted. This project also aims to increase food exports by providing buyers and interested parties with information on local processed food products that meet international requirements for quality and safety.

It is recommended that the project utilizes resources available in academic sphere. Realistically, a new faculty teaching Shari'ah business and administration should be established in Mindanao State University (MSU) to lead Bangsamoro students to more Islamic business. The faculty should cover the fields of basic Shari'ah law, halal food development, Islamic banking and Islamic rituals etc. BDA tying up with CHED will advance this concept having support from outer Muslim societies.

According to the interview to MSU on June 2015, there is only few combat happened inside campus and it is rather safe for the donors to implement the designated project inside the academic campus. This education faculty can be utilized for re-educating militants and army as well.

4.4 Diet Improvement Campaign in Rural Area (2016–2022)

The food habits in Bangsamoro are still traditional Philippine style. Although cereals, starchy roots, and tubers are eaten abundantly, consumption of fresh meat, eggs, and regulating food is still small. These habits may lead to diseases, especially those attributed to vitamin A and B shortages such as beriberi and night blindness. For young children, it causes development disorders. The 2010 food intake survey (FNRI) shows that Bangsamoro inhabitants take lowest level of regulating foods in the Philippines; for instance, the daily intake of green leafy vegetable and vitamin C rich food is 33g and 15g respectively as the national averages, while 31g and 7g are the intake by Bangsamoro inhabitants.

Table 4.1 shows the summary of the results of the 2010 FNRI survey. The values represent the food intake per gram per day. As seen in the table, ARMM has lagged behind the Mindanao average and the Philippine average in terms of body building and regulating foods.

In July 2015, the ARMM Department of Health urged the Regional Nutrition Committee to emulate awareness programs and campaigns for better education of proper eating habits such as the national programs *Pinggang Pinoy* and *10 Kumainments* to address the emerging issues in nutrition in the region. The Pinggang Pinoy program aims to educate the consumers on having a healthy balanced meal by providing recommendations on the proportions of the food content. Meanwhile, the 10 Kumainments provides guidelines on positive nutrition practices and encourage the adoption of healthy lifestyle among households.

Aside from educating the locals, it is also important to promote production of vegetables among the communities. Starting to address the food intake for regulating foods will be ideal since production of some vegetables can be done at home or in each community.

Green leafy vegetables such as *malunggay* and *pechay* can be produced very easily even at backyard and vitamin C rich food such as tomatoes and mangos as well. It is recommended that the importance of proper food intake is promulgated through information dissemination and also backyard production of such crops are extended through the barangay health worker of the Department of Health. Nutrition experts from international donors will train barangay health workers and disseminate proper and efficient dietary habit.

International donors may provide three to five nutrition experts and let them understand the present

[54] ibid.

situation of food intake by barangay and extend practical training on backyard vegetable production. The promulgation of recipes for easy intake of these products is also the role of such nutrition experts.

Table 4.1 Summary of Results of 2010 FNRI Survey

Food Group	Philippines	Mindanao	ARMM
ENERGY GIVING FOODS			
Cereals and Cereal Products	367	384	396
Starchy Roots and Tubers	17	19	29
Sugar and Syrups	40	14	16
Fats and Oils	15	11	9
BODY BUILDING FOODS			
Fish, Meat and Poultry	175	165	151
Eggs	14	11	7
Milk and Milk Products	7	26	19
Dried Beans, Nuts and Seeds	9	7	5
REGULATING FOODS			
Green Leafy and Yellow Vegetables	33	40	31
Vitamin C-Rich Foods	15	12	7
Other Fruits and Vegetables	114	113	87
Miscellaneous	29	27	15

Source: National Nutrition Survey.

4.5 Improvement of Regulatory Framework of Islamic Finance (2016–2022)

Having a dual banking system combining conventional banking and Islamic banking may be necessary in Bangsamoro to support existing business and investors in the region. Capital and access to finance should be present to indicate the readiness of the region to welcome new investments. This proposed dual banking and finance recognizes the following tenets in Bangsamoro[55].

- The conventional banking and finance system is a support on the economic structure of the country. Since the rest of the Country follows the conventional type, it will be plausible for Bangsamoro to have such as system as well.
- The Islamic banking and finance system is an alternative for market segments that would like to uphold Islamic principles in doing business.

In fact, the current situation proves that a conventional banking system and Islamic banking system share the same set of difficulties in Bangsamoro as described below.

4.5.1 Current situation

There is only one entity operating under the concept of Islamic finance in the Philippines: Al-Amanah Bank, a government-owned Islamic bank. However, there is no legal framework supporting Islamic finance in the Philippines. The Al-Amanah Islamic Investment Bank had failed to be successful for the following reasons:

- *Weak financial literacy and fundamentals among the people.* The people in Bangsamoro lacked a clear understanding of the concepts of Islamic banking system and products.
- *Perception of high risk situation.* The peace and order situation had made it challenging for people and companies to access the bank's offices and to transact for funding for their business activities.
- *Current economic situation.* There is a high degree of informality in the business sector, and there is low savings levels in the region.

[55] *Workshop on Banking and Finance in the Bangsamoro: Notes on Outcome and Options for An Action Agenda.* 2014

- *Lack of skills to handle Islamic banking.* Within Al-Amanah Islamic Investment Bank, its officials seem to lack appropriate skills and capacity to manage the operations.
- *Politics*. There is a prevailing perception that Al-Amanah Islamic Investment Bank only served as the national government's instrument to appease the Muslims. The reason for this is that Muslim members of the board may not have sufficient or have no background on Islamic banking and finance[56].

To be able to attract market players to do Islamic finance, there must be robust regulations supporting Islamic finance following the Sharia Law. Since the concept of Islamic finance in the Philippines is fairly new, regulators may not have the technical and practical capacity in drafting all the necessary regulations.

4.5.2 Potential, development concept and project component

Technical assistance is necessary to support drafting of necessary regulations for Islamic finance, in terms of banking and capital markets. Necessary expertise includes deep knowledge of Sharia Law, and establishment of Islamic finance in Malaysia. Capacity building is necessary for regulators to be adept with Islamic finance. For practicality, case or site studies with Malaysian regulators (i.e., Bank Negara Malaysia, Securities Commission) are to be undertaken.

4.5.3 Institutional setup such as financial, implementation and coordination bodies

Recognizing possible entry points for Islamic banking and finance system will be important, three aspects for Islamic banking and finance can be considered in the region[57].

(1) First aspect: Banking

There are two general categories of Islamic banking: (1) fully fledged Islamic banking, and (2) conventional banks operating Islamic windows. One example of Islamic window is to have some of the fully fledged Islamic banks to set up as a subsidiary of conventional banks where the operation and management are clearly defined. While being a subsidiary of a conventional bank, these fully fledged Islamic banks should be able to comply with Shari'ah principles. This method could be a strong entry point due to the following arguments:

- Gradual implementation is more easily absorbed; customer base will be built, public will be educated, and management capabilities for Islamic banking will be developed.
- Cost efficiency will be ensured, since the existing infrastructure of the banks can be used and the current manpower can be trained for Islamic banking.
- Conventional banks can use their technological know-how in the region.
- It will be relatively easier to attract non-Muslim market to Islamic instrument.

(2) Second aspect: Capital markets, including sukuk, stock market, and mutual funds

Sukuks are certificates of ownerships in a pool of underlying assets in which the certificates are of equal value. These financial instruments are suitable for mobilizing funds for new projects, expanding an existing project, and supporting a business venture. It is important to note that a return is obtained through a sharing or leasing of assets, and reflects the profitability of a project. Moreover, the assets are used for creating Shari'ah compliant returns—in essence, it works as *asset-based* financing, not *asset-backed*.

At present, Islamic financial instruments such as sukuks could be expensive given the Philippine

[56] *Workshop on Banking and Finance in the Bangsamoro: Notes on Outcome and Options for an Action Agenda.* 2014

[57] The three aspects are summarized from the results of the *Workshop on Banking and Finance in the Bangsamoro: Notes on Outcome and Options for An Action Agenda.*

taxation regulations. These instruments would be subject to transfer taxes, value added taxes, and capital gains tax.

(3) Third aspect: Non-banking financial institution, including *takaful* (Islamic insurance) and microfinance

One possible non-banking financial instrument in Bangsamoro would be Islamic pawn broking. Money from pawned items could be used for emergency purposes such as educational needs and hospitalization of the people. On a broader perspective, it can also be used for additional capital among small businesses. Some of the advantages of Islamic Pawn Broking are[58] as follows:

- The cost is cheaper and the procedure is simpler.
- It is free from interest.
- Pawned assets are kept for safety and insured from loss.
- The borrower is given advance notice before the auction and bidding process. If the pawned assets are sold, any excess amount is returned to the borrower.

Takaful (Islamic insurance) is also needed for agricultural produce in the region. Since farmers may not have the enough financial resources to avail sizeable insurance products, introduction of micro-insurance products is a major consideration. Related regulations of the Insurance Commission are still not deemed to be appropriate for takaful, which works under Islamic principles. For instance, insurance companies are required to invest about 60% of their assets on interest bearing Government Securities, which may not be in accordance with Islamic principles. Thus, Islamic insurance companies may find it hard to enter the market.

The following institutional setup is recommended:

1) For Islamic banking: Bangko Sentral ng Pilipinas (BSP), as regulators for all kinds of banks in the Philippines. After the regulations are set up, the following options can be considered and decided upon:
   - To allow only fully fledged Islamic banks operate in the region to avoid moral hazard in possible contamination associated with Islamic banking windows (a prudent measure)
   - To create a fully-fledged Islamic bank under the Bangsamoro government (an enhanced revival of Al-Amanah bank)
   - To allow Islamic banking windows along with fully fledged Islamic banks, letting the market decides the most suitable form of delivery mechanism for Islamic banking products (a market-driven measure).
2) For non-bank Islamic finance activities (i.e., capital markets): Securities and Exchange Commission, as regulator for all capital markets products and participants.
   - It is important to continue the efforts creating an "equal playing field" for Islamic financial instruments. One example is the move of the Philippine Stock Exchange (PSE) in announcing that about 47 of its listed companies have Shari'ah compliant stocks. PSE's screening was based on the globally accepted Accounting and Auditing of Islamic Financial Institutions (AAOIFI) standards. This is one step to encourage Muslim Filipinos to invest.
   - Insurance products such as takaful will require an enabling law to be enforced. However, there is a lack of technical expertise and competent professionals to introduce and manage takaful insurance (not only in Bangsamoro, but also in the Philippines).
3) For implementation of necessary legislation: Congress and Senate of the Philippines (Bangsamoro Basic Law Committee, Banking and Intermediaries Committee).

[58] Latiph, Acram, *Banking and Finance in ARMM*; presentation material, March 11-12, 2014.

4.6 Comprehensive SMEs Support Measures (after 2022)

There are about 50 SMEs are registered in the Bangsamoro area but their operation is still vulnerable due to the lack of hard and soft recourses needed for their business. Under the situation of Bangsamoro for now, it is not effective to introduce SME development policy/project as it is from the Philippines because industrial structure as well as hard/soft resources surrounding SME is quite different from them. For example, the corporate tax applicable to the Philippine local company at 30% seems too high for the locators in Bangsamoro, or the public finance to SMEs is actually limited to LBP, but relaxing this rule may take effect.

The Republic Act 9501 Magna Carta for Micro, Small and Medium Enterprises (MSME) serves as the governing policy for MSME development in ARMM. The region also follows the national definitions for MSME categories. Based on the capitalization requirements shown in Table 4.2, most of the Bangsamoro's enterprises will fit into micro to medium enterprises.

Under the law, DTI-ARMM is the lead agency responsible for the mobilization the necessary technological support and coordination mechanisms for promoting MSME and other entrepreneurial initiatives in the region. One notable program of the DTI-ARMM is its one-town one-product (OTOP) initiative. Through this project, each cities or municipalities will have a focus on specific product or service on which they have significant competitiveness. The support of each local government unit is paramount to make the OTOP successful. The OTOP becomes a support mechanism for MSMEs to manufacture and market their distinctive products[59].

Table 4.3 shows identified OTOP with Small Business (SB) Resolution Numbers.

Table 4.2 MSME Categories in the Philippines

MSME Category	Capitalization	Number of Employees
Micro	< PHP 1.5 million	1–9
Small	PHP 1.5–15 million	10–99
Medium	PHP 15–60 million	100–-199
Large	> PHP 160 million	200 ≤

Source: Department of Trade and Industry.

Table 4.3 OTOP with Small Business (SB) Resolution Numbers

Name of LGU	Identified OTOP	Sustainability (SB Resolution No.)
Basilan Province		
1) Ungkaya Pukan	Rubber – First Priority Coconut – Second Priority Seaweeds – Third Priority	SB Resolution No. 08-11, s. 2008
2) Lamitan City	Rubber – First Priority Coconut – Second Priority Marine/Fishery – Third Priority	SB Resolution No. 2008-16
3) Sumisip	Rubber – First Priority Casssava – Second Priority Fish Industry – Third Priority	SB Resolution No. 02, s.2008
4) Lantawan	Coconut – First Priority Rubber – Second Priority Seaweeds – Third Priority	Resolution No. 47, s.2008
Sulu Province		
1) Kalingalan Caluang	Seaweeds Production	SB Resolution No. 04, s. 2008
2) Talipao	Coffee	SB Resolution No. 05, s. 2008
3) Siasi	Red Clay Bricks	SB Resolution No. 06, s. 2008
4) Patikul	Abaca Fiber	SB Resolution No. 26, s. 2008
5) Parang	Piz Cloth	SB Resolution No. 08-082
Maguindanao		
1) Sultan Kudarat	Inaul (Loom Woven Fabric)	SB Resolution No. 08-01, s. 2008

[59] Barandino, Rizalino. *Working Paper No. 11 Indicative Business and Investment Opportunities in the ARMM.* 2014

2) Ampatuan	Rice and Corn	SB Resolution No. 2208-30
3) Rajah Buayan	Rice and Corn	SB Resolution No. 022, s. 2008
4) Shariff Kabunsuan Province	Halal Products	SB Resolution No. 20, s. 2008
5) Parang	Seaweeds	SB Resolution No. 07-15-08, s. 2008
6) Datu Odin Sinsuat	Livestock Production	SB Resolution No. 332, s. 2008
7) Mother Kabuntalan	Aqua Fresh Water Fish Production	SB Resolution No. 42, s. 2008
Tawi-Tawi Province		
1) Sitingkai	Seaweeds	Resolution No. 008-012
2) Languyan	Processed Fish and Marine Products	SB resolution No. 009, s. 2008
3) Panglima Sugala	Cassava and Fresh Fruits	Draft already presented to SB
4) Simunul	Native Delicacies	Draft already presented to SB
5) Bongao	Cassava and Native Delicacies	Draft already presented to SB
Lanao del Sur		
1) Balabagan	Abaca Production	Resolution No. 001
2) Buadipuso-Buntong	Rice Production	Resolution No. 10, s. 2008
3) Butig	Gravel and Sand (by concrete products)	Resolution No. 45-07
4) Ditsaan-Ramain	Rice Production	Resolution No. 032-008
5) Malabang	Fish Processing (Smoke Tuna-Fish)	Resolution No. 08-005
6) Maranatao	Corn Production (By-products)	Resolution No. 19, s. 2008
7) Masiu	Gravel and Sand (by concrete products)	Resolution No. 20, s. 2008
8) Pualas	Food processing (Halal spice-palapa)	Resolution No. 0055-08
9) Tugaya	Metal and woodcraft	Resolution No. 09-08

Source: Barandino, 2014. DTI-ARMM.

There are also other municipalities which are awaiting for the SB Resolutions to implement OTOP (Table 4.4).

Table 4.4 OTOP Waiting for SB Resolutions

Lanao del Sur		Maguindanao	
Municipality	Identified OTOP	Municipality	Identified OTOP
1) Bacolod-Kalawi	Loom Weaving	1) Northern Kabuntalan	Rice
2) Kapai	Ginger Production	2) North Upi	Corn
3) Madalum	Bamboo Rattan Craft	3) Matanog	High Value Fruits
4) Madamba	Bamboo Rattan Craft	4) Paglat	Kawilan Rice
5) Mulondo	Livestock and Corn	5) Buluan	Banana Chips
6) Wao	Feeds	6) South Upi	Abaca
		7) Datu Paglas	Rice
		8) SK Pendatun	Corn

Source: ibid.

To cope with policies and project surrounding SMEs in Bangsamoro, a special time bound policy is needed to enhance the SME development. Such special temporary policy includes the following:

1) Special authorization given to SME support organization,
2) Tax policy of SMEs,
3) Business incentives of financial institutions and money lenders,
4) Incentives of investors,
5) Labor code for local SME employees,
6) Policies identified by CARP, especially on ARBs and formed cooperatives, and
7) SME cultivation policy especially start-ups and business promotion.

The temporary legislation needs limited time-span so that the staged support by international donors will be necessary applying project-type technical assistance.

4.7 Strengthening Judicial System for Land Issues (2016–2022)

In the Philippines, a Torrens title system[60] is used for land ownership. Various government agencies are involved in land ownership system[61] as follows:

- The Land Registration Authority (LRA) under the Department of Justice (DOJ) keeps the official registry.
- The Land Management Bureau (LMB), under the Department of Environment and Natural Resources, administers the distribution of alienable and disposable public lands using patents of various forms; it also maintains technical information on land records based on cadastral surveys.
- The Forest Management Bureau (FMB), also under DENR, issues instruments of land rights for inalienable public forest lands.
- The Department of Agrarian Reform (DAR) implements the Comprehensive Agrarian Reform Program (CARP), and issues the Certificate of Land Ownership Award as proof of land transfer; this is registered with LRA with encumbrances.
- The National Commission on Indigenous Peoples (NCIP) issues instruments over lands in the ancestral domain (i.e., Certificate of Ancestral Domain Title and Certificate of Ancestral Domain Claim).

The involvement of various government offices in handling land tenure and ownership in the Philippines would eventually lead to challenges in coordination and organization of land information. Actual land practices show that a special case of formal tenure is land held by agrarian reform communities (ARC) and resettlement areas. This is premised on proper land documentation. These lands showcase the exercise of *de facto* and *de jure* property rights by smallholders in ARMM.

Doing business in Bangsamoro will entail partnerships with local strongmen or *Datus*. With their presence and influence in the region, several important features on land tenure system has to be noted as follows:

- Datus and their clans enjoy the authority in the traditions and the state laws as they are often elected local officials in their respective domains.
- Any business prospects should entail the blessing of a Datu in the particular location, since Datus can be gatekeepers for gaining access to land and can provide security and property rights within territory.
- It is imperative to find a progressive Datu who can address both the developmental concerns of the communities and the commercial interests of the clan and business partners.
- It is advantageous to find a clan with dynastic succession to ensure potential business continuity. Clan members will ensure the long term arrangements with the business partner.[62]

The banana plantation of La Frutera overcame the challenge of land ownership issue by establishing a company that takes the responsibility of land leasing from small-scale farmers. This was the method that leveraged traditional culture and leadership of the Datu system. However, there is no guarantee that the same method works in other areas. There is no guarantee that a method successfully applied in one area is sustainable either. Agumil initially attempted the same approach in palm oil plantation. However, the problems emerged once the Datu who was the partner passed away and his successor did not continue the contract. Agumil's strategy today is to have individual farmers to join the cooperative that is a partner of Agumil.

Not all investments in the proposed Bangsamoro region met the same success with that of Agumil. In

[60] A Torrens system is a land registration system in which the government is the keeper of all land and title records. The land title serves as a certificate of full, indefeasible, and valid ownership.
[61] Workshop on Land and Property Rights in Bangsamoro. Notes on Outcome and Options for Action Agenda. 04-05 June 2014.
[62] Workshop on Land and Property Rights in Bangsamoro. Notes on Outcome and Options for Action Agenda. 04-05 June 2014.

particular, there are significant challenges for foreign investors in seeking for potential partners (land owners) in the region. Disputes on land tenures and titles are barriers to investment promotion in the region. Table 4.5 shows the typology of land conflicts in Mindanao.

Table 4.5 Land Conflicts in Mindanao

Province/Area	Moro vs. Christian	IP vs. Moro vs. Christian	Intra-Moro (Rido)	Private vs. Government
Maguindanao (South Upi)		√		
North Cotabato (Aleosan, Arakan, Carmen, Kabakan, Midsayap, Pikit)	√	√		√
Lanao del Norte (Tubod, Linamon, Kauswagan)	√		√	
Lanao del Sur (Marami)			√	√
Zamboanga Peninsula (Zamboanga City, Ipil)		√	√	√
BaSulTa (Basilan, Sulu)			√	

Source: World Bank. Towards a Viable Solution to Land Conflict in Mindanao. Presentation Workshop 2014.

At both national and local levels, there have been a number of issues relating to land tenure to be addressed. These initiatives are supported by different NGOs and multilateral organizations. Some examples of on-going projects are the following:

- A Joint Administrative Order was signed in 2012, which required DAR, DENR, LRA, and NCIP to coordinate and ensure no overlap in titles prior to issuing any new land tenure documents. While this will begin to help address the coordination problems, it is unlikely to resolve pressing issues in landownership in the Bangsamoro region due to the mandated functional overlaps of the agencies.
- LMB is currently updating the 1970s cadastral survey on a nationwide basis and aims to complete the process by 2015. Signing a memorandum of agreement with the ARMM Regional Government, LMB planned to start its efforts in the Bangsamoro region at the provinces of Maguindanao and Basilan.
- DENR has Land Administration and Management Project (LAMP). The project was funded by the World Bank and Australian Aid. LAMP had a pilot test on the process of surveying, individual titling, proper record keeping, and storing of land titles. However this initiative's success was limited to particular areas in; this did not cover conflict-affected areas in Mindanao, as gaining support from individual LGUs had been very difficult.

Related initiatives on land tenure are the following:

- The National Land Use Commission (NLUC)[63] was recently strengthened and reformed as a NEDA Board Committee.
- Catholic Relief Services, an international NGO, implemented the Applying, Binding, Bonding, and Bridging to Land Conflict in Mindanao (A3B) project. Funded by USAID, A3B project aimed to bring diverse identity group together to collaborate to resolve land-related conflict. In particular, this project puts weight on trust building as a key component of sustainable conflict resolution.[64]

Because of such background, the Bangsamoro Development Agency (BDA) needs to handle each individual case of private investment plantation with flexibility. Each investment case needs to be handled separately/individually, considering and adjusting to the situation of business activity at the site of investment as well as demographics and cultural characteristics of the site.

One immediate action is proper identification of areas where there are major land disputes and related

[63] an interagency body on land use and physical planning

[64] *Workshop on Land and Property Rights in Bangsamoro. Notes on Outcome and Options for Action Agenda.* 04-05 June 2014.

conflicts. The data would be used to map the particular areas which are perceived to have high land-ownership risks (the higher the disputes and conflicts, the higher the risk). The following are some examples of the results of this immediate action[65]:

- Existing data on land rights and land classification obtained from DENR, LRA, DAR, and NCIP,
- A map of ongoing and potential conflicts related to natural resources and plantations with a focus on the surrounding territory of indigenous peoples and ancestral origin, and
- A map of potential areas for agribusiness and mining investors

The protection of property rights must extend beyond the attributes of land and resources. In order to ensure the safety/security of investment contracts, it is necessary to legislate a conflict/dispute resolution mechanism. Bangsamoro needs both official and unofficial judicial systems functioning. As official systems, judiciary at the barangay level, judiciary based on Shari'ah, and judiciary by civil court are needed. Methods of various conflict/dispute resolutions should be clearly articulated, stipulated and promulgated widely. Each judiciary system requires capabilities for proper enforcement.

Bangsamoro should take into consideration the models of Malaysia and Thailand for land management. In Malaysia, the government introduced a good land titling system, which was based on Torrens system and had programs to enable the issuance of provisional titles based on limited surveys. Thailand's strength in land management system are defined by the following characteristics[66]:

- A strong and unified policy/legal framework, with systematic administrative processes for registration to formalize rights,
- A sound institutional framework, with a single land administration agency for land registration, cadastral survey and mapping, and collection of land and related fees,
- Streamlined procedure and reasonable transaction cost through one-stop shops,
- A strong public confidence in the land administration system, and
- High levels of participation.

For Bangsamoro, it will be paramount to explore alternatives and best-fit models, especially on potential industries (such as agribusiness in the short term and mining in the long term). These models should be structured according to the land ownership aspirations and cultural characteristics of the people. For instance, matching progressive-minded Datus to be development entrepreneurs will be ideal for agribusiness industry in Bangsamoro.

4.8 Bangsamoro Investment Window (after 2022)

Land issue was the original issue of conflict in Bangsamoro and without establishing land development strategy this issues will remain unsolved. BDA as the administrative body of Bangsamoro recognizes that deregulated permits on land development induce unorderly development, income differential and areal conflicts.

Most big land owners (including Datus) are expecting to start business with investors and they are waiting for this opportunity. While small land owners, ARBs and landless farmers are expecting to their participation in that project, which is initiated by Datus and investors.

On the other hand, the potential investors to large scale plantation from outside Bangsamoro want to tie-up with promising Datu as his investment partner. They are keen to collect information on suitable partner but they are not familiar with practical customs on land management and endemic issues on their prospecting land.

The Bangsamoro investment window (BIW) supports realizing the stakeholders' needs described above and strive matching of both investor and land owner in line with the regulation set by the administrator.

---

[65] *Workshop on Land and Property Rights in Bangsamoro. Notes on Outcome and Options for Action Agenda.* 04-05 June 2014.

[66] *Workshop on Land and Property Rights in Bangsamoro. Notes on Outcome and Options for Action Agenda.* 04-05 June 2014.

The ideal functions of BIW are as follows:

1) Strategize the involvement of small land owners, ARBs, and landless farmers to the development,
2) Provide investment information to potential investors,
3) Intermediate big land owners to investors,
4) Monitor the development and accumulate the case studies, and
5) Disseminate successful cases.

The focus on the agricultural sector is due to the landscape of current activities in Bangsamoro. Agriculture and agri-business are clustered mainly in Maguindanao and Lanao del Sur. Information facilitation between progressive Datus and potential investors will be necessary since *enlightened* leadership is one condition for a successful investment project in Bangsamoro. Other key investment drivers[67] which can be integrated in the proposed Bangsamoro investment window are the following:

- Competitiveness of land (including components of price and fertility) and labor (prevailing rate of the workers),
- Adaptation to the local cultural environment,
- Emphasis on shared goals and values, and
- Appreciation of similarities and interfaith dialogues.

The BIW is formed by different agencies, each regularly providing information to the BIW center. In fact, the BIW can work for both local and foreign investors interested in operating business in Bangsamoro. Aside from gaining support from local influential people to be part of the BIW, the participation of the Land Registration Authority and other land-related agencies will be needed to account for the possible tracts of land open for investment. Other agencies that are recommended to be involved in the proposed BIW as part of industry and investment promotion are presented in Table 4.6.

Table 4.6 Roles of Other Agencies in Local Industry Promotion

Agency	Roles in local industry promotion
DTI-ARMM	Promote, regulate, and coordinate trade and industry activities
DAF-ARMM	Develop agriculture, forestry and fisheries in the region
DOST-ARMM	Processing technologies
DILG-ARMM	Supervise LGUs in the region, support in preparing and evaluating development plans
RBOI-ARMM	Promote, assess, and develop local and foreign investment opportunities
CDA-ARMM	Register, supervise, train, and assist in the direction of cooperatives in ARMM

Source: Development Study on Local Industry Promotion in ARMM (JICA, 2011).

[67] Malik, Urooj. *The Bangsamoro: An Overview of Ecosystems, Endowments and Investments*. Presentation Material. Presented on 26 November 2013.