



Department of Environment and Natural Resources

FOREST MANAGEMENT BUREAU

FORESTRY INVESTMENT ROAD MAP 2018-2028



Tree Plantation



Fuelwood



Biomass



Ecotourism



Coffee



Cacao



Rubber



Grazing



Rattan



Bamboo



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DENR ADMINISTRATIVE ORDER
No. 2019- 22

DEC 02 2019

SUBJECT: ADOPTION OF THE FORESTRY INVESTMENT ROAD MAP (FIRM)

Pursuant to Presidential Decree No. 705 (Revised Forestry Code of the Philippines) as amended, Executive Order No. 318 (Promoting Sustainable Forest Management in the Philippines), Philippine Master Plan for Climate Resilient Forestry Development, and Republic Act No. 11032, Ease of Doing Business and Efficient Government Service Delivery Act of 2018; and in support to attainment of the Sustainable Development Goals which balances the economic, social and environmental dimensions of sustainable development, the Forestry Investment Road Map (FIRM) 2018-2028, attached hereto as Annex A, is hereby adopted.


The FIRM is the country's blueprint to encourage private sector investments in forestry. It will provide an avenue to hasten the country's progress, and socio-economic development through the optimization and wise use of forestlands under the purview of sustainable forest management.

The FIRM aims to revitalize forestry investments through local and foreign direct investments in an environmentally-sound, economically-viable and socially-responsible manner towards inclusive growth and sustainable development. It will also prescribe guidelines on how industrial-level partnerships can be strengthened to transform the production forests into a significant contributor to the national economy.

The DENR Regional Offices shall implement, monitor and submit the necessary report on FIRM accomplishments to the DENR Central Office copy furnished the Forest Management Bureau.

All Department Orders, Circulars, and other issuances inconsistent herewith are hereby revised, repealed and/or modified accordingly.

This Order shall take effect immediately.


ROY A. CIMATU
Secretary



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List of Acronyms/Abbreviations

ADSDPPs	Ancestral Domain Sustainable Development Plans
AFF	Agriculture, Fisheries, and Forestry
APO	Asian Productivity Organization
BCR	Benefit-Cost Ratio
BIR	Bureau of Internal Revenue
BOC	Bureau of Customs
CADC/T	Certificate of Ancestral Domain Claim/Title
CBFM	Community-Based Forest Management
CBFMA	Community-Based Forest Management Agreement
CENRO	Community Environment and Natural Resources Office
CHP	Combined Heat and Power
CLUP	Comprehensive Land Use Plans
CNFPO	Certificate on Non-Timber Forest Product Origin
DA	Department of Agriculture
DA-BAI	Department of Agriculture-Bureau of Animal Industry
DAR	Department of Agrarian Reform
DBM	Department of Budget and Management
DILG	Department of the Interior and Local Government
DOE	Department of Energy
DOLE	Department of Labor and Employment
DOST	Department of Science and Technology
DPWH	Department of Public Works and Highways
ENR	Environment and Natural Resources
FDIs	Foreign Direct Investments
FIPA	Forestry Investment Portfolio Approach
FIRM	Forestry Investment Road Map
FLAgT	Forest Land Use Agreement for Tourism
FLGMA	Forest Land Grazing Management Agreement
FLUPs	Forest Land Use Plans
FMB-FIDD	Forest Management Bureau-Forest Investment Development Division
FMUs	Forest Management Units
GCB	Green Coffee Bean
GDP	Gross Domestic Product
GIDAs	Geographically Isolated and Depressed Areas
GOCC	Government-owned and Control Corporation
GVA	Gross Value Added
HVC	High-Value Crops
ICO	International Coffee Organization
IFMA	Integrated Forest Management Agreement
IFP	Industrial Forest Plantation
IPP	Investment Priority Plan
IRR	Internal Rate of Return
ITH	Income Tax Holiday
IWRMP	Integrated Watershed Resources Management Plans
MC	Management Cost
MMBFOE	Million Barrels of Fuel Oil Equivalent
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NEDC	National Ecotourism Development Council
NESAP	National Ecotourism Strategy and Action Plan

List of Acronyms/Abbreviations

NGP	National Greening Program
NPV	Net Present Value
NTDP	National Tourism Development Plan
ODAs	Official Development Agencies
PBID	Philippine Bamboo Industry Development
PBIDC	Philippine Bamboo Industry Development Council
PD	Presidential Decree
PHIRMA	Philippine Rubber Manufacturers Association
PMPCRFD	Philippine Master Plan for Climate Resilient Forestry Development
PPP	Public-Private Partnership
PRIA	Philippine Rubber Industries Association
PRRI	Philippine Rubber Research Institute
PSA	Philippine Statistics Authority
PTSA	Philippine Tourism Satellite Accounts
PV	Present Value
RCC	Rattan Cutting Contracts
RIAP	Rubber Industries Association of the Philippines
ROI	Return on Investment
RWE	Round Wood Equivalent
SFM	Sustainable Forest Management
SHP	Separate Heat and Power
SIAD	Sustainable Integrated Area Development
SIFMA	Socialized Industrial Forest Management Agreement
SMEs	Small-Medium Enterprise
SMP	Survey, Mapping and Planning
SP	Selling Price
VAT	Value Added Tax
WPP	Wood Processing Plant

FORESTRY INVESTMENT ROAD MAP OF THE PHILIPPINES (2018-2028)

EXECUTIVE SUMMARY

The Forestry Investment Road Map (FIRM) 2018-2028 with the vision: “*Revitalized Philippine forestry investments towards inclusive growth and sustainable development*” is the country’s strategy to encourage the private sector to invest in the development of potential categories identified within forest lands. It will provide the pathways on how the country’s progress will be realized through the optimization and sustainable utilization of forest resources.

The FIRM aims to drive the development of the forests through local and foreign direct investments and increase the GDP contribution of the forestry sector to the national economy. It focuses on industrial-level capital investments to maximize the utilization of production forest lands in a socially-acceptable, economically viable, and environmentally sound projects. It will also provide directions to the DENR and concerned stakeholders and create enabling environment for private and other sectors to infuse capital investments in forestry. The potential investment areas include:

- a. forest plantations for timber, non-timber forest products, fuelwood, biomass, and high value crops (coffee, cacao and rubber);
- b. Cattle grazing;
- c. Ecotourism outside NIPAS areas; and
- d. other ecosystem services.

The FIRM has the following goals:

- Provide an enabling environment for investments in forest and forest-based products and services to assure investors of stable policies, secure tenure, incentives, and technical support;
- Generate additional and sustained forestry investments to meet the demands for forest and forest-based products and high value-added commodities and services;
- Ensure the sustainable supply of raw materials to produce globally competitive forest-based products and services; and
- Promote equity and social justice by uplifting the socio-economic status of women and men in forest-dependent communities.

The implementation of the FIRM will have short-term (2018-2020), medium-term (2021-2025), and long-term (2026-2028) targets. It will be reviewed periodically for improvements in the light of emerging policies and potential investment areas.

The government through the DENR – Forest Management Bureau is the lead agency in terms of creating the enabling environment to encourage the private sector to invest in forest development. For this matter, responsive policies will be formulated to ensure that the sustainable development agenda is properly embedded in each investment package.

The challenge in forestry investments now is to make sustainable forest management more commercially competitive and economically attractive to

investors – may they be small, medium, or international business operators. Therefore, to attract investments and respond to the clamor of private investors to reduce transaction time and costs, there is a need to standardize and streamline requirements and fees, and clarify policies that will facilitate ease of doing business. Further, there must also be incentives provided to the investors to encourage and infuse capital for the attainment of the economic, social and environmental sustainability. Thus, apart from making the investment climate favorable, there is also a need to develop compliance audit systems so that proper incentives will be rendered to deserving investors and encourage other tenure holders to consider the best practices.

The FIRM contains five (5) sections which will provide the strategic directions and programs about how the efforts of relevant stakeholders will be harmonized towards sustainable utilization of open access forest lands. The contents of the sections are based on published official data, actual case studies, and from opportunities and challenges gathered from the DENR Regional Offices. The actual experiences of existing tenure holders and interested new investors were also considered in the development of the FIRM.

The Road Map has the following sections:

Section 1 – Status and Trends of Forestry Investments

As provided in the 1987 Philippine Constitution, the lands of the public domain are classified into Agricultural Lands, Forest or Timberlands, Mineral Lands, and National Parks. Agricultural lands of the public domain may be further classified by law according to the uses to which they may be devoted. Alienable lands of the public domain shall be limited to agricultural lands. However, the Forestry Investment Road Map covers the management and development of forestlands and forest resources.

Based on Philippine Forestry Statistics, the Philippines has a total land area of about 30 million hectares (M ha) which are legally classified as alienable and disposable (A&D) land (14.2M ha) and forestland (15.8M ha) with categories such as forest reserve, timberland, national parks, military and naval reservation, civil reservation and fishpond and unclassified forest land (755,009 ha). The total forest cover of 7.016 M ha is accounted as open forest (4.684 M ha), closed forest (2.028 M ha), and mangrove forest (0.304 M ha). The Government through the DENR with the interested and qualified entities manage public forest and forestland areas through the Forest Management Agreement such as Integrated Forest Management Agreement (IFMA) and Socialized Industrial Forest Management Agreement (SIFMA) for tree plantation development, Community-Based Forest Management Agreement (CBFMA) for people's organization, Forest Land Grazing Management Agreement (FLGMA) for grazing land development, Forest Land Use Agreement (FLAg) for special uses, and Forest Land Use Agreement for Tourism (FLAgT) for ecotourism development.

It is indeed a big challenge for the forestry sector to sustain investments so that they will be commercially competitive and economically attractive. Thus, to sustain private sector investments, the need for the creation of suitable investment climate is inevitable. This includes the development of viable investment packages and institutionalization of appropriate policies to ease the required business processes which will maximize the utilization of

production forests. Moreover, aligning the FIRM to the Philippine Development Plan (PDP) 2017–2022 and Ambisyon 2040, the FIRM will identify the strategies to open economic opportunities to uplift the living condition of women and men in forest-dependent communities. The strategies will also define the processes to ensure the availability of goods and quality of services from the forestry investments. The goals and objectives of the FIRM are also consistent with the Philippine Master Plan for Climate Resilient Forestry Development (PMPCRFD).

Section 2 – Forestry Investment Opportunities

The section tackles the importance of private sector investments to boost the contribution of the forestry sector to local and national economies. The projected revenues and increased contribution of the forestry sector – with GDP and GVA as indicators – are provided to brace the strategies formulated for the FIRM. Moreover, it also discussed the projected job generation and the estimated monetary value based on minimum wage from the effective and sustainable utilization of the production forest.

Section 3 - Vision, Goals, Objectives, and Strategies

The FIRM is envisioned to attain the revitalized and sustainable forestry investment in the Philippines through private investments which are anchored with the dimensions of sustainable development. The FIRM aims to increase the contribution of the Production Forest to the country’s GDP from 0.01% to 0.14% in 2028 through the attainment of forestry development goals and objectives and implementation of programs and strategies. The goals and objectives will be achieved through the following strategic components:

- a) Provision of stable enabling policy and investor-friendly environment;
- b) Institutionalization of forestry investment support mechanism;
- c) Identification, mapping, and assessment of potential investment areas;
- d) Provision of secure tenure and partnership agreements;
- e) Development and management of potential areas for forestry investments;
- f) Building, strengthening and sustaining partnership with existing tenure holders; and
- g) Marketing strategies.

Section 4 - Roadmap Implementation, Monitoring and Evaluation

The roadmap will be implemented from the period 2018 – 2028. The targets are divided into short-term – which will be implemented from 2018 – 2020; the medium-term – wherein the implementation period will be from 2021 – 2025; and the long-term targets – wherein the implementation will be from the 2026-2030. The groundwork for the medium- and long-term targets starts at 2018 but the realization of the desired outputs and outcomes should be by 2025 and 2030 respectively.

Section 5 – Communication Plan

The Communication Plan is formulated to provide communication support to the implementation of the Forestry Investment Road Map. It will ensure that the concepts, benefits, and challenges of FIRM are understood right from the onset and throughout its implementation. The key messages are the:

'Investment with social and environmental purposes' for the potential investors, *'Women have key roles to play in forestry investments'* for the women's group, and *'Uniting our strengths for the forestry sector'* for the partners.

Section 1

STATUS AND TRENDS OF FORESTRY INVESTMENT

An investment is the “act of handing over resources (i.e. effort, money, time) with the expectation of some kind of result at some point in the future.” Two major types of investments are asset investments and enabling investments. Asset investments seek a return from the cash input usually as profit or products. Enabling investments, on the other hand, do not expect any direct financial reward, but prepare the ground for commercial success such as investments on infrastructure, research, capital goods, or human capital (Elson. 2012). The enabling investments includes the preparation of investment packages and creation of policies for facilitating the ease of doing business with the government.

The challenge in forestry investments now is to make good forest management more commercially competitive and economically attractive to investors – may they be small-, medium-, or international business operators. Therefore, to attract investments and in response to the clamor of private investors to reduce transaction time and costs, there is a need to standardize and streamline requirements and fees. Further, there must also be incentives provided to those who can prove the attainment of the economic, social and environmental sustainability bottom lines. Thus, apart from making the investment climate favorable, there is also a need to develop compliance audit systems so that proper incentives will be rendered to deserving investors.

The Philippine Development Plan (PDP) 2017-2022 seeks the opening of more economic opportunities for all. Lagging economic sectors like farmers will be given priority and will have easier access to economic opportunities¹. As the PDP aims to expand economic opportunities in the Industry and Services, creating “*Trabaho*” (jobs) and “*Negosyo*” (enterprises) are necessary. The *Trabaho* and *Negosyo* will provide income to people and ensure availability of good quality products and services in the country at competitive prices (PDP 2017-2022). Thus, one of the strategies under the *Trabaho* and *Negosyo* is to increase local and foreign direct investments. In line with the *Ambisyon 2040* the FIRM will create opportunities for Filipinos to enjoy a “*matatag, maginhawa at panatag na buhay*”. Because the FIRM will spark local economic development in the grassroots and upland areas, it is expected to make significant contributions to the aims of *Ambisyon 2040*.

Moreover, at the national level, the country’s Investment Priority Plan (IPP) enumerates the areas or sectors of the economy that are deemed priorities for investments and development. The 2014-2016 IPP highlights among its short-term goals the need “to maintain the competitiveness of our industries with comparative advantage, strengthen emerging products, and rebuild the capacity of existing industries.” Among the priority activities for investments under the 2014-2016 IPP that are forestry-based are manufacture of virgin paper pulp; commercial production of high value crops mainly rubber; commercial processing such as bioprocessing of forest-based raw materials; and energy development through biomass energy crops.

¹ Philippine Development Plan 2017-2022

In congruence to the Philippine Master Plan for Climate Resilient Forestry Development (PMPCRFD), the investments are expected to make significant contributions to climate change mitigation by increasing the forest cover and generation of jobs which will strengthen self-reliance among the women and men in the communities. Jobs lead to better health, better education, better access to information and disaster-resilient homes. Therefore, the FIRM may also help create the desired situation identified in the Forestry Master Plan, which are (a) strengthened resilience of forest ecosystems and communities to climate change; (b) effective response to the demands for forest ecosystems good and services; and, promotion of responsive governance.

Land Classification in the Philippines

As provided in the 1987 Philippine Constitution, the lands of the public domain are classified into agricultural, forest or timber, mineral lands, and national parks. Agricultural lands of the public domain may be further classified by law according to the uses to which they may be devoted. Alienable lands of the public domain shall be limited to agricultural lands. However, this Road Map covers only the management and development of forestlands and forest resources.

Based on PFS data, The Philippines has a total land area of about 30 million hectares (M ha) which are classified as alienable and disposable (A&D) land (14.2M ha) and forestland (15.8M ha). Figure 1 shows the land classification categories while Table 1 shows the details of land classification (PFS, 2016).

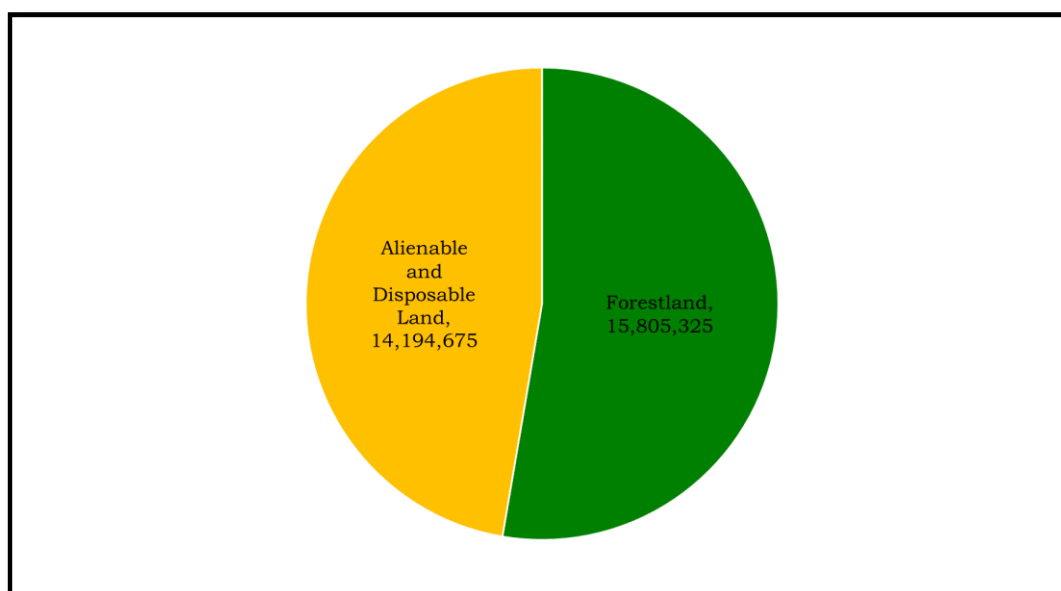


Figure 1. Land Classification in the Philippines

Table 1. Details of Land Classification in the Philippines (PFS 2016)

Classification	Area (Ha)
Total Area	30,000,000
Certified alienable and disposable land	14,194,675
Total forestland	15,805,325
Unclassified forestland	755,009
Classified forestland	15,050,316

Classification	Area (Ha)
• Established forest reserve	3,270,146
• Established Timberland	10,056,020
• National Parks and GRBS/WA	1,340,997
• Military and Naval Reservation	126,130
• Civil Reservations	165,946
• Fishpond	91,077

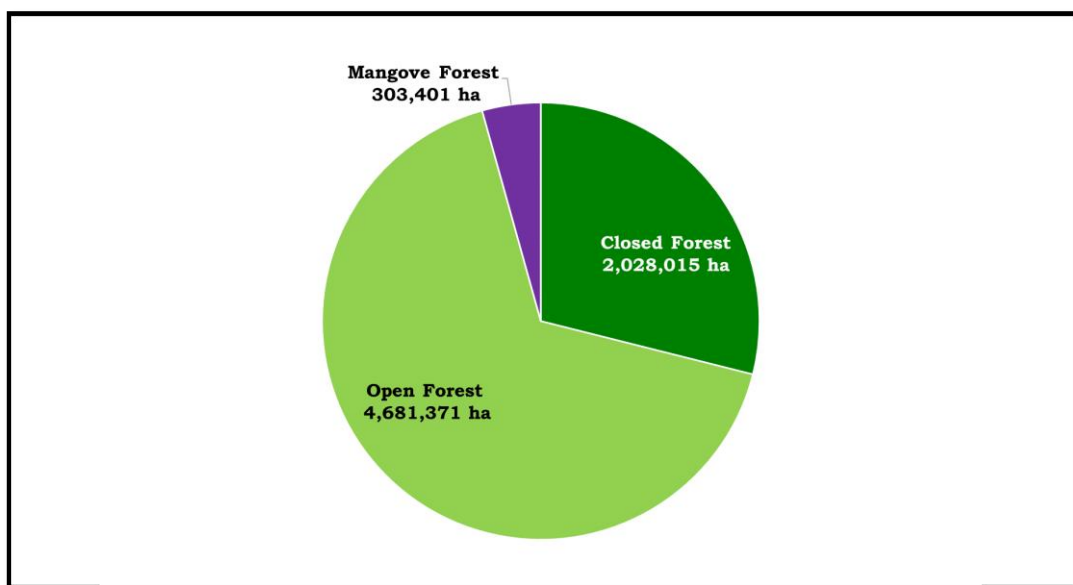


Figure 2. Philippine Forest Cover (NAMRIA, 2015)

Based on the 2015 satellite imageries, the Philippines’ estimated total forest cover is 7.016 M ha. Of the total forest cover, 4.684 M ha are accounted as open forest while the rest include closed forest with an area of 2.028 M ha and mangrove forest with 0.304 M ha (NAMRIA, 2015).

Existing Tenure Instruments in Forestlands

The National Government allocates forest lands and issues tenure instruments to private entities for the development and utilization of forest and forest-based resources. Policies and guidelines on tenure and permits indicate fees and charges including government’s share.

The 1987 Philippine Constitution provides that the State may enter into co-production, joint venture, or production sharing agreements with Filipino citizens or corporations or associations in the exploration, development, and utilization of natural resources (Article XII, Section 2).

Forest tenure instruments are issued to interested and qualified individuals, organization or entities to manage public forests and forestland areas in a sustainable manner.

These include the Integrated Forest Management Agreement (IFMA); and Socialized Industrial Forest Management Agreement (SIFMA) for plantation development; Community-Based Forest Management Agreement (CBFMA) for people’s organizations, Forest Land Grazing Management Agreement (FLGMA)

for the development of grazing land; Forest Land Use Agreement (FLAg) for special uses and Forest Land Use Agreement for Tourism (FLAgT) for ecotourism purposes. These management agreements have tenure of 25 years renewable for another 25 years depending on the performance of the tenure holder.

It can be noted that majority of the forest lands are being utilized through the Community-Based Forest Management Agreement (CBFMA) tenure instrument. CBFMA is an agreement entered by and between the government and the local community, represented by people's organization, as forest managers, which has a term of 25 years renewable for another 25 years (DAO 2004-29). The total of 1,884 CBFMAs have been issued covering a total area

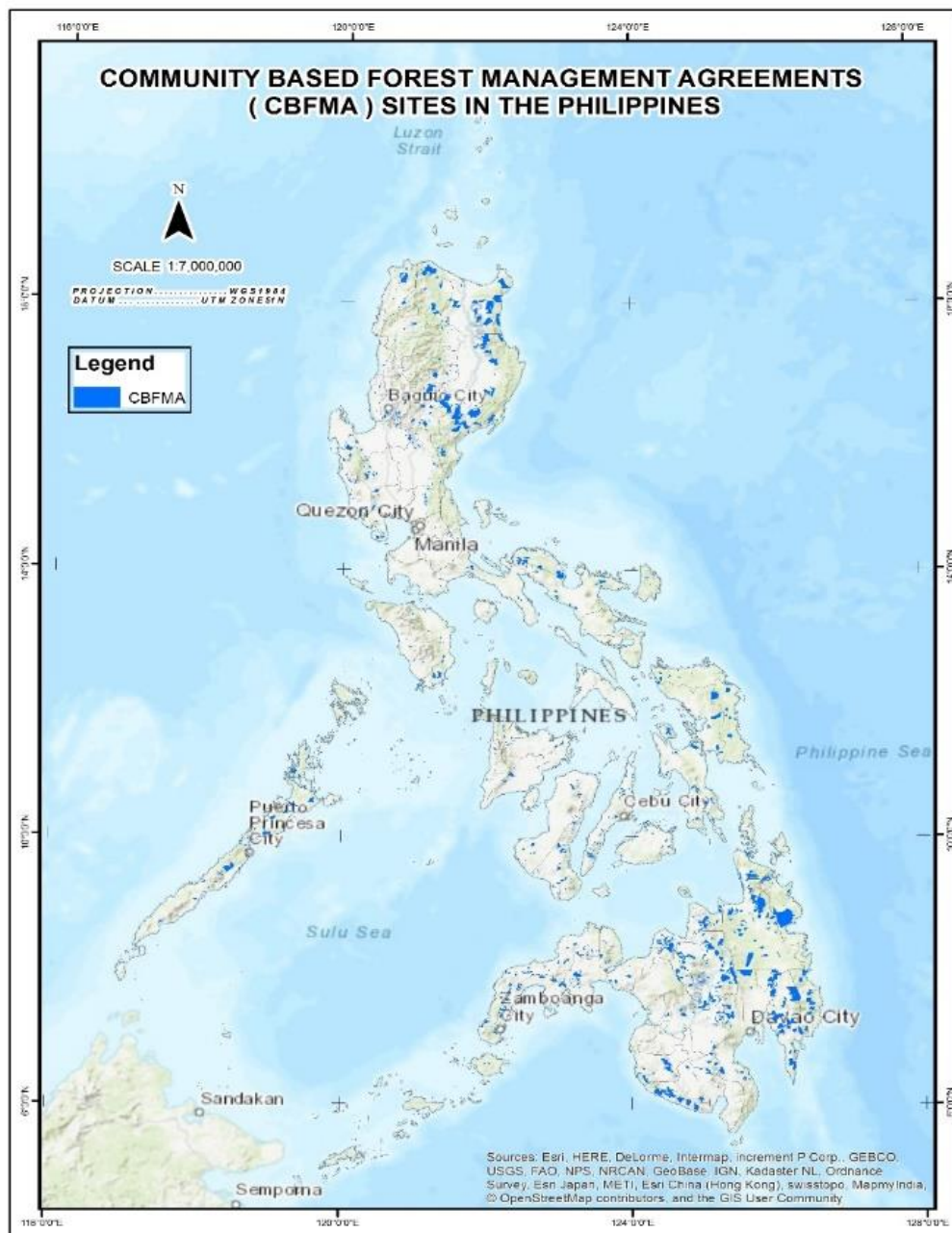


Figure 3. Map of Community-Based Forest Management Agreements (CBFMA) Sites of 1,615,598 ha all over the country. The CBFM sites are shown in Figure 3. Region 2 has the largest area of 264,280 ha covered by 109 CBFMAs while Region 4A has the least number (47) and total area (18,401 ha). About half

(50.5%) of the CBFMAs with aggregate area of 815,587 ha are found in Mindanao, 36.57% with an area of 590,792 ha are found in Luzon, and the rest (12.94% or 209,219 ha) are in the Visayas islands (PFS 2017).

IFMA is an agreement entered by the DENR and a qualified person or entity to occupy and possess in consideration of a specified rental, any forestland of the public domain to establish an industrial forest plantation (DAO No. 99-

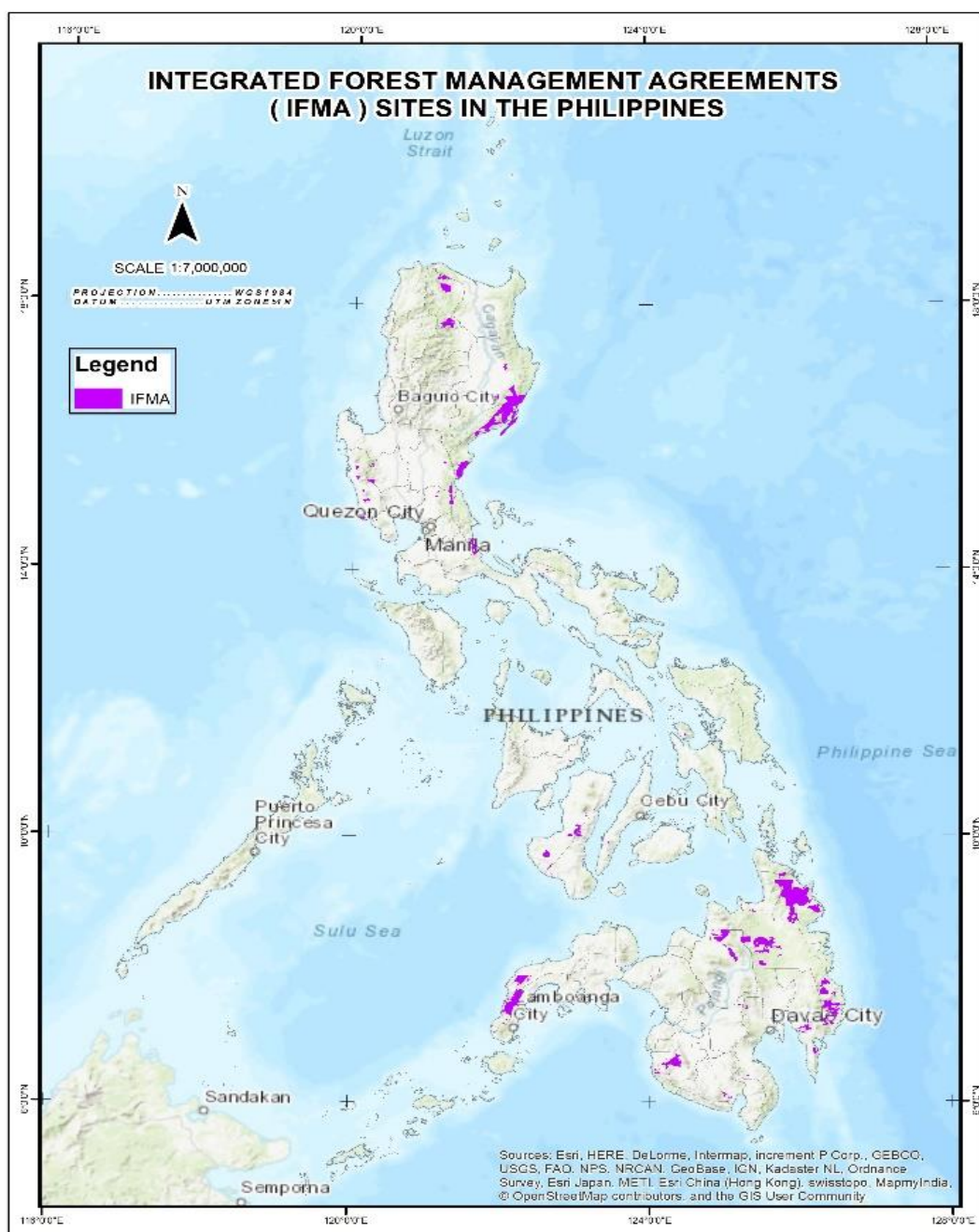


Figure 4. Map of Integrated Forest Management Agreements (IFMA)

53). An IFMA has a maximum area of 40,000 ha with both natural forests and plantations. There are 102 IFMAs issued as of 2017 covering a total area of 727,983 ha (PFS 2017). The IFMA sites are shown in Figure 4. Region 3 has the most number (19) of IFMAs with an area of 88,262 ha but Region 13 has the largest total area (156,575 ha) covered by only 6 agreements. About 50% of the IFMA holders with an aggregate area of 395,415 ha (54.32% of total

area) are found in Mindanao Island which has suitable climate and soil characteristics for forest plantations.

SIFMA is an agreement entered by and between a natural and juridical person and the DENR wherein the latter grants to the former the rights to develop, utilize, and manage a small tract of forestland, consistent with the principle of sustainable development (DAO 2004-30). SIFMA has a maximum area of 500 ha for the development of tree plantations. The SIFMA sites are shown in Figure 5. There are 1,511 SIFMAs with a total area of 32,005 ha.

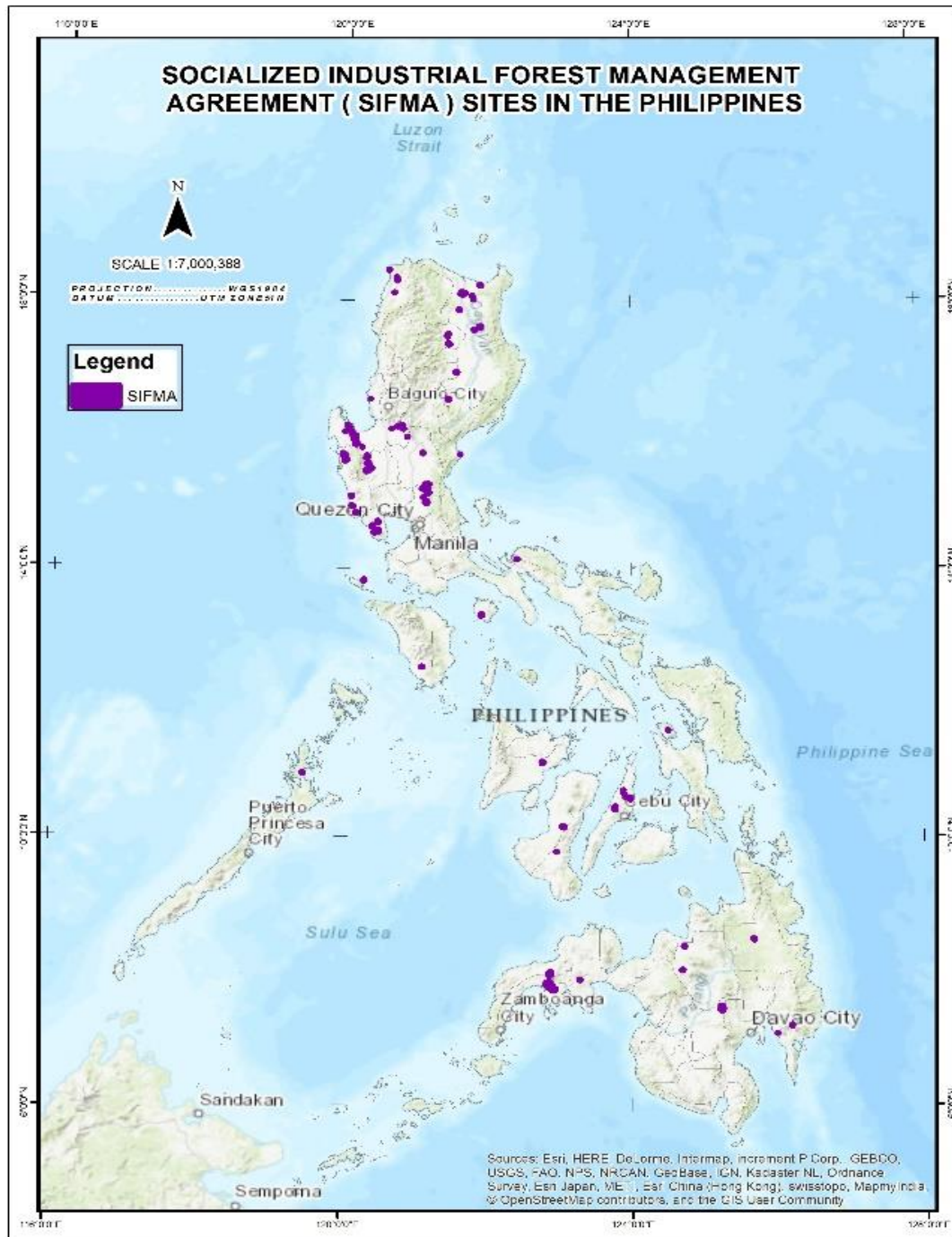


Figure 5. Socialized Industrial Forest Management Agreement (SIFMA) Sites

Region 2 has the most number (989) of SIFMAs with an area of 6,450 ha but Region 9 has the largest area (7,001 ha) under 15 SIFMAs. About 20,589 ha or 64.33% of the SIFMA areas are found in Luzon Island (Region CAR to 5)

while 8,813 ha (27.54%) are in Mindanao and only 2,602 ha or 8.13% are in Visayas. (PFS 2017).

FLGMA is a production sharing agreement between a qualified person, association, or corporation and the government (DENR) to develop, manage and utilize grazing lands for 25 years renewable for another 25 years (DAO 1999-36). The FLGMA sites are shown in Figure 6.

As of 2017, there are 171 FLGMAs with a total area of 48,823 ha. The top five regions with tenured grazing lands include Region 2 with 79 FLGMAs and

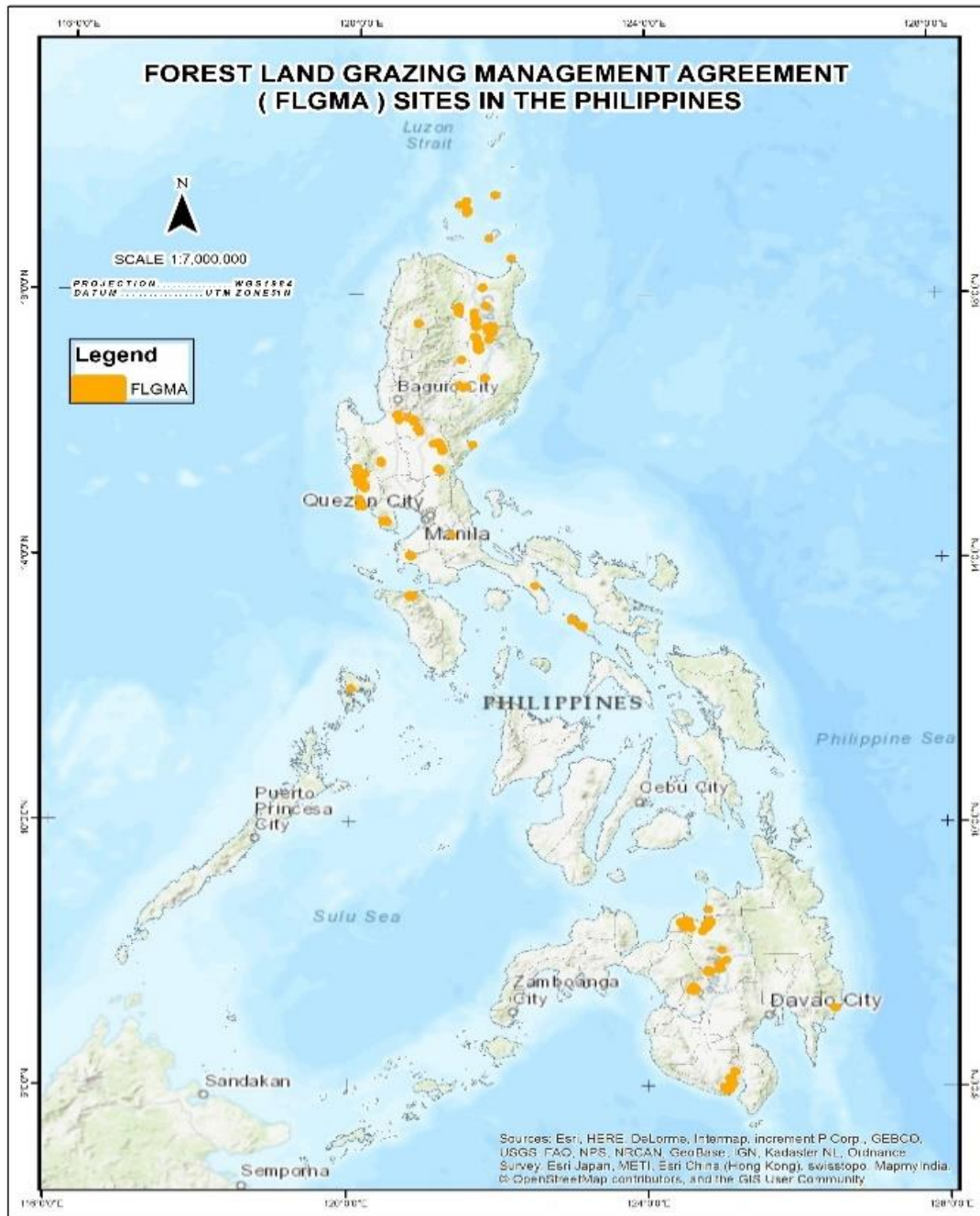


Figure 6. Forest Land Grazing Management Agreement (FLGMA) sites

largest total area of 13,348 ha followed by Region 10 with 16 agreements and an area of 7,380 ha, Region 12 with 12 agreements and an area of 7,226 ha (PFS 2017).

FLAgT is a contract between the DENR and a natural or juridical person, authorizing the latter to occupy, manage and develop, subject to government share, any forestland of the public domain for tourism purposes and to undertake any authorized activity therein for a period of 25 years and renewable for the same period upon mutual agreement by both parties.

It shall include special forest land uses such as bathing establishment, campsite, ecotourism destination, hotel site (inclusive of related resort facilities) and other tourism purposes (DAO 2004-28). For 2017, there are 33 FLAgTs with a total area of 308 has. The FLAgT sites are shown in Figure 7.

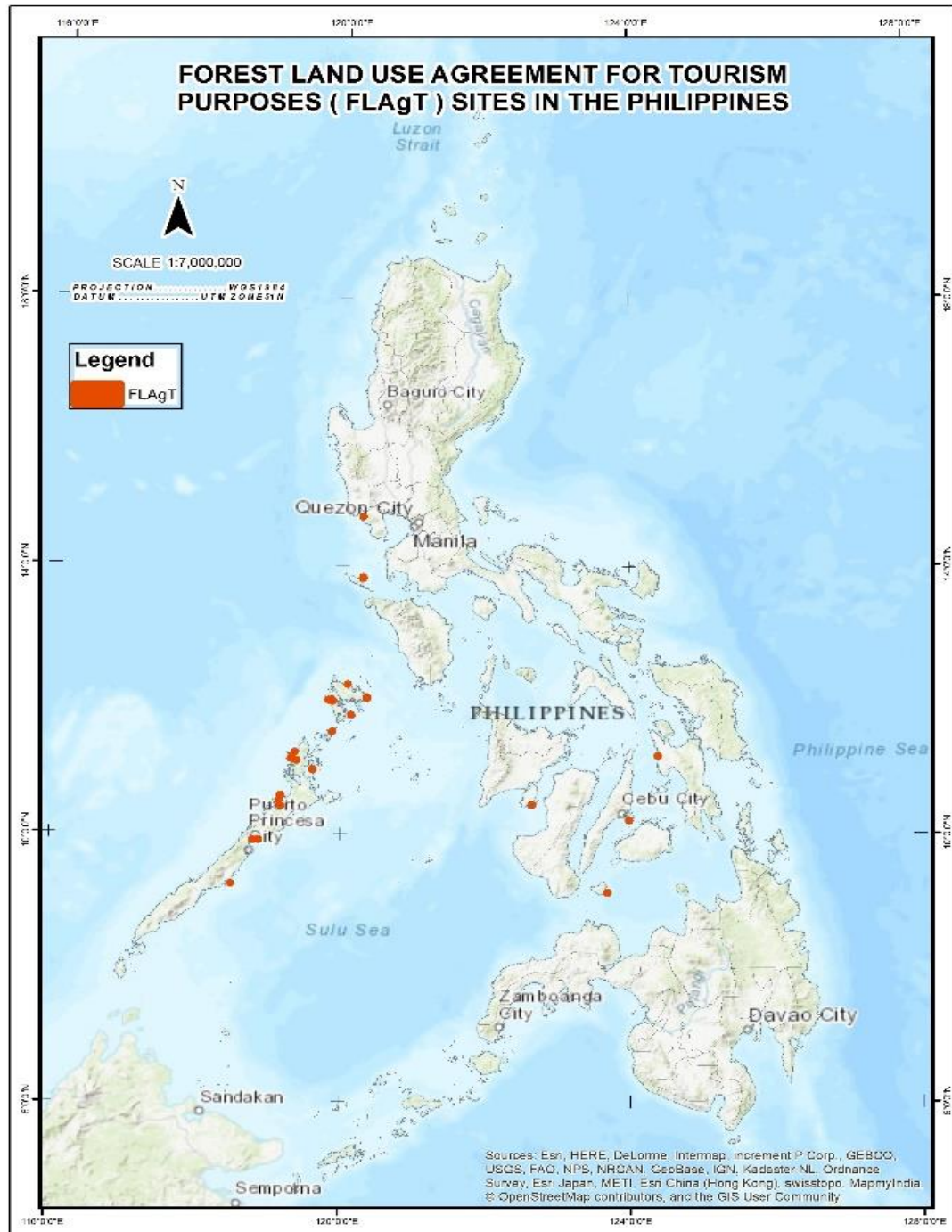


Figure 7. Forest Land Use Agreement for Tourism Purposes (FLAgT) sites

FLAg is issued for forest land uses such as nipa or herbal/medicinal plantations, log pond or depot, lumberyard, forest nursery, industrial processing plants, and communication or power station sites, among other uses. The agreement has a 25-year tenure renewable for the same period and is awarded through competitive bidding (DAO 2004-59). The FLAg sites are shown in Figure 8.

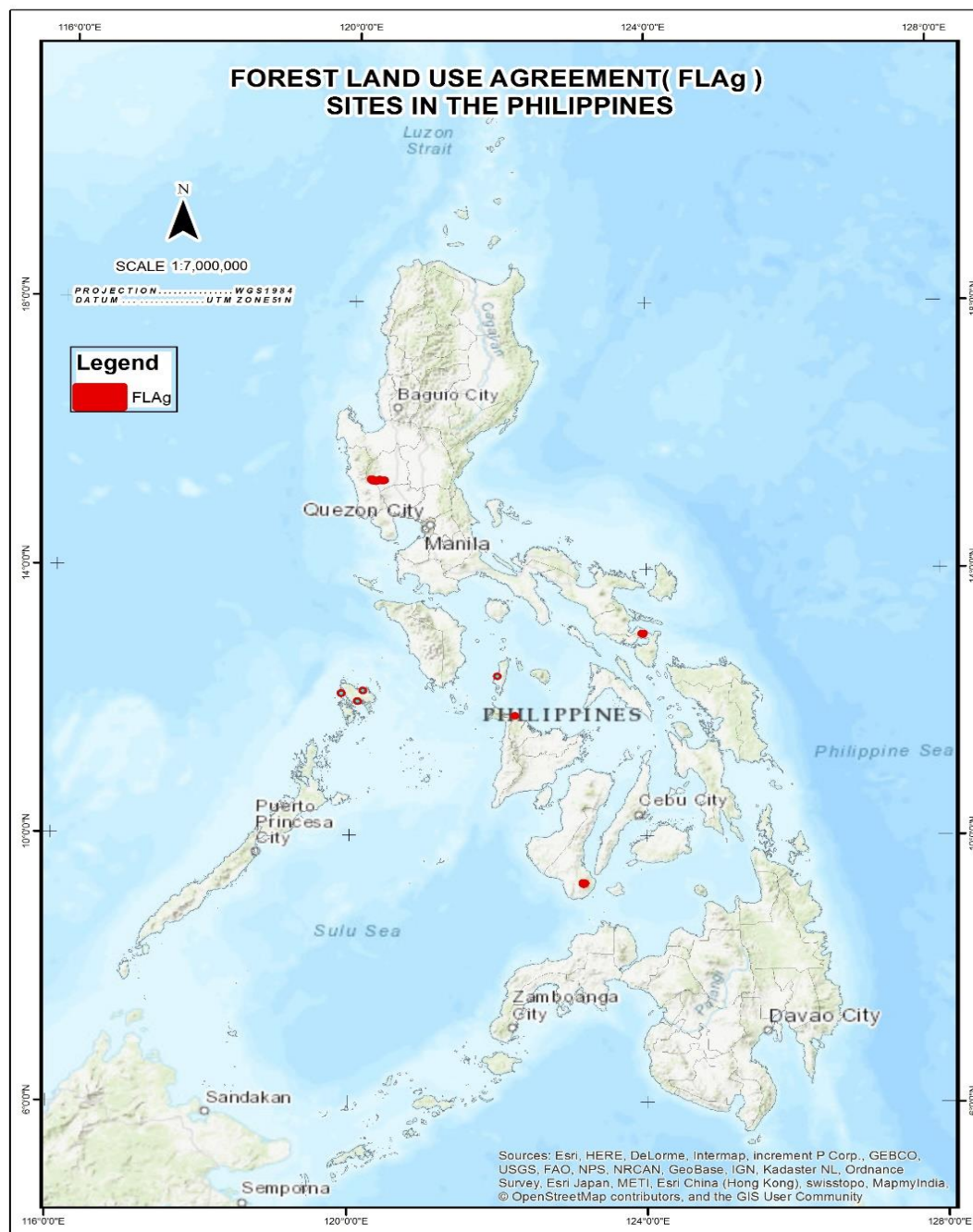


Figure 8. Forest Land Use Agreement (FLAg) Sites

As of 2017, there are 39 FLAgS with a total area of 4,077 ha. The largest FLAg area is found in Region 1 (2,727 ha) for a renewable energy project while the smallest area of 4 ha is issued in Region 5 (PFS 2017). Based on FMB-FGDIS data, only 38% of the production forests are tenured. Therefore, about 62% of the total Production Forest are open access areas

which can be offered to local and foreign investors. The production forests refer to forest lands available for timber and agroforestry production, range lands for grazing, and other forest lands for special uses. The protection forests refer to the forest lands wholly or partially covered with woody vegetation managed primarily for its beneficial effects on water, climate, soil, aesthetic value and preservation of genetic diversity (including all legislated protected areas and NIPAS initial component).

The demand for forest-based goods and services has shifted in the past decades from mainly timber-based harvesting to the provision of ecosystem-based goods and services. Ecosystem goods and services include food, timber, fuelwood, non-timber forest products, medicine, resin, and latex, among other things. Among the regulating services are carbon sequestration, soil and water conservation, clean air, watershed services, and biodiversity conservation. Cultural services provide ecotourism, aesthetic value, and education. There is heightened appreciation and demand for these ecosystem goods and services due to globalization of technology and information. The demand for these ecosystem goods and services which fuel both upstream and downstream economic activities should be addressed by the road map with private sector participation.

POTENTIAL INVESTMENT AREAS

The status and emerging trends on potential investment areas which will be focused on forest plantations for timber, non-timber forest products (bamboo and rattan), fuelwood, biomass, high value crops (coffee, cacao and rubber), cattle grazing, ecotourism outside NIPAS areas and other ecosystem services are discussed below:

- **Round Wood and Wood-Based Products**

Industry and Commodity Profile. The local wood industry has changed much over the decades. From being the lead exporter of premium timber species that brought about millions of investments and revenue, the Philippines has become a timber deficit country where the cost of a board foot of lumber is beyond the means of an average wage earner. As our forest cover apparently declined over the years, the government decided to ban the exportation of logs from natural forest starting in 1976, and instead to gradually move to wood products manufacturing to improve the utilization of our forest resources.

Towards the turn of the century, the local wood industry was slowly being reshaped under the sustainability principle. With government more inclined to call for a total logging ban of natural forests, the concept of man-made forest

plantations evolved. (PhilStar Global 2011) The government encourages the private sector investments in the establishment of tree plantations to augment and address the need for wood and wood-based products deficiency and provide employment and benefits to the women and men in upland communities. Tree plantation can significantly contribute to the sufficiency of wood supply with the premise that maximum efforts shall be done by the government.



Figure 9. Falcata plantation in IFMA (CSDC), CARAGA Region

Relevant Policies. Major policies on wood production, utilization, and marketing include the following:

- **Executive Order No. 23 (2011):** additional requirement of a 5-year log supply contract for WPP renewal;
- **DAO No. 1995-19: Rates of Forest Charges Pursuant to RA No. 7161 and Based on the FOB Market Price of Forest Products** – this sums up all the imposed forest charges rates per timber and non-timber forest products to ensure the sustainability of these resources. This Order also reiterates exemption of planted trees and other forest products harvested from industrial tree plantation and private lands covered by existing titles and by approved land application from forest charges;
- **Export Development Act (1994) or BOI Credit Programs for Beginning and Developing Enterprises Magna Carta for Exporters:** exemption from advanced payments of duties and taxes of exports prior to the letter of credit, percent duty on importation of machines and equipment, and others;
- **RA 7161 (1992):** Increased the forest charges for timber and non-timber forest products up to 25 percent and 10 percent of FOB prices, respectively; and
- **Sec. 36h (Incentives) of the Presidential Decree No. 705 of 1975, revised** - The Board of Investments shall classify industrial tree plantations, tree farms and agroforestry farms as pioneer areas of investment under its annual priority plan, to be governed by the rules and regulations of said Board.

Value Chain. The value chain analysis of the wood industry cluster shows the various stages of the industry’s production processes. These processes basically cover the vital components of business development, namely: production, processing, marketing and research and development. The wood and wood-based industry is composed of raw material suppliers (local and imported logs or round wood), primary processor (lumber, veneer), and secondary or tertiary processors (plywood, wood-based panels and articles, furniture, paper). Primary processed products such as lumber are directly used by local consumers or exported. Processed or finished products are sold locally or exported. The general production and marketing chain for the wood-based industry is shown below.

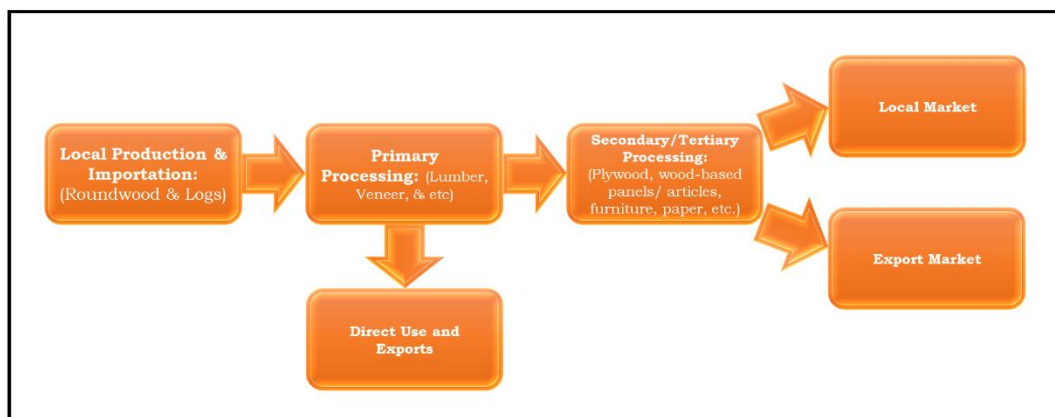


Figure 10. Value Chain of Round Wood

Forest tenure instruments are used by the government to allocate public forests and forest lands to interested individuals, organization or entities and put these areas into effective and responsible onsite management for plantation purposes.

For the raw material production, the sources are mostly plantations in tenured areas and private tree plantations. The industry has also been importing wood (sawlogs, peeler/veneer logs, poles and piles) from neighboring countries Malaysia, Papua New Guinea, and Solomon Islands, among others. Locally produced and imported logs are processed into lumber in sawmills and mini-sawmills.

Peeler/veneer logs are further processed into plywood while pulp wood is processed into paper products although most paper mills are using recycled paper products both local and imported. Local and imported wood is used in the construction industry as well as in the manufacture of wood-based furniture, panels, and articles.

DENR issues permit to operate wood processing plant (WPP) defined as “set-up of machines for the conversion of logs and other wood raw materials into lumber, veneer, plywood, wall board, block board, wood-cement board, paper board, pulp, paper, wood chips, or for the processing of other finished wood products” (DAO 2003-41). The WPP permit is co-terminus with forestry tenure instruments such as IFMA and SIFMA held by the applicant. For non-holders of tenure instruments, the WPP has duration of three (3) years renewable for the same period.

For 2016, there are 171 wood-processing plants, 11 regular sawmills, 115 mini sawmills, 44 veneer plants, 20 plywood plants, 1 block board plant and 21 integrated plants (PFS 2017). Marketing process is the final component of business development. The finished products will either go to export market thru traders while others are for domestic market thru lumber dealers/retailers.

National Production. For 2017, the total log production has a total amount of 790,098 cubic meters, with Region 13 as top log producer, followed by Regions 9, 8, 10, and MIMAROPA. The lumber production amounting to 424,681 cubic meters with Region 10 as top lumber producer followed by Region 13, 7, 11 and 6. The veneer production has a total amount of 58,665 cubic meters and plywood production of 152,145 cubic meters.

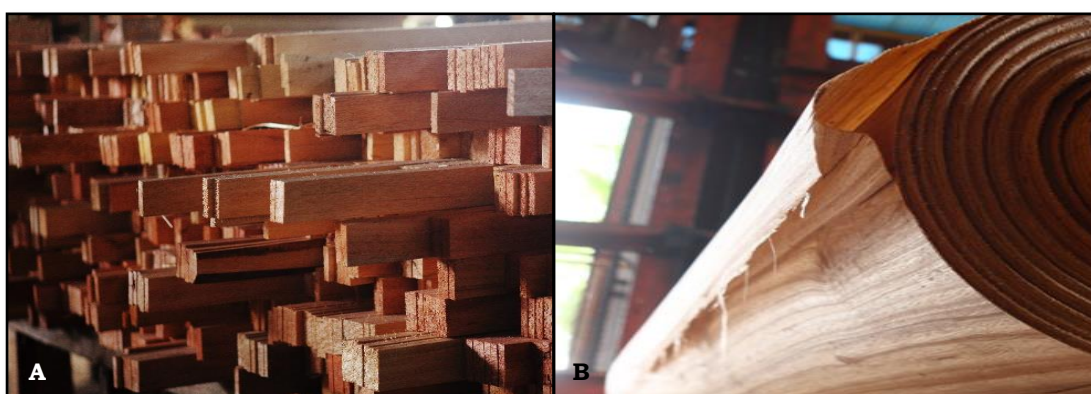


Figure 11. Lumber (A) and Veneer (B) (Retrieved file: CSDC 2018)

Timber-producing species include Falcata (*Paraserianthes falcataria*), Mangium (*Acacia mangium*), Yemane (*Gmelina arborea*), Mahogany (*Swietenia macrophylla*), Bagras (*Eucalyptus deglupta*), para-rubber (*Hevea brasillensis*), Gubas (*Endospermum peltatum*), Ipil-ipil (*Leucaena leucocephala*), and Acacia (*Samanea saman*), among other trees.

Trade. Exports of forest-based products posted a value of USD3.18 billion or 5.55 percent share to the country’s total export receipts of USD 57.41 billion. (PFS, 2017)

Table 2. Exported products with trading partners (PFS, 2017)

Top exported products	Top trading partners
1. Other wood based manufactured articles	Japan, Singapore and USA
2. Pulp and waste paper	UK, Netherlands, Japan
3. Paper and articles of paper and paperboard	Indonesia, USA, Malaysia
4. Forest-based furniture	USA, Japan, UAE
5. Lumber	China, Japan, Dominican Republic

Total importation of forest-based products was valued at USD1.85 billion or a 2.19 percent share of the total country’s import receipts of USD 84.11 billion. (PFS, 2017)

Table 3. Imported products with trading partners (PFS, 2017)

Top imported products	Top trading partners
1. Paper and articles of paper and paperboard	China, Indonesia and USA
2. Plywood and plywood veneer plants	China, Malaysia, Japan
3. Forest-based furniture	China, Malaysia, Thailand
4. Lumber	Canada, Malaysia, USA
5. Other-wood based manufactured articles	Canada, China, Japan

Based on the value of exports as against the value of imports, the Philippines may be considered a net exporter of round wood-based products. On the other hand, there is a need to manage the information about additional investment opportunities in the category to further increase the value of exports.

- **BAMBOO**

Industry and Commodity Profile.

Bamboo is a fast-growing, woody perennial grass that is widely distributed in the country and in the rest of Asia, Africa and Latin America. It is one of the most economically-important non-timber forest products that can be processed into various commodity types for local people and global consumers. Its excellent properties make it an ideal substitute to wood for furniture, handicrafts, construction material, and chemical products. Bamboo can also be manufactured in combination with rattan and other materials to produce chairs, furniture and consumer goods.



Figure 12. LGU-managed plantation of Kawayan Tinik (*Bambusa blumeana*) in Lubao, Pampanga

Bamboo is also revered as a good material in rehabilitating degraded lands and waterways and in absorbing carbon emissions making it as one of the suitable species for mitigating the effects of climate change.

Relevant Policies. The production and utilization of bamboo is governed by the following policies:

- **Executive Order No. 26, S 2011 and Executive Order No. 193 S 2015:** Included bamboo as one of the priority commodities under the National Greening Program and its expansion program until 2028;
- **Executive Order 879, S 2010:** Created the Philippine Bamboo Industry Development Council (PBIDC). It mandated to allocate at least 20% of annual reforestation and rehabilitation targets for bamboo production and use bamboo as a material for at least 25% of desk and

other furniture requirements of the Department of Education and other government agencies;

- **DAO 59 s. 1993: Revised Rules and Regulations Governing the Transport/Shipment of Logs, Lumber, Plywood, Veneer, Non-Timber Forest Products and Other Forest-based Products/Commodities.** Requires a Certificate on Non-Timber Forest Product Origin (CNFPO) in the transport of bamboo from public lands and Certification from the CENRO in the transport of bamboo from Industrial Tree Plantation and private titled lands;
- **Presidential Decree No.930 S 1976:** Regulations on the importation and exportation of different commodities including bamboo; and
- **Revised Forestry Administrative Order No 11 S 1970: Revised Forestry License Regulations.** Requires a cutting permit in the harvesting of bamboo from forest lands/public lands.

Value Chain. The bamboo industry is dependent on its linkages with suppliers, processors, and the market as shown in Figure 13. Farmers and bamboo plantation owners depend on suppliers of rooting hormones and fertilizers for growing bamboo and post-harvest materials such as preservatives. Bamboo poles are then sold to processors (intermediate

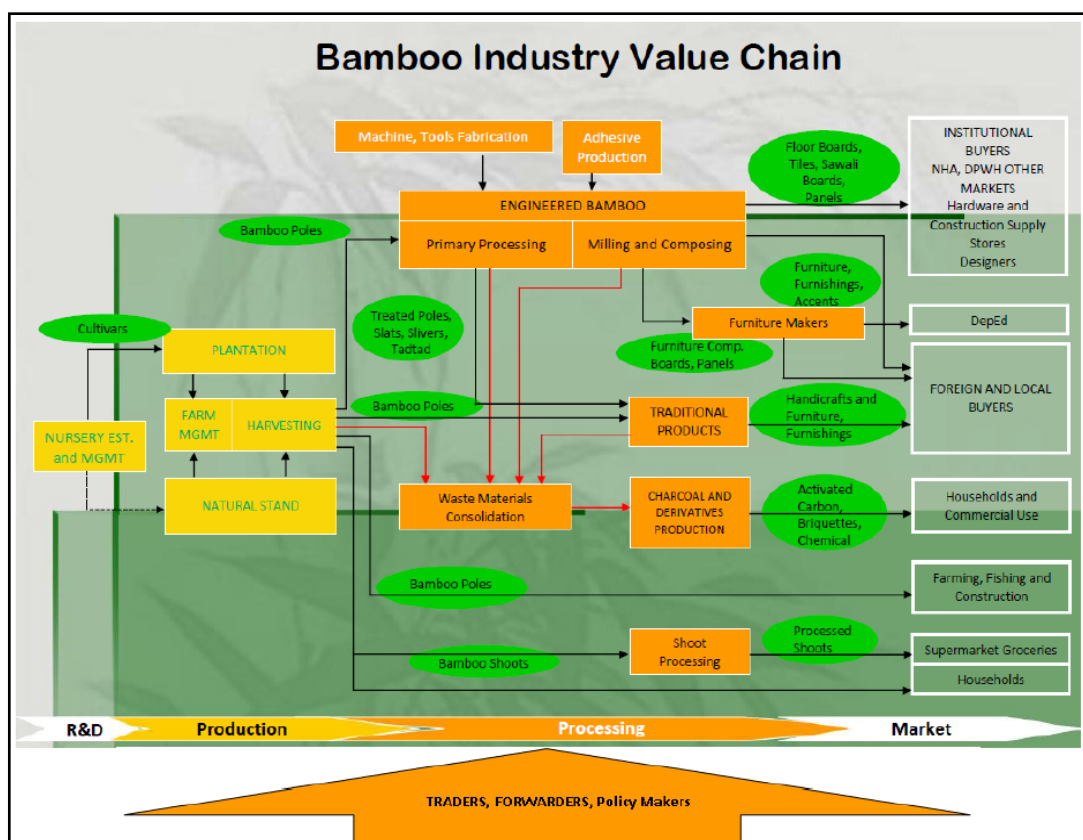


Figure 13. Value Chain of the Bamboo Industry (G. Cameron. Bamboo Industry Value Chain)

products, engineered bamboo products, furniture and handicrafts, etc.) which in turn sell them to local and foreign markets.

Production and Utilization. Bamboo products are classified as primary (poles, shoots and stumps), secondary or semi-processed (bamboo

mats “*sawal*”, splits, sticks, boards) and finished products (handicraft, furniture and ready to cook/eat bamboo shoots). Primary and secondary products are inputs for various industries including housing, fishing, and agriculture and manufacturing while finished products are directly channeled to end-users in both domestic and export markets for direct consumption (OIDCI, 1997). Finished bamboo products can be clustered into the following: formal furniture/handicrafts; musical instruments; specialized products (barbeque sticks, toothpicks, chopsticks, coffee stirrer, etc.); engineered bamboo² products (panels, floor tiles, furniture, cabinets, school desks and chairs); construction materials; banana props; fishpens; banca outriggers; bamboo charcoal; charcoal briquettes; and food (Tesoro, 2016).



Figure 14. Bamboo poles ready for sale or processing in Lubao, Pampanga

Among the emerging products of bamboo are: bamboo chips for fuel; pulp and paper and other cellulosic products – fiber for textiles; chemical products (deodorizer, disinfectant, anti – fungal solution, perfume and ointments, insecticide etc. (PBID, 2016)

National Production. Based on the Philippine Forestry Statistics, the production of bamboo culm for 2016 is 882,725 pieces. The regions with the highest production are Region 1 Ilocos Region (619,837 culms), Region 12 Northern Mindanao (104,681 culms), and 4A CALABARZON (76,150 culms).

Trade. According to the Institute of Bamboo and Rattan (2018), the world export of bamboo and rattan products was estimated at USD 1.741 in 2015.

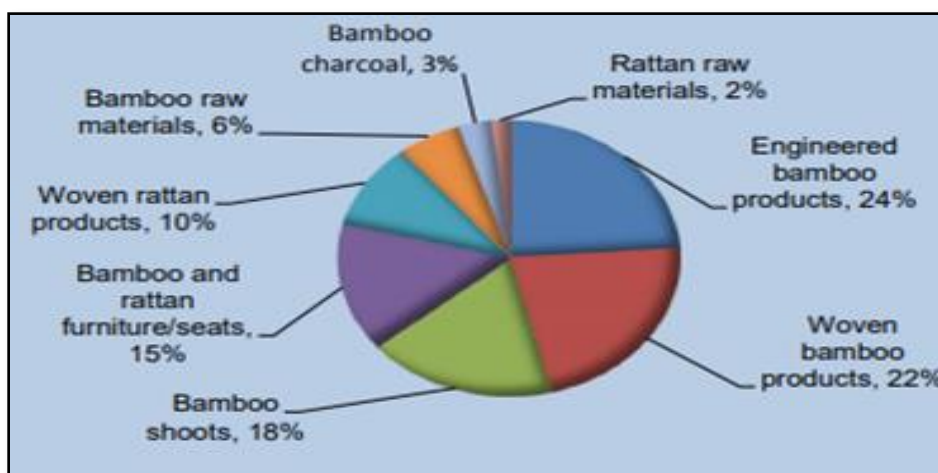


Figure 15. World Exports of Bamboo and Rattan Products in 2015 (INBAR, 2018)

² Engineered bamboo- includes a wide range of products made by binding together bamboo veneers, strands, fibers, strips or slats, woven mats or flattened bamboo with a suitable glue to form a composite material designed to meet specific needs (fprdi.dost.gov.ph, 2015)

This mainly comprises engineered bamboo products, woven bamboo and rattan products, bamboo and rattan raw materials, bamboo shoots and bamboo charcoal. Figure 15 shows that engineered bamboo accounts for 24% of the total with an export value of USD420 million. Woven bamboo accounts for 22% while the export of bamboo shoots accounts for 18%.

The country's export for bamboo and rattan in 2015 accounts for 2% or an export value of USD33.97million. Out of this amount, pure bamboo products (bamboo basketwork, bamboo mats and screen, bamboo flooring, raw materials etc.) were valued at USD995,000. Products (seats and furniture) with mix bamboo and rattan materials have a value of USD16.039 million. The remaining balance is attributed to pure rattan export.

The top three importers of Philippine's bamboo products in 2015 are the United States (USD21.025million), China (USD5.807million) and EU 27 (USD2.041million).



Figure 16. Engineered bamboo products

- **RATTAN**

Industry and Commodity Profile. Furniture craft first came to the Philippines in the 16th century when cabinet makers from Spain were brought in by colonial merchants who saw distinct possibilities for good furniture products in the Philippine hardwood in abundance. Filipino craftsmen learned quickly not only the art of masonry but also intricate carvings and adornments on doors and other church furnishing.



Figure 17. Rattan furniture

By the 18th century, distinct regional styles of furniture-making had emerged in the Philippines, and the whole range of European domestic furniture was not only being replicated but redesigned to suit local tastes and lifestyles.

Casualness, comfort and practicality were values that arrived during American colonial times in the early 1900s. These times gave birth to the rattan furniture industry, which continues to lead the furniture industry today. The ban on the export of rattan poles in 1977 led to the establishment of more rattan factories in Manila and Cebu. Particularly in Cebu, traders who used to export rattan poles to the U.S.A. and Taiwan, upgraded their production to unfinished rattan parts such as chair backs,

legs and seats which were then exported to furniture assemblers. With continuous production improvement and product development, the furniture makers were soon able to export complete furniture pieces which attracted the attention of the international market. In the 80's, manufacturers began to produce assembled furniture from blueprinted designs provided by buyers. The value-added chain was completed by the late 80's when the companies started undertaking their own product development and design manufacturing, assembly and final finishing (CFIP and DTI, Industries of the Philippines and Department of Trade and Industry).

Relevant Policies. Policies on rattan extraction, production, manufacturing, and export include the following:

- **DAO 1993-69:** sets the floor price rates for bidding rattan areas for licensing Export Development Act (1994) or BOI Credit Programs for Beginning and Developing Enterprises Magna Carta for Exporters: exemption from advanced payments of duties and taxes of exports prior to the letter of credit, percent duty on importation of machines and equipment, and others
- **DAO 89-04: Revised Regulations Governing Rattan Resources.** For those found in forest lands, the DENR issues rattan cutting contracts (RCC) to individuals or entities to cut, gather, and transport rattan from forest lands. It also prescribes the computation of AAC for rattan and contained rules governing cutting, gathering, transporting, and disposal.

Value Chain. One tool for understanding the rattan value chain is “access mapping.” This involves (a) identifying the actors who extract, produce, process, exchange, transport, distribute, and consume the commodity; (b) evaluating income and profit at each level; and (c) evaluating the distribution and tracing the mechanisms by which access to benefits is maintained and controlled within each group.

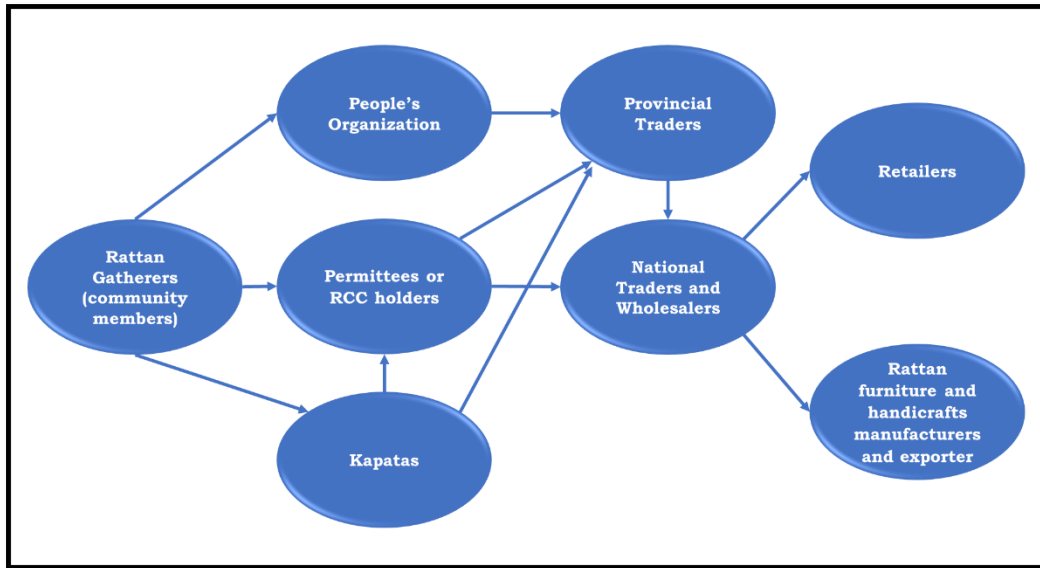


Figure 18. Rattan Value Chain using Access Mapping

National Production.

As of 2017, unsplit rattan has a total production of 2,381,038 lineal meters of which 34.7% of it comes from MIMAROPA, followed by Region 2 with 23.1%, Region 13 with 21.9%, Region 4A with 10.5% and Regions 11, 12, 8 and 9 with a collective share of 9.8%. (PFS, 2017)

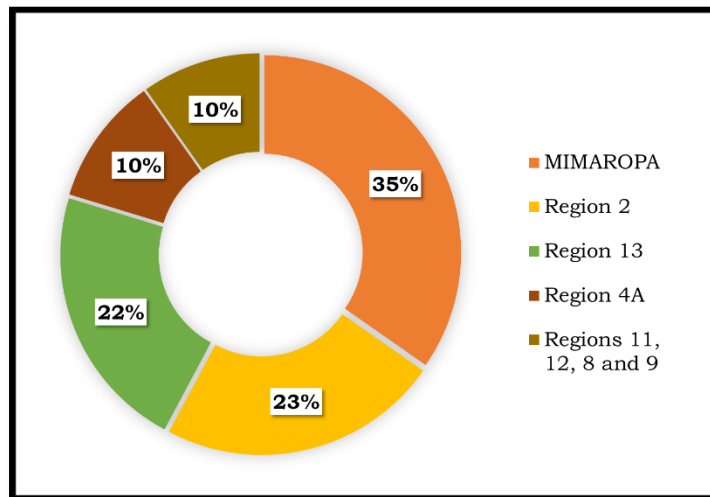


Figure 19. Total production of unsplit rattan in lineal meters

Trade. It is estimated that 80 to 90 percent of raw rattan poles go into exported furniture (Table 4). A decade ago when cheap, low quality furniture started to flood exports markets from China and Indonesia, the Philippines successfully positioned its furniture with customers who care more about quality and fashion than price. The Philippines enjoys having skilled craftsmen who are reputed to be among the world’s best. Through excellent design flair, the Philippines is a trendsetter among furniture-producing countries in Asia earning the title “Milan of Asia.”

Table 4. Exports of rattan poles by quantity and value from 2007-2016 (PFS, 2016)

Year	Quantity (thousand kg)	Value (USD)
2016	46	58
2015	1,349	1,560

Year	Quantity (thousand kg)	Value (USD)
2014	345	634
2013	236	278
2012	111	95
2011	A	6
2010	16	25
2009	4	1
2008	25	13
2007	7	16

a – less than one thousand

- **BIOMASS**

Industry/Commodity Profile

Biomass refers to any organic matter, particularly cellulosic or ligno-cellulosic matter, which is available on a renewable or recurring basis, including trees such as *falcata* and *mangium*, crops and associated residues, plant fiber, poultry litter and other animal wastes, industrial wastes, and the biodegradable component of solid waste (Elauria et al., 2003).



Figure 20. Wood chips

Forest-based biomass includes stem, tops and branches of harvested trees, and understory vegetation. Agriculture-based biomass includes crops grown specifically for bioenergy production, or dedicated bioenergy crops, and plant residues collected after harvest of crops grown for food or feedstock.

Biomass energy or bioenergy is the one derived from recently living organisms including plants, animals and their byproducts. It is renewable because the energy contained in biomass comes from the sun captured through natural processes of photosynthesis. Bioenergy is replenishable as long as the quantity of biomass used is equal to or less than the amount that can be regrown.

Biopower is electricity generated from the combustion of biomass. Heat and steam, or a combination of both, may also be produced through combustion of biomass, and may be produced in co-generation with electricity.

In response to the challenges of unstable supply and rising demand for energy, the government has initiated programs to enhance its energy security, adopt climate-resilient economic development and help mitigate climate change. It has realized the need to promote renewable energy as an integral part of its long-term energy plan. For instance, the Department of Energy has set an ambitious target in 2011 projecting a 15.3 gigawatts of renewable power capacity by 2030 (DOE, 2017).

In 2016, the share of renewable energy was 24.2% of the country's total power generation of 90,797 GWh with a measly 0.8% coming from biomass. It is worth noting that biomass fuel consists mainly of agricultural and domestic wastes with negligible quantity coming from forestry. Hence, there exists a great opportunity for the sector to assert its important role in the country's economic development, in general, and to its energy security, in particular (DOE, 2017).

A study conducted by Elauria et al. in 2003 found out that based on existing land use pattern in the country, only two land categories were found suitable for plantation forestry: brushland and grassland. Hence, a total annual biomass production potential for energy in the Philippines is in the range of 3.7 to 20.37 Mt. Assuming the energy content of wood is 15 GJ t⁻¹, energy potential of the produced biomass is 55.5 to 305 GJ. Likewise, if 1 M t of woody biomass can generate 1 TWh of electric power, the annual electricity generation potential also ranges from 3.7 to 30.37 TWh.

Relevant Policies.

- **RA 9513 or the Renewable Energy Act of 2008 and DAO 2009-05-0008 or the Implementing Rules and Regulations of RA 9513**, particularly in Section 13, Section 16 and Section 17, wherein incentives can be availed by developers and farmers who engaged in the plantation and development of biomass resources and processing.

Fiscal and non-fiscal incentives include Income Tax Holiday (ITH), Exemption from Duties on RE Machinery, Equipment and Materials, Tax Exemption of Carbon Credits, Financial Assistance Program, etc. while Incentives for Farmers Engaged in the Plantation of Biomass Resources shall be entitled to duty-free importation and exemption from payment of value added tax (VAT) on all types of agricultural inputs, equipment, and machinery within ten (10) years from the effectivity of the Act, subject to verification by Department of Energy (DOE).

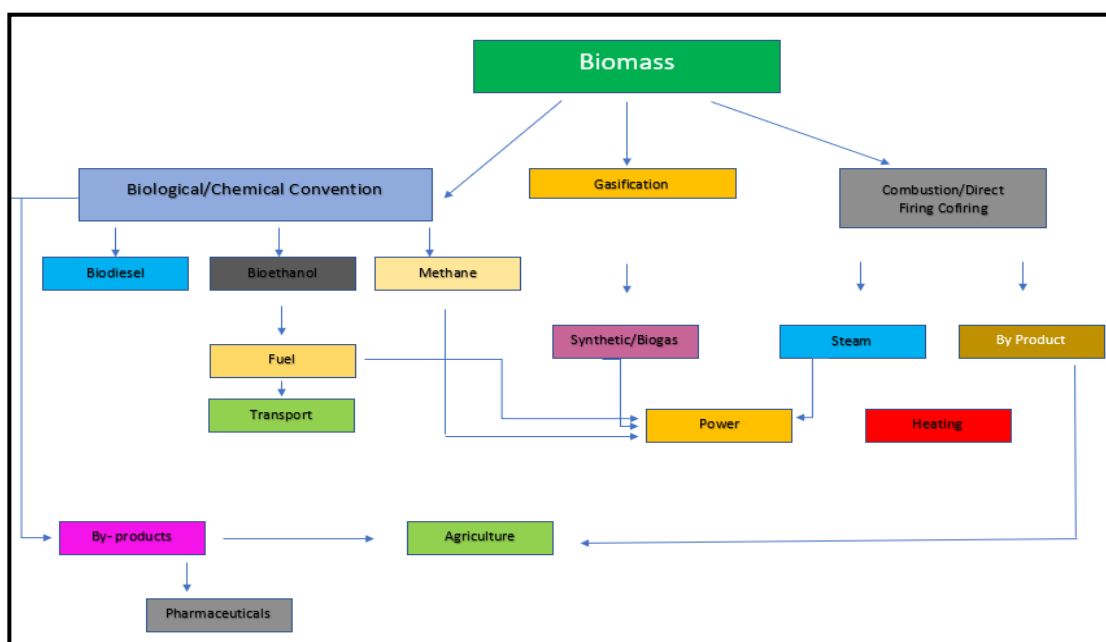


Figure 21. Value/Supply Chain Map of Biomass (Dalusong, 2012)

The technology to generate energy from wood has entered into the new millennium, with virtually limitless possibilities. Wood fuel has several environmental advantages over fossil fuel. The main advantage is that wood is a renewable resource, offering a sustainable, dependable supply. Other advantages include the fact that the amount of carbon dioxide (CO₂) emitted during the burning process is typically 90% less than when burning fossil fuel. Wood fuel contains minimal amounts of sulfur and heavy metals. It is not a threat to acid rain pollution, and particulate emissions are controllable.

Biomass resources have been in use for a variety of purposes since ages. The multiple uses of biomass include usage as a livestock or for meeting domestic and industrial thermal requirements or for the generation of power to fulfill any electrical or mechanical needs. One of the major issues, however, associated with the use of any biomass resources is its supply chain management. The resource being bulky, voluminous and only seasonally available creates serious hurdles in the reliable supply of the feedstock, regardless of its application.

Table 5 shows the list of registered Biomass Energy Plants that consumed woodchips as fuel feedstock (in ratio with other agricultural feedstock depending on the design of the boiler).

Table 5. Biomass power plants/projects utilizing wood chips

Item	Project Name	Company Name	Location	Feedstock	Status
1	8-MW Biomass Cogeneration Plant	San Carlos Bioenergy, Inc.	San Carlos City, Negros Occidental	Bagasse and wood chips	Operational
2	12.5 MW Biomass Cogeneration Plant	Bataan 2020, Inc.	Samal, Bataan	Rice husk, saw dust, wood chips, paper wastes	Operational
3	63-MW Biomass Cogeneration Power Plant	Victorias Milling Company Inc.	Victorias City, Negros Occ.	Bagasse, saw dust, wood chips	Operational
4	20-MW Biomass Power Plant Project	San Carlos BioPower, Inc.	San Carlos City, Negros Occ.	Biomass residues (bagasse, wood chips)	80% electro mechanical completion
5	12-MW Biomass Power Plant	Megawatt Clean Energy, Inc.	Himamaylan City, Negros Occ.	50% Wood chips (Acacia mangium) 50% Napier grass	For construction

- **COFFEE**

Industry/Commodity Profile.

The first Philippine Coffee was introduced as early as 1730 in Lipa, Batangas by a Franciscan friar. In 1880, the Philippines was the fourth largest exporter of Coffee bean. The country became a member of the International Coffee Organization (ICO) in 1980. In 2002, the consumption of the Philippines was 75,000 metric tons and it grew to 170,000 metric tons annually for succeeding years. In 2016, according to PhilMech-DA, Mindanao particularly Sultan Kudarat takes the lead in the production of dried Coffee beans.



Figure 22. *Cofea robusta*

Existing Policies

- Republic Act (RA) No. 7900, An act promoting the Production, Processing, Marketing and Distribution of High-Value Crops, Providing Funds, therefore, and for other purposes or known as the High-Value Crops Development Act of 1995 defines high value crops (HVC) as crops other than traditional ones which include Coffee.

Value Chain

The sections along the value chain of coffee include nursery development and farm inputs, farm production, primary processing, marketing/trading, secondary processing, logistics and market. Activities/inputs for each section are enumerated below:

- Nursery Development and Farm Inputs
 - Area selection, seeds, plastic bags, fertilizer, tools & equipment
- Farm Production
 - Area selection, land preparation, maintenance, fertilization, pest control, harvesting, sorting/grading and storage
- Primary Processing
 - Depulping, fermentation, drying and dehulling to green coffee beans. Green beans are used to produced roasted beans which is intended for grinding and ground Coffee which is used for brewing. High end coffee such as arabica blends, civet coffee and organic coffee are also in the market. Instant soluble Coffee such as 3 in 1 is popular for household consumption.
- Marketing/Trading/Logistics
 - Trading, handling, transport/shipping and storage
- Secondary Processing
 - Roasted beans, roast and ground coffee and instant coffee
- Logistics
 - Handling, transport/shipping and storage
- Market
 - Domestic and exports

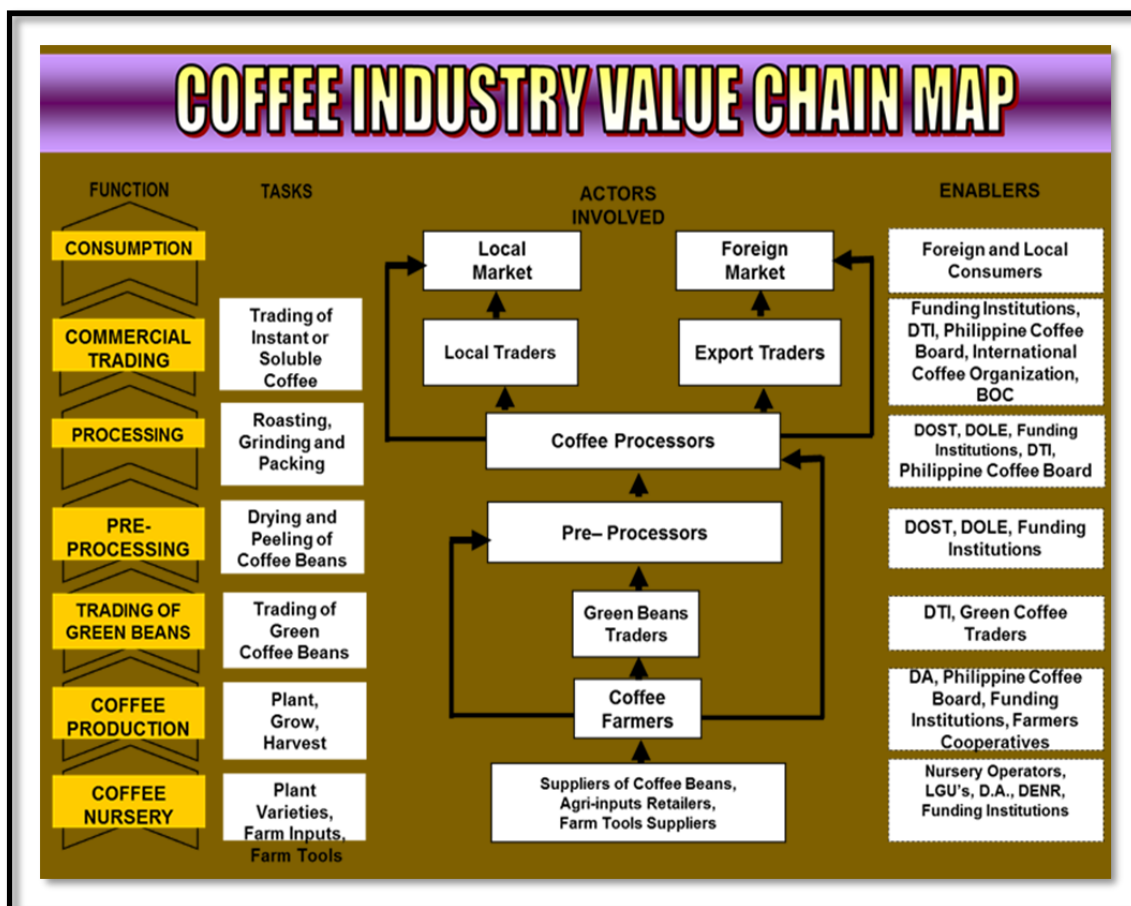


Figure 23. Coffee Value Chain Map (Department of Agriculture)

National Production. Robusta accounted for 24, 924 MT or 69% of total production in 2015 followed by Arabica, Excelsa and Liberica with 8717, 2273 and 257, respectively.

Trade. In the 19th century, Batangas was once a popular coffee exporter. The Philippines was the world's fourth biggest exporter of coffee beans and lasted until the Coffee rust hit the country in 1889. The country produces 25,000 MT or 25 M Kg of Coffee and ranks 110th in the world in terms of output.

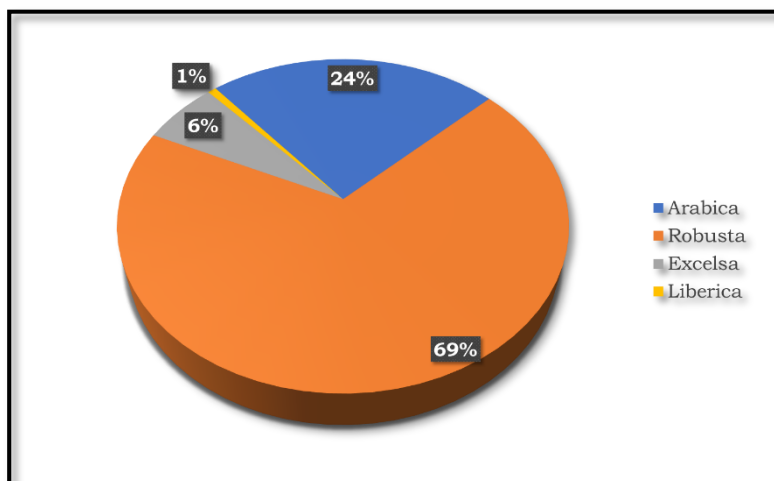


Figure 24. National Production of Coffee in the Philippines (PSA, 2015)

The globally estimated number of Coffee produced based from the 2017-2022 Philippine Coffee Industry Roadmap for 2015-2016 is 8.688 million tons. There was an increase of 1.6% compared to 2014-2015. PSA classified imports into Green Coffee Bean (GCB), roasted and soluble/instant while export

volume was highest for other instant Coffee forms at more than 70,000 tons in 2014. GCB and soluble/instant coffee form export volume declined in 2014 compared to 2013.

- **CACAO**

Commodity Profile. Cacao (*Theobroma cacao*), also known as the “tree of love” and food of the gods, produces dried and fermented fatty seed, which is used to make chocolates. Recently, cacao is now applied in food, beverage, cosmetics, and pharmaceuticals application.



Figure 25. Cacao Plantation in Davao City

Cacao was first introduced in the Philippines by the Spaniards in San Jose, Batangas. The country was the first in Asia to plant cacao and prepare chocolate drinks from cocoa beans. In the mid-1950s, commercial cacao farms were established in the country.

The increasing demand for Cacao both at the domestic and export markets makes it a very important commodity. As reported, the annual local consumption on Cacao is 50,000 MT while local supply is only around 10,000 MT per year. To address this impending deficit, the Philippines committed to produce 100,000 MT of fermented beans for the export and domestic markets through 40% annual increase in production by 2020 (DTI, 2016). The Forestry sector aims to contribute to this goal by allowing the growing of Cacao in Agroforestry systems in suitable and designated production zones within forestlands.

Relevant Policies. The integration of agroforestry crops is allowed in production sharing agreements of IFMA, SIFMA and CBFMA, pursuant to DENR’s existing guidelines.

The Department of Agriculture issued different standards for the production and processing of cacao beans as enumerated below:

Table 6. Policies related to Cacao

Policy No.	Title
PNS 58:2008	Cacao or Cocoa Beans - Specifications
PNS 104:2011	Code of Practice for Philippine Cocoa Beans
PNS 88:2012	Code of Hygienic Practices for Philippine Tabea
PNS 111:2012	Philippine Tablea
PNS 130:2013	Code of Practice for the Prevention and Reduction of Ochratoxin A in Philippine Cacao Beans
PNS 131:2013	Code of Practice for the Prevention and Reduction of Ochratoxin A in Philippine Tablea

Policy No.	Title
PNS 132:2013	Principles, Guidelines, and Procedures for the Establishment of a Traceability System for Philippine Cacao Beans
PNS 190:2016	Agricultural Machinery-Cacao Grinder – Specifications
PNS 191:2016	Agricultural Machinery-Cacao Grinder – Methods of Test

Value Chain. There are six types of activities in cacao value chain that include input provision, nursery operation, cacao production, local trading, processing, and exporting as shown in Figure 26.

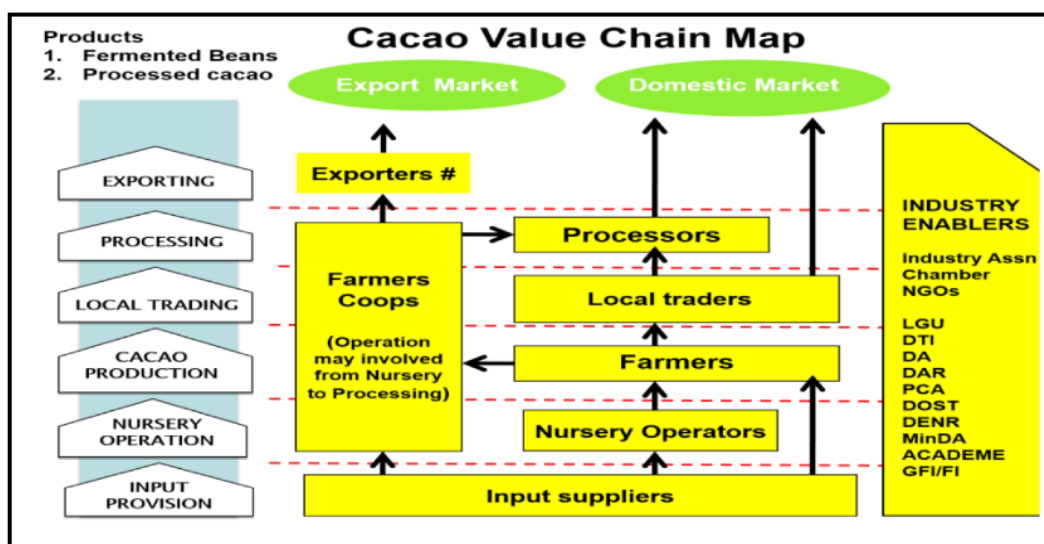


Figure 26. Philippine Cacao Industry Value Chain Map (PCRIM 2017-2022)

The government sector, academe, private sector, and non-government organizations serves as the enablers of cacao industry that provides technical and financial support including facilities and infrastructures based on their respective mandates.

Products from cacao are cocoa mass or liquor “*Tableya*,” cocoa butter, cocoa cake and cocoa powder. Dried cacao beans or cocoa is also a main ingredient of chocolate and other cocoa-based products. Cacao also is now being used as ingredient for the manufacturing of non-food products like facial mask and body lotion. This trend provides more market opportunities.

National Production. Based on the Cacao Roadmap, the two (2) million (M) hectares of coconut farms ideal for cacao intercropping supplement the industry’s competitive advantage. However, the Philippine cacao production in 2017 stands at 10,000–12,000 MT from the 20,000–25,000 hectares (ha) of land planted with cacao per industry estimate.

From 2005-2014, planting/harvesting of cacao from 2005 (10,719 ha) significantly decreased until 2013 (4,846 ha) and increased in 2014 (12,035 ha). On the other hand, production in metric tons relatively increased from 2005 (5,679) until 2012 (9,339) and decreased from 2013 (4,876) and 2014 (5,428) (PCIRM, 2016).

As of December 2016, there are a total of 44,489 hectares of cacao planted in the upland areas nationwide through the National Greening Program (NGP). Davao Region constitutes 26% (11,756 has) of the total areas planted followed by Region 3 (6,235 has) and Region 2 (4,095 has). These trees may be expected now as yielding, if properly nurtured and maintained, and may contribute enough to cover the country's demand for cacao.

Trade. Philippines is still an importer of cocoa products such as chocolate, cocoa powder, cocoa beans, and cocoa butter. In 2014, import and export recorded were valued at USD 102.3-M and USD 24.3-M, respectively. Table 7 shows the trade performance of cacao products in 2014.

Table 7. Philippine Cacao Trade Performance, CY 2014 (PCRIM 2017-2022)

Cocoa Products	Import (in Million USD)	Export (in Million USD)
Chocolate	54.6	13.3
Cocoa Powder	44.8	2.2
Cocoa Beans	1.7	4.5
Cocoa Butter	0.53	4.3
Total	102.3	24.3

Two (2) of the chocolate companies being supplied by Philippine cocoa beans are Mars Incorporated (US Company) and Barry Callebaut (Belgian Company). More opportunities are open to bean exporters due to the widening of supply and demand gap in the world market.

- **RUBBER**

Industry and Commodity Profile.

The Philippines has been among the top-ranking countries in rubber production until the 80's, when demand for car tires and other rubber-made products slowed down following the decline in the Japanese and European



Figure 27. Rubber Plantation (Bukidnon)

economies. In recent times, however, the Philippine market for rubber products has demonstrated new vitality shown by the increasing demand for rubber-made goods.

The Philippine rubber industry is characterized by its expertise to manufacture a wide array of rubber products, existing capacity to meet customer demands, technical capability to satisfy customer needs, strong ability to adjust to customer requirements, and highly-experienced direct labor.

The main industry organization is the Philippine Rubber Industries Association, Inc. (PRIA), formed in 1979 from the merger of the Philippine Rubber Manufacturers Association (PHIRMA) and the Rubber Industries Association of the Philippines (RIAP). PRIA today has 46 member-firms, 26 of which are direct industry players, while the rest are business development service providers (e.g. material suppliers and logistics companies) (source: Board of Investments, Department of Trade and Industry)

On the other hand, the Philippine Rubber Research Institute (PRRI) was established in 2010 in Zamboanga Sibugay to implement research and development programs to improve quality and increase productivity particularly among smallholder rubber producers and processors.

Relevant Policies.

- **DAO 1999-53: Regulations Governing the Integrated Forest Management Program (IFMP):** Development that include forest lands devoted to industrial plantations such as wood and non-timber crops (rubber, bamboo, rattan, etc.). Joint venture agreements may be forged by DENR with private entities, community organizations, or government entities.
- Rubber products are certified under the Philippine Standard Quality and/or Safety Certification Mark Scheme (source: DTI-BOI)

Value Chain. There are three (3) identified major stages of Rubber Value Chain, these are Propagation, Production and Distribution as shown in Figure 28 below:

The proper procedure in establishing rubber plantation starts by conducting site preparation and staking to procurement and transportation of rubber seedlings, budding (for rubber trees to mature early to have better yield), seedling planting, as well as farm and seedling maintenance (brushing, replanting, and fertilization). Both budded and unbudded seedlings are being used in rubber plantations. In contrast, unbudded seedlings were easier to produce, cheaper, and presumably have longer production years than budded seedlings, however, budded seedlings have better latex production, can be tapped earlier, and can assure growth of a known and better clone. (Ecosystems & Development Journal 2014)

Rubber is harvested mainly in the form of latex. Tapping of rubber trees starts in the fifth to seventh year after planting and then continues for 25 to 30 years. After 30 years, there is a decline in latex production. The trees are then removed and replaced with new seedlings. In the past, felled rubber trees were either processed into usable furniture, burnt on the spot or used as fuel for locomotive engines, brick burning or latex curing. The latex then is refined into rubber ready for commercial processing. In major areas, latex is coagulated in the collection cup/container. The coagulated lumps are collected and processed into dry forms for marketing (FAO 2001).

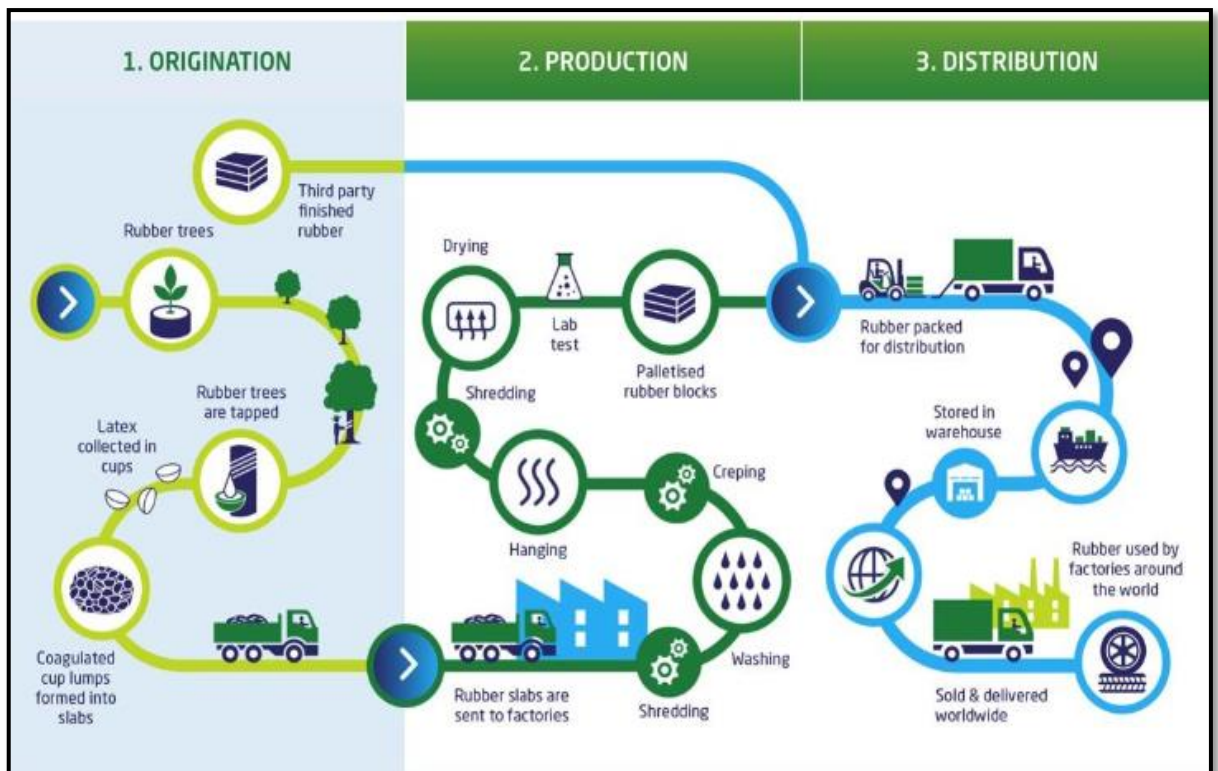


Figure 28. Value chain map of rubber production (Halcon Agri retrieved 2018)

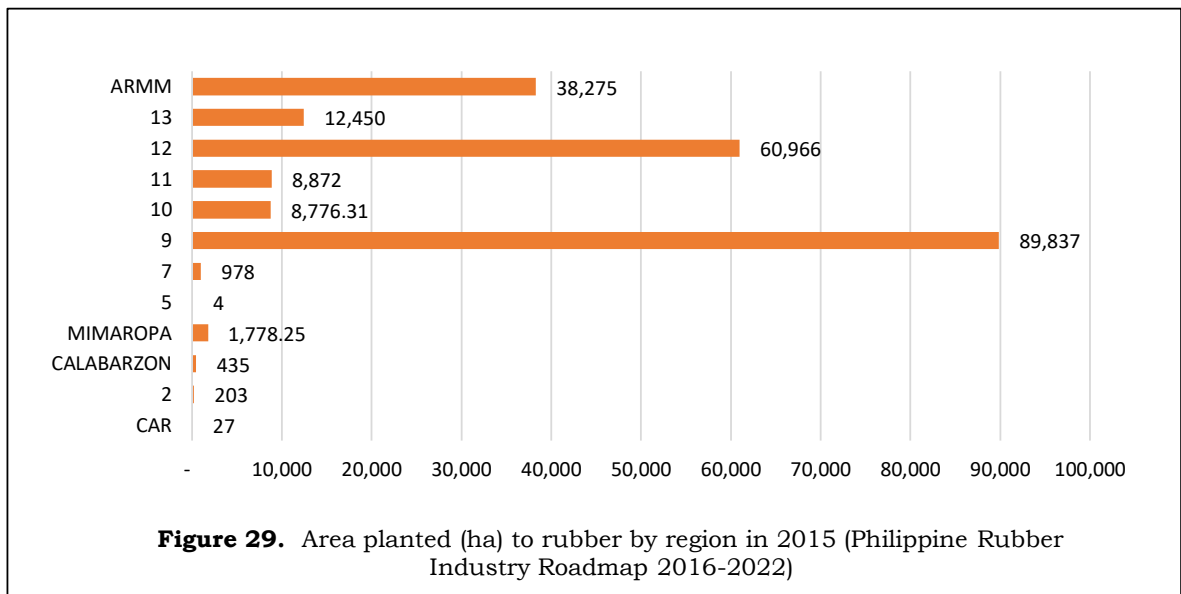


Figure 29. Area planted (ha) to rubber by region in 2015 (Philippine Rubber Industry Roadmap 2016-2022)

National Production. During the first quarter of 2018, the production of rubber increased by 4.4 percent, from 45.37MT in the same quarter last year to 47.36MT this year. The growth in production resulted from the increase in number of tappable trees in SOCCSKSARGEN (North Cotabato) and Zamboanga Peninsula (Zamboanga Sur); and production of more latex due to enough rains in SOCCSKSARGEN (North Cotabato). The top rubber-producing region during the period is SOCCSKSARGEN, with a production level of 21.26MT which was 44.9 percent of the national total. Zamboanga Peninsula came in next with 17.35MT or 36.6%, followed by ARMM with 3.36MT or 7.1% of the total rubber production (Philippine Statistics Authority, 2016).

Trade. According to International Trade Statistics, the following countries are the supplying markets for rubber products imported by the Philippines from 2013-2017:

Table 8. Countries and the corresponding imported value of rubber

Countries	Imported Value in USD				
	2013	2014	2015	2016	2017
Malaysia	50	11	457	3,802	8,914
Indonesia	0	2	2,403	9,512	7,593
Singapore	0	0	2,963	3,157	7,046
Korea	1	5	2,128	1,080	6,262
Japan	34	19	1,775	1,126	4,117

On the other hand, the following countries are the importing markets for natural rubber products exported by Philippines from 2013-2017:

Table 9. Countries and the corresponding exported value of rubber

Countries	Exported Value in USD				
	2013	2014	2015	2016	2017
Malaysia	44,446	34,329	29,130	29,882	85,975
Korea	5,205	3,812	2,094	2,214	4,839
India	1,252	6,209	5,326	1,645	3,879
Vietnam	0	384	0	0	2,067
Lithuania	0	3,993	1,255	840	1,338

Based on the current data (2017) on the calculated monetary value of exports against imports (USD 64,166.00), it can be noted that the Philippines is a net exporter of rubber products. However, the country should do a benchmarking on its world ranking for rubber exports to determine its competitive position.

- **CATTLE GRAZING**

Industry/Commodity Profile. The Cattle Industry is one of the important livestock industries in the Philippines since its first practice decades ago. This sector is traditionally implemented in the provincial areas for the need of forage and available farm-products for the cattle's consumption. Despite of continuous decrease in number of cattle production engagements, it has the highest room for growth due to increasing demand for meat and meat products.

Relevant Policies. The Department of Environment and Natural Resources (DENR) issues Forest Land Grazing Management Agreement (FLGMA) to

qualified individuals, associations, or corporation. It is a production sharing agreement which enables the holder to develop, manage and utilize grazing lands for 25 years renewable for another 25 years.

The policy issuances on the administration and disposition of grazing lands include as follows:

- **DAO 2000-23:** (amended some provisions of DAO 99-36) Amending Certain Sections of DAO 99-36 entitled "Revised Rules and Regulations Governing the Administration, Management, Development and Disposition of Forest Lands Used for Grazing Purposes."
- **DAO 1999-36:** Revised Rules and Regulations Governing the Administration, Management, Development and Disposition of Forest Lands Used for Grazing Purposes. DAO 99-36 provides the criteria of areas available for FLGMA and the guidelines in applying for the said agreement.

Value Chain. Value Chain is a substantial tool to easily understand the production flow of Cattle Grazing in the Philippines. It encompasses the actors, relationships, opportunities, and bottlenecks and suggests the specific areas for intervention. It also shows the linkage of the value of the activities together with the functions and interactions of elements.

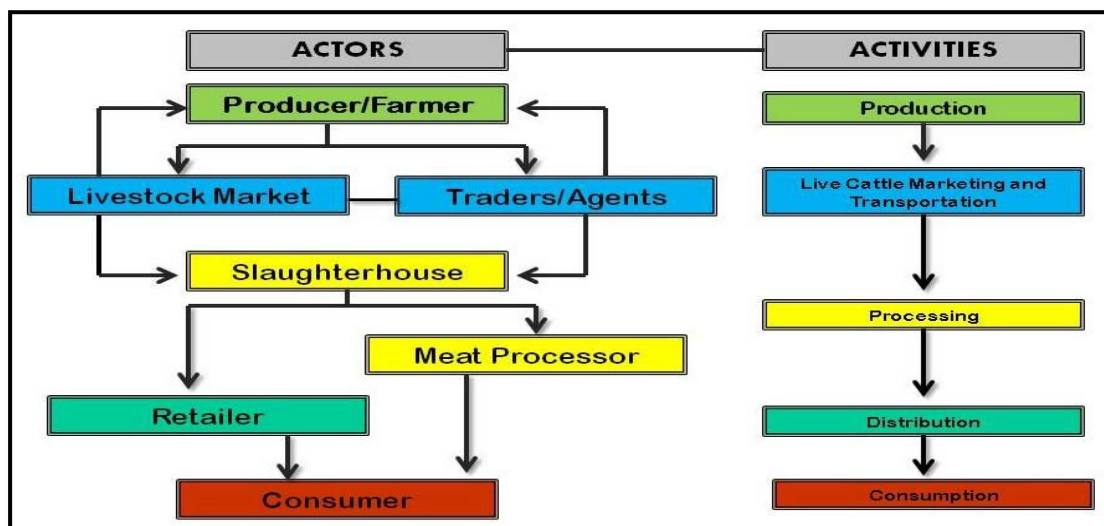


Figure 30. Various actors involved in conducting the activities for cattle grazing which include production, live cattle marketing and transportation, processing, distribution and consumption

During Production, the main actors involved are the Producers/Farmers. In the Philippine setting, these actors can raise cattle either in a backyard farm or commercial farm. Backyard Farm refers to any farm or household whether farming or non-farming raising at least one bird of animals and does not qualify as commercial farm. On the contrary, Commercial Farm refers to any livestock farm which satisfied at least one of the following conditions:

- Tending at least 21 heads of adult and zero head of young
- Tending at least 41 heads of young animals
- Tending at least 10 heads of adult and 22 heads of young

The Producers/Farmers can sell their cattle directly to the Livestock Market or they can opt to go to Traders/Agents. The cattle, then, can either be brought to a different Producer/Farmer for production or can be transported to a slaughterhouse for processing.

Meat processed at slaughterhouses can be delivered to Meat Processors for further processing or already be distributed to Retailers for Consumers' consumption.

National Production. In January 1, 2017, the total cattle inventory was estimated at about 2,547,643 heads. Around 94% or about 2,389,191 heads were raised in backyard farms and the remaining 6 percent or 158,452 heads were found in commercial farms. The total volume of cattle production in 2016 is estimated at 270.42 thousand metric tons, liveweight.

Cattle volume of production in 2037.4216 reached 270.42 thousand metric tons, liveweight. It is higher by 1.32 percent from the 2015 output of 266.90 thousand metric tons, liveweight.

The top three regions in the country with highest inventory were Ilocos Region (R-I), CALABARZON (R-IVA), and Northern Mindanao (R-X) with estimated contribution of 31.92% of the total cattle population. Ilocos Region topped the inventory in backyard farms with 297,832 heads, while Bicol Region has the highest inventory in commercial farms with 34,232 heads. (PSA, 2017)

Trade. Philippine imports live cattle because of reduction in local cattle production while there is increasing local demand ("Beef Cattle", n.d.). The total number of imported live cattle in CY 2016 was 15, 934 heads, which was recorded at 37.42 percent lower than CY 2015 data. These imported cattle were mostly from Australia, New Zealand, India, USA, and Brazil. There were 240 heads of breeder stocks and 15,694 heads of feeder stocks imported in CY 2016.

- **ECOTOURISM**

Ecotourism is defined as a form of sustainable tourism where community participation, protection and management of natural resources, culture and indigenous knowledge and practices, environmental education and ethics as well as economic benefits are fostered and pursued the enrichment of host communities and satisfaction of visitors (DAO 2004-28). Ecotourism is considered under nature-based tourism products which refer to nature-based recreational and educational activities in the National Tourism Development Plan (NTDP) 2018-2022

The Philippines is one of the best tourist destinations. Homing the best areas to visit and popular for various ecotourism destinations located throughout the country and as an example the Banawe Rice Terraces in Ifugao, Osmeñas Peak in Cebu, El Nido in Palawan, and the Mantigue National Park in Camiguin.

Relevant Policies and Plans. The relevant policies and plans on ecotourism are the following:

- **National Tourism Development Plan (NTDP) 2018-2022** includes ecotourism “nature-based tourism products” among the nine product portfolios for Philippine tourism.
- **Philippine Development Plan 2017–2022** identifies tourism as priority sector for development due to its potentials for high growth and job generation.
- **DAO 2004-28** or the Rules and Regulations Governing the use of Forestlands for Tourism purposes.
- **Executive Order 111 series of 1999** or Establishing the Guidelines for Ecotourism Development in the Philippines. The National Ecotourism Development Council (NEDC) was created as the policy-making body for ecotourism and chaired by the Department of Tourism and co-chaired by the Department of Environment and Natural Resources.



Figure 31. Potential Ecotourism Site in Roxas, Palawan

As of 2017, there are 33 agreements covering a total area of 308 ha of forest lands within R3, R4B, R5, R6, and R7 as shown below (PFS 2017). Region 4B has the most numbers with 28 FLaGT agreements covering 262 hectares followed by Region 7 with 2 agreements covering 36 hectares. Region 3, Region 5 and Region 6 with only one agreement 1 covering 3 ha, 2 ha and 5 ha respectively.

Table 10. Tourism Industry Performance

Year	Tourism Expenditure (In Million PhP)	
	Inbound	Domestic
2013	225,300	1,136,995
2014	276,894	1,403,813
2015	306,489	1,770,749
2016	311,698	2,108,216
2017	448,561	2,644,833

Philippine Tourism Satellite Accounts (PTSA), Philippine Statistics Authority

Tourism Expenditure refers to the total consumption expenditure made by a visitor for goods and services during the trip and stay at the specific destination. Inbound tourism expenditure, which refers to non-resident visitors within the Philippines, grew by 43.9% in 2017, amounting to PhP 448.6 billion from PhP 311.7 billion in 2016. Domestic tourism expenditure, which includes the expenditure of resident visitors within the country either as a domestic trip or part of an international trip, grew by 25.42%, from PhP 2,108.2 billion in 2016 to PHP 2,644.8 billion in 2017.

As part of the industry performance and travel report of the Department of Tourism, the tourist arrival from 2013 successively increased until 2018. Annually more and more tourists arrive and seek leisure and recreational areas in the country. In 2017 arrivals came from the top 3 group of the Asia, America, and Europe.



Figure 32. Tourist Arrival in Dos Palmas Island Resort in Palawan

The National Ecotourism Strategy and Action Plan (NESAP) for 2013-2022 reported that nature tourism is growing by 10-12% per annum in the international market. In the Philippines, there were 4.3 million foreign tourists while domestic tourists reached 41 million in 2012. These are projected to reach 10 million and 35 million, respectively in 2016. The report also states that ecotourism in the country has a potential market of about 1.25 million to 14.17 million with a potential gross earning of USD81.2 million – USD1.4 billion from foreign ecotourism and PhP9.5–102 billion from domestic ecotourism.

Section 2

FORESTRY INVESTMENTS OPPORTUNITIES

The FIRM will provide the direction about how the production forests can be effectively optimized to produce raw materials, for manufacturing activities, for power generation and for tourism. As mentioned, the country's production forest is a very important resource which provides ecosystem goods and services such as food, timber, fuelwood, non-timber forest products (medicine, resin, and latex) among other things. The forests can also provide the raw materials and means for green energy generation (e.g. biomass and hydro power). Further, by simply providing customer centered end-to-end adventure and rest-and-recreation experiences, the forest can help open job opportunities for the informal sector and boost revenue generation from tourism activities.

Thus, the section will provide the basis about how production forests can enhance the country's global competitiveness by opening various revenue streams under the potential investment categories, the country's current economic state and how the production forest can render significant contributions as well as importance of private sector investments.

The remaining opportunities for investments in the forest-based industry is the availability of production forest (about 7.3 M ha) where ecosystem goods and services can be developed and sustainably managed to address the continuously growing demand for such. The areas planted with tree species and high value crops such as rubber, coffee, cacao, and rattan under the National Greening Program (NGP) also serve as investment opportunities for development of processing industries.

Advantages of Private-Sector Investments

Forestry investments refer to private sector asset investments in the development and utilization of resources in public forest lands. These include development and management of plantations for round wood production, non-timber forest products (bamboo and rattan), high value crops (cacao, coffee, and rubber), fuelwood, biomass, cattle grazing, and ecotourism outside NIPAS areas, and forest carbon projects within forest lands.

Private-sector managed forestry development has several advantages in terms of managing functional strategies. Private business operators have the resources to develop the organizational plan that reflects the appropriate mix of functions - such as marketing, production, finance, human resource management, etc. - to achieve their desired profitability level. Consequently, the government is the lead agency in terms of creating the enabling investment climate to encourage the private-sector to invest in forest development. Thus, responsive policies must be formulated to ensure that the sustainable development agenda are properly embedded in each investment package.

Private business operators are guided by the principles of quality, just-in-time delivery and productivity. Quality is about ensuring customer delight since the definition of such is different per target group. Just-in-time delivery is about the assurance that products and services will arrive at the specific time that they are needed. Productivity is synonymous to efficiency – wherein no time nor resource is wasted in any activity.

Contribution of the Forestry Sector to the GDP

The Gross Domestic Product (GDP) is the monetary value of all the finished goods and services produced within a country's borders in a specific period of time.³ It includes all private and public consumption, government outlays, investments, private inventories, paid-in construction costs and the foreign balance of trade⁴. In calculating the foreign balance of trade, the value exports are added to the GDP while the value of imports are subtracted. To simplify, the GDP is a broad measurement of a nation's overall economic activity and an indicator of the health of the economy. Hence an increasing GDP indicates growth.

In terms of contribution to the national economy, the forestry sector is delivering about 0.01% (or PhP 1.53 Billion) contribution to the country's Gross Domestic Product (GDP). With a total of 7,329,858.44 ha production forest and 6,924,296.72 ha protection forest, it can be deduced that the contribution from forestry is very minimal (about PhP 375.00 per hectare per year). The basis for the estimated annual contribution has to be validated extensively and the root causes of the low contribution must be identified to be able to formulate strategies and programs with due consideration to the dimensions of sustainable development.

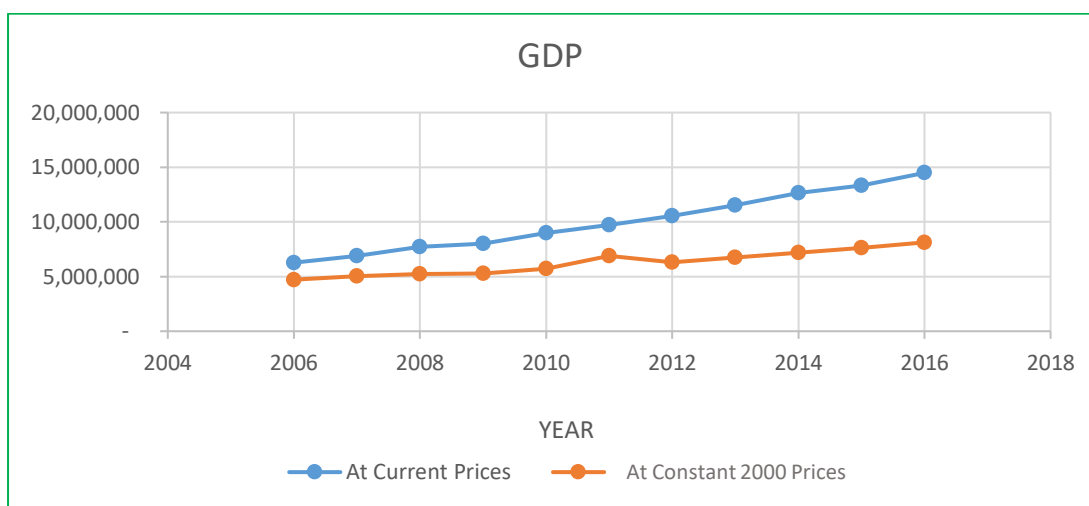


Figure 33. GDP Contribution, PFS 2016

Based on PSA data from 2006-2016, the country's GDP is steadily increasing from 2006 to 2016. The contribution of the forestry sector to the GDP can be determined through the Gross Value Added (GVA) – which is the measure of the value of goods and services produced in an area, industry or sector of an economy.⁵ The GVA is used for calculating the GDP. The calculation for the GVA considers the contribution of individual producers, industry, sector or region.⁶

³ Copied verbatim from www.investopedia.com

⁴ Ibid

⁵ The definition of the GVA was copied verbatim from www.wikipedia.org

⁶ Copied verbatim from lexicon.ft.com

It can be noted from the Figure 34 below that, gross value added (GVA) in forestry has been fluctuating with declining values from 2006 to 2016. The increase was noted from 2012 to 2016 at constant prices.

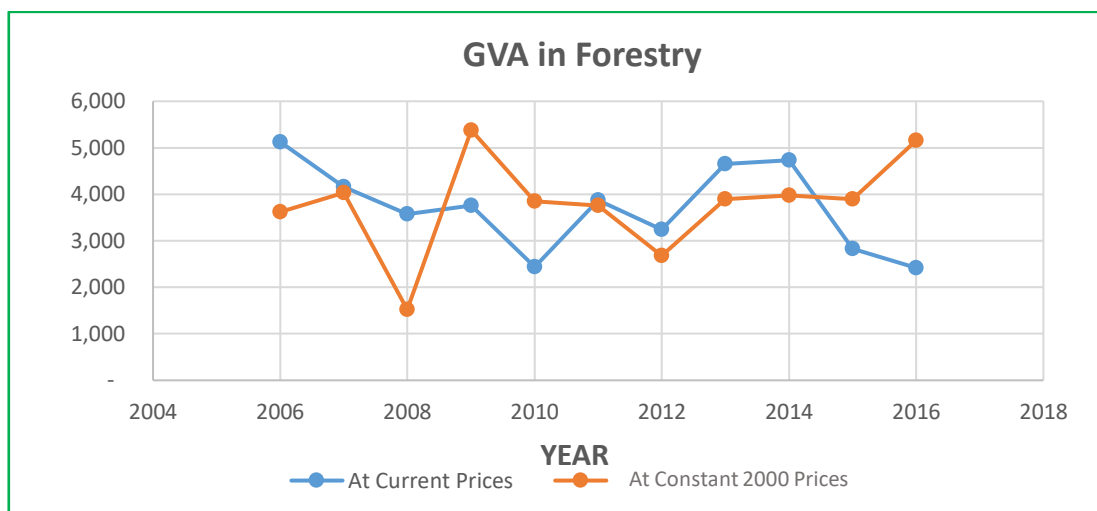


Figure 34. GVA Contribution, PFS 2016

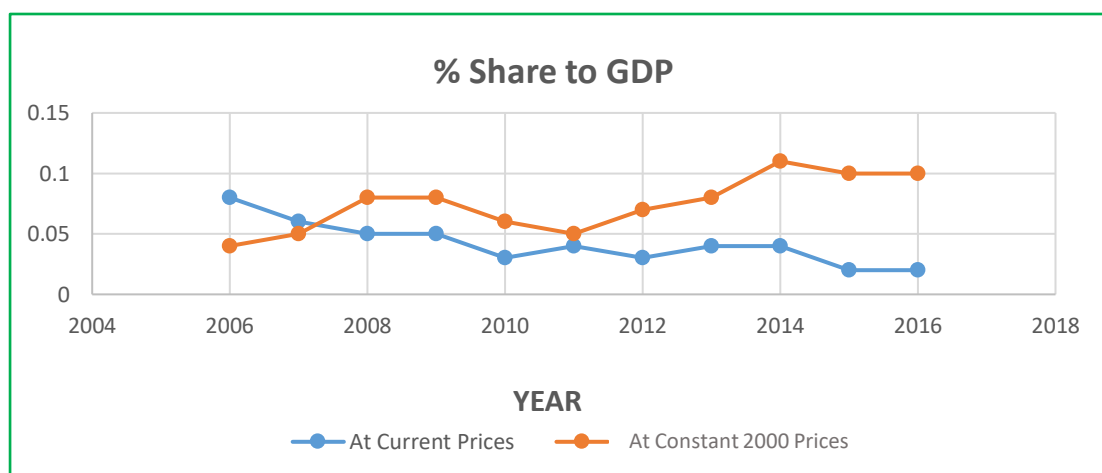


Figure 35. Percent Share in GDP, PFS 2016

However, if the current prices are considered, it can be noted that the share of GVA in forestry to GDP has been constantly declining from 0.09% in 2006 to 0.03% in 2010 and slight increase to 0.05 % in 2011, consistent increase from 2012 to 2014 (0.03 to 0.04 %). Thereafter, there was an abrupt and continuous decrease from 2014-2016. This means that thorough diagnosis must be done to determine the root causes of the decline vis the opportunities to increase the GVA contribution considering the richness of forest resources in the production forest lands.

The data provided above further justify the need to extensively develop production forests through local and foreign direct investments.

The table below shows the projected contribution of several forest-based commodities to the Gross Value Added of different sectors and the Gross Domestic Product in 2028, established under the Philippine Master Plan for Climate Resilient Forestry Development (PMPCRFD).

Table 11. Projected Additional Contribution of Several Commodities to GVA/GDP in 2028 Under FIRM

Commodities	Gross Value Added (Php)	Percent GVA to GVA of Manufacturing	Percent GVA to GVA of AFF sector	Percent GVA to GDP	Number of Full-time employees
Logs	39,582,524,235	-	1.66%	0.14%	156,679
Lumber	18,281,932,335	0.27%	-	0.06%	35,873
Plywood	19,918,391,264	0.29%	-	0.07%	39,084
Furniture/WBMA	108,423,608,116	1.59%	-	0.38%	212,752
Bamboo	880,540,827	-	0.04%	0.003%	3,805
Coffee	437,924,800	-	0.02%	0.002%	1,892
Cacao	196,758,662	-	0.01%	0.00%	850
Rubber	298,687,211	-	0.01%	0.001%	1,291
TOTAL	188,020,367,451	2.14%	1.73%	0.66%	452,226

Notes:

Sector	Baseline GVA and GDP (2017)	Projected GVA and GDP in 2028 (based on available historical annual average growth)
Agriculture, Fisheries and Forestry	1,452,597,461,190	2,387,543,374,512
Manufacturing	3,043,780,416,580	6,839,835,552,287
GDP	15,288,744,176,000	28,346,479,541,085

The establishment of 1.4 million ha in 2028 of commercial tree plantations is expected to generate a total of 12 million cu m in log production annually by 2028, which can then be processed further into lumber, plywood, furniture, and other wood-based manufactured articles. It is also expected to increase the GVA of forestry to 1.66% of the GVA of the Agriculture, Fisheries, and Forestry (AFF) sector, and 0.14% of the total GDP of the country by 2028, employing 157 thousand full-time employees.

The production of processed wood products such as lumber, plywood, furniture, and other wood-based manufactured articles would also be able to contribute an additional 2.14% to the GVA of the manufacturing sector and 0.52% to the GDP, as well as generate around 288 thousand employees.

Other crops would also be established, such as Bamboo (18,000 ha), Coffee (100,686), Cacao (69,236), and Rubber (130,079). These would be able to provide an additional 0.08% increase in the GVA of the AFF sector and employ 7,838 employees.

Overall, the GVA of selected forest-based commodities would be able to contribute an additional increase of 0.7% in the GDP in 2028 and generate employment for around 452 thousand Filipinos.

In 2017, the GVA of Forestry contributed 0.15% to the GVA of AFF sector and 0.01% to the total GDP. This increased to 1.66% (AFF) and 0.14% (GDP) in 2028, respectively.

Table 12. Percentage Contribution of GVA Forestry to AFF and total GDP

	2017	2028
GVA Forestry to AFF	0.15%	1.66%
GVA Forestry to GDP	0.01%	0.14%

Projected Job Generation through Sustainable Utilization of Forests

One of the major agendas is to optimize the sustainable utilization of the forests to generate sustainable jobs. As presented in Table 13, the possible skills and direct requirement per investment category may include (but not limited to):

Table 13. Projected Job Generation

Aspect	Possible Job Opportunities
Timber production	<ul style="list-style-type: none"> • Foresters • Agriculturists • Laborers for forest maintenance and protection
High value crops production	<ul style="list-style-type: none"> • Machine operators (e.g., tractors, chainsaw, etc.) • Administrative staff
Grazing: Cattle production and meat processing	<ul style="list-style-type: none"> • Veterinarians • Laborers/Cowboys • Food technologists • Factory workers • Administrative staff
Eco-Tourism	<ul style="list-style-type: none"> • Foresters • Tour guides • Hotel and restaurant crew (chefs, cooks, kitchen and wait staff, laundry, maintenance staff, landscaping/ground custodians, etc.) • Administrative Staff
Manufacturing industries	<ul style="list-style-type: none"> • Furniture factory workers • Food and beverage processing workers • Professional-level (CEOs, managers, etc) and rank-and-file level administrative staff • Research and Development managers and personnel • Administrative Staff • Laborers

Based on FMB-GIS, the Philippines has a total of 7.3 Million Hectares of Production Forests. If 50% of the total area will be optimized and one (1) hectare will be managed by one (1) laborer, the possible regional financial contribution of the forestry sector to the economy is estimated in Table 14.

Table 14. Possible Regional Financial Contribution

Region	Total Production Forest Area ('000 Ha)	50% Target Utilization (Ha)	Approved Minimum Wage (PhP/day) *	Estimated Annual Economic Contribution from Labor (in Billion PhP)**
XIII	855.69	427.84	280	119,796.51
IV-B	850.95	425.48	235	99,987.08
IX	626.17	313.09	267	83,594.12

Region	Total Production Forest Area ('000 Ha)	50% Target Utilization (Ha)	Approved Minimum Wage (PhP/day) *	Estimated Annual Economic Contribution from Labor (in Billion PhP)**
XII	559.66	279.83	272	76,113.20
II	551.38	275.69	250	68,922.76
XI	535.07	267.53	315	84,272.84
CAR	503.49	251.74	300	75,523.40
X	424.61	212.31	291	61,781.23
VIII	418.42	209.21	245	51,256.54
III	414.90	207.45	264	54,766.19
V	376.60	188.30	280	52,724.57
NIR	322.41	161.20	280	45,137.00
I	263.60	131.80	243	32,026.90
IV-A	237.40	118.70	275	32,642.38
VI	228.98	114.49	271	31,026.29
VII	160.54	80.27	288	23,117.36
Grand Total	7,329.86	3,664.93		992,688.36

The target contribution is only possible if the outputs will have a concrete market. Thus, market research and the value chain studies are needed to ensure demand-driven production. Both the market research and value chain studies will help identify the industries and activities that can reduce poverty through the development of chains that can effectively integrate the outputs of the forest lands to the dynamics of the demand. Therefore, there is a need to ensure that 50% of the country's forest lands are utilized for raw materials with substantial local and international demand.

Section 3

VISION, GOALS and OBJECTIVES

The vision for the forestry sector is articulated in the PMPCRFD as follows: “Climate resilient and sustainably managed watersheds and forest ecosystems, providing environmental and economic benefits to society with globally competitive forest-based industries contributing to the national economy and livelihoods of local/indigenous communities.” One of the forestry sector goals to pursue this vision is the sustainable management of watersheds and forest ecosystems in partnership with stakeholders so that demands for forest ecosystem goods and services are met (PMPCRFD 2016).

The PMPCRFD mentions the need to take advantage of the comparative and competitive edge of the different regions in terms of the forest ecosystem goods and services that they provide and have already developed through the years. Hence, the marketability and sustainability of forest ecosystem goods and services will depend on the appropriate matching of regional comparative advantages with adequate financial support or investment allocations. Likewise, a stable enabling environment where policies, guidelines, and institutional arrangements should be made available to ensure that forestry investors will get their returns on investment.

The FIRM will provide directions about how industrial-level partnerships can be strengthened to transform the production forests into a significant contributor to the national economy. In order to maximize the economic benefits that will increase the GDP contribution of forestry sector, careful planning, management and implementation of forestry and forest-based projects shall be undertaken.

The Forestry Investment Road Map (FIRM) for 2018-2028 has the following vision, goals, and objectives:

Vision: ***“Revitalized Philippine forestry investments toward inclusive growth and sustainable development”***

Goals:

- Provide an enabling environment for investments in forest and forest-based products and services to assure investors of stable policies, secure tenure, incentives, and technical support;
- Generate additional and sustained forestry investments to meet the demands for forest and forest-based products and high value-added commodities and services;
- Ensure the sustainable supply of raw materials to produce globally competitive forest-based products and services; and
- Promote equity and social justice by uplifting the socio-economic status of women and men in forest-dependent communities.

Banner Objective: To increase the contribution of the Production Forest to the country’s GDP from 0.01 to 0.14% in 2028 through private investments which are anchored with the dimensions of sustainable development.

Specific Objectives:

- Identify and delineate potential investment areas based on regional comparative advantages
- Develop and maintain 1,439,298 ha commercial forest plantations by 2028 (PMPCRFD 2016)
- Establish and maintain 297,234 ha fuelwood/biomass energy plantations by 2028 (PMPCRFD 2016)
- Develop and maintain 500,000 ha non-timber forest product plantations and high value crops by 2028 through community partnerships with private investors
- Develop and maintain 111,000 ha grazing land by 2028 (PMPCRFD 2016)
- Formulate or amend policies and guidelines related to forestry investments
- Establish specific guidelines for implementing payment for ecosystem services
- Provide appropriate tenure instruments for private investors or community partnerships with private investors
- Increase 50% in average annual income of upland communities
- Place 75% of open access forestlands under appropriate management arrangements
- Establish forest-based industries with sustainable source of raw materials

Strategic components on how to achieve the goals and objectives are as follows:

1. Provision of stable enabling policy and investor-friendly environment
2. Institutionalization of forestry investment support mechanisms
3. Identification, mapping, and assessment of potential investment areas
4. Provision of secure tenure and partnership agreements
5. Development and management of potential areas for forestry investments
6. Strengthening and sustaining partnership with existing tenure holders
7. Marketing strategies

Provision of stable enabling policy and investor-friendly environment

Appropriate policy instruments to implement the forestry investment portfolio approach, forest certification, secure tenure and rights, and risk management need to be in place to ensure a stable policy environment for investors. Issuance of joint administrative orders between or among concerned agencies (i.e. DENR, DA, DILG, NCIP, DTI, DOE, DOT) which are necessary in the implementation of the Forestry Investment Portfolio Approach (FIPA).

Restrictive, conflicting, and overlapping regulations on investment-related activities will need to be amended to reduce transactions costs of investors. Continuous upgrading and enhancement of governance capacities and capabilities of DENR will help sustain forestry investors' confidence. These initiatives will also help improve the country's ranking in ease of doing business by the Asian Productivity Organization (APO) which is currently at 113 of 190 countries in 2017.

Policy formulation is necessary to answer policy gaps which must be resolved to address some issues and concerns. On the other hand, policy development

activities that will further support and strengthen the FIRM implementation include the following:

- Advocacy for the passage of the Sustainable Forest Management (SFM) bill which will replace the Presidential Decree (PD) 705 or the Forestry Reform Code since most of its provisions have become obsolete particularly the allocation of forest lands and tenure (through timber license agreement). The SFM bill addresses current and future trends in forestry such as climate change and disaster management issues, carbon projects, forest estate delineation, and risk management in forestry projects, among other issues.
- Review and amendment of guidelines on permitting, utilization, and transportation of forest-based products.
- Harmonization of guidelines and processes by DENR and Other Government Agencies (OGA), Local Government Units (LGUs) on the issuance of necessary clearances for the approval of tenure and permits which are overseen by these agencies.
- Harmonization and streamlining of guidelines and processes by DENR and concerned OGAs on how private investors and upland communities can access incentives provided by the Board of Investments (BOI), Bureau of Customs (BOC), Bureau of Internal Revenue (BIR), DOE, LGUs, and Department of Budget and Management (DBM).

Likewise, improved forest governance is a continuing imperative of government in the allocation, protection, and conservation of the country's forests and forest resources. Good governance promotes collective responsibility of the government, private sector and civil society groups for improving the lives of all Filipino through stable policies, decision making and institutional processes. The pillars of good governance include accountability, transparency, rule of law, responsiveness, equity and inclusiveness, effectiveness and efficiency, consensus-oriented, and participation. These contribute to a stable and investor-friendly environment for forestry investments.

Institutionalization of forestry investment support mechanisms

The DENR through the Forest Management Bureau (FMB) is the focal office for forestry investments at the national level. At the field level, the Regional Offices shall be capacitated to provide support and technical assistance in the implementation of forestry investment projects.

The forestry investments information and technical support to be provided include:

1. Sustained Information, Education, and Communication campaign on forest investment potentials;
2. Technical support for resource development planning, technology updates, PPP arrangements, acquiring of incentives, among others.;
3. Provision of technical assistance on forest plantation development, utilization, marketing, and entrepreneurship;
4. Linkaging with financing agencies and facilities;
5. Marketing information;
6. Information on incentives; and
7. Linkaging with research & development institutions.

A database on forestry investments shall be maintained at the regional offices (Planning and Management Division) and at the central office for purposes of information, monitoring and evaluation. The database shall be updated regularly as part of information systems management. Likewise, monitoring and evaluation system shall be developed to provide a feedback mechanism for investors and other stakeholders.

Identification/validation, mapping, and assessment of potential investment areas

The potential investment areas for each category need to be validated and delineated on the map based on the regional comparative advantages and competitive edge. The comparative advantages of each region refer to its strengths and assets such as its natural endowment, socio-cultural resiliency, and capacities resulting from its accumulated experience in managing a resource or in producing good quality forest products (PMPCRFD, 2016). The identified and validated sites will be appropriately packaged for promotion by the Regional Offices. Assessment tool had been developed for approval.

Identification of investments should consider what competitive forest-based products and services already exist (and can be strengthened) in each region based on the bio-physical and environmental conditions as well as technologies, skills, facilities, and markets already developed or have emerging market demands.

The potential forestry investments will also be validated with the priorities identified in the regional development plans, integrated watershed resources management plans (IWRMPs), LGU-based comprehensive land use plans (CLUPs), and its forest land use plans (FLUPs) and the Indigenous People Groups' Ancestral Domains Sustainable Development and Protection Plans (ADSDPPs), among other plans and strategies within the region. These regional and local development plans include priority investment areas based on historical assessments prior to the preparation or updating of the plans.

The assessment involves ground validation of the availability (i.e. absence of encumbrances such as active/inactive tenure holders or adverse claims) and extent of the potential investment areas like survey, mapping and planning (SMP) being done in DENR project areas. The area and location of the investment areas must be delineated on the ground, mapped, and inputted in the regional database including bio-physical (i.e. physiographic, edaphic, climate, rainfall, land uses, resources inventory, etc.) and environmental characteristics of the site. Socio-economic, cultural, institutional, and political information within or surrounding the investment areas are also important to inform the potential investors in making investment decisions based on proper site-species-market or site-commodity-market matching. Likewise, the framework and assessment tool in profiling, identifying, and evaluating potential Biodiversity-Friendly Enterprise (BDFE) in selecting livelihood/enterprises within forestlands and areas outside NIPAS will be used in prioritizing potential investment areas.

For operating mines, the mining contractor may adopt the identified potential investment areas in determining post-mining land use under its Final Mine Rehabilitation and/or Decommissioning Plan subject to approval of Contingent Liability and Rehabilitation Fund Steering Committee and shall be in accordance with existing laws and policies.

For abandoned mines, the DENR may also adopt the identified potential investment areas in developing/revising Environmental Monitoring Plan for existing abandoned mines subject to applicability and available government resources.

Information from value chain analyses of the potential investment areas will help determine the enabling investments needed as well as where asset investors can come in along the chain. Potential investments exist from the raw material production, primary, intermediate, or final product processing, transporting to marketing. Related services include suppliers of raw materials (seeds, planting materials, forage, etc.), other inputs (fertilizers, pesticides, etc.), facilities and equipment, and other production, transport, and marketing requirements.

The DENR will facilitate the issuance of permits and endorsements from LGUs, NCIP, and concerned government agencies for the potential investment areas within the region. The purpose for this is to reduce transaction costs and time spent by the investor in getting the necessary permits. The process is part of the proposed forestry investment portfolio approach which will require a policy imperative from the central offices of the concerned agencies to be operationalized at the local levels.

Provision of secure tenure and partnership agreements

There are two possible arrangements for forest investors: the public-private partnership, and people-private partnership. Public-private partnerships refer to investment agreements between government (DENR; other government agencies; LGU co-managed with DENR; government-owned and controlled corporations or GOCC) and private investors. People-private partnerships refer to agreements between CBFMA holders and private investors or between private investors as tenure holders and local communities (tenured or untenured) within forest lands.

Partnership agreements between tenured communities and private investors are often negotiated among themselves. However, in NGP areas where government invested in the planting of tree species, NTFPs, and HVCs by untenured upland communities, possible partnership agreements can also be made pursuant to existing guidelines. Either party could apply for tenure or through a Memorandum of Understanding (MOU) or Agreement (MOA).

Development and management of forestry investments

Private investors in forest lands shall be encouraged to develop diversified products, services, or commodities and infuse capital investment in forestry as well as to manage financial and environmental risks. Since development is at hand, it is also important to consider the reduction of negative impacts in the interventions to be introduced in the target investment areas. In this case, sustainable consumption and production patterns are needed. This prevents over extraction of resources and minimizes significant loss of biodiversity.

Moreover, development by block or agroforestry systems such as intercropping of trees and cash crops will be promoted for soil and water conservation,

biodiversity conservation, and ensuring environmental integrity. This management type will ensure that the communities or private investors are able to earn income during the years after planting and while waiting for the tree crops to mature. Depending on the site-species-market matching, plantation development, grazing and ecotourism may be integrated in the forestry investment plan.

Furthermore, forestry investments are possible at different stages of the value chain: production of raw materials, intermediate to final product processing, and the related industries such as provision of inputs to production, transport of goods and services, marketing and other services.

To ensure that the investments to be offered are based on hard evidence, business model case studies were developed per investment category. Briefly, the operational and financial data about each investment category was documented from various tenure holders. The critical success factors of the business model are also captured to support the simulations.

The potential investment categories under the FIRM are presented in the succeeding discussion. For the financial analyses of forest investments, assumptions used in deriving financial values are based on the real time case studies conducted by the FMB in 2018.

- **Commercial Forest Plantations for Round Wood Production**

Potential investments for commercial forest plantations can be done in open access areas such as expired/cancelled IFMAs/TLAs and untenured areas with extensive grasslands and shrublands. Co-production or joint ventures with communities or LGUs are possible in CBFMA areas as well as established NGP tree plantations in untenured areas which need additional investments for their maintenance and protection after the 3-year initial funding from DENR. Potential partnerships with processing and manufacturing plant owners may be arranged to ensure their sustained raw material supply.

Additional investments in commercial forest plantations are expected to contribute to the current supply gap of about 1.48M cu m based on average annual supply of 4.58M cu m and consumption of 6.06M cu m over the past decade. About 70% of our total wood supply were imported and only 52% of the total wood supply is for domestic consumption while 48% is exported as finished products. The PMPCRFD (2016) estimates that the country needs to establish 1,439,000 ha of commercial forest plantations in 2028 to meet our future wood needs.

There are at least two cutting cycles for fast growing tree species within the 25-year tenure but only one cycle for planted long-gestation indigenous tree species within the 50-year maximum tenure. Hence, investors really need to diversify their crop combinations within the forest land.

An important consideration in tree plantation is the choice of suitable tree species which grow best under given ecological limitations. The most often used species are fast-growing or short rotation hardwoods. Some of the tree species for tree plantation are Agoho (*Casuarina equisetifolia*), Auri (*Acacia auriculiformis*), Bagras (*Eucalyptus deglupta*), Benguet Pine (*Pinus kesiya*), Falcata (*Paraserianthes falcataria*), Gubas (*Endospermum peltatum*),

Mahogany (*Swietenia macrophylla*), Mangium (*Acacia mangium*), Narra (*Pterocarpus indicus*), Rain tree (*Samanea saman*), Teak (*Tectona grandis*), and Yemane (*Gmelina arborea*).

The Soil and Climate Requirements for each tree species have different soil, elevation and temperature requirements.

The assumptions and resulting financial values for roundwood plantation such as NPVs, BCR, IRR, ROI, and payback period are presented in Table 15.

Table 15. Assumptions for the financial analysis of a 1-ha roundwood plantation

Activities/Items	Assumptions
<p>1. Stocking Density</p> <p>Species</p>	<p>750 trees per ha</p> <p>Falcata (<i>Paraserianthes falcataria</i>, Mangium (<i>Acacia mangium</i>), Yemane (<i>Gmelina arborea</i>), Mahogany (<i>Swietenia macrophylla</i>) and Gubas (<i>Endospermum peltatum</i>)</p>
<p>2. Operation Costs</p> <p>2.1 Nursery operation/development</p> <p>2.2 Plantation establishment/development</p> <p>2.3 Plantation maintenance and protection</p> <p>2.4 Infrastructure development and utilities maintenance</p> <p>2.5 Forest protection</p> <p>2.6 Management/Administrative Cost</p>	<p>Ave. P3,010 per ha per year (Years 1-12)</p> <p>Ave. P14,040 per ha per year (Years 1-12)</p> <p>Ave. P2,410 per ha per year (Years 1-25)</p> <p>P5,199 per ha per year (Years 1-25)</p> <p>P418 per ha per year (Years 1-25)</p> <p>8% of Total Cost</p>
<p>3. Harvesting Cost and Income</p> <p>3.1 Harvest/yield</p> <p>3.2 Harvesting cost</p> <p>3.3 Selling price per unit</p> <p>3.4 Gross income</p>	<p>Ave.159 cu m per ha per year</p> <p>30% of SP</p> <p>P4,400 per cu m</p> <p>Ave. P698,528 per ha per year (Years 10-25)</p>
<p>4. Other assumptions</p> <p>4.1 Discount rate</p>	<p>10%</p>

Activities/Items	Assumptions
4.2 Analysis period	25 years

Table 16. Financial analysis of 1-ha roundwood plantation

PV of Benefits per Ha	P181,293.46
PV of Costs per Ha	P62,803.77
NPV per Ha	P118,489.69
Benefit-Cost Ratio (BCR)	2.89
Internal Rate of Return (IRR)	43%
Return on Investment (ROI)	1.89
Payback Period	Year 10

▪ **Plantations for NTFPs (bamboo & rattan)**

BAMBOO

Commercially Traded Varieties/Species. There are currently 70 known bamboo species in the country (Virtucio 2008). Eight of these are highly regarded as commercial species which include Kauayan Tinik (*Bambusa blumeana*); Kiling (*Bambusa vulgaris*); Bayog (*Dendrocalamus merrillianus*); Laak (*Bambusa philippinensis*); Giant Bamboo (*Dendrocalamus asper*); Bolo (*Gigantochloa levis*); Kayali (*Gigantochloa atter*); and Buho (*Schizostachyum lumampao*).

The Philippine Bamboo Industry Development (PBID) Roadmap of 2016 had an annual estimated current demand for bamboo culms by the traditional (present) bamboo industry sectors and sub-sectors amounts to 21,250,874 culms. If in the future the government or industry decides to invest in pulp and paper production as well as in the production of bamboo chips for boiler fuel, the total requirements would amount to 107,058,770 culms per year. Kawayan Tinik tops the list of the highly demanded bamboo species for manufacturing.

The PBID Roadmap estimates the total demand for bamboo to be 85.81M culms annually. Demand from the pulp and paper industry is about 34M culms/year while biomass energy plants need 51M culms/year for bamboo chips and pellets, the furniture industry requires about 8.7M culms/year, and 10.5M culms/year are needed for banana props and fish pens/cages.

Some regions with established technology and skills for bamboo harvesting and marketing and access to ports and market are Regions 1, 3, 4A, 4b, 5, 6, NIR, 8, 10. Furniture industry centers are Cebu, Metro Manila, and Pampanga.

Soil and Climatic Requirements. Bamboo can survive in a wide range of soil and climatic conditions, but it requires some favorable conditions to achieve its optimum growth.

- **Soil.** Grows well in various types of soil but prefers damp soils near river and stream banks, lower slopes of mountains, well drained soils such as sandy loam and clay loam types; pH: 5-6.5

- **Rainfall (most important).** Between 1,270 – 4,050 mm/ annual rainfall range
- **Temperature.** Wide range of temperature from 8.8°C to 36°C. Giant bamboo thrives best at lower temperature
- **Elevation.** Lowlands (*Bambusa*, *Schizostachyum* and *Dendrocalamus*); 1,500 masl (*Phyllostachys*); 400 – 500 masl up to 1,500 masl (Giant Bamboo)
- **Latitude – Philippines lies from 5-20 degrees N latitude.** Favorable for *Bambusa* (Kawayan Tinik), *Schizostachyum* (Buho) and *Dendrocalamus* (Giant Bamboo)

Regional Comparative Advantage. There are 15,121.82 ha (95%) of bamboo plantations in forestlands and 735.41 ha (5%) found in private lands (Dolom et al. 2012). Topping the list of Regions with the largest bamboo plantation is Region 6, Western Visayas (8,942.51 ha) followed by Region 7, Central Visayas (4,492.08 ha).

The National Greening Program reported a total of 18,615 ha planted with bamboo for the period 2011-2016. Region 3, Central Luzon had the largest area (4,765 ha) planted with bamboo followed by Regions 4A, CALABARZON (2,592 ha), Region 7, Central Visayas (1,825 ha), Region 5, Bicol (1,631 ha) and Region 12 Northern Mindanao (1,000 ha).

The assumptions and resulting financial values for bamboo plantation such as NPVs, BCR, IRR, ROI, and payback period are presented in Table 17.

Table 17. Assumptions for the financial analysis of 1-ha bamboo plantation

Activities/Items	Assumptions
1. Area Spacing Stocking Density Species	Kawayang tinik 7 x 7 meters spacing 204 clumps per ha
2. Operation Costs 2.1 Nursery production 2.2 Plantation establishment/development 2.3 Plantation protection and maintenance (P&M) 2.4 Other operation cost - wages & salaries	P10,266 per ha (Year 1) P13,944 per ha (Year 1) P19,380 per ha (Year 2) P17,100 per ha (Year 3) P19,140 per ha per year (Years 4-5) P7,392 per ha per year (Years 6-11)
3. Harvesting Cost and Income 3.1 Harvest/yield	408 poles per ha (Year 6) 816 poles per ha per year (Years 7-9) 1,224 poles per ha per year (Years 10-11)

Activities/Items		Assumptions
3.2	Harvesting cost (including transport and incorporating P&M during harvest)	P10,200 per ha (Year 6) P20,400 per ha per year (Years 7-9) P22,440 per ha per year (Years 10-11)
3.3	Selling price per unit	P100 per pole
3.4	Gross income	P40,800 per ha (Year 6) P81,600 per ha per year (Years 7-9) P122,400 per ha per year (Years 10-11)
4. Other assumptions		
4.1	Discount rate	10%
4.2	Analysis period	11 years

Table 18. Financial analysis of 1-ha bamboo plantation

PV of Benefits per Ha	Php 227,668.56
PV of Costs per Ha	Php 146,730.81
NPV per Ha	Php 80,937.75
Benefit-Cost Ratio (BCR)	1.55
Internal Rate of Return (IRR)	24%
Return on Investment (ROI)	0.55
Payback Period	Year 6

RATTAN

Variety. Rattans are naturally found in the Philippine dipterocarp forests and are distributed throughout the country. Four genera and about 64 species are found in the country (PCARRD, 1991).

- *Calamus* with 44 species and 23 varieties, is the largest of the four genera. It is widely distributed, but some species are narrow endemics and confined to specific islands or mountains.
- *Daemonorops* is the second largest group of Philippine rattans. There are 14 species and one variety under this genus. Like *Calamus*, they are widely distributed but many are confined to islands and mountains.
- *Korthalsia* consists of only five species. Members of this genus have a more restricted distribution. Three species are only found in Palawan, two species in Mindanao and one species in Luzon, Polillo Island and in Mindanao.

- *Plectocomia* has the smallest number of members. It consists of two species. Members of this genus are confined to the primary rainforests of Palawan, Leyte and Mindanao.
- **Soil and Climate Requirements.** Throughout their natural range,



Figure 36. Rattan (Palasan (*Calamus merilii*) in Leyte

rattan species are found in a wide range of forest and soil types. Some species are common components of the forest understory, whilst some rely on good light penetration for their development; hence several species are found in gap vegetation and respond very well to canopy manipulation, particularly that caused by selective logging. Other species grow in swamps and seasonally inundated forest whilst others are more common on dry ridge tops. Despite this wide range of ecological conditions, most of rattans need adequate light for their development. (FAO 2000)

Regional Comparative

Advantage. Production areas of rattan are found from the most common legal tenure rights and rattan cutting permits, which include (a) Certificate of Ancestral Domain Claim/Title (CADC/T), (b) Community-Based Forest Management (CBFM) Agreement, and (c) negotiated rattan-cutting concessions (RCCs). It covers the rattan-rich areas of Mindoro in Luzon (CADC/T site), Samar province in the Visayas (CBFM site), and Agusan del Sur in Mindanao (RCC site).

Furthermore, there are three major furniture-making areas in the country: Cebu, Metro Manila, and Pampanga. Amongst the three major areas, Metro Cebu, is a conglomeration of four progressive cities: Cebu City, Mandaue, Lapu-Lapu, and Talisay where largest-sized rattan, stone craft, and metal furniture industry in the country are found. Cebu province accounts for more than 60 percent of the country's annual furniture export sales. The second furniture cluster is located in Pampanga (USAID February 2006).

The assumptions and resulting financial values for rattan production such as NPVs, BCR, IRR, ROI, and payback period are presented in Table 19.

Table 19. Assumptions for the financial analysis of 1-ha rattan plantation

Activities/Items	Assumptions
1. Area Spacing/Stocking Density	4 x 5 meters spacing 500 Seedlings per ha
2. Operation Costs <i>(Note: reflected only the cost for rattan plantation; the cost for roundwood is excluded)</i>	
2.1. Nursery production	Php 10,500 per ha (Year 1)
2.2. Plantation establishment/development	Php 5,571 per ha (Year 1) Php 2,225 per ha per year (Years 1 & 3)
2.3. Plantation protection and maintenance	Php 2,336 per ha (Year 2) For Years 4-25, assumed to be incorporated in the cost for roundwood plantation
2.4. Infrastructure	Assumed to be incorporated in roundwood plantation
3. Harvesting Cost and Income	
3.1. Harvest/Yield	3 poles per plant or 1,500 poles per ha per year (Years 12-25)
3.2. Production cost	25 % of SP
3.3. Selling price (SP) per unit	Php 35 per pole
3.4. Gross income	Php 52,500 per ha per year (Years 12-25)
4. Other assumptions	
4.1. Discount rate	10%
4.2. Analysis period	25 years

Table 20. Financial analysis of 1-ha rattan plantation

PV of Benefits per Ha	Php 135,553.90
PV of Costs per Ha	Php 53,321.96
NPV per Ha	Php 82,231.94
Benefit-Cost Ratio (BCR)	2.54
Internal Rate of Return (IRR)	23%
Return on Investment (ROI)	1.54
Payback Period	Year 12

BIOMASS ENERGY/FUELWOOD PLANTATIONS

Biomass energy plantations: The supplementation of renewable energy sources (biomass, wind, solar, geothermal, ocean, and hydropower) is driven by oil price increases and efforts to reduce national GHG emissions. The DOE estimated that the demand from industrial and commercial users for renewable energy (about 67% for biomass energy) is growing by an average of 3% annually or about 29.9 million barrels of fuel oil equivalent (MMBFOE) as of 2012.

Biomass power plants have a total contribution of 119 MW or 0.68% of all types of fuel in the country and these are distributed by island group below (DOE-IPO, 2014).

Table 21. Megawatt distribution by island group

Island Group	Capacity (MW)	% Share of power plants
Luzon	33	0.03
Visayas	44	1.80
Mindanao	36	1.68
TOTAL	119	0.68

Priority regions for investments in biomass energy plantations are R1, R3, NIR, R10, and R13 where there are biomass co-generating plants and processing plants for wood chips (NIR) and pellets (R13). Most biomass co-generating plants are using bagasse (50-70%) and supplemental fuel which includes wood chips (10-25%) and agricultural wastes (25-50%). Some biomass plants are importing wood chips from Indonesia, Malaysia, Thailand, and Singapore. Hence, there is high potential for investments in biomass plantations particularly for falcata, mangium, ipil-ipil, and bagras.

There is high demand for pellets in other countries such as Japan, Korea, North America, and the European Union mostly for heating and industrial uses.

Recommended Varieties/Species. Based on the actual requirements of an energy-intensive company, trimmings of tree species with acceptable heating value can be utilized for energy generation. Apart from trees, waste materials like cacao pods, durian peelings, coffee shells, corn cobs, and many others may also be used for power generation. The study of Sarmiento and Varela (2015) cited the biomass estimates of various species and age in different tree farms in CARAGA, Mindanao, Philippines (Table 22). They used existing allometric equations of various species measuring height and diameter. The study however did not mention spacing or density and site characteristics or whether the measurements included big branches and other tree components that may qualify as fuelwood.

Table 22. Biomass estimated of various species and age in Mindanao (Sarmiento & Varela 2015)

Tree Species	Biomass (Mg ha ⁻¹)				
	1 year	2 years	3 years	4 years	5 years
<i>Acacia mangium</i>	14.38	29.23	48.66	70.61	110.64
<i>Paraserianthes Falcataria</i>	0.09	18.16	25.36	31.93	125.25
<i>Leucaena leucocephala</i>	8.21	38.13	56.31	70.41	77.36
<i>Eucalyptus deglupta</i>	0.14	5.76	23.96	40.00	58.20

The assumptions and resulting financial values for woody biomass plantation such as NPVs, BCR, IRR, ROI, and payback period are presented in Table 23.

Table 23. Assumptions for the financial analysis of 1-ha woody biomass plantation

Activities/Items	Assumptions
1. Area Spacing Stocking Density Species	2 x 3 meters spacing 1,667 trees per ha <i>Acacia mangium</i>
2. Operation Costs 2.1. Nursery operation 2.2. Plantation establishment 2.3. Administrative Cost (harvesting cost incorporated)	Php 5,555 per ha (Year 1) Php 6,390 per ha (Year 1) Php 5,522 per ha (Year 2) Php 2,487 per ha (Year 3) 10%-30% of Total Cost
3. Yield & Income 3.1. Yield of woodchips 3.2. Farm gate price of woodchips	112 cu m per ha P600 per cu m
4. Other Assumptions 4.1. Discount rate 4.2. Analysis period	10% 4 years

Table 24. Financial analysis of 1-ha woody biomass plantation

PV of Benefits per Ha	Php 46,108.02
PV of Costs per Ha	Php 24,734.38
NPV per Ha	Php 21,373.64
Benefit-Cost Ratio (BCR)	1.86
Internal Rate of Return (IRR)	42%
Return on Investment (ROI)	0.86
Payback Period	Year 4

Fuelwood plantations. There is high demand for fuelwood and charcoal among households and commercial businesses (bakeries, restaurants, barbecue stands, etc.) all over the country and demand will increase as population grows.

The PMPCRFD 2016 estimates a total annual wood fuel consumption of 46-70M cu m/year based on an average annual per capita consumption of 400-700 kg/capita/year. The estimated total planting area to supply total wood fuel consumption is around 150,000 to 210,000 ha/year.

Potential fuelwood plantations can be established in CBFMA areas or in open access/untitled forestlands in all regions. Aside from fuelwood and charcoal, these plantations can also supply wood chips to produce pellets and charcoal briquettes for use in biomass co-generating plants and for exports.

There is also a growing demand for activated charcoal or activated carbon which is derived from charcoal and has many uses, among which are gas

purification, decaffeination, gold purification, metal extraction, water purification, medicine, sewage treatment, and air filters.

Soil and Site Requirements. The suitability of species to a given objective of management is usually gauged on an existing selection criteria. The criteria are simply an enumeration of desirable traits that the species should possess to qualify for the said objective of management as shown in Table 25.

Table 25. Characteristics of Fuelwood Species according to Parameters (Carandang, 2004)

For species that can be regenerated naturally
Profit seeder
Ability to coppice
Fast growing
Seeds early before rotation age
For species that can be regenerated artificially
Good availability of seeds
Ease of production of seedlings
High survival rate
Simple plantation establishment with low technical requirements
For either method of generation
High calorific content
Competes with host regeneration
Needs minimal cultural requirements
Resistant against pests and diseases
Fire resistant
Drought resistant
Easy to transport
Does not emit obnoxious or toxic smoke/odor

Regional Comparative Advantage. The comparative advantage of regions in producing biomass needed by powerplants were analyzed. The case analysis focused on the suitability of fuelwood production in Regions 1, 2, 3, 4A, 4B, 5, 6, 7, 12 and ARMM. Based on the results of the case analysis, the *available extensive shrublands and grass lands* in Regions 4A, 4B, 10, 9, ARMM are potentially good for *roundwood and fuelwood production*.

The assumptions and resulting financial values for fuelwood plantation such as NPVs, BCR, IRR, ROI, and payback period are presented in Table 26.

Table 26. Assumptions for the financial analysis of 1-ha fuelwood plantation

Activities/Items	Assumptions
1. Area Spacing Stocking Density Species	2 X 3 meters spacing 1,667 trees per ha <i>Leucaena leucocephala</i> (Ipil-ipil)
2. Operation Costs a. Nursery operation b. Plantation establishment	Php 3,920 per ha (Year 1) Php 5,481 per ha (Year 1) Php 5,250 per ha (Year 1)

c. Plantation protection and maintenance	Php 8,567 per ha (Year 2) Php 2,012 per ha (Year 3) Php 262 per ha (Year 4)
d. Infrastructure	Php 1,000 per ha (Year 1)
e. Management Cost	3% of Total Cost
3. Harvesting Cost and Income	
a. Harvest/yield	150 cubic meters (cu m) per ha (Year 5)
b. Harvesting cost	25% of selling price
c. Selling price per unit	Php 800 per cu m
d. Gross income	Php 120,000 per ha (Year 5)
4. Other assumptions	
a. Discount rate	10%
b. Analysis period	5 years

Table 27. Financial analysis of 1-ha fuelwood plantation

PV of Benefits per Ha	Php 74,510.56
PV of Costs per Ha	Php 42,032.21
NPV per Ha	Php 32,478.35
Benefit-Cost Ratio (BCR)	1.77
Internal Rate of Return (IRR)	40%
Return on Investment (ROI)	0.77
Payback Period	Year 5

- **Plantations for high value crops**

The high value crops development program of the government is geared to address food security, poverty alleviation, and sustainable growth. The DENR's NGP commodity roadmap includes high value crops such as rubber, cacao, coffee, and other fruit trees in NGP areas. The road maps for rubber (developed by the Department of Trade and Industry), cacao and coffee (developed by the Department of Agriculture) shall be adopted.

Since these crops require intensive care and maintenance for better yield, communities in untenured NGP plantation areas and CBFMA holders can partner with investors through co-production or joint venture agreements. They could also consolidate their products and partners with processing companies as raw material or semi-processed product suppliers.

COFFEE

There is an increasing global demand for coffee. The country is a net importer of coffee in such forms as raw, ground and unground, roasted and unroasted, preparations, extracts, and instant sachets among other products. The country has been importing about 75,000 to 100,000 MT of coffee annually from Vietnam and Indonesia at a cost of about PhP7-10 billion. Average local production is about 25,000 MT annually while local demand is around 100,000 MT per year (DTI, 2016).

Commercially Traded Varieties/Species. ARABICA -Best known and widely consumed Coffee in the world. It is mainly cultivated in high altitudes. It has a bittersweet to sweet taste with floral aroma. Arabica yields 500-1,000kg of clean dry Coffee beans per hectare.

ROBUSTA. This is the most commercialized type of Coffee. It thrives on lowlands. It has a sharper flavor and a burnt or woody aftertaste. It yields 1,200 kg of dry Coffee beans per hectare.



Figure 37. Coffee (*Coffea robusta*)

LIBERICA. “Barako” Coffee is the most famous variation of Liberica in the Philippines. It has a distinct aroma and strong woody taste with high natural acidity. It yields approximately 500 kg of dry Coffee beans per hectare.

EXCELSA. It has a sweet and fruity flavor; its aroma is more prominent than its taste. It yields approximately 1,000 kg of clean dry Coffee beans per hectare.

Soil and Climatic Requirements. Arabica Coffee is suitable in tropical uplands and subtropics with latitudes up to 24 degrees and a temperature range of 13°C to 24°C. Optimal rainfall is 1000 to 2000 mm well spread but with two to three drier months for harvesting, rest, and flower initiation. Soil is well drained fertile humic loams with volcanic origin and Ph range of 5.5-6.5. It requires elevation > 900m with three to four years of gestation period. On the other hand, Robusta, Excelsa and Liberica grows ideally on altitude < 900m. The ideal rainfall range is 1500-2500mm, fairly well spread, but needs dry period for flower initiation. It is tolerant of a wider range of soils with pH range 5.5-6.5 with gestation period of two (2) to three (3) years.

Regional Comparative Advantage. There are nearly 276,000 Coffee farms in the country, with about 79.4 M trees based from the Philippine Statistics Authority (PSA) in 2015.

The five (5) regions with largest area planted to Coffee include SOCCSKSARGEN, Davao Region, ARMM, CALABARZON and Northern Mindanao. A total of 113, 738 hectares land area were planted with Coffee in the Philippines in 2015.

Table 28. Local production, area harvested and yield per Region (PSA, 2015)

Region	Number of coffee bearing trees	Production (mt)	Area (ha)	Yield (mt/ha)
PHILIPPINES	77,440,524	36,171	113,738	0.32
CAR	4,455,089	2,605	6,631	0.39
Ilocos Region	121,965	40	352	0.11
Cagayan Valley	1,594,099	372	2,922	0.13
Central Luzon	1,123,365	824	1,957	0.42
CALABARZON	10,345,601	1,136	13,409	0.08
MIMAROPA	269,228	89	933	0.10
Bicol Region	531,243	148	737	0.20
Western Visayas	5,866,854	2,195	9,857	0.22
Central Visayas	1,047,765	104	1,702	0.06
Eastern Visayas	75,439	30	172	0.17
Zamboanga Peninsula	649,788	504	919	0.55
Northern Mindanao	5,896,738	2,718	11,709	0.23
Davao Region	13,608,316	5,840	17,344	0.34
SOCCSKSARGEN	19,114,155	13,479	26,731	0.50
CARAGA	3,420,507	823	4,417	0.19
ARMM	9,320,372	5,263	13,946	0.38

The assumptions and resulting financial values for coffee such as NPVs, BCR, IRR, ROI, and payback period are presented in Table 29.

Table 29. Assumptions for the financial analysis of 1-ha coffee plantation

Activities/Items	Assumptions
1. Area Spacing Stocking Density	4 x 5 meters spacing 500 trees per ha
2. Operation Costs	
a. Nursery production	Php 10,500 per ha (Year 1)
b. Plantation establishment/development	Php 6,316 per ha (Year 1)
c. Plantation protection and maintenance	Php 7,688 per ha per year (Years 1 & 3) Php 7,912 per ha (Year 2) Php 1,264 per ha per year (Years 4-6)
d. Infrastructure	Php 1,075 per ha (Year 1)
3. Harvesting Cost and Income	
a. Harvest/Yield	900 kg Green Coffee Beans (GCB)
b. Harvesting cost	45% of SP or gross income
c. Selling price (SP) per unit	Php 95 per kg

d. Gross income	Php 85,500 per ha per year (Years 4-6)
4. Other assumptions	
a. Discount rate	10%
b. Analysis period	6 years

Table 30. Financial analysis of 1-ha coffee plantation

PV of Benefits per Ha	Php 159,748.94
PV of Costs per Ha	Php 109,817.28
NPV per Ha	Php 49,931.66
Benefit-Cost Ratio (BCR)	1.45
Internal Rate of Return (IRR)	42%
Return on Investment (ROI)	0.45
Payback Period	Year 4

CACAO

The world market demand for cacao has been growing along with the demand for chocolate products in the European Union, United States, China and the rest of the world. The country's share to global cacao production is less than 1% (DAR, 2016). However, the Philippines is a net importer of cacao products (Ramos, 2016). The total imports amounted to USD 101.63M while total exports were valued at USD 24.3M in 2014.

Commercially Traded Species/Varieties.

There are three major cacao varieties being grown in the Philippines and the rest of the Cacao growing countries, as follows:

Criollo (Native variety). Possesses the finest flavor and aroma, but, low yielding variety, difficult to grow, as it is extremely susceptible to pests and diseases.

Forastero (mainstream Cocoa). The most versatile and commonly grown cocoa. It is sturdy, high yielding and disease-resistant variety.

Trinitario. The hybrid of Criollo and *Forastero* that combines the best of the two other main varieties: the hardiness and high yield of *Forastero* and the refined taste of Criollo. It is the predominant fine flavor cocoa and distributed in all the countries where Criollo was once grown including Southeast Asia and the Philippines.

At present, there are 15 approved varieties/clones registered in the National Seeds Industry Council, to wit: UF18, BR25, K1, K2, PBG123, K4, K7, K8, K9, K10, ICS40, UIT1, TSO1, TSO2 and TSO3. Of these major clones, six (6) are prevalently used, namely: UF18, PBC123, BR25, K1, K2 and K9. Scientists

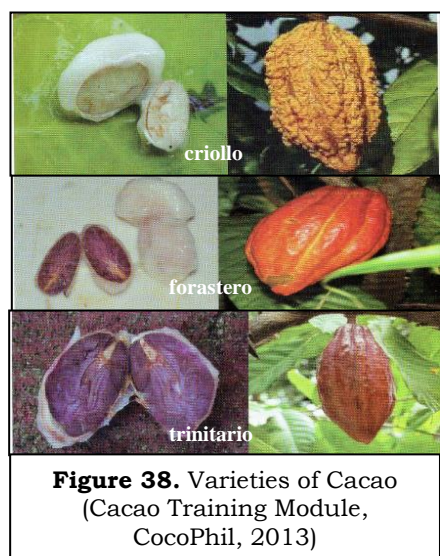


Figure 38. Varieties of Cacao (Cacao Training Module, CocoPhil, 2013)

and industry experts are recommending having at least 3-5 clones in one farm site to facilitate pollination.

Soil and Climatic Requirements. Cacao is grown in areas between 10°N and 10°S of the equator. Cacao grows best in clay loam soil of good structure since the aggregate of sand, silt, and clay provides large pore spaces for aeration, drainage and moisture retention. Specifically, the best soil for cacao is characterized as made-up of aggregated clay or loamy sand with 50% sand, 30-40% clay, and 10-20% silt, deep soil is about 15 cm, and soil pH of 5.0 to 6.5.

Cacao is not good for water-logged areas or places with prolonged drought. Ideal rainfall for cacao cultivation ranges from 1250 to 3000 mm per annum, preferably 1500-2000 mm with dry season of not more than 3 months. Temperature ideal for cacao lies between a mean maximum of 30-32°C and mean minimum of 18°C. Altitude of the area should lie between 300-1200 meters above sea level. Suitable temperature is generally found in an altitude up to 700 m. In the Philippines, Cacao thrives best in areas under Corona Type IV climate which has an evenly distributed rainfall throughout the year.

Regional Comparative Advantage.

In 2015, the top producing region of cacao is Davao Region, considering its climatic and strategic location, followed by Cagayan Valley and Northern Mindanao, as presented in Figure 39.

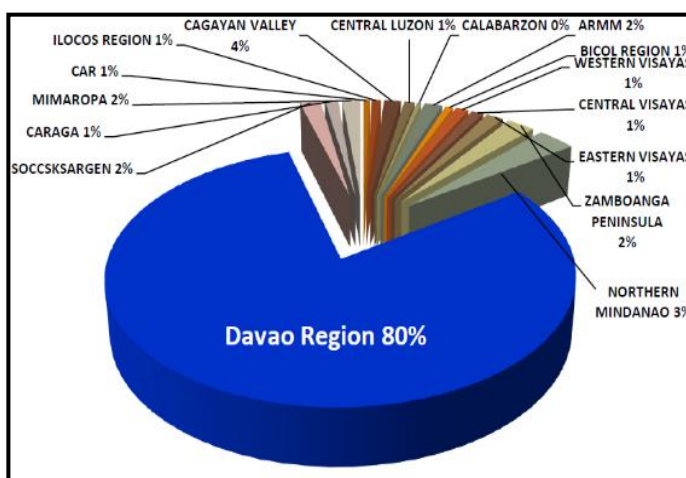


Figure 39. Top Producing Regions in the Philippines in 2015 (PCRIM, 2017-2022)

In 2014, Region 11 was recorded with the highest number of cacaos bearing trees with 2, 557, 174 trees followed by Region 13 and 10 with 209, 661 trees and 203,090 trees, respectively (PSA 2014).

The assumptions and resulting financial values for cacao plantation such as NPVs, BCR, IRR, ROI, and payback period are presented in Table 31.

Table 31. Assumptions for the financial analysis of 1-ha cacao plantation

Activities/Items	Assumptions
1. Area Spacing Stocking Density	3 x 3 meters spacing 1,000 trees per ha
2. Operation Costs	
a. Nursery production	Php 38,500 per ha (Year 1)
b. Plantation establishment/development	Php 3,000 per ha (Year 1)
c. Plantation protection and maintenance (fertilizers and chemicals)	Php 69,000 per ha (Year 1)

d. Infrastructure	Php 1,075 per ha (Year 1)
3. Harvesting Cost and Income	
a. Yield (dried beans)	300 kg per ha (Year 2) 1,000 kg per ha (Year 3) 1,500 kg per ha (Year 4) 1,800 kg per ha per year (Years 5-6)
b. Production cost	Php 14,696 per ha (Year 2) Php 26,700 per ha (Year 3) Php 39,182 per ha (Year 4) Php 41,481 per ha per year (Years 5-6)
c. Selling price per unit	Php 75 per kg
d. Gross income	Php 22,500 per ha (Year 2) Php 75,000 per ha (Year 3) Php 112,500 per ha (Year 4) Php 135,000 per ha per year (Years 5-6)
4. Other assumptions	
a. Discount rate	10%
b. Analysis period	6 years

Table 32. Financial analysis of 1-ha cacao plantation

PV of Benefits per Ha	Php 311,811.02
PV of Costs per Ha	Php 218,018.77
NPV per Ha	Php 93,792.25
Benefit-Cost Ratio (BCR)	1.43
Internal Rate of Return (IRR)	32%
Return on Investment (ROI)	0.43
Payback Period	Year 2

RUBBER

Global rubber production and consumption are expected to continue to increase. The Philippines is a net exporter of natural rubber and the main markets are Malaysia, China, Hong Kong, Taiwan, Vietnam, and Singapore. The export of natural rubber from the Philippines was steadily increasing in volume from 38,164 MT valued at USD 55.5M in 2010 to 88,606 MT valued at USD 78.56M in 2014 (PSA 2015).

Variety. The only species of rubber found in the Philippines which has surmountable amount of latex is the Para Rubber (*Hevea brasiliensis*) which is widely distributed throughout the country. The National Seed Industry Council also approved several rubber variety namely: RRIM 600, PB 235, USM Rb 1, PB 217, PB 260, PB 330, and PB 311.

Soil and Climate Requirements. These species are generally found in low-altitude moist forests, wetlands, riparian zones, forest gaps, and disturbed areas. Specifically, the site ideal for rubber should be flat, well-drained and gently sloping/undulating to rolling terrains. The soil pH should be between 4.5-6.5 (ideal is 5.5) and aeration of about 30%. Rubber thrives successfully in an average temperature of not exceeding 28°C where there is 80% atmosphere humidity with moderate winds and a rainfall pattern of 2,000mm. It must be planted with an elevation of 0-800masl (Prof. Testado, R.C. Establishment & Management of Rubber Plantation).

Regional Comparative Advantage. The top rubber producing regions with largest rubber plantation areas are all found in Mindanao (R9, R12, and ARMM). The total area planted with rubber is 222,601.56 ha in the Philippines (Philippine Rubber Industry Roadmap 2016-2022).

The assumptions and resulting financial values for rubber plantation such as NPVs, BCR, IRR, ROI, and payback period are presented in Table 33.

Table 33. Assumptions for the financial analysis of 1-ha rubber plantation

Activities/Items	Assumptions
1. Area Spacing Stocking Density	4 x 5 meters spacing 500 trees per ha
2. Operation Costs a. Nursery operation or procurement handling of budded plants b. Plantation establishment/development c. Plantation protection and maintenance d. Infrastructure	Php 13,980 per ha (Year 1) Php 2,000 per ha (Year 1) Php 3,488 per ha (Year 1) Php 1,340 per ha (Year 2) Php 1,225 per ha (Year 3) Php 1,900 per ha (Year 1)
3. Harvesting Cost and Income a. Volume harvested and sold b. Harvesting cost c. Selling price per unit	172 kg per ha (Year 4) 800 kg per ha (Year 5) 1,000 kg per ha per year (Years 6-11 and Years 23-25) 1,200 kg per ha per year (Years 12-14 and Years 20-22) 1,500 kg per ha per year (Years 15-19) Php 500 per ha Php 30 per kg
4. Other assumptions a. Discount rate b. Analysis period	10% 25 years

Table 34. Financial analysis of 1-ha rubber plantation

PV of Benefits per Ha	Php 190,392.19
PV of Costs per Ha	Php 33,166.58
NPV per Ha	Php 157,225.61
Benefit-Cost Ratio (BCR)	5.74
Internal Rate of Return (IRR)	36%
Return on Investment (ROI)	4.74
Payback Period	Year 4

- **Cattle grazing**

There is need to revitalize the grazing land management program in the Philippines given the declining number and area under FLGMA for the past decade. Cattle is the main livestock raised in FLGMA areas.

Commercial cattle production in ranches and grazing lands contributes only 6.4% compared with 93.6% from backyard production. The country has been importing beef from Australia, New Zealand, India, USA, and Brazil with total import volume of 105,029.55 MT valued at USD 344M in 2014 (PSA 2016). The increasing demand for beef imports is driven by the growth of the food service sector, particularly the fast food chains, and local consumption of canned beef and hotdogs (Ompoy and Prantilla, 2013).

Aside from meat production, cattle can also be a very good source of milk. Based on the Dairy Industry Performance Report (January-December 2015), the total dairy animal population was 44,432 heads (as of January 01, 2016). The 2015 milk production in the country was 20.39 million liters, 12.93 million liters or 63.42% came from cows' milk.

The PMPCRFD 2016 targets about 111,063 ha of grazing land area management by 2028 – this is about 50% of the total commercial grazing land requirement of the country. The area to be developed in 2016, 2022, and 2028 are shown below:

Table 35. Grazing Land Requirement

Year	Total commercial grazing land requirement (ha)	Target for grazing land area management under FLGMA (ha)
2016	173,914	88,609
2022	198,405	99,203
2028	222,125	111,063

Regions with long established grazing operations with access to existing and potential markets are CAR, R1, R2, R3, 4B, R5, R10, and R12. Potential investment areas are grazing lands under cancelled FLGMAs or those areas which are still untenured. Enabling investments required for improved grazing include: fodder seed sources/nurseries and improved livestock breeding centers.

Commercially Traded Varieties/ Species.

Brahman – one of the most popular breeds of cattle intended for meat processing. This breed comes in two colors; white to grey and red. Whitish Brahmans, especially the bulls, have much greyer around the neck, shoulder and head area than the rest of their body with grey tail switch. Red Brahman bulls typically have black tail switch.



Figure 40. Brahman cattle

Ongle/Nellore – this breed is from India which is most popular in white, but its hump and neck are dark gray. Forehead is broad between eyes and is slightly prominent. Ongle cattle is efficiently used for working purposes and milk production, as well as meat production.

Indu-Brazil – a Zebu beef breed developed in Brazil from Gir, Kankrej and Ongole from India. The colors vary from white to silver gray and brownish dark gray to red with short horns and large ears. Indu – Brazilian cattle have good heat and parasite resistance and thrive in the tropics.

Soil and Climatic Requirements. Cattle ranching and backyard cattle fattening are widely practiced in the Philippines. The tropical climatic condition is conducive for livestock production because of the favorable environment for the continuous growth of forage throughout the year unlike in temperate countries. Most forage does not require fertile soil but needs direct sunlight.

The production of high quality and quantity of forage is necessary in animal production industry (Rosacia et al., 2007). Forages are above ground plant materials such as leaves, soft stems, flowers and pods that provide the necessary nourishment to sustain life of ruminants (Department of Agriculture-Bureau of Animal Industry [DA-BAI], n.d.).

There are forages that are advisable for grazing of livestock/ruminants which includes; Humidicola grass (*Brachiria humidicola*), Signal grass (*Brachiria decumbens*), Mulato II grass (*B.decumbens x B. brizantha x B. ruzizienses*), Star grass (*Cynodon nlemfuensis*), *Centrosema sp.*, and *Kudzu sp.*, among others.

However, for cut and carry, the following are preferred; Napier grass (*Pennisetum purpureum*), Guinea grass (*Panicum maximum*), Guatemala grass (*Tripsacum laxum*), Mombasa guinea grass, Kakawate (*Gliricidia sepium*), and Ipil-ipil (*Leucaena leucocephala*), to name a few.

Regional Comparative Advantage. Based on existing records of the Forest Management Bureau, the Regions with existing Forest Land Grazing Management Agreements and the corresponding area per regions are shown in Table 36.

Table 36. Regions with Existing FLGMAs with corresponding area (PFS 2016)

Region	No. of Existing FLGMA CY 2018	Total Area (hectares)
CAR	16	3,809.5
Region 1	9	1,249.5
Region 2	75	12,588.4
Region 3	18	5,006.6
CALABARZON	4	985.0
MIMAROPA	8	5,896.0
Region 5	7	3,308.0
Region 6	1	50.0
Region 10	16	7,379.97

In addition, according to the conducted cattle inventory (number of heads) of commercial farms, Regions 2, 3, 5, 10 and 12 are the top producing regions in the country (PSA, 2016). The listed top producing regions have large and open areas, and presence of natural grasses.

The assumptions and resulting financial values for grazing such as NPVs, BCR, IRR, ROI, and payback period are presented in Table 37.

Table 37. Assumptions for the financial analysis for cattle grazing

Activities/Items	Assumptions
1. Land Improvement	Php 500/ha
2. Purchase of Livestock	Php 20,920 per ha (Year 1)
a. Heifer	400 heads at Php 25,000/head
b. Jr. Bull	8 heads at Php 45,000/head
c. Horse	5 heads at Php 20,000/head
3. Purchase of Farm Equipment (cost vary depending on specifications)	Php 4,000 per ha (Year 1)
a. 4w Farm Tractor	Php 500,000/unit
b. Truck	Php 1,000,000/unit
c. Multicab	Php 500,000/unit
4. Livestock Operations/Health	Php 600 per ha (Year 1)
a. Deworming, Vitamins and Vaccine	Php 200,000 a year
b. Feeds (Darak, Molasses, etc.) and Salt	Php 100,000 a year
5. Infrastructure and Facilities (cost vary depending on the design)	Php 3,600 per ha (Year 1)
a. Bunkhouse	2 bunkhouses at Php 50,000/bunkhouse

Activities/Items	Assumptions
b. Lookout Tower	5 towers at Php 20,000/tower
c. Working Corral/Cattle Shed	3 Corral at Php 250,000/Corral
d. Fattening Shed/Feedlot	1 Shed at Php 250,000/Shed
e. Access Road	Php 200,000
f. Perimeter Fence (Cement, Wood and Wire)	Php 400,000
6. Maintenance of Facilities and Farm Equipment	Php 400 per ha per year (Years 1-25)
7. Administrative Cost	3% of Total Cost
8. Personnel Wages	Php 1,387 per ha per year (Years 1-25)
a. Supervisor	Php 10,800 per month
b. Cowboys	Php 6,500 per month (5 cowboys)
c. Admin/Secretary	Php 14,500 per month
9. Other Assumptions	
a. Production (<i>Note: fattening system and grasses are ready</i>)	400 heifers will produce 150 calves per year
b. Disposal/Sale per Year	150 heads
c. Selling Price per Head	Php 45,000 per head (Php 140/kg at 250 kg/head)
d. Sales or Gross Income	Php 13,500 per ha per year (Years 2-25)
e. Discount Rate	10%
f. Analysis Period	25 years

Table 38. Financial analysis for grazing

PV of Benefits per Ha	Php 110,267.31
PV of Costs per Ha	Php 49,492.04
NPV per Ha	Php 60,775.27
Benefit-Cost Ratio (BCR)	2.23
Internal Rate of Return (IRR)	34%
Return on Investment (ROI)	1.23
Payback Period	year 2

- **ECOTOURISM**

The ecotourism resources and products available in the country are categorized into three: natural areas/resources, culture/tradition, and products/activities and these are listed below (NES 2014).

Table 39. List of Available Ecotourism Resources and Products

Categories	Example
1. Natural areas/resources:	mountains, volcanoes, hills, forests, caves, karst/limestone formations, marshes, lakes, rivers, white beaches, mangroves, coral reefs, flora and fauna, landscapes, and seascapes
2. Culture/tradition:	festivals, fiestas, cuisine, historical sites, archeological sites, rituals, and costumes
3. Products/activities:	mountaineering/trekking, hiking, spelunking, biking, bird-watching, whitewater rafting, kayaking, scuba diving, snorkeling, dolphin-/whale-/whaleshark-watching, firefly-watching, research

Because Eco-tourism is a substantially viable activity, it is important that a development plan is prepared to ensure social and environmental integrity. The Eco-tourism planning process is illustrated in Figure 41, as follows:

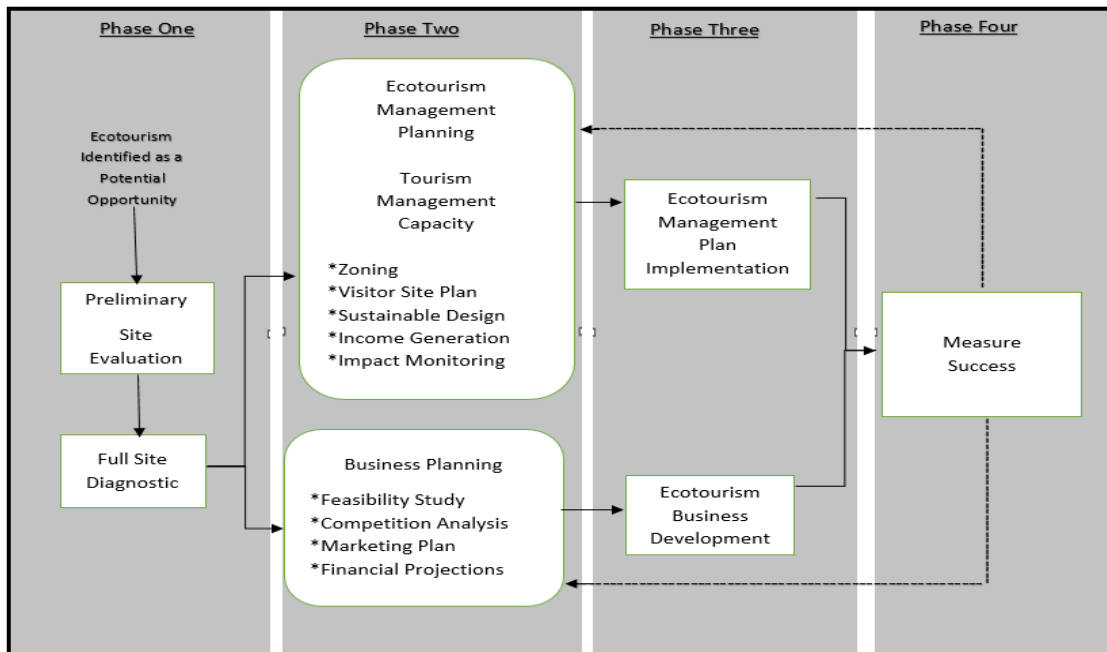


Figure 41. Ecotourism Management and Development Planning Process (*Ecotourism Development, 2004*)

As illustrated above, the unchartered and newly-discovered eco-tourism site may be developed through phases, as follows:

- Preliminary site evaluation
- Full site diagnosis
- Eco-tourism management planning
- Business planning

- Monitoring and evaluation

Site evaluation is about identifying the potential strategies for the area with the criteria based on benefits, feasibility, and cost of implementation. This will determine whether ecotourism development and management is the appropriate strategy.

Full site diagnostic includes data gathering about the natural resources and features, cultural variables, area status, tourism industry interest and participation. It will also consider visitor patterns, interest and infrastructures. If found viable, planning for marketing and promotion is included in this step.

In preparation for the development of the Ecotourism Management Plan and Business Plan, the second phase of the process where concerns analysis will be based on the appropriate ecotourism and business strategies in the area.

Ecotourism Business Development includes financial projections and marketability of the ecotourism enterprises. It is also important to be consistent with the existing plans like the National Ecotourism Strategy and Action Plan (NESAP) jointly issued by the DENR and DOT. In addition, any activity should conform to the program and priorities of the concerned LGUs.

During the implementation, the regular evaluation on carrying out the plan shall be conducted. The success of the ecotourism management plan can be measured based on the economic, cultural and environmental impact.

The assumptions and resulting financial values for ecotourism in forestland (outside NIPAS) such as NPVs, BCR, IRR, ROI, and payback period are presented in Table 40.

Table 40. Assumptions for the financial analysis of ecotourism in forestland (outside NIPAS)

Activities/Items	Assumptions
1. Costs <ul style="list-style-type: none"> a. Cost of Sales b. Building Cost c. Equipment & Simple Amenities (e.g. benches, signages, zipline, etc.) d. Government Share e. Administrative Cost 	<ul style="list-style-type: none"> Php 2,364 per ha per year to Php 3,596 per ha per year (Years 2-11) Php 8,000 per ha (Year 1) Php 8,000 per ha (Year 1) 5% of Gross Income 10% of Total Cost
2. Sales <ul style="list-style-type: none"> a. From House/Dorm b. From the Park c. From Other Sources of Sales 	<ul style="list-style-type: none"> Various sales: depending on the fees and packages availed (ranges from P9,059 per ha per

	year to P18,992 per ha per year, Years 2-11)
3. Other Assumptions	
a. Discount Rate	10%
b. Analysis Period	11 years

Table 41. Financial analysis of ecotourism in forestland (outside NIPAS)

PV of Benefits per Ha	Php 75,570.78
PV of Costs per Ha	Php 36,770.07
NPV per Ha	Php 38,800.72
Benefit-Cost Ratio (BCR)	2.06
Internal Rate of Return (IRR)	47%
Return on Investment (ROI)	1.06
Payback Period	year 2

Other Ecosystem Services

Alternative Forestry Investment Mechanisms

There are several investment mechanisms that can be set up to harness funds to conserve, manage, and develop forestlands, as follows:

- **Payments for Ecosystem Services**

PES is an innovative approach to nature conservation. It refers to a variety of schemes and arrangements where the users/beneficiaries of ecosystem services provide payments or rewards to a defined set of sellers/providers whose services provide or sustain the delivery of the said ecosystem services. In the PES landscape for watershed conservation, the users/beneficiaries of water can include commercial businesses and industries, downstream farmers and agricultural users, resorts and recreational facilities, local water districts and domestic households. On the other hand, examples of sellers/providers include upstream communities who are engaged in forest protection activities, reforestation of open and denuded areas of watersheds, among others.

Currently, FMB is replicating PES initiatives in the municipalities of Mariveles and Bagac, Bataan, and the Freeport Area of Bataan. The PES mechanism in Mariveles and Bagac is being set up as an LGU-led initiative. An ordinance will have to be passed by the LGU on an imposition of an environmental fee that will collect funds to finance watershed conservation activities such as reforestation, forest protection, and capacity building for alternative livelihood options for upland communities. The DENR-FMB-USAID B+WISER Program is assisting the LGUs in formulating such ordinance and develop collection agreements with stakeholders and potential contributors.

- **Reorganizing/Redirecting Corporate Social Responsibility Activities of Private Sector**

Corporate Social Responsibility (CSR) activities of companies usually involved community-based projects like livelihood programs or environmental projects like tree planting or coastal clean-up activities. Certainly, millions of funds are being used by the private sector for CSR not only to meet the society and their employees' demand, but also to comply with regulation or even boost profitability.

Some of these CSR funds can be reorganized or redirected to support/fund conservation and development of forestlands. Currently, the DENR-FMB-USAID B+WISER Program is assisting the Authority of the Freeport Area of Bataan (FAB) in formulating and adopting an investment plan which can be presented to FAB locators for funding. Locators that have already done reforestation and forest protection activities can support the investment plan which aims to sustainably manage the watershed of the FAB to continuously provide critical ecosystem services for its locators like water supply.

- **Forest Carbon Projects**

The Carbon Accounting, Verification, and Certification System (CAVCS) for Forest Carbon Projects encourages private sector investment in projects that sequester carbon by formally recognizing forest protection, reforestation and other forest restoration activities. It is envisioned to open opportunities for private sector investments into forestry projects and standardize related greenhouse gas (GHG) monitoring and reporting procedures.

Currently, the DENR-FMB-USAID B+WISER Program is piloting the application phase of CAVCS with Holcim Philippines as the private sector partner. Holcim would have to develop a Forest Carbon Project Plan which shall be subjected to the validation/review.

Participating entities and persons can use the CAVCS to demonstrate their commitment to forest protection and reforestation, meet carbon neutrality goals, and report on GHG mitigation and/or corporate sustainability. CAVCS will include an online registry platform for tracking applications, facilitating review and verification, recognizing protection of carbon stocks and issuing verifiable carbon sequestration certificates (CSCs).

The potential of forest carbon project investments is being recognized globally and in the Philippines through national initiatives on REDD-Plus or reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries. REDD-Plus is a performance-based incentive mechanism where “developing countries are rewarded financially for any emissions reductions achieved associated with a decrease in the conversion of forests to alternate land uses” (The Red desk 2016).

The financial incentives can be obtained through forest carbon trading which refers to activities leading to an agreement that measures, verifies and offers forest carbon primarily for profit or any commercial transaction (FMB 2016). Forest carbon trading involves two mechanisms: (1) cap and trade, and (2) offsetting. Under the cap and trade, carbon permits (equivalent to one tonne of carbon dioxide) are bought by one polluter (whose emission exceeds its reduction commitment or ‘cap’) from another polluter who can make equivalent changes more cheaply (the trade).

Carbon offsetting is based on the assumption that pollution in one location (i.e. industries in a developed country) can be ‘offset’ by ‘saving emissions’ elsewhere (i.e. developing country). Emissions saving projects generate carbon credits that can be used to meet pollution targets or traded in the carbon market. Forest carbon trading involves both regulated (under the United Nations) and voluntary markets (not under UN regulation) (Carbon Trade Watch 2012).

There is still no national statute or legislation on REDD-Plus in the Philippines although its implementation is mandated under the National Framework Strategy on Climate Change (NFSCC) issued in 2010 and the National Climate Change Action Plan (NCCAP) issued in 2011. The Philippine National REDD-Plus Strategy (PNRPS) developed in 2009 and approved in 2010 serves as the guiding document to facilitate REDD-Plus implementation in the country (FMB 2016).

DENR has issued a memorandum in 2012 as an interim policy on forest carbon trading and registry of REDD-Plus activities. It enjoins DENR bureaus and regional directors not to entertain any initiative on forest carbon trading until further notice. This initiative was in response to reports of unauthorized forest carbon trading activities in certain parts of the country. There are six documented forest carbon projects with varying agreements between local communities and voluntary markets for the carbon credits from their forests (FMB 2016).

Hence, recommendations have been made for: (1) the issuance of a DAO rationalizing forest carbon projects and activities; (2) formulation of a policy on carbon rights; and (3) policy issuance designating FMB as the REDD-Plus focal point (FMB 2016).

The above recommendations are expected to lay down concrete guidelines on how to implement private investments for carbon projects in the country.

- **Reducing Emissions from Deforestation and Forest Degradation (REDD+)**

REDD+ is an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. REDD+ goes beyond deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.

Building, Strengthening and Sustaining Alliances with Partners and Existing Tenure Holders

High investments are needed to unleash the full potential of the forestry sector in driving economic productivity and growth coupled with the provision of ecosystems goods and services in a responsible and sustainable manner. The task is enormous that no single entity like the government or DENR can do it single handedly. It requires high level of cooperation and collaboration from the different actors like private/business sector, corporations, cooperatives,

civil society organizations, government, Non- government organizations, academic institutions and many others in attaining the goals of promoting forestry investment. In the long term, driving forestry investments will contribute to the attainment of the country’s sustainable development goals.

DENR, or the government per se can benefit from partnerships in two ways: increased efficiencies and or increased effectiveness. By simply building a partnership, the government may save costs and resources, become better at what should be done and do and/or achieve something that cannot be done alone.

In structuring and managing partnerships, there are things to consider that includes the identification of shared vision between and among partners, determine the readiness of partners, partnership dynamics, planning and others. There is also a need to embrace the importance of being involved in the whole partnership life cycle. Figure 42 shows the partnership life cycle that can serve as a guide in developing forestry partnerships.

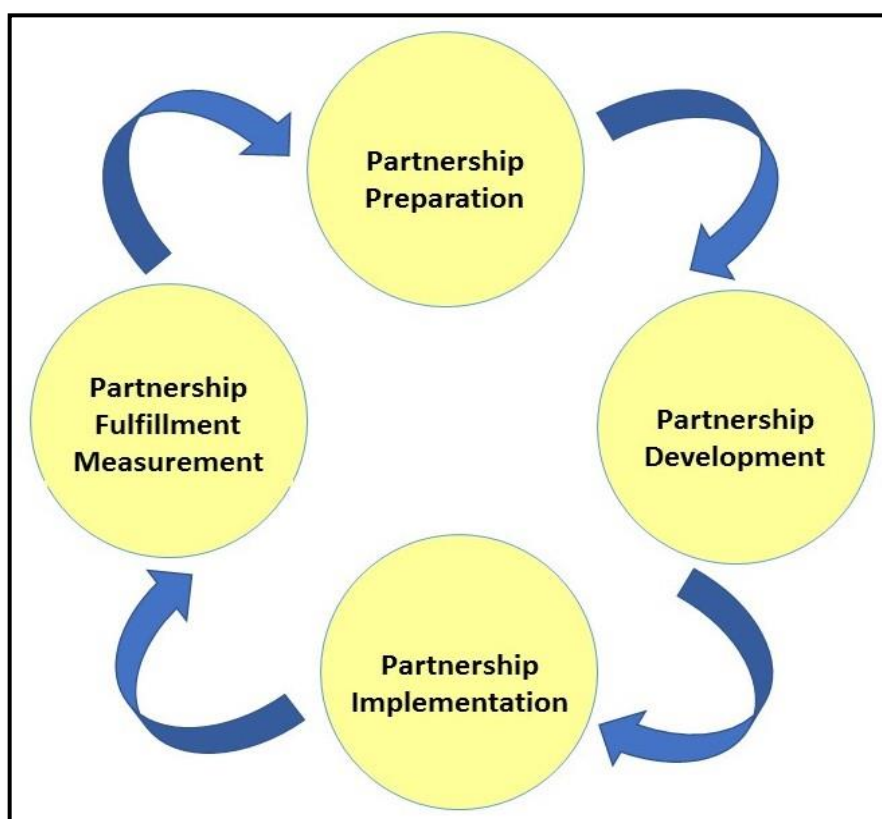


Figure 42. Partnership Life Cycle (Hill and Hunt, 2016)

The abovementioned life cycle of partnership focuses on the following:

1. *Preparation.* It involves developing a clear picture of what partnerships the DENR needs, what it will deliver and on who it will work with;
2. *Development.* The process of finding and engaging with potential partners, sharing ideas and reaching a joint agreement;

3. *Implementation.* This is about building on the agreement reached and putting in place the structures and process to make the partnership work, building towards its launching; and
4. *Fulfillment and Measurement.* It involves delivering the promise and working together to achieve the benefits agreed in the Development phase and taking opportunities to achieve more.

Any organization may face challenges in managing a partnership. These challenges may be related to balancing values of lead organization with the other partner institution/s, the need for accountability, ensuring acceptable and timely monitoring and reporting, different or other agenda and project vision of partners, balancing unequal power relationships, creating opportunities to learn from partners, communication, project management at a distance, tensions caused by partners juggling the needs of different donors, managing changing systems/practices with established partners, different working cultures, transparency, building trust, sustainability of the project and of the partnership

Enhancing collaboration or establishing alliances with the private sector and other sectoral actors will increase the chance of attaining the desired outcomes of the FIRM. In this context, the goals of partnering or establishing partnerships include the following:

1. Engage partners in increasing the productivity of degraded, unproductive and developed open access forestlands
2. Enhance partners' involvement in adding value to forest and non-timber forest products found in developed and partly developed tenured forestlands
3. Facilitate the creation of enabling environment to maximize the flow of investments in forest and forest - based products and services
4. Create a platform for consultation and exchange of information among sectors or stakeholders

Specific Objectives

1. To review and assess existing partnership mechanisms being adopted by the DENR
2. To review and identify potential partnership with the private sector, foundations, development and financial institutions, civil society and academe
3. To develop the rules of engagement with the private sector and other stakeholders
4. To formulate a Monitoring and Evaluation System to measure the outcome and impact of collaboration/ partnership
5. To create and maintain a database of past and on - going partnerships
6. To conduct regular consultation and feedback sessions with partners

Opportunities for Engagement/ Collaboration

Attaining the goals of the FIRM put primary consideration on the investment that the private sector can bring to the endeavor. The private sector encompasses those for-profit organizations that include enterprises, companies or businesses, regardless of size, ownership and structure. It covers the sectors from production to consumption, including associated services like financing, investment, insurance, marketing and trade. Other

stakeholders like Civil Society Organizations (not – for profit organizations), other public organizations and academic institutions are also instrumental in effecting positive change in the forestry sector. Among the potential areas for engagement with partners include but not limited to the following:

- Forest development and production
- Environment and Natural Resources (ENR) and Agroforestry – based Enterprise Development
- Policy Dialogue and Formulation
- Advocacy and Communication
- Norms and Standard Setting
- Capacity Building
- Knowledge Management and Sharing of Information
- Mobilization of Resources.

Partnership Mechanisms between the Government and the Private Sector, other Government Agencies and other Sectors

Partnership can be defined as a way of working; a type of strategic relationship or alliance. Sometimes it's about an exchange, such as an output or resource from an organization or even skills and know-how. Other times it is about mutual understanding, about the end goal and agreeing to work with each other to achieve this. Partnerships can be formal and informal in nature depending upon the requirements of the engagement. Several partnership modalities/mechanisms can be adopted to reach the goals of the FIRM. These are the following:

- *Public – Private Partnership (PPP)*. Government tendered partnerships or public - private partnership (PPP) are built around contracts or transaction-based arrangement. It has specific targets, deliverables and timeframes and operates under regulatory and legal processes. In PPP, the delivery of goods and services is improved by collaborating with the private sector while maintaining the government's role in ensuring that national socio - economic objectives can be attained. This kind of partnership is often practiced in the infrastructure and health sectors.

In the forestry sector, the Government builds alliance with the private sector in the development, management and protection of the forestlands through the issuance of various kinds of forest tenure instruments. As defined, tenure is the guaranteed peaceful possession and use of specific forest land area and the resources found therein, covered with an agreement, contract or grant which cannot be altered or abrogated without due process. Most of the tenure instruments awarded by the DENR are categorized as *production sharing agreements*. This is an agreement wherein the government grants the contractor the exclusive rights to conduct forestry development activities within but not little over, the contract area and shares in the production whether in kind or in value as owner of the forest product therein. The contractor provides all the necessary financing, technology management and personnel.

The government can also enter into *joint venture agreement* and *co-production agreement* with the private sector. A Joint Venture is when two (2) or more entities share their technical, financial and other resources to establish a new business or accomplish a specific task or project. While co – production is an agreement entered by and in between the government

and qualified individuals or entity to develop, utilize and manage consistent with the principle of sustainable development, a specific portion of the forest land.

Partnership agreements can also be forged with private financing and insurance institutions to help manage the financial risks associated with investing in the forestry sector.

- *Public – Public Partnership in Delivering Government Services.* The DENR needs to collaborate with other government entities to facilitate the flow of investments in forestlands. Support services outside of the mandate of the DENR need to be properly coordinated with the agencies concerned. Existing partnership mechanism like the National Convergence Initiative can be tapped to deliver integrated approach in developing the forestlands found in identified convergence areas by the NCI agencies – the Department of Agriculture (DA), the Department of Agrarian Reform (DAR), the Department of the Interior and Local Government (DILG) and the DENR. For example, DA and DAR can provide support in the establishment of farm to market roads. They also provide support in enterprise development and inputs for the raising and post-harvest processing of high value crops. The DA also conducts capacity building activities like the production of quality planting materials and Good Agriculture Practice for coffee, cacao and rubber.

The Department of Trade and Industry aids in establishing shared service facility for the value adding of various products. It likewise provides capacity building activities pertaining to business operations. The Department of Science and Technology could provide machineries and equipment used in product processing activities. They can also be tapped in the conduct of Research and Development for the processing of forest products.

The DENR can also build alliance with public financing institutions like the Development Bank of the Philippines and Land Bank of the Philippines for the crafting of financing window for community organizations and Small and Medium Enterprises for plantation establishment and processing of products derived from the forest.

Partnership with public institutions can be covered with Memorandum of Agreement and Memorandum of Understanding depending upon the purpose of engagement.

- *Co – management agreement* can also be entered by the DENR with local government units for the development and management of certain portion of forestlands within their areas of jurisdiction. Co – management agreement can be applied in the management and protection of communal forests and community watershed.
- *Community – Private Partnership in Increasing the Productivity of Tenured Forest Lands.* The community organizations with established plantations under the National Greening and the Community – Based Forest Management Programs may enter into joint venture or memorandum of agreement with the private sector in further

development of their areas and in value addition and marketing of products from their tenured areas. The communities concerned may enter into supply contract with the private sector concerned to have a ready market for their products (e.g. Energy-intensive company needing substantial supply of forest-based materials). This shall ensure that people's organization and communities who have entered into agreements with private entities will have additional income and shall not rely on unsustainable natural resources extraction activities.

Maintaining high levels of partners' participation over time is a huge challenge for partnerships. Partnerships should also take steps to ensure that partners develop their own capabilities, which in turn helps the partnership to sustain itself. Partnerships can develop their capabilities when: a) best practices are regularly shared through forum, discussions and other forms wherein partners value the chance to learn and discuss other partners' techniques, and also as a way to sustain partnerships and strengthen partners' abilities to prepare for, respond to, and mitigate against disasters; b) the partnership conducts joint exercises (e.g. capacity building or training activities, monitoring and evaluation process which must be implemented at the beginning of the partnership, etc.); c) partners engage in continuity planning; d) partners consider recognition; and e) feedbacking is continuous between and among stakeholders relative to the implementation of the partnership.

The FIRM's communication plan and its key strategies (see Section 4) plays an important role in the building, strengthening and sustaining of forestry partnerships as it bridges the forestry partners and stakeholders towards achieving its vision and goals.

Marketing Strategies

Marketing strategies refer to activities/processes of communicating to target markets/investors the potential forest investments. It aims to close a deal with the private sector to invest and conduct a business in any of the investment offerings. Activities for marketing strategies will be done in consonance with the activities stipulated in the Communication Plan. The strategies are categorized as follows:

1. *Direct Promotion.* The FMB will communicate directly to clients/investors through one-on-one meetings, as necessary, and massive roll-out of FIRM to DENR field offices. Communication materials developed for FIRM such as fliers, catalogs/pamphlets and other promotional papers and/or items will be provided to clients/investors and partners at the DENR field offices.
2. *Event Marketing.* It refers to the conduct of events related to promoting forest investments. FMB will organize Forest Investment Summit (may be biennial) highlighting the potential forest investments, success stories, and current and emerging opportunities. There will also be annual investors' fora to be held nationwide and at the regional level.
3. *Tradeshow Marketing.* The FMB will also organize tradeshow or trade fairs to gather various industry players in forestry. This activity will be

done either on a separate event, or during the Forest Investment Summit, depending on the decision of top management and the availability of funds. In this tradeshow, participants will have the opportunities to network, and experience the products and services that will be offered.

4. *Media and PR Marketing.* FMB will work with media partners to raise awareness on forest investments to the general public, particularly the clients/investors. The Bureau will launch aggressive promotional activities and rolling out of advertisements in all media channels such as, but not limited to, radio, TV, emails, letters and web pages. A National Forestry Investment Portal will be developed as an interactive website to promote specific forestry investments locally and globally. The portal will include vital information relevant to investment.
5. *Social Media Marketing.* Social media platforms such as Facebook, Twitter and Instagram, among others, will be used by FMB to interact with clients/investors. As indicated in the Communication Plan, a regular feedback collection mechanism will be created, i.e. a hotline/chat facility can be set up for this purpose.
6. *Participation in Local and International Fora/Trade and Exhibits.* The FIRM should be visible to investors. Thus, funds will be allocated on the participation to relevant trade and investment exhibits. Participation in exhibits will provide face-to-face encounter with investors, and opportunity to share the details about the investments.

SECTION 4

ROAD MAP IMPLEMENTATION, MONITORING AND EVALUATION

The roadmap will be implemented from the period 2018 – 2028. The targets are divided into short term (2018-2020); the medium-term (2021-2025); and the long-term targets (2026-2028). The groundwork for the medium- and long-term targets starts at 2018 but the realization of the desired outputs and outcomes should be by 2025 and 2028 respectively.

The short-term targets are generally the pre-requisites for the desired overall outputs and outcomes of the FIRM. The outputs and outcomes should be realized by 2020 and the activities and tasks will be executed by 2018-2020. The medium-term targets will be designed and proposed beginning 2018. However, because of the required preparations to gather the needed resources for implementation, the activities and task may be executed starting 2021 while the outputs and outcomes will be realized by 2025. Similarly, the groundwork for the long-term targets may start as early as 2018 but the outputs and outcomes will be realized by 2028.

Table 42. Strategic Components and Target Activities for the FIRM 2018-2028

Short term 2018-2020	Medium Term 2021-2025	Long term 2026-2028
Strategy 1. Provision of stable enabling policy and investor-friendly environment		
Data base management of investment related information such as: <ul style="list-style-type: none"> • Registry of potential areas suitable for various investment categories • Opportunity for further business development with CBFM Holders • Other relevant information pertaining to the optimization of production forest areas 	Maintenance and updating of databases	Maintenance and updating of databases
<ul style="list-style-type: none"> • Policy Formulation/Revision 		
<ul style="list-style-type: none"> - Policy adoption and institutionalization mechanism of FIRM 	FIRM operational at the field level	FIRM operational at the field level
<ul style="list-style-type: none"> - Approval of Forest Investment Portfolio Approach guidelines 	FIPA implementation	FIPA implementation
<ul style="list-style-type: none"> - Collaboration among DENR, DTI (BOI, 	MOAs/MOUs in place	MOAs/MOUs in place

Short term 2018-2020	Medium Term 2021-2025	Long term 2026-2028
BoC), DILG-LGUs, DOT, DOE, NCIP to harmonize, streamline, & amend investment-related policies- MOAs- MOUs formulation		
- Forest Certification System	Operational forest certification system	Trading of certified forest products
- Conduct boundary survey to resolve overlapping areas	Conflict resolutions on overlapping areas	
- Review of Policies on exportation and importation-revision	Approval of revised export and import policies	
- Advocacy for the passage of the sustainable forest management (SFM) bill	Advocacy	Advocacy
- Collaboration with other agencies to access incentives provided by the (BoI), (BoC), (BIR), DOE, LGUs, (DBM).	Provision of technical assistance to the investors in availing credit and insurance facilities	Inter-agency collaboration
- Follow-up the approval of PPP and PPCP guidelines		
- Establish REDD + operational guidelines	Implementation guidelines in place	Implementation guidelines in place
• Technology updates/ Research and product development		
- Formulation of Forest Resource accounting valuation guidelines	Capacity building of DENR personnel on valuation methods	Implementation of valuation guidelines
- Study on the carrying capacity of ecotourism sites outside NIPAs areas	Dissemination and replication of study results	
- Commodity-specific research activities to determine possible investments on the	Improve the country's position in global trade of non-timber forest	

Short term 2018-2020	Medium Term 2021-2025	Long term 2026-2028
value-addition and trade of forest-based products, such as: <ul style="list-style-type: none"> ○ The emerging trends on emerging forest and forest-based products ○ The country's position on the global wood industry vis how it can improve its position (e.g., better technology, skills, logistics, etc); ○ Addressing the emerging demand for woody biomass; 	products, rubber, coffee and cacao	
- Research and linkage with forest-timber insurance company	Collaboration	Collaboration
- Sustainable financing mechanism for monitoring and evaluation	Develop sustainable financing mechanism	Implement sustainable financing mechanism
Strategy 2. Institutionalization of forestry investment support mechanisms		
- Creation of TWG on Forest investment at the Regional Offices	FIRM TWG already operational	FIRM TWG already operational
- Finalization of Regional Investment Action Plan	Action Plan Implementation	Action Plan Implementation
- Capacity building of DENR Field Offices on forestry investment related interventions	Capacity building	
Strategy 3: Identification, mapping, and assessment of potential investment areas		
- Survey, mapping, assessment and planning	- Survey, mapping, assessment and planning	- Survey, mapping, assessment and planning
Strategy 4: Provision of secure tenure and partnership agreements		
Review, evaluation and issuance of tenure and	Review, evaluation and issuance of tenure and	Review, evaluation and issuance of tenure and

Short term 2018-2020	Medium Term 2021-2025	Long term 2026-2028
other management arrangements	other management arrangements	other management arrangements
Strategy 5: Development and management of potential areas for forestry investment		
- Development of forestry investment packages (Forest Investment Portfolio Approach)	- Development of commercial forest plantations; fuelwood/biomass energy plantations; NTFPs and HVC plantations; grazing lands and ecotourism sites	- Development of commercial forest plantations, fuelwood/biomass energy plantations; NTFPs and HVC plantations; grazing lands and ecotourism sites
	Established plantations already supplying at least 25% of the raw material requirement of the forest-based industry	Established plantations already supplying at least 26-70% of the raw material requirement of the forest-based industry
Strategy 6: Strengthening and sustaining partnership with existing tenure holders		
- Capacity building of POs on enterprise development	Upgrading the capacity of CBFM POs to become ready to enter into sustainable business partnerships involving small-medium- and large-scale industries	Further development of CBFM Areas into sustainable forest-based industrial and eco-tourism zones in partnership with local and global industry players
- Link CBFM POS with investors and financing institutions		
- Inventory of existing plantations with tenured holders by species, age, etc.		
- Provision of post-harvest facilities and technology		
- Provision of alternative livelihood activity		
- Development of Social Enterprise of People's Organization		
- Establishment of Regular M & E and Feedback Mechanism to immediately address issues and concerns	Feedback mechanism in place	Feedback mechanism in place

Short term 2018-2020	Medium Term 2021-2025	Long term 2026-2028
- Other related activities included in the communication strategies in Section 4		
Strategy 7: Marketing Strategies		
- Direct Promotion; - Event Marketing; - Tradeshow Marketing; - Media and PR Marketing; - Social Media Marketing; and - Participation in Local and International Conferences/Trade and Exhibits.	Intensification of large-scale local and foreign direct investments by promoting business-to-business partnerships	Intensification of promotional activities through global television advertisements and other initiatives with international outreach

The Forest Management Bureau and the DENR system, in general, may be considered as a new entrant in pushing investments. Thus, there is a need to evaluate the methods in terms of the attainment of targets. The indicators of success must also be set per activity/task. Areas and indicators for the component strategies and activities as listed in Table 43.

Table 43. FIRM Implementation by Key Result Areas and Performance Indicators

Key Result Areas	Performance Indicator(s)	Action Programs	Time Frame
Strategy 1: Provision of stable enabling policy and investor-friendly environment			
Database developed on forestry investments	All the production forest lands are properly profiled, and the information can be readily accessed by investors and relevant stakeholders	Database management of related investment information: <ul style="list-style-type: none"> • design • establishment • pilot testing and fine tuning 	2018 – 2020
		Database maintenance and updating	2021 – 2028
Harmonized and stable policies in place	MOAs, JAOs and harmonized guidelines issued	Harmonizing, amending and formulation of policies to streamline processes and clearances including dialogue with NCIP on FPIC clearance and guidelines	2018 - 2020

Key Result Areas	Performance Indicator(s)	Action Programs	Time Frame
		Guidelines on forest certification system, etc	2019 - 2020
		Conflict resolution regarding overlapping areas	2018 – 2025
		Review and revision and approval of policies on exportation and importation of forest products	2019 – 2025
		Advocacy for the passage of sustainable forest management (SFM) Bill	2019 – 2025
		Collaboration with other agencies to access incentives provided by the (BoI), (BoC), (BIR), DOE, LGUs, (DBM).	2019 – 2028
		Approval of PPP and PPCP Guidelines	2019 - 2025
		Approval of the Forest Investment Portfolio Approach (FIPA)	2018 - 2020
Research/study results packaged and disseminated	Updated data/research study on forest resources developed	Development of systems and structures on forest resource accounting valuation	2019 – 2025
		Carrying capacity of ecotourism sites outside NIPAs areas	2019- 2025
		Commodity-specific research activities to determine possible investments on the value-addition and trade of forest-based products, such as: <ul style="list-style-type: none"> • The emerging trends on wood-based products • The country’s position on the global wood industry vis how it can improve its position (e.g., better technology, skills, logistics, etc); • Addressing the emerging demand for woody biomass; • Improving the country’s position in global trade of non-timber forest 	2019 - 2028

Key Result Areas	Performance Indicator(s)	Action Programs	Time Frame
		products, rubber, coffee and cacao;	
		Research and linkage with forest-timber insurance company	2019-2028
Sustainable financing mechanism for monitoring and evaluation	Develop sustainable financing mechanism	Implement sustainable financing mechanism	2020-2025
Strategy 2: Institutionalization of Forestry Investment Support Mechanism			
FIRM support and institutional mechanism in place	Institutional mechanism established in regional offices/guidelines issued	Policy review, formulation/revision of policies related to investments	2018 – 2020
		Finalization of Regional Investment Action Plan	2019 - 2020
		Conduct of information dissemination activities and coordination with concerned offices. (DTI (BoC and BOI), DILG-LGUs, DOT, DOE, NCIP, etc)	2019 – 2021
		Capacity building of DENR Field Offices on forestry investment related trainings	2019 – 2025
Strategy 3: Identification, mapping, and assessment of potential investment areas			
Registry of potential investment areas	Number of investments per category identified mapped, and assessed for packaging and promotions	Survey, mapping, assessment and planning	2019 – 2028
		Preparation of investment packages with promotional activities	2019 – 2028
		Capacity development activities among regional offices on the identification, profiling and preparation of attractive investment products (with fine tuning initiatives)	2019 – 2028
Strategy 4: Provision of secure tenure and partnership agreements			
Tenure awarded to the qualified investors	No. of tenure instruments issued	Review, evaluation and issuance of tenure	2020 - 2028
Strategy 5: Development and management of potential areas for forestry investment			

Key Result Areas	Performance Indicator(s)	Action Programs	Time Frame
Established plantations already supplying at least 25-70% of raw material requirement of the forest and forest-based industry	Potential investment areas developed	Development of commercial timber plantations, fuelwood/ biomass for energy plantations	2019 - 2028
		Development of plantation for non-timber forest products and high value crops plantations	
		Cattle production from grazing land management	
		Development of potential ecotourism areas outside NIPAS	
Strategy 6: Strengthening and sustaining partnership with existing tenure holders			
Partnership mechanism in place	Number of CBFM-POs which were transformed into “investment-ready” and sustainable social enterprises	Capacity building of POs on livelihood/ enterprise development	2019 – 2025
		Linking of CBFM POs with investors and financing institutions	2019 – 2025
		Inventory of existing plantations with tenured holders by species, age, etc	2020 – 2025
	Increased contribution of the tenured forest areas to the country’s GDP	Provision of post-harvest facilities and technology	2019 – 2023
		Development of social enterprises	2019 – 2025
	Database of existing partnerships	Development/updating of database of existing partners	2019 – 2025
	Feedback mechanism in place	Establishment of M & E and feedback mechanism	2020-2025
Strategy 7: Marketing Strategies			
Marketing strategy in place		Conduct of marketing strategies: <ul style="list-style-type: none"> • Direct Promotion • Event Marketing • Tradeshow Marketing • Media and PR Marketing; • Social Media Marketing and • Participation in Local and International Conferences/Trade and Exhibits. 	2019-2028

Section 5

COMMUNICATION PLAN

RATIONALE

Communication has always been considered as the lifeblood of any organization and an integral part in the success of any program/initiative. Communication assures the “*meeting of minds*” and “*sharing of the same language games*” among the initiative’s stakeholders. As such, the Communication Plan (ComPlan) for the Forestry Investment Road Map (FIRM) has been conceptualized to provide communication support to the initiative with the end in view of increasing forestry investments in the Philippines.

From the conception stage of FIRM until its full swing and implementation, communication is evident through the conduct of meetings, consultations, writing of memoranda/press releases/news articles/policy briefs, preparation of powerpoint presentations, etc. Key messages, strategies, techniques, media, and channels aimed at specific target audiences are carefully defined in the ComPlan to create awareness on FIRM among its immediate stakeholders. Likewise, ComPlan ensures that the concepts, benefits, and challenges of FIRM are understood right from the onset and throughout its implementation and guarantees as well, the use of gender fair language in all communication support materials that will be produced. It could also motivate, entice, lead, delegate, and solicit the intended feedbacks and responses from all the stakeholders/clienteles.

GOALS

1. Awareness on forestry and forest-based investments through sustainable development
2. Promotion of FIRM to help generate forestry investments that will stimulate and sustain the country’s forest-based industry and contribute to the local and national economy
3. Active participation and equal representation of men and women in forestry investment
4. Equity & social justice to uplift socio-economic status of forest-dependent communities & workers

OBJECTIVES

1. Promote FIRM with confidence to DENR employees and to potential investors at the national and field levels
2. Increase the number of stakeholders expressing intent to support and invest in forest and forest-based businesses/enterprises
3. Establish new partnerships and strengthen the existing ones
4. Encourage active participation of forest- dependent communities in FIRM - related initiatives
5. Promote gender equality and women empowerment

6. Promote streamlined forestry investment processes and forestry investment opportunities
7. Increase the number of financial institutions, formal or informal, assisting potential investors

COMMUNICATION COMPONENTS

ComPlan components like social mobilization, advocacy, and behavior change are vital to the success of any communication campaign in achieving change.

Social mobilization – stimulating the stakeholders’ participation by undertaking active roles on the initiative

Advocacy – motivates leadership to create a supportive environment to achieve goals and objectives

Behavior change – developing communication strategies to promote positive behavior or action towards the initiative

KEY AUDIENCES

FIRM target audiences are also its key stakeholders. A target audience is the intended audience or readership of a publication, advertisement, or other message. Meanwhile, a stakeholder is person, group or organization that has interest or concern in an initiative. Stakeholders can affect or be affected by an initiative’s objectives, targets, and implementing policies. As such, FIRM stakeholders are also considered as ComPlan for FIRM’s target audiences. Some examples of key stakeholders are:

Corporate clients - serve as advocates, enablers, or champions; help sponsor fora, training programs, or other FIRM-related events; provide inputs on improving key activities relating to forestry investments

Private/business sector (e.g. SM Foundation, Nestle Philippines, Inc.) - help fund some activities; help in promoting the FIRM-related activities by allowing the Team to post their promotional materials in their respective premises; help in convincing potential investors

Funding institutions (Land Bank, DBP, rural banks, cooperatives) - help promote/champion the best-fit practices that will be generated from this initiative

Academe/State Universities and Colleges - provide technical assistance as necessary and mobilize to serve champions

Research and Development Institutions - serve as a source of innovations and new technologies relating to forest and forest-based products and can serve as champions

Religious organizations/groups - serve as advocates and/or enablers by calling for support to this initiative; assist in the conduct of fora or other FIRM-related events; help promote awareness on environmental issues

DENR Field Offices - prepare and implement regional communication plans patterned after the national communication plan with some modifications as necessary; train FIRM champions or spokespersons; and provide support to IEC activities

Local Government Units – responsible for issuing local ordinances, permits, etc. before an investor could engage in investments

OGAs (DILG, DA, DAR, DPWH, DND, GSIS, DSWD, DBP) - assist in coordination and campaign activities

Development partners (i.e. UN FAO, UNDP, USAID, JICA, GIZ, AFoCo, ITTO) - assist in the conduct of fora or other FIRM-related events (e.g. resource person, through financial assistance, etc.)

Women’s groups - serve as advocates and/or enablers by calling for support to this initiative; assist in the conduct of fora or other FIRM-related events; help promote awareness on environmental issues; help solicit support to the advocacy

Peoples Organizations / Local Communities – share indigenous skills and practices; pull support to this initiative by influencing decision-making; and helping disseminate information about the program (especially if initiated by their leaders)

Non-Government Organizations/Civil Society Organizations - support and disseminate information about the initiative; assist in the conduct of fora, etc.; help promote awareness on environmental issues

Media – promote the initiative by featuring it in all media channels; provide discounts to advertisements relating to the initiative; help create champions

Students - promote the initiative in social media; help in producing communication materials for this initiative (through OJT programs)

KEY MESSAGES

Messages to be effective should be based on the implementers’ understanding of the target audiences and stakeholders.

Proposed tagline in relation to FMB’s tagline: *Harnessing forestry science for sustainable development* **is Forestry investments matter: From seeds to end-users**

Target Audience	Message
Potential investors	<i>Investment with social and environmental purposes.</i>
Women’s Group	<i>Women have key roles to play in forestry investments</i>
Partners	<i>Uniting our strengths for the forestry sector Walang iwanan – sa gubat may kabuhayan! Hawak kamay, uunlad tayo ng sabay sabay!</i>
Others (public)	<i>Gubat+Yaman = Yamang-gubat</i>

*Sa Gubat May Forever
Sa Gubat na Hiyas, Aangat ang Pilipinas
Invest in your future, Invest in our forests now!
Puno, punung puno ng buhay
Forest, For Life*

Forest-dependent
Communities

*Kagubatan. Kabuhayan. Kasiyahan. Kinabukasan.
Kagubatan ay yaman, Dapat ingatan
Gubat ay alagaan, proteksyon ngayon at sa
kinabukasan
Gubat nasa Iyo na ang Lahat*

CONSIDERATIONS FOR SUCCESS

There are quite several things needed to realize the objectives set forth in this Plan.

Capacity Enhancement activities will help the implementers perform their roles better for the ComPlan. The applications of the learnings from these capacity enhancements will even go beyond the purposes of the FIRM. These will help them grow professionally.

Supplies, Equipment, and Others are more on the office supplies requirement (the need for exhibit materials upgrade). These materials have to be lightweight so even the ladies can set up the exhibit on their own. There is also a need for additional vehicle(s) since the implementation phase of the ComPlan will be demanding travel-wise.

Personnel Complement: the need to hire additional personnel relative to FIRM and its ComPlan (Layout artist/graphic designer, report officer, and web developer).

Institutional and/or Structural Changes: creating an IEC unit whose task is to conceptualize, develop, produce, and disseminate IEC materials on FIRM. DENR Regional Offices have RPAOs that take charge of their respective public information/relations concerns.

Budget for the following must be allocated: Communication; Travels; Hiring of personnel (members for the Communication group, consultants); Sponsorships; Advertisement fees; Supplies; Equipment (might need to buy powerful computers); Printing; and Events.

COMPLAN ACTIVITIES

The activities enumerated in the ComPlan are expected to help realize the objectives set. They are a combination of the three communication components: advocacy, social mobilization, and behavior change communication. The use of gender fair language shall be observed in all communication materials that will be produced and developed.

- Massive roll out of FIRM to field offices
 - Conduct of training programs
 - Develop communication materials for different purposes and audiences such as brochures, leaflets, infomercials, infographics, posters, teasers, etc.
 - Groom 1 spokesperson per region
 - Launch of aggressive promotional activities such as participation in trade exhibits, rolling out of advertisements in all media channels, fun run/marathon, concert, green gala
- ◆ Conduct of edutainment activities such as poster-making, slogan, essay writing, and photography contests
- Setting up of website to serve as information hub for potential investors
 - Conduct of investment fora (national and regional)
 - Conduct of meetings, dialogues, and consultations stakeholders and potential investors
 - Regular sending of news briefs on what's going on with forestry investment initiatives and other related information
 - Conduct of community orientations
 - Launch and maintain an aggressive social media campaign
 - Conduct of Forestry Summit
 - Promote the initiative in all media channels
 - Regular sponsorship activities
 - Regular feedback collection to improve on the processes in place (a hotline/chat facility/ text center can be set up for this purpose)

Table 44. Communication Plan Strategies/Activities and Timelines

<i>Strategies/Activities</i>	<i>Timelines</i>
<i>Strategy 1: FMB staff members promote FIRM with confidence to their colleagues and to potential investors</i>	
Massive roll out of FIRM	2018-2020
Conduct of training programs on effective communication skills, process documentation, personality development, conflict management, and risk communication	2018-2020
Develop communication materials that will be used in the roll out	2018
Groom spokespersons per regional office	2020
<i>2. Increase the investors expressing intent to invest in forest and forest-based products</i>	
Develop communication materials for different purposes (meetings, advertisements and others)	2018-2020
Conduct of one-on-one meetings, as necessary, with potential investors	2019-2020
Launch of aggressive promotional activities such as participation in trade exhibits, rolling out of advertisements in all media channels	2019-2020
Setting up of website to serve as information hub for potential investors	2020
Conduct of annual investors fora (national and regional)	2020

<i>Strategies/Activities</i>	<i>Timelines</i>
<i>Strategy 3: Existing partnerships with investors reinvigorated</i>	
Regular sending of newsbriefs on what's going on with forest investment initiatives and other related information	2019-2028
Conduct of informal catching up sessions	2019
Regular feedback collection to improve on the processes in place (a hotline/chat facility can be set up for this purpose)	2019-2028
<i>4. Forest-dependent communities within the area actively participate in FIRM-related initiatives</i>	
Conduct of community orientations	2019-2020
Conduct of one-on-one meetings, as necessary, with community leaders	2019-2020
Develop communication materials to be given away to community members	2018-2025
<i>5. Promote streamlined forest investment processes and forest investment opportunities in general to 1,000,000 people by 2020</i>	
Launch and maintain an aggressive social media campaign	2019-2020
Conduct of edutainment activities (contests such as poster, film, and essay)	2020
Conduct of innovative promotional activities such as webinars, roadshows	2020
Promote the initiative in all media channels	2020
Conduct of media monitoring	2020
Regular sponsorship activities	2020
Develop communication materials suited to different media	2018-2020
Conduct of policy fora	2019-2020
<i>6. Increase the number of financial institutions, formal or informal, assisting potential investors</i>	
Develop communication materials specific for financing institutions	2020
Conduct of policy fora	2020
Conduct of one-on-one meetings with representatives of financing institutions	2019-2020

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