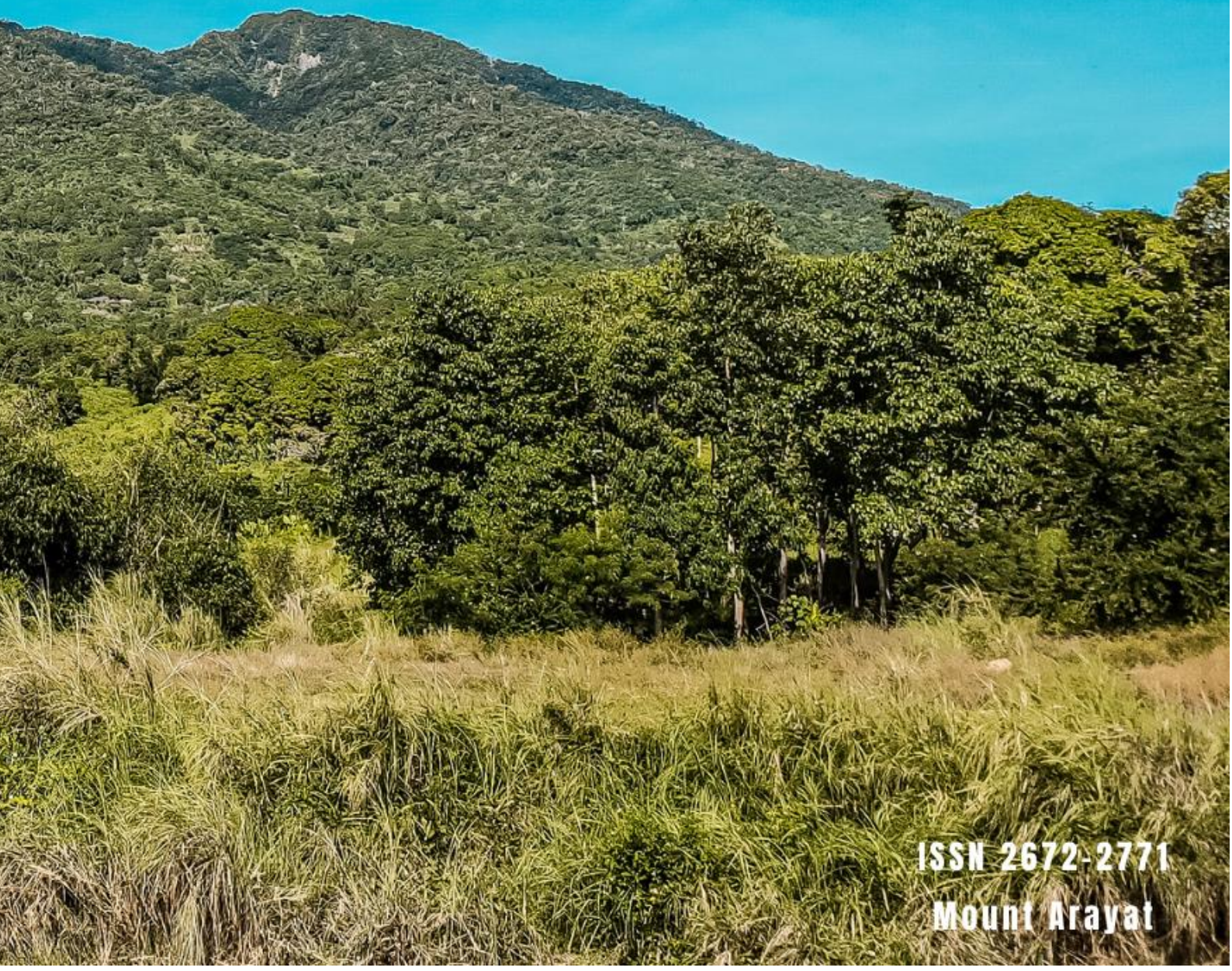
Republic of the Philippines
PHILIPPINE STATISTICS AUTHORITY
Regional Statistical Services Office
Central Luzon

Land Asset Accounts



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Mount Arayat

About the Cover

The cover of the Central Luzon Land Asset Accounts depicts the active stratovolcano Mount Arayat in the Province of Pampanga with a height of 1,026 meters. It serves as a cradle of a rich biodiversity within its total land area of 3,715.23 hectares. Extending to its piedmont are the lush and verdant fields of neighboring localities where multitudes of crops are planted and animals are reared.

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CENTRAL LUZON LAND ASSET ACCOUNTS: 2000 - 2015

System of Environmental - Economic Accounting 2012
Central Framework

REPUBLIC OF THE PHILIPPINES
PHILIPPINE STATISTICS AUTHORITY
REGIONAL STATISTICAL SERVICES OFFICE III

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FOREWORD

With the release of its debut issue, the Land Asset Accounts of the Philippine Statistics Authority - Regional Statistical Services Office III (PSA-RSSO III) is designed to provide timely, relevant, and reliable data on environment statistics. It seeks to assess and monitor the physical and monetary status of land in the region by presenting various indicators that provide a summary on how the land asset of the region gradually changed over the past years.

The publication of such data is found to be necessary in addressing environmental concerns that contribute to the thriving societies towards holistic development. It serves as a guide for policy-makers, project-implementers and evaluators, and regional stakeholders in crafting evidence-based policies and programs, and mainstreaming environmental concerns at the regional level. Moreover, this publication is anchored towards the country's aspirations as stipulated in certain commitments such as in the Philippine Development Plan (PDP), Ambisyon Natin 2040, 10-point Socio-Economic Agenda, Sustainable Development Goals (SDGs), and Paris Agreement on Climate Change.

PSA is grateful to the data providers and members of the Central Luzon - Environment and Natural Resources Accounts Steering Committee (CL-ENRASC) for their valuable contributions that paved the way for the completion of this project. We are looking forward for continued collaboration and strengthened tie-ups with you in our future endeavors.

DENNIS S. MAPA, Ph. D.
Undersecretary
National Statistician and Civil Registrar General

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MESSAGE FROM THE REGIONAL DIRECTOR

From its inception in 2019 to the birth of its debut issue in 2021, the Philippine Statistics Authority - Regional Statistical Services Office III (PSA-RSSO III) is pleased to present the Land Asset Accounts of Central Luzon. This publication is a compilation of data on environment particularly on the land resource of the region. It provides environment statistics that were intricately analyzed and processed to come up with summary tables, figures, and analyses that present the physical and monetary land status of the region.

The Land Asset Accounts of Central Luzon seeks to provide the policymakers as well as the program providers and implementers with the timely and relevant statistics on environment that will help them efficiently address and evaluate related programs and policies. It is hoped to serve as a tool that will contribute in addressing environmental concerns not only at the local and national level, but also at the international community as well. The publication also serves as an emblem of our steadfast commitment and support to various environmental aspirations.

It is still a clear picture until today on how we started this undertaking in 2019 from scratch, came up with drafts, followed by series of revisions after consultations and meetings, and until we presented it to the authorities and was approved. The materialization of this project will not be possible without the significant contribution of our valued partners. PSA will remain grateful to the unwavering support of the members of the Central Luzon Environment and Natural Resources Accounts Steering Committee (CL-ENRASC) chaired by the Department of Environment and Natural Resources (DENR) III. Our heartfelt gratitude also goes to our friends from the National Mapping and Resource Information Authority (NAMRIA) for the valuable support. Moreover, we are glad to announce that we are also working on the Timber Asset Account of the region and is scheduled to be released within the year. The team is looking forward to working with you towards the future improvements and next issues of these publications.

In behalf of PSA RSSO 03,

ARLENE M. DIVINO
(Chief Statistical Specialist)
OIC-PSA RSSO 03

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MESSAGE FROM DENR III

I wish to congratulate the Philippine Statistics Authority for this timely and relevant publication on our region's land asset accounting.

Land and its associated assets are vital component of our environment and natural resources. This is where we perform our economic activities and most importantly, it supports flora and fauna that compose our biodiversity, and the various man-made and natural vegetation including our forests, watersheds, protected areas, grassland, marshland and other wooded land.

And Central Luzon is one of the regions in the country with rich and diverse land asset. Our region has a total land area of 2,147,036 hectares. Of these, 1, 204, 649 hectares or 56% are alienable and disposable lands or those that can be issued with title by the DENR for human settlements, agriculture, social and economic development and other human activities. The rest or 44% (942,387 ha) of our total land area is classified as forestland.

According to statistics, 95% of our basic needs and requirement like food, clothing and shelter are obtained from land resources. It is high time that we protect and conserve this precious and limited resources to sustain our environment and natural resource that are essential to human survival.

Sustainable land-use management coupled with green architecture are also key to sustain our land resources. Your DENR is firmly committed and dedicated in continuously protecting our environment and in improving our land administration and management.

Let us continue to advance and champion the cause of environmental protection and conservation here in Central Luzon.

Again, congratulations and more power!

ENGR. PAQUITO T. MORENO, JR., CESO III
Regional Executive Director
DENR Region III

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MESSAGE FROM NEDA III

Akin to human resources, our natural resources is a vital component of regional wealth, and provides a deeply embedded link to economic development. The accounting and management of this wealth, including its volume, monetary value, and sustainability, represents an important function in regional planning, policy formulation, and decision making.

This publication of the Philippine Statistics Authority – Regional Statistical Services Office III (PSA-RSSO III) on Land Asset Accounts of Central Luzon, therefore, is an important headway towards the development of an established environmental and natural resource accounting system in Central Luzon. It will serve as a sufficient and reliable database for future physical and development planning in the region.

I highly commend PSA-RSSO 3 for crafting this valuable publication which is among the first land asset account publications generated in the country.

I am confident that through this pioneering initiative, the scorekeeping system of our land assets will be further institutionalized, and will encourage sector specialists to ponder more clearly and constructively on the important relationship between the environment and sustainable development.

I am hopeful that this publication will guide our local planners, policy-makers and decision-makers in formulating and implementing policies and programs that will steer our region into the path towards achieving sustainable development.

AGUSTIN C. MENDOZA
OIC Regional Director, NEDA 3
Vice-Chairperson, RDC III

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Central Luzon Land Asset Accounts: 2000 – 2015 is a publication prepared by the Statistical Operations and Coordination Division (SOCD) of Philippine Statistics Authority - Regional Statistical Services Office (PSA-RSSO) III:

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ACKNOWLEDGMENT

The PSA RSSO III would like to extend its deepest gratitude to everyone who had imparted their knowledge and rendered their precious time in the materialization of the Central Luzon Land Asset Accounts especially to the members of the Central Luzon Environment and Natural Resource Steering Committee (CL-ENRASC). The PSA is grateful to the different agencies who have provided data essential in the accomplishment of the publication. Lastly, to the Almighty Father, for the continuous gift of wisdom and everlasting guidance all throughout.

TERMS OF USE OF PSA PUBLICATIONS

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March 2021

EXECUTIVE SUMMARY

Central Luzon recorded a total land cover of 2,115,691 hectares (ha) in 2010 and 2,117,099 ha in 2015. The Central Luzon Land Asset Accounts followed the UN System of Environmental-Economic Accounting (SEEA) 2012 – Central Framework (CF) which is a multi-purpose conceptual framework for describing the interaction between the economy and the environment, and the stocks and changes in stocks of environmental assets.

In 2010, annual crops accounted for the highest share in land cover at 34.5 percent. However, this went down to 31.9 percent in 2015. Meanwhile, brush/shrubs accounted for the second highest share at 17.5 percent in 2010 which also went down to 15.8 percent in 2015. Mangrove forest, on the other hand, had the lowest share of approximately 0.1 percent in 2010 and 2015. The decrease in the above land cover can be seen in the uptake on grassland which has 7.8 percent in 2010 to 9.2 percent in 2015.

The total value of land in Central Luzon rose by 26.3 percent to PhP 2.31 trillion in 2015 from PhP 1.83 trillion in 2010, which was largely due to the updating of zonal values. Built-up area contributed the highest at 42.9 percent in 2010. This increased to 56.4 percent (PhP 1.30 trillion) in 2015. On the other hand, agricultural land grabbed a share of 28.7 percent in 2010 but then decreased to 24.3 percent in 2015. In the same manner, forestry took a hold of 18.1 percent share in 2010 and decreased to 16.5 percent share in 2015. Furthermore, land use for aquaculture had a 3.4 percent share in 2010 which also declined to 2.8 percent in 2015.

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ACRONYMS

A&D	Alienable and Disposable
BIR	Bureau of Internal Revenue
CAGR	Compounded Annual Growth Rate
CF	Central Framework
CL-ENRASC	Central Luzon - Environment and Natural Resource Steering Committee
DA	Department of Agriculture
DAR	Department of Agrarian Reform
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DO	Department Order
ENRAD	Environment and Natural Resources Accounts Division
FMB	Forest Management Bureau
GIS	Geographic Information System
MGB	Mines and Geosciences Bureau
NCIP	National Commission on Indigenous Peoples
PENRO	Provincial Environment and Natural Resources Office
RSSO	Regional Statistical Services Office
LMB	Land Management Bureau
NAMRIA	National Mapping and Resource Information Authority
NEDA	National Economic and Development Authority
SEEA	System of Environmental-Economic Accounting
UN	United Nations

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Chapter 1

INTRODUCTION

Rationale

Land is a fundamental material resource and the primary platform for economic and other social activities. The way land is used and how it is intended to be used are integral components of human development. (*Corpuz, 2012, p.2*)

In environmental accounting, land is defined as a unique environmental asset that delineates the space in which economic activities and environmental processes take place within which environmental assets and economic assets are located. *(SEEA 2012-Central Framework, 2014, p.174)*

Central Luzon has an estimated total land area of 2,147,036 hectares, wherein 56.1 percent (1,204,649 ha) are classified as alienable and disposable lands. The remaining 43.9 percent (942,387 ha) are classified as forestland, which are mostly concentrated in the provinces of Zambales and Aurora.

Table 1. Land Classification by Province, Central Luzon: 2019
(In Hectare)

Region/Province	Total Area	Certified A&D	Forestland	% Share (A&D)	% Share (Forestland)
Central Luzon	**2,147,036**	**1,204,649**	**942,387**	**56.1**	**43.9**
Aurora	323,954	132,008	191,946	40.8	59.3
Bataan	137,291	69,975	67,316	51.0	49.0
Bulacan	262,505	185,333	77,172	70.6	29.4
Nueva Ecija	528,433	343,257	185,176	65.1	35.0
Pampanga	218,068	172,616	45,452	79.2	20.8
Tarlac	305,345	184,975	120,370	60.6	39.4
Zambales	371,440	116,485	254,955	31.4	68.6

Source: Philippine Forest Statistics
Forest Management Bureau, DENR

About 70 percent of the total land area of the province of Zambales are classified as forestland in 2019. Likewise, Aurora, known for its timber resource, has about 60 percent of its land area classified as forestland.

Central Luzon, known as the “Rice Granary of the Philippines”, is the top producer of palay in the country and other numerous crops such as sugarcane, stringbeans, ampalaya, eggplant, tomato, okra, squash, and other vegetables. The region has about 40 percent of its total alienable and disposable lands used for agriculture. Despite being an agricultural region, Central Luzon is keeping up with the evolving cultural and technological development as it is now gearing towards industrialization with the emergence of various companies and universities in the region and even the construction of the proposed metropolis commonly known as the “New Clark City” (Bracher, 2018).

Moreover, the region recorded a total of 11,218,177 individuals in 2015, recording an increase of 1,080,440 persons from its total population in 2010. It is also the third most populated region in the country representing 11.1 percent of the country’s total population.

Along with the increasing population is the region’s fast-growing economy which goes hand in hand with industrialization. Hence, land conversion is now very common in the region so as to give way to the rising needs of the community. These needs keep on multiplying but the land resource remains the same prompting the necessity to analyze the current situation of the region’s land assets and develop ways for it to be managed sustainably making it available for the future generation.

PSA RSSO III intends to compile and develop Central Luzon’s environmental asset accounts for land to provide updated statistics for environmental policies and planning activities. The land asset accounts will encompass a 15-year period data and will follow the SEEA 2012-CF. In line with the SEEA 2012-CF concept introduced by the United Nations Statistical Commission in 1993 and proceeded to be updated with the most recent one in 2012, the PSA started to revolutionize its national accounts by starting to include factors that were once not considered (e.g., timber and land accounts).

Objectives

This project generally aims to assess the physical and monetary asset accounts of land in the region. Specifically, it aims to:

1. identify land data indicators that will support policy formulation in the region;
2. determine the changes in the land classification within the region;
3. determine the value of the region's land asset; and
4. establish environmental economic accounting following the UN SEEA 2012-CF, particularly in land resource accounting by producing a Land Asset Accounts publication.

Scope and Limitations

To pursue the objectives of SEEA 2012-CF, data from the National Mapping and Resource Information Authority (NAMRIA) and Bureau of Internal Revenue (BIR) from provincial to regional level were used.

The study covers the physical and monetary asset accounts of land in the region from year 2000 to 2015 based on the Land Cover Statistics provided by NAMRIA and Zonal values from the BIR. The 2003, 2010, and 2015 land cover statistics were used to compute for the annual land cover estimates. However, due to data limitations, only the 2010 and 2015 statistics were presented. For land valuation, data presented was limited to land use classification with zonal values as provided by BIR.

To align the land cover classification used by NAMRIA with the SEEA 2012-Central Framework, a bridge table was adopted through consultation with the Central Luzon Environment and Natural Resource Steering Committee (CL-ENRASC).

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Chapter 2

CONCEPTUAL FRAMEWORK

The Central Luzon Land Asset Accounts followed the UN System of Environmental-Economic Accounting (SEEA) 2012 – Central Framework (CF). This framework is adopted by the UN Statistical Commission as an international standard for environmental-economic accounting. The SEAA 2012 – CF is a multi-purpose conceptual framework for describing the interaction between the economy and the environment, and the stocks and changes in stocks of environmental assets.

The term “environmental asset” is used to denote the source of inputs which may be measured in both physical and monetary terms.

Physical Asset Account for Land

The objective of land accounts in physical terms is to describe the area of land and changes in the area of land over an accounting period; this was usually envisaged using data on land use and land cover statistics. The measurement units of land in physical terms are units of area as hectares and square meters. *(SEEA 2012-Central Framework, 2014, p.178)*

The basic structure for the physical accounting includes the opening stock which is the beginning of the accounting period and the closing stocks, which refers to the stocks at the end of the accounting period. In between the accounting period, several changes in the stocks may occur which may be an addition or reduction to the total stocks of land in the region.

Table 2. Structure of Physical Asset Account for Land

Opening stock of resources	
Additions to stock	
Managed expansion	Represents the increase in the area of land cover due to human activity
Natural expansion	Represents the increase in an area resulting from natural processes, including seeding, sprouting, suckering or layering
Upward reappraisals	Represents the increase due to the use of updated information that permits a reassessment of the size of the area of the different land covers
Total additions to stock	Sum of Managed expansion, Natural expansion, and Upward reappraisals
Reductions in stock	
Managed regression	Represents the decrease in the area of land cover due to human activity
Natural regression	Represents the decrease in the area of land cover due to natural reasons
Downward reappraisals	Represents the decrease due to the use of updated information that permits a reassessment of the size of the area of the different land covers
Total reduction in stock	Sum of Managed regression, Natural regression, and Downward reappraisals
Closing stock	

Physical Account for Land Cover

A physical account for land cover shows the opening and closing areas for different land cover types and various additions and reductions in those areas over the accounting period.

In 2002-2003, the first Land Cover Mapping project in the country was a joint effort between the NAMRIA and the Forest Management Bureau (FMB) of the Department of Environment and Natural Resources (DENR). The project is a nationwide assessment of land cover using a satellite-based remote sensing images and integrating tool of GIS technology. Satellite images was mostly taken in the last quarter of CY 2002 using Landsat ETM 5 and 7 categorized into 21 land cover classification, however, no ground validation was conducted.

The second Land Cover Mapping activity was undertaken in 2010 wherein the satellite images was captured using Landsat TM7, ALOS AVNIR-2, and SPOT5. For this project, the 21 land cover classification was reduced into 14 classes. Moreover, unlike the 2003 project, the 2010 Land Cover Mapping project has undergone ground validation activities and accuracy assessment.

Table 3. Land Cover Classification

2003 (21 classes)	2010 (Aggregated to 14 classes)	2015 (Aggregated to 12 classes)
Closed forest, broadleaved	Closed forest	Closed forest
Closed forest, mixed		
Closed forest, coniferous		
Open forest, broadleaved	Open Forest	Open Forest
Open forest, mixed		
Open forest, coniferous		
Forest plantation, broadleaved	Closed or Open Forest	Closed or Open Forest
Forest plantation, coniferous		
Mangrove forest	Mangrove forest	Mangrove forest
Other wooded land, shrubs	Shrubs	Shrubs
Other wooded land, fallow	Fallow	
Other wooded land, wooded grassland	Wooded Grassland	
Other land, natural, grassland	Grassland	Grassland
Other land, cultivated, pastures		
Other land, cultivated, annual crop	Annual Crop	Annual Crop
Other land, cultivated, perennial crop	Perennial Crop	Perennial Crop
Other land, natural, barren land	Open / Barren	Open / Barren
Other land, built-up area	Built-Up	Built-Up
Other land, natural, marshland	Marshland	Marshland
Other land, fishpond	Fishpond	Fishpond
Inland water	Inland Water	Inland Water

Source: Paper Presented by Dr Rijaldia Santos entitled "National Mapping Efforts": The Philippines

The latest land cover statistics available in the country is the 2015 Land Cover Map, which was undertaken in 2015 using the Landsat8 with 30m resolution. Reference data used were google earth images, topographic maps, ground truth data, and Interferometric Synthetic Aperture Radar (IFSAR) data for coastline with ground validation and accuracy assessment. The 14 land cover classification was further reduced into 12 classes in 2015. (Table 3)

On the other hand, the SEEA 2012-CF Land Cover is classified into nine categories namely the artificial surfaces, crops, grassland, closed and open forest, mangroves, shrubland, regularly flooded areas, open/barren area, and inland water bodies.

For the purpose of compiling the region's physical land asset account, the SEEA 2012-CF land cover classification was bridged with the DENR land cover classification. (Table 4)

Table 4. Bridge Table of the Land Cover Classification

LAND COVER CLASSIFICATION			SEEA 2012 CF
2003	2010	2015	
Closed forest, broadleaved	Closed forest	Closed forest	Closed and Open Forest (Tree-covered areas)
Closed forest, mixed			
Closed forest, coniferous			
Open forest, broadleaved	Open Forest	Open Forest	
Open forest, mixed			
Open forest, coniferous			
Forest plantation, broadleaved	Closed or Open Forest	Closed or Open Forest	
Forest plantation, coniferous			
Mangrove forest	Mangrove forest	Mangrove forest	Mangroves
Other wooded land, shrubs	Shrubs	Brush / Shrubs	Shrubland
Other wooded land, fallow	Fallow		
Other wooded land, wooded grassland	Wooded Grassland		
Other land, natural, grassland	Grassland	Grassland	Grassland
Other land, cultivated, pastures			
Other land, cultivated, annual crop	Annual Crop	Annual Crop	Crops
Other land, cultivated, perennial crop	Perennial Crop	Perennial Crop	
Other land, natural, barren land	Open / Barren	Open / Barren	Open/barren area
Other land, built-up area	Built-Up	Built-Up	Artificial Surfaces
Other land, natural, marshland	Marshland	Marshland	Regularly flooded areas
Other land, fishpond	Fishpond	Fishpond	Inland water bodies
Inland water	Inland Water	Inland Water	

Monetary Asset Account for Land

The monetary asset account for land follows the structure of the SEEA-CF 2012 as shown in Table 5. Changes in the overall value of land will relate primarily to the revaluations of land, since the total area of land will remain unchanged. *(SEEA 2012-CF, 2014, p.184)*

Table 5. Structure of Monetary Asset Account for Land

Opening value of stock of land	
Additions to stock	
Acquisition of land	
Reclassifications	Occurs in situations in which an environmental asset is used for a different purpose
Total additions to stock	Sum of Acquisition of land and Reclassifications
Reductions in stock	
Disposal of land	
Reclassifications	Occurs in situations in which an environmental asset is used for a different purpose
Total reductions in stock	Sum of Disposal of land and Reclassifications
Revaluations	Relate to changes in the value of assets due solely to price change
Closing value of stock of land	

For this study, the zonal value by land-use classification provided by the BIR was used in generating the monetary asset account for land of Central Luzon. The monetary value of land was derived by multiplying each transaction item in the physical asset account with the computed average zonal value by land-use classification.

Zonal value is the value of a real property which can more or less approximate the present fair market values of real properties as basis for computing the Property Tax (capital gains tax, documentary stamp tax, estate tax when the property is sold or transferred).

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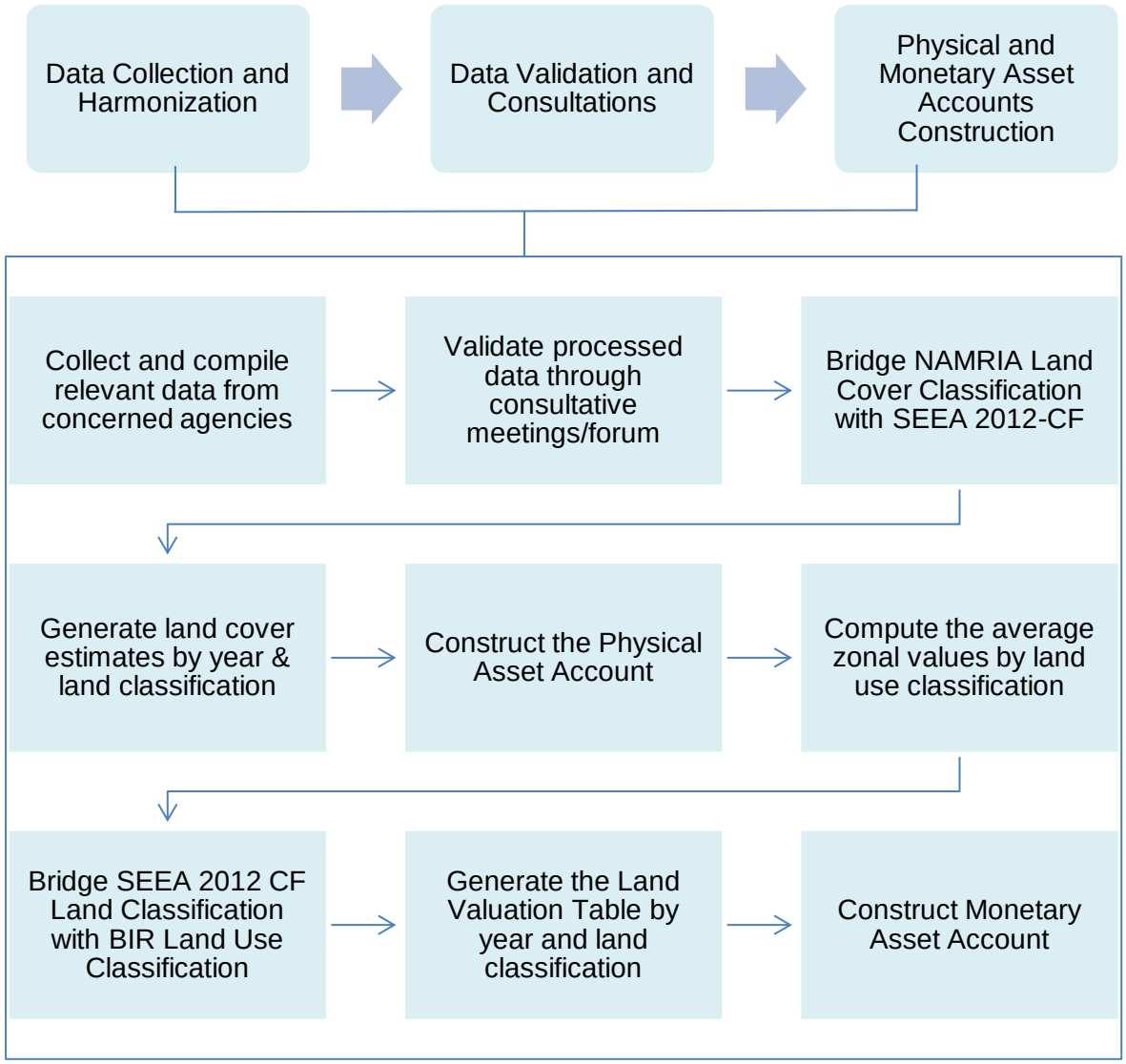
Chapter 3

METHODOLOGY

Estimation Process Framework

In developing the Central Luzon Land Asset Accounts, it involved three major phases; namely, (1) data collection and harmonization, (2) data validation and consultations, and (3) construction of the Physical and Monetary Asset Accounts. (Figure 1)

Figure 1. Process for Developing Central Luzon Land Asset Account



Estimation of Land Cover by Land Classification Estimates

The land cover estimates were derived from the data provided by NAMRIA. The land cover statistics for the years 2003, 2010, and 2015 were used to compute for the annual estimates following the steps below:

1. Calculate the Compounded Annual Growth Rate (CAGR) using the formula given below. The 2003 to 2010 CAGR was used to estimate the land cover estimates for years 2000-2002 and 2004-2009 while the 2010 to 2015 CAGR was used for years 2011-2014 estimates.

$$CAGR = \left(\frac{EV}{BV}\right)^{\frac{1}{n}} - 1$$

where: *EV = ending value*
BV = beginning value
n = number of years

2. Compute for the annual land cover estimates using the formula:

$$LCE_t = LCE_{t-1} * (1 + CAGR)$$

where: *LCE = land cover estimate*
t = year

3. To avoid over estimation of the total land cover for the region, it was assumed that the total land cover of Central Luzon did not change for years with no land cover data available. The 2003 land cover was used to estimate data for the years 2000-2002, 2010 land cover for the calculation of 2004-2009 estimates, and 2015 land cover for 2011-2014. The following formula was employed in this process:

$$LCE_{adj.t} = LCE_t + \left((TLC_u - TLC_t) * \left(\frac{LCE_t}{TLC_t}\right)\right)$$

where: *LCE = land cover estimate*
TLC = total land cover
adj = adjusted
t - year with no available land cover data from NAMRIA
u - year with available land cover data from NAMRIA

$$u = \begin{cases} 2003 \text{ if } t=2000\text{-}2002 \\ 2010 \text{ if } t=2004\text{-}2009 \\ 2015 \text{ if } t=2011\text{-}2014 \end{cases}$$

Physical Asset Account

The physical asset account serves as the summary of the land cover change matrix. Hence, the values were obtained by using the land cover change matrix data. The following formulas were employed in the computation of the additions and reductions to stock:

$$AS = \sum_{1}^{12} CV - UL$$

where: *AS = addition to stock*
CV = column values
UL = unconverted land

$$RS = \sum_{1}^{12} RV - UL$$

where: *RS = reductions to stock*
RV = row values
UL = unconverted land

The relative change (in hectares and in percentage) per land classification was calculated following the formula below.

$$RC(ha.) = CS_{2015} - OS_{2010}$$

$$RC(\%) = \left(\frac{CS_{2015} - OS_{2010}}{OS_{2010}} \right) * 100$$

where: *RC = relative change*
CS = closing stock
OS = opening stock

Zonal Value

Zonal value refers to the values of real properties which can approximate the present fair market values of real properties as basis for computing the Property Tax such as capital gains tax, documentary stamp tax, and estate tax when the property is sold or

transferred. It was based on land use classification from BIR which was adopted to compute for the land monetary value. Each province has its own zonal value which is being updated through Department Orders (DO).

Different approaches were made to come up with zonal value estimates for the region. Specifically, the mean, median, minimum, and maximum were calculated for all land use classification wherein it was concluded that the mean value would be the best representative of the data. However, upon review of the complied data it was observed that there are outliers for data on commercial and residential lands – areas near Metro Manila are remarkably higher than those in rural areas. Thus, an outlier test was also performed and it was proven that the data contains outliers. Hence, outliers were removed and the mean was recalculated. Nevertheless, it was inferred that outliers could not be simply removed from the data given that it contains vital information. In conclusion, all the zonal values from the different cities and municipalities were averaged by land use classification by province to come up with the regional zonal value estimates by land use classification.

Table 6 shows the reconciled BIR Land Use Classification and SEEA 2012 – CF Land Cover Classification assuming that the land cover classification and the land use classification were the same.

Table 6. Bridge Table on SEEA 2012 – CF Land Cover Classification and BIR Land Use Classification

SEEA 2012 – CF Land Cover Classification	BIR Land Use Classification
Closed and Open Forest (Tree-covered areas)	Forestry
Mangroves	N/A
Shrubland	
Grassland	
Open/barren area	
Crops	Agriculture
Artificial Surfaces	Built-up
Regularly flooded areas	N/A
Inland water bodies	Aquaculture

Source: adopted from the presentation on the Training Workshop on the Physical and Monetary Accounts for Land and Timber Resources of Central Luzon by Bathan, Virginia M. et al.

N/A - no available data to derive the monetary value

Value of Land by Classification

The value of land by classification was calculated by multiplying the land cover estimate with the corresponding zonal value of the same year.

Monetary Asset Account

The monetary asset account was established to determine the value of the land and to record the changes in stock. It is a reflection of the physical asset account in monetary terms. The 2010 and 2015 land cover statistics were multiplied with the respective zonal values. The entries in the monetary asset account were derived using the given formula:

$$PMV_t = ALC_t * ZV_t$$

where: *PMV = prevailing market value*
ALC = area of land cover classification (sq.m)
ZV = average zonal value of respective land use
t = year

Listed below are the general procedures in the estimation of the monetary asset account:

1.) Compute for the opening stock by multiplying the 2010 land cover area with the respective 2010 zonal value per land use classification;

2.) For changes in stocks (addition/reduction to stocks), multiply the land cover value with the corresponding 2015 zonal value for each land use classification;

3.) To derive the closing stock, multiply the 2015 land cover area with the 2015 zonal value by land use classification; and

4.) Compute for the relative change (in Philippine peso and in percentage).

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Chapter 4

RESULTS AND DISCUSSION

About 40.0 percent of the total land cover in Central Luzon was agricultural land.

The total land cover of Central Luzon was recorded at 2,115,691 hectares in 2010 and 2,117,099 hectares in 2015. About 40 percent of the total land cover of Central Luzon in 2010 and 2015 were agricultural land and about 25 percent were forest land. (Figure 2)

However, a decrease of about 3.3 percent was recorded for agricultural land from 2010 to 2015. Meanwhile, a 3.0 percent increase for forest land was reported. (Table 7)

Figure 2. Percent Distribution of Land Cover Statistics, Central Luzon: 2010 and 2015

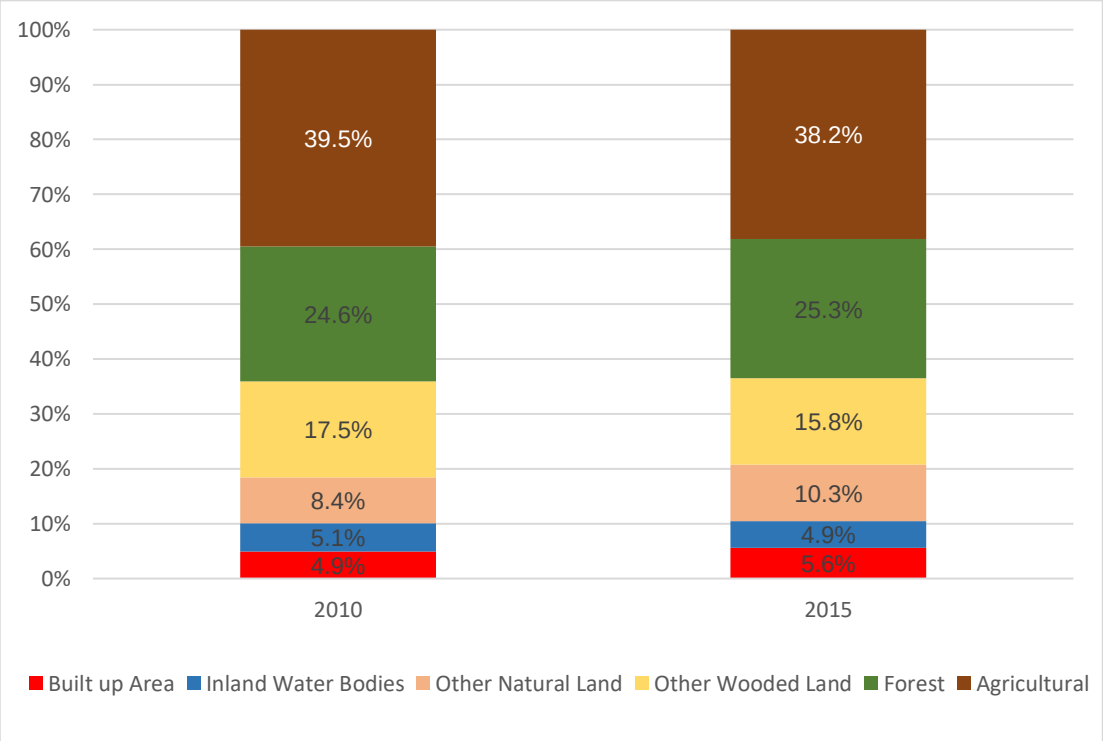


Table 7. Land Cover Statistics, Central Luzon: 2010 and 2015
(In Hectare)

CLASSIFICATION	2010	2015	2010 Percent Share	2015 Percent Share	% Change 2010-2015
Forest	**520,705**	**536,565**	**24.6**	**25.3**	3.0
Closed	225,352	234,839	10.7	11.1	4.2
Open	294,332	299,826	13.9	14.2	1.9
Mangrove	1,021	1,900	0.0	0.1	86.0
Other Wooded Land	**370,230**	**333,977**	**17.5**	**15.8**	-9.8
Fallow	1,355		0.1		
Shrubs	151,950		7.2		
Wooded Grassland	216,925		10.3		
Agricultural	**834,876**	**807,684**	**39.5**	**38.2**	-3.3
Annual Crop	729,421	676,379	34.5	31.9	-7.3
Perennial Crop	105,455	131,305	5.0	6.2	24.5
Inland Water Bodies	**108,653**	**103,366**	**5.1**	**4.9**	-4.9
Artificial Surfaces (Built-up Area)	**103,861**	**118,196**	**4.9**	**5.6**	13.8
Other Natural Land	**177,365**	**217,311**	**8.4**	**10.3**	22.5
Barren Land	11,706	20,748	0.6	1.0	77.2
Grassland	164,529	194,769	7.8	9.2	18.4
Marshland	1,129	1,794	0.1	0.1	58.9
TOTAL	**2,115,691**	**2,117,099**	**100**	**100**	**0**

Source: NAMRIA
Note: 0 – less than 0.05 share
The boundary used to generate the statistics are approximate in the absence of the official administrative boundary from the Land Management Bureau`. A more advanced camera was utilized for the 2015 mapping activities which generated clearer images as compared to the 2010 images.

The highest change in land cover classification from 2010 to 2015 was posted at 86.0 percent increase (879 ha) for mangroves followed by barren area which recorded 77.2 percent increase (9,042 ha). In addition, grassland and artificial surfaces registered an increase of 18.4 percent and 13.8 percent, respectively. (Table 7)

More than 70.0 percent of Aurora province is forest land.

In 2010, Aurora province was dominated by forest land which accounted 71.1 percent of its total land cover followed by agricultural and other wooded land at 13.4 percent and 12.4 percent, respectively. Moreover, five provinces predominantly comprised of agricultural land; namely Pampanga (55.1%), Nueva Ecija (54.0%), Tarlac (53.1%), Bulacan (43.3%), and Bataan (41.6%). Zambales, on the other hand, comprised mainly of forest land (26.0%), other wooded land (26.0%), and other natural land (24.8%). (Figure 3)

In 2015, Aurora's forest land slightly increased to 71.5 percent from 71.1 percent in 2010. The same pattern was observed in the forest lands of Bataan, Bulacan, Nueva Ecija, and Zambales. On the other hand, forest lands in Pampanga and Tarlac decreased. (Figure 4)

Agricultural lands decrease in most of the provinces

Except in Aurora, agricultural lands in six provinces decreased with Bulacan having the highest decrement of 20,703 hectares in 2015 compared to that of 2010. This was followed by Zambales and Pampanga with decrements of 9,526 hectares and 9,440 hectares, respectively. Nueva Ecija, Tarlac, and Bataan posted decreases of 3,296 hectares, 2,964 hectares and 450 hectares, respectively. On the other hand, Aurora's agricultural lands increased by 19,060 hectares compared to its level in 2010. (Figures 3 and 4, and Tables 8 and 9)

Figure 3. Percent Distribution of Land Cover Statistics by Province, Central Luzon: 2010

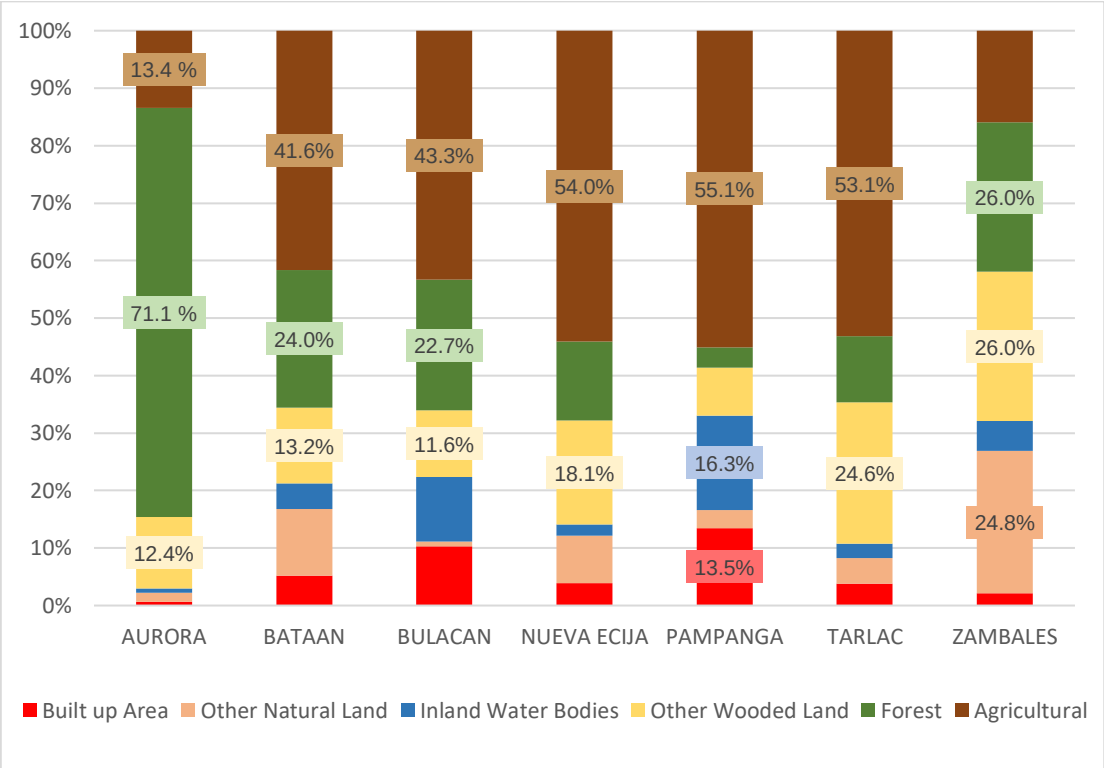


Figure 4. Percent Distribution of Land Cover Statistics by Province, Central Luzon: 2015

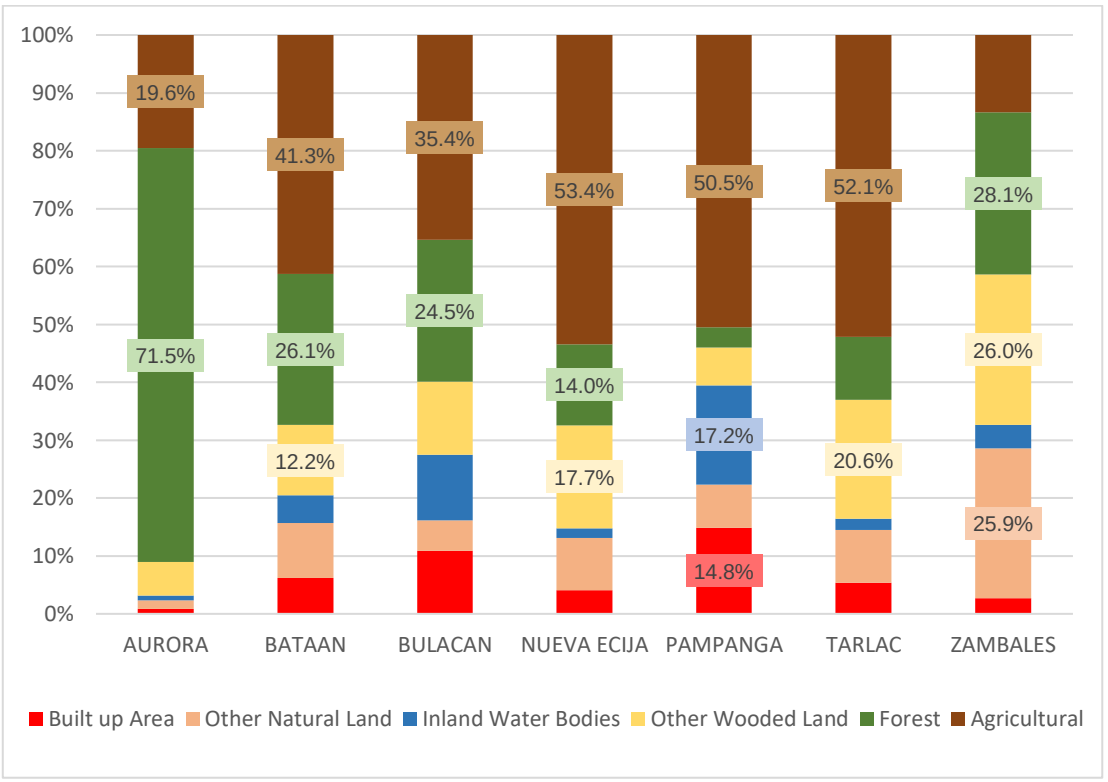


Table 8. Land Cover Statistics by Province, Central Luzon: 2010
(In Hectare)

CLASSIFICATION	AURORA	BATAAN	BULACAN	NUEVA ECIJA
Forest	**218,588**	**31,617**	**58,720**	**74,605**
Closed	132,548	10,618	35,266	9,530
Open	85,519	20,791	23,387	65,074
Mangrove	521	208	67	-
Other Wooded Land	**38,167**	**17,359**	**29,936**	**98,417**
Fallow	12	-	1,311	-
Shrubs	26,173	9,194	7,338	31,606
Wooded Grassland	11,982	8,165	21,287	66,811
Agricultural	**41,281**	**54,954**	**112,044**	**293,446**
Annual Crop	19,741	30,534	88,855	288,527
Perennial Crop	21,540	24,420	23,189	4,919
Inland Water Bodies	**2,368**	**5,944**	**29,111**	**10,681**
Built-up Area	**2,072**	**6,846**	**26,520**	**21,055**
Other Natural Land	**4,811**	**15,281**	**2,153**	**44,733**
Barren Land	2,347	132		1,231
Grassland	2,465	14,916	2,148	43,502
Marshland	-	233	6	-
TOTAL	**307,288**	**132,002**	**258,485**	**542,938**

Source: NAMRIA
Note: - means no data recorded
Data may not add up to total due to exclusion of unclassified land cover
The boundary used to generate the statistics are approximate in the absence of the official administrative boundary from the LMB.

Table 8. Land Cover Statistics by Province, Central Luzon: 2010
*(In Hectare) c*oncluded

CLASSIFICATION	PAMPANGA	TARLAC	ZAMBALES
Forest	**7,465**	**34,842**	**94,869**
Closed	773	5,407	31,209
Open	6,607	29,435	63,519
Mangrove	85	-	140
Other Wooded Land	**17,389**	**74,135**	**94,828**
Fallow	-	33	-
Shrubs	1,893	22,183	53,564
Wooded Grassland	15,496	51,919	41,264
Agricultural	**114,528**	**160,386**	**58,237**
Annual Crop	108,257	151,356	42,151
Perennial Crop	6,271	9,030	16,086
Inland Water Bodies	**34,003**	**7,621**	**18,922**
Built-up Area	**27,994**	**11,570**	**7,805**
Other Natural Land	**6,643**	**13,349**	**90,392**
Barren Land	1,027	-	6,970
Grassland	4,726	13,349	83,423
Marshland	890	-	-
TOTAL	**208,022**	**301,903**	**365,054**

Source: NAMRIA
Note: - means no data recorded
Data may not add up to total due to exclusion of unclassified land cover
The boundary used to generate the statistics are approximate in the absence of the official administrative boundary from the LMB.

Table 9. Land Cover Statistics by Province, Central Luzon: 2015

(In Hectare)

CLASSIFICATION	AURORA	BATAAN	BULACAN	NUEVA ECIJA
Forest	**220,295**	**34,461**	**63,190**	**76,012**
Closed	126,883	10,793	41,654	14,109
Open	92,933	23,326	21,099	61,903
Mangrove	479	343	437	
Other Wooded Land	**17,954**	**16,117**	**32,693**	**96,371**
Fallow	…	…	…	…
Shrubs	…	…	…	…
Wooded Grassland	…	…	…	…
Agricultural	**60,341**	**54,504**	**91,341**	**290,150**
Annual Crop	16,168	19,772	79,708	282,000
Perennial Crop	44,173	34,731	11,633	8,150
Inland Water Bodies	**2,574**	**6,213**	**29,238**	**9,383**
Built-up Area	**2,670**	**8,177**	**28,167**	**22,190**
Other Natural Land	**4,485**	**12,606**	**13,567**	**48,833**
Barren Land	1,765	226	1,003	2,103
Grassland	2,720	12,380	12,504	46,730
Marshland	-	-	60	-
TOTAL	**308,319**	**132,078**	**258,197**	**542,938**

Source: NAMRIA

Note: … means no disintegrated data available

- means no data recorded

Data may not add up to total due to exclusion of unclassified land cover

The boundary used to generate the statistics are approximate in the absence of the official administrative boundary from the LMB.

Table 9. Land Cover Statistics by Province, Central Luzon: 2015

(In Hectare) concluded

CLASSIFICATION	PAMPANGA	TARLAC	ZAMBALES
Forest	**7,255**	**32,777**	**102,577**
Closed	649	6,298	34,453
Open	6,516	26,479	67,571
Mangrove	89		553
Other Wooded Land	**13,505**	**62,181**	**95,155**
Fallow	…	…	…
Shrubs	…	…	…
Wooded Grassland	…	…	…
Agricultural	**105,088**	**157,422**	**48,711**
Annual Crop	97,228	146,566	34,807
Perennial Crop	7,860	10,855	13,904
Inland Water Bodies	**35,703**	**5,675**	**14,579**
Built-up Area	**30,875**	**16,276**	**9,969**
Other Natural Land	**15,555**	**27,572**	**94,693**
Barren Land	2,072	3,250	10,328
Grassland	11,749	24,322	84,365
Marshland	1,734	-	-
TOTAL	**207,981**	**301,903**	**365,684**

Source: NAMRIA

Note: … means no disintegrated data available

- means no data recorded

Data may not add up to total due to exclusion of unclassified land cover

The boundary used to generate the statistics are approximate in the absence of the official administrative boundary from the LMB.

Land Cover Estimates by Year

The land cover estimates found in Table 10 resulted from the estimation process using the formula for Compounded Annual Growth Rate (CAGR). Specifically, two CAGRs were utilized for the years 2000 to 2009 and for the years 2010 to 2015.

Throughout 2000 to 2015, an upward trend was observed in the built-up areas, mangroves, and inland water bodies in Central Luzon. On the other hand, the estimates for grassland, closed and open forest, and open/barren area were decreasing for the years 2000 to 2010 and started to increase from 2011 to 2015. Contrarily, crops, shrubland, and inland water bodies had an increasing trend from 2000 to 2010 while a downward trend was observed for the years 2011 to 2015.

Built-up area rose to 118,196 ha in 2015 from 25,331 ha in 2000 implying the expansion of built-up areas through time as observed with the emergence of new subdivisions and establishments in Central Luzon. Whereas, lands usually converted to artificial surfaces such as open/barren area, grassland, and closed and open forest reported reductions from 2000 to 2015 equivalent to 81.3 percent, 14.0 percent, and 16.0 percent, respectively. (Table 10)

Table 10. Land Cover Estimates, Central Luzon: 2000-2015
(In Hectare)

Year	Forest			Other Wooded Land	Agricultural	
	Closed	Open	Mangrove		Annual Crop	Perennial Crop
2000	250,728	385,766	225	316,929	677,964	59,961
2001	250,615	379,327	264	325,200	689,957	64,095
2002	249,786	371,929	310	332,733	700,154	68,319
2003	248,328	363,750	362	339,578	708,701	72,636
2004	246,357	355,000	422	345,831	715,837	77,063
2005	243,852	345,680	492	351,407	721,416	81,576
2006	240,904	335,952	571	356,379	725,629	86,185
2007	237,552	325,895	662	360,756	728,520	90,887
2008	233,828	315,574	766	364,533	730,115	95,674
2009	229,756	305,040	885	367,698	730,419	100,535
2010	225,352	294,332	1,021	370,230	729,421	105,455
2011	227,568	295,877	1,158	363,236	719,597	110,351
2012	229,542	297,089	1,312	355,965	709,088	115,343
2013	231,417	298,156	1,485	348,663	698,382	120,499
2014	233,185	299,071	1,680	341,334	687,479	125,820
2015	234,839	299,826	1,900	333,977	676,379	131,305

Source: PSA RSSO III

Table 10. Land Cover Estimates, Central Luzon: 2000-2015
(In Hectare) concluded

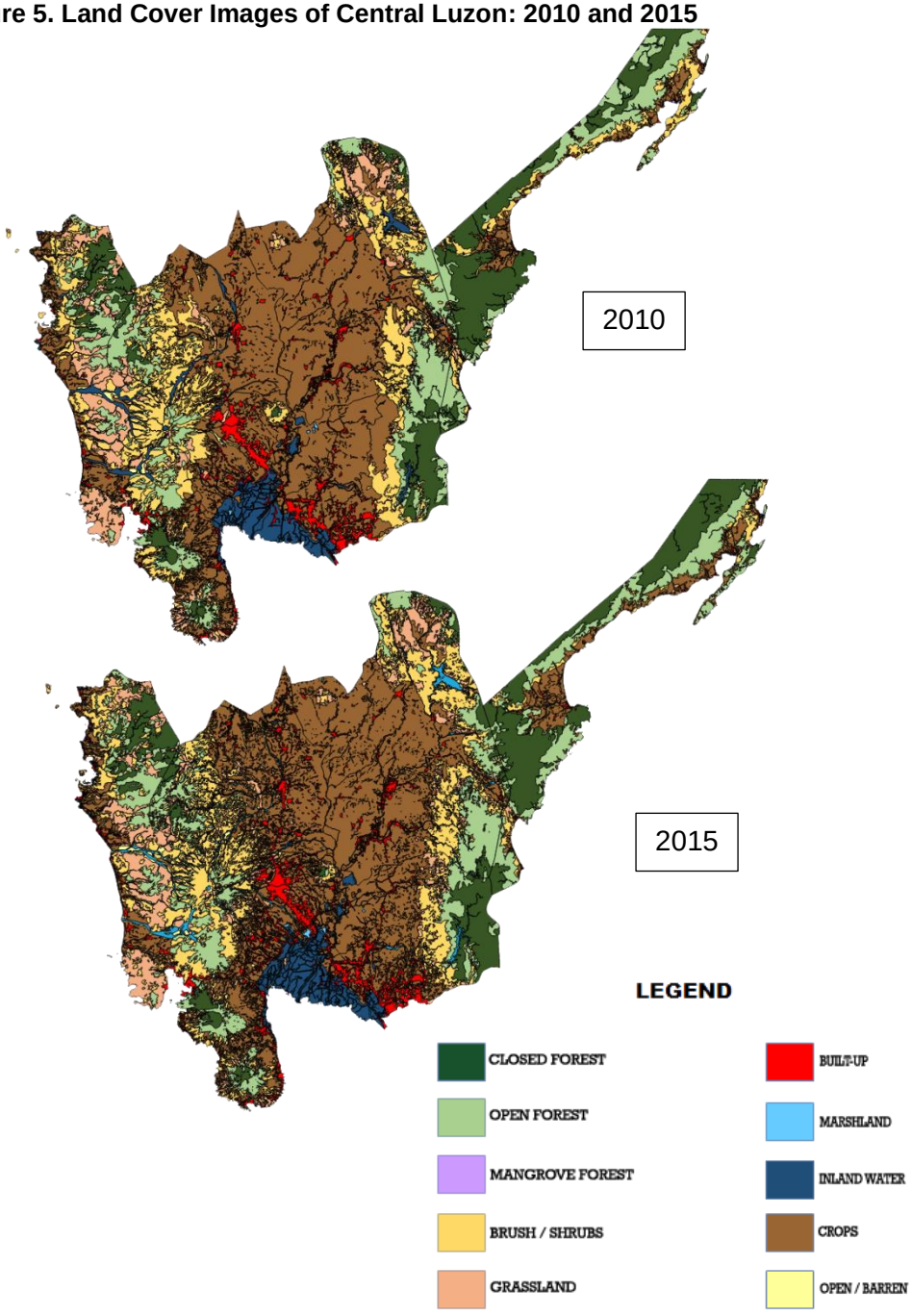
Year	Inland Water Bodies	Built-up Area	Other Natural Land			TOTAL
			Barren Land	Grassland	Marshland	
2000	60,838	25,331	111,042	226,516	37	2,115,337
2001	65,133	29,470	89,582	221,642	52	2,115,337
2002	69,532	34,186	72,062	216,252	74	2,115,337
2003	74,039	39,557	57,822	210,459	105	2,115,337
2004	78,672	45,675	46,298	204,388	148	2,115,691
2005	83,407	52,620	36,987	198,045	209	2,115,691
2006	88,255	60,504	29,491	191,527	294	2,115,691
2007	93,213	69,440	23,471	184,882	413	2,115,691
2008	98,273	79,554	18,647	178,148	578	2,115,691
2009	103,425	90,980	14,788	171,356	809	2,115,691
2010	108,653	103,861	11,706	164,529	1,129	2,115,691
2011	107,740	106,746	13,146	170,438	1,241	2,117,099
2012	106,712	109,585	14,746	176,356	1,361	2,117,099
2013	105,640	112,443	16,532	182,388	1,493	2,117,099
2014	104,525	115,315	18,526	188,528	1,637	2,117,099
2015	103,366	118,196	20,748	194,769	1,794	2,117,099

Source: PSA RSSO III

Land Cover Images of Central Luzon

Central Luzon's land remained to be dominated by cropland amidst the gradual conversions to other land classifications. Several grasslands were converted to croplands in 2015. Portions of open forests in 2010 were converted to closed forests in 2015 which was in line with the tree-cutting moratorium imposed by DENR in 2011. Built-up areas became more evident in 2015 compared to that of 2010. In addition, some inland water bodies were converted to marshlands. (Figure 5)

Figure 5. Land Cover Images of Central Luzon: 2010 and 2015

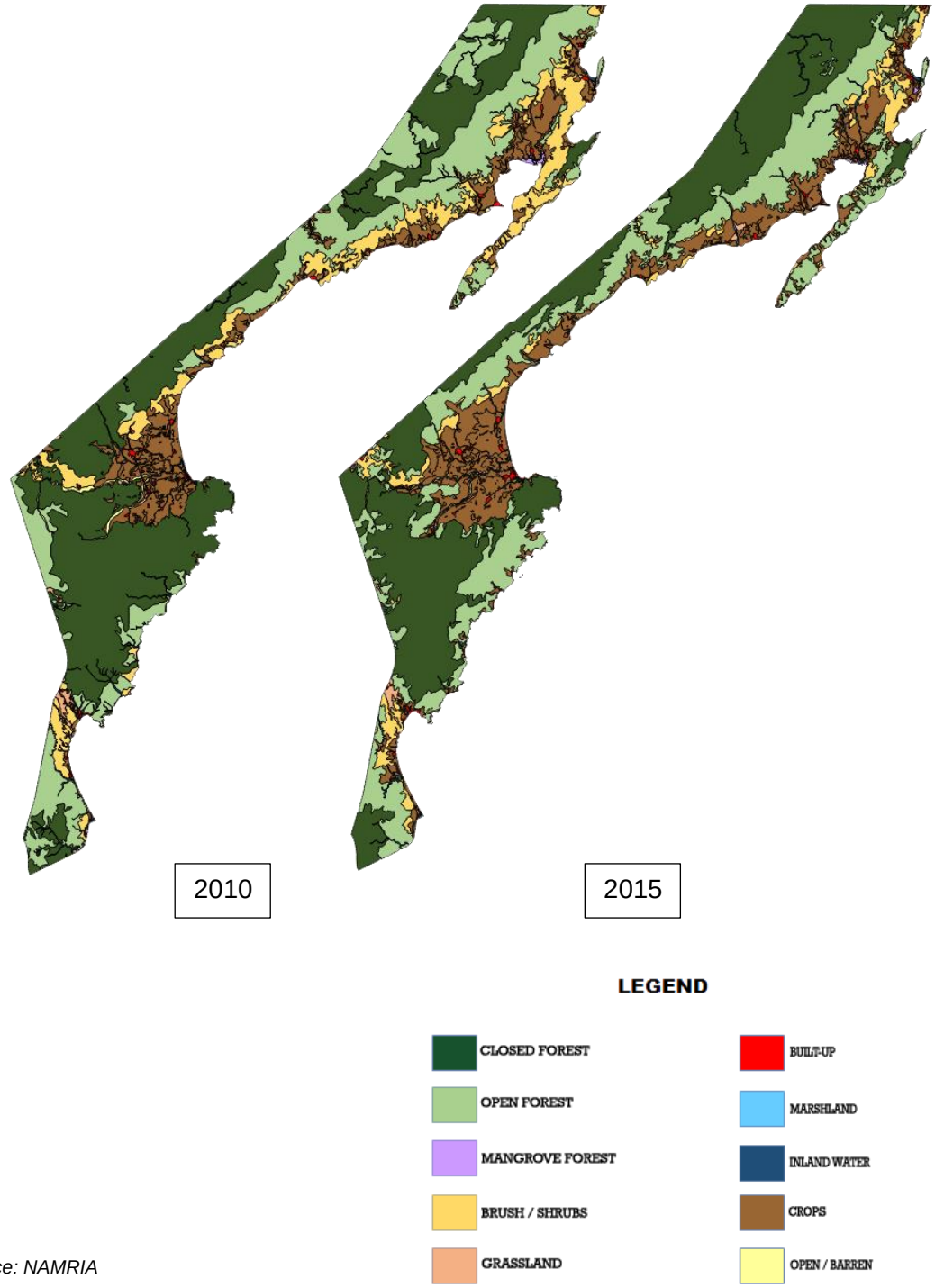


Souce: NAMRIA

Land Cover Images of Aurora Province

As seen in Figure 6, a large portion of open forests in Aurora in 2010 were converted to closed forest in 2015. In addition, some brush/shrubland became cropland. Furthermore, more artificial surfaces areas were cited in 2015 as its area posted a 28.9 percent increase.

Figure 6. Land Cover Images of Aurora: 2010 and 2015

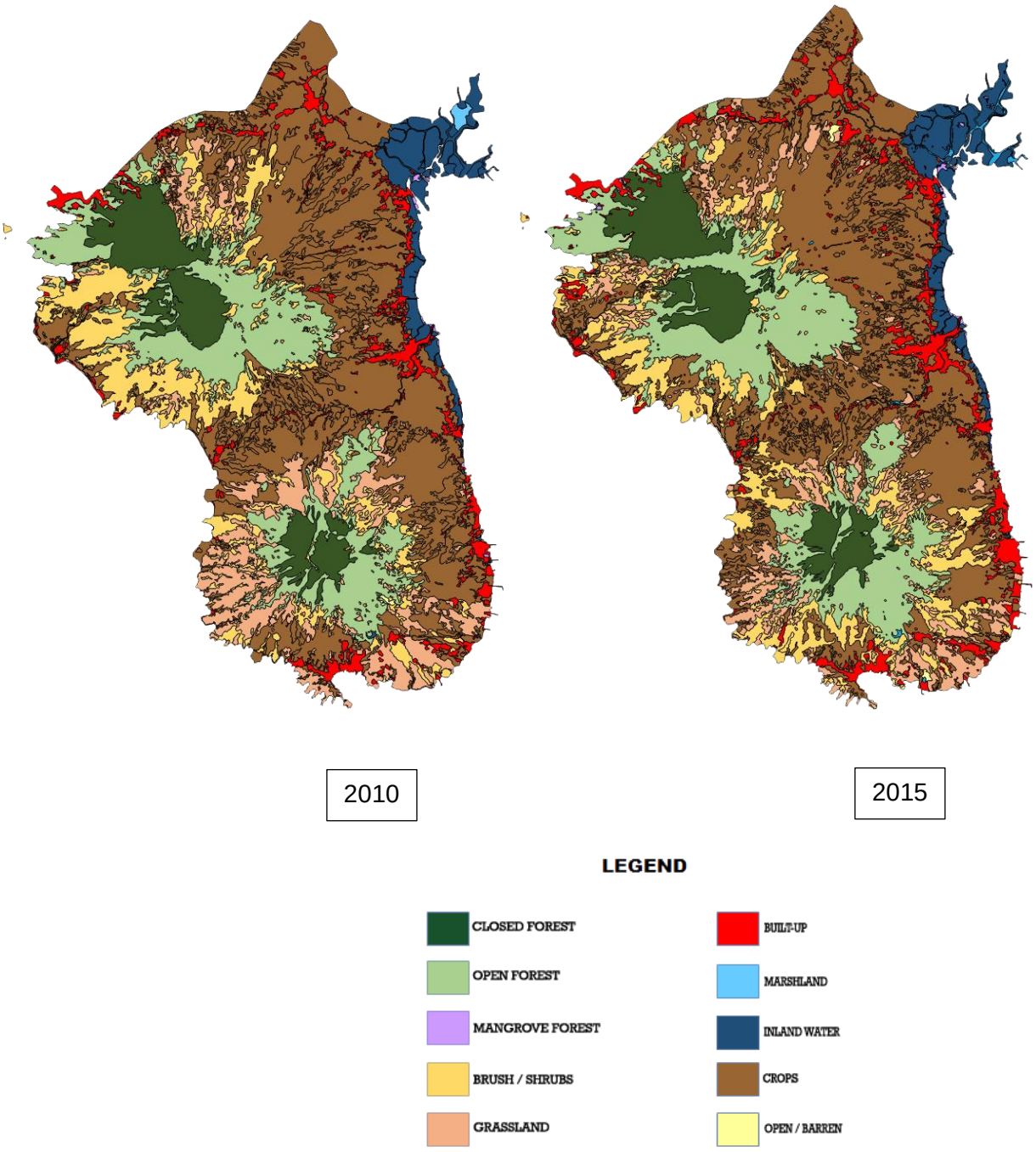


Souce: NAMRIA

Land Cover Images of Bataan Province

Figure 7 shows that cropland was still dominant in Bataan although a slight decrease of 0.8 percent was observed from 2010 to 2015. Moreover, fragments of built-up areas in 2015 were more than that of 2010. Grasslands were also developed into cropland while a portion which was originally classified as marshland was converted to inland water.

Figure 7. Land Cover Images of Bataan: 2010 and 2015

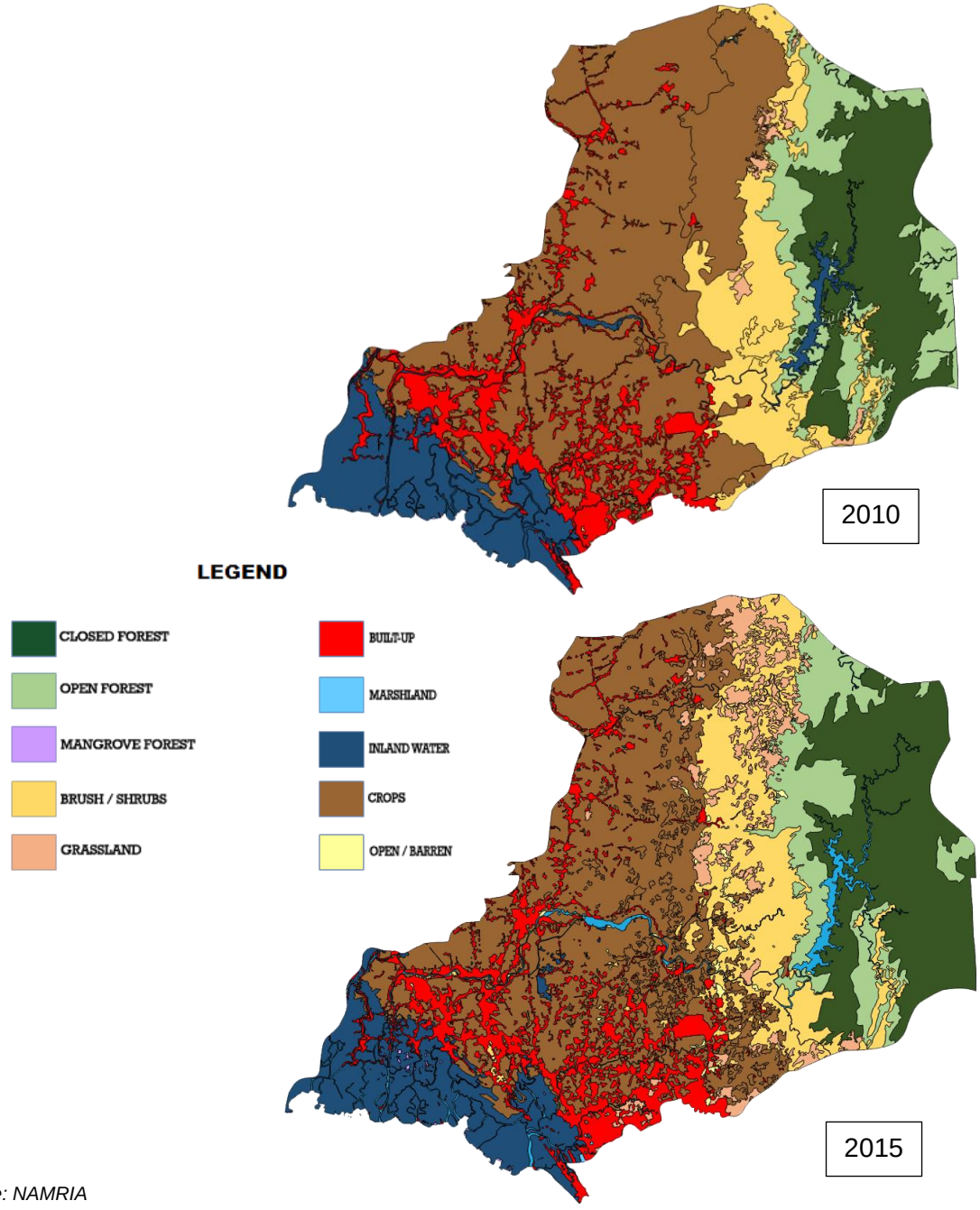


Souce: NAMRIA

Land Cover Images of Bulacan Province

More built-up areas were evident in 2015 as compared to that in 2010 in the province of Bulacan. Moreover, several brush/shrublands and some croplands were converted into grasslands whereas open forests were reclassified as closed forests. Portions of inland water bodies were also converted to marshlands. Furthermore, croplands remained to have the highest share in the total land cover of Bulacan although it has gradually decreased. Substantial increase of mangroves was also noted in 2015. (Figure 8)

Figure 8. Land Cover Images of Bulacan: 2010 and 2015

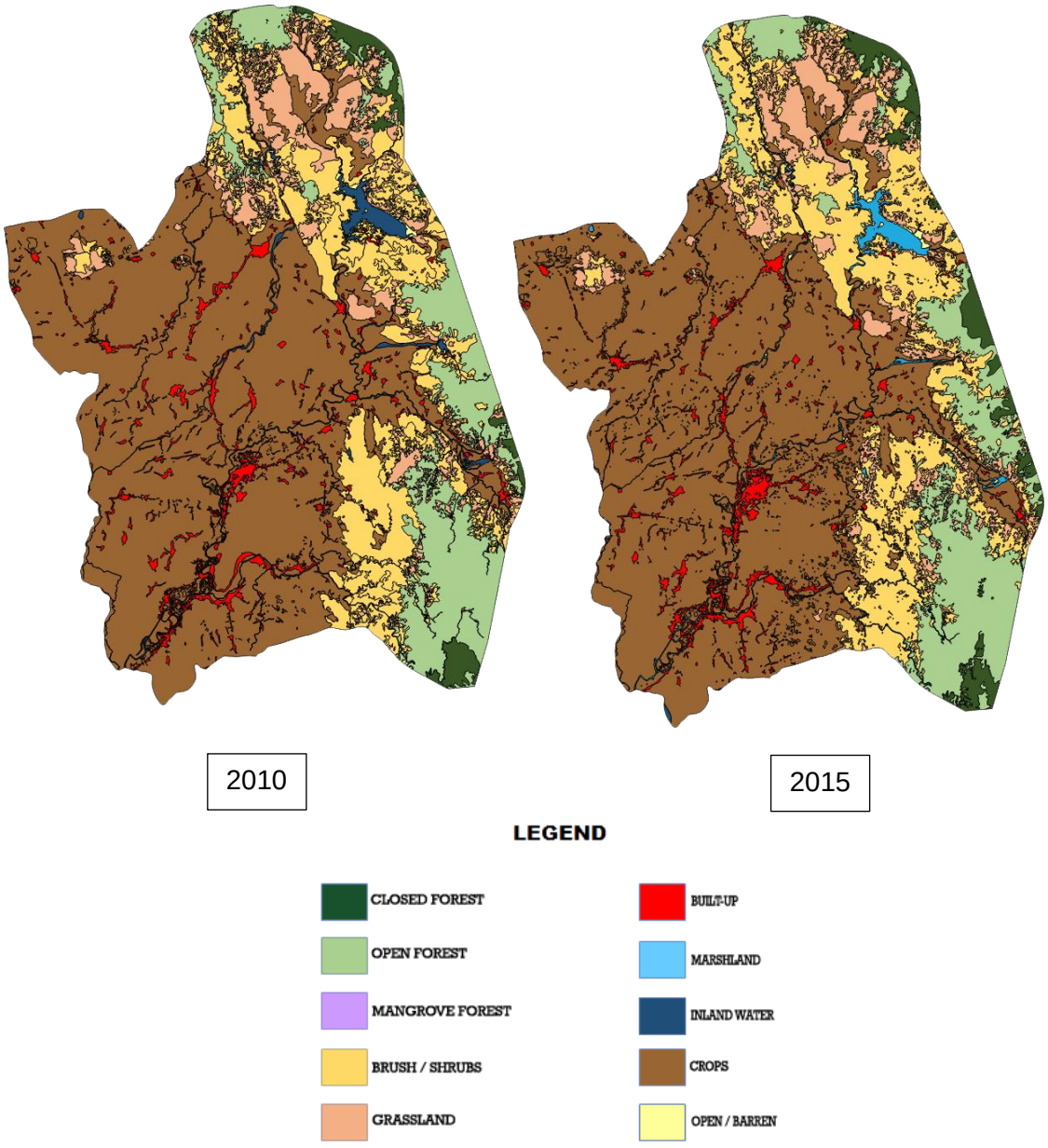


Souce: NAMRIA

Land Cover Images of Nueva Ecija Province

Nueva Ecija's total land cover was still dominated by croplands in 2015. Meanwhile, open/barren lands increased and portions of built-up areas became more evident in the 2015 land cover image while some croplands became brush/shrublands. The restriction of human activities in some open forests resulted to the expansion of closed forests. Moreover, some inland waters were converted into marshlands. (Figure 9)

Figure 9. Land Cover Images of Nueva Ecija: 2010 and 2015

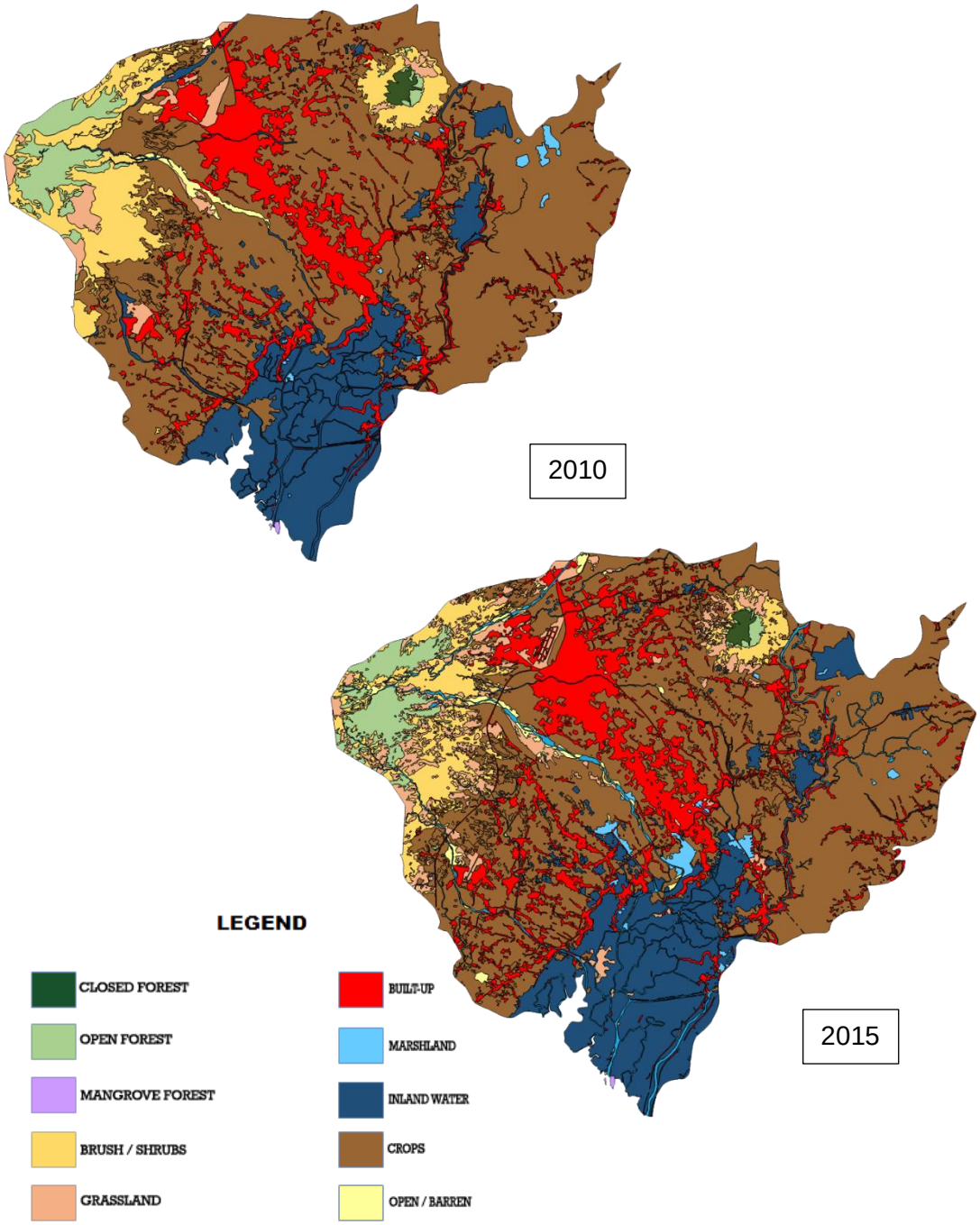


Souce: NAMRIA

Land Cover Images of Pampanga Province

Land cover images of Pampanga show that a number of brush/shrublands in 2010 were converted into grasslands in 2015. Moreover, some marshlands were converted into croplands and noteworthy expansions were also observed for open/barren lands. (Figure 10)

Figure 10. Land Cover Images of Pampanga: 2010 and 2015

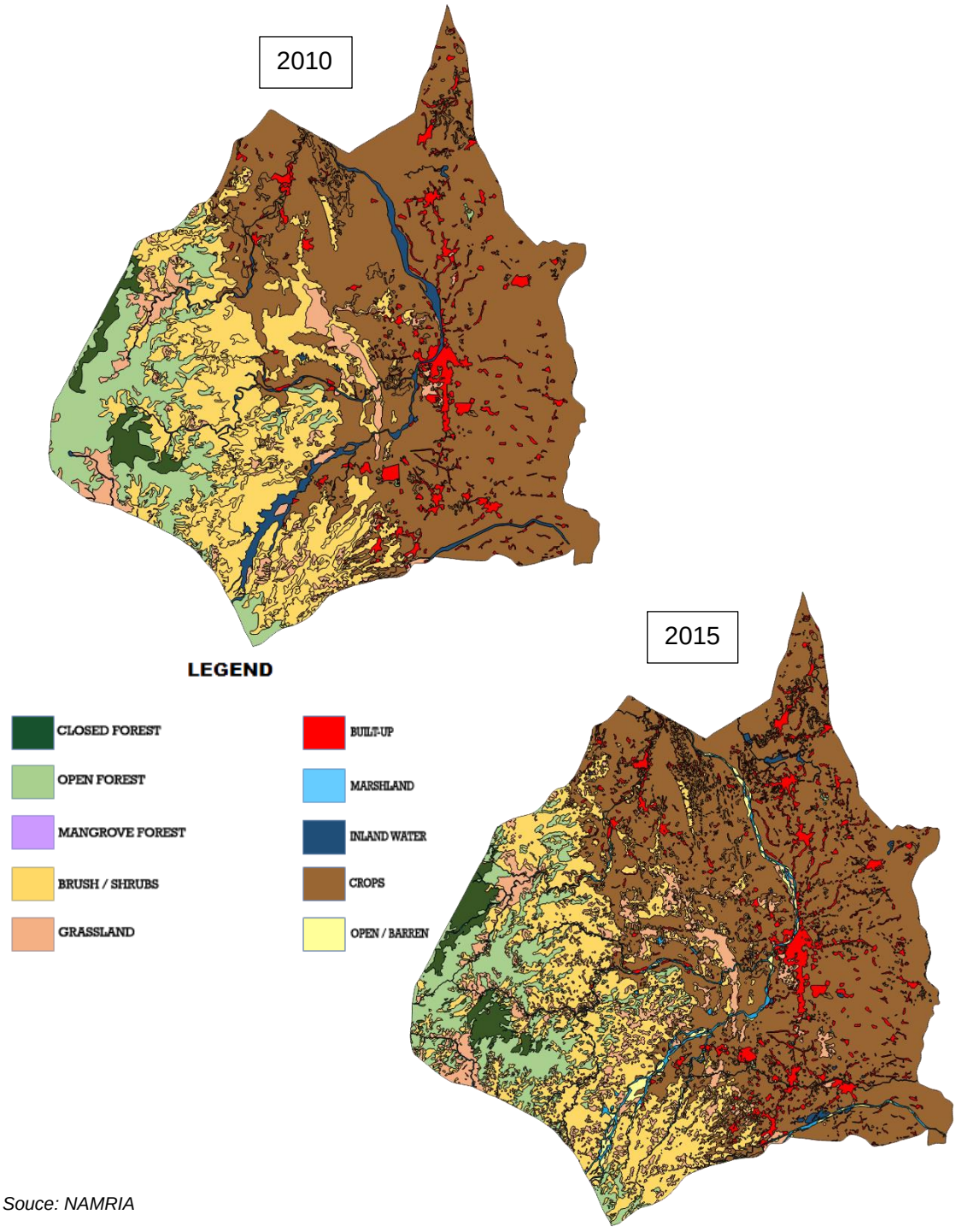


Source: NAMRIA

Land Cover Images of Tarlac Province

It was evident that Tarlac's built-up area in 2015 was larger than that of 2010. Moreover, numerous grasslands and some inland water bodies became croplands. The area covered by closed forests in 2015 was also larger than that of 2010. Croplands still remained to have the highest share to the total land cover in 2015 accounting for 52.1 percent. (Figure 11)

Figure 11. Land Cover Images of Tarlac: 2010 and 2015

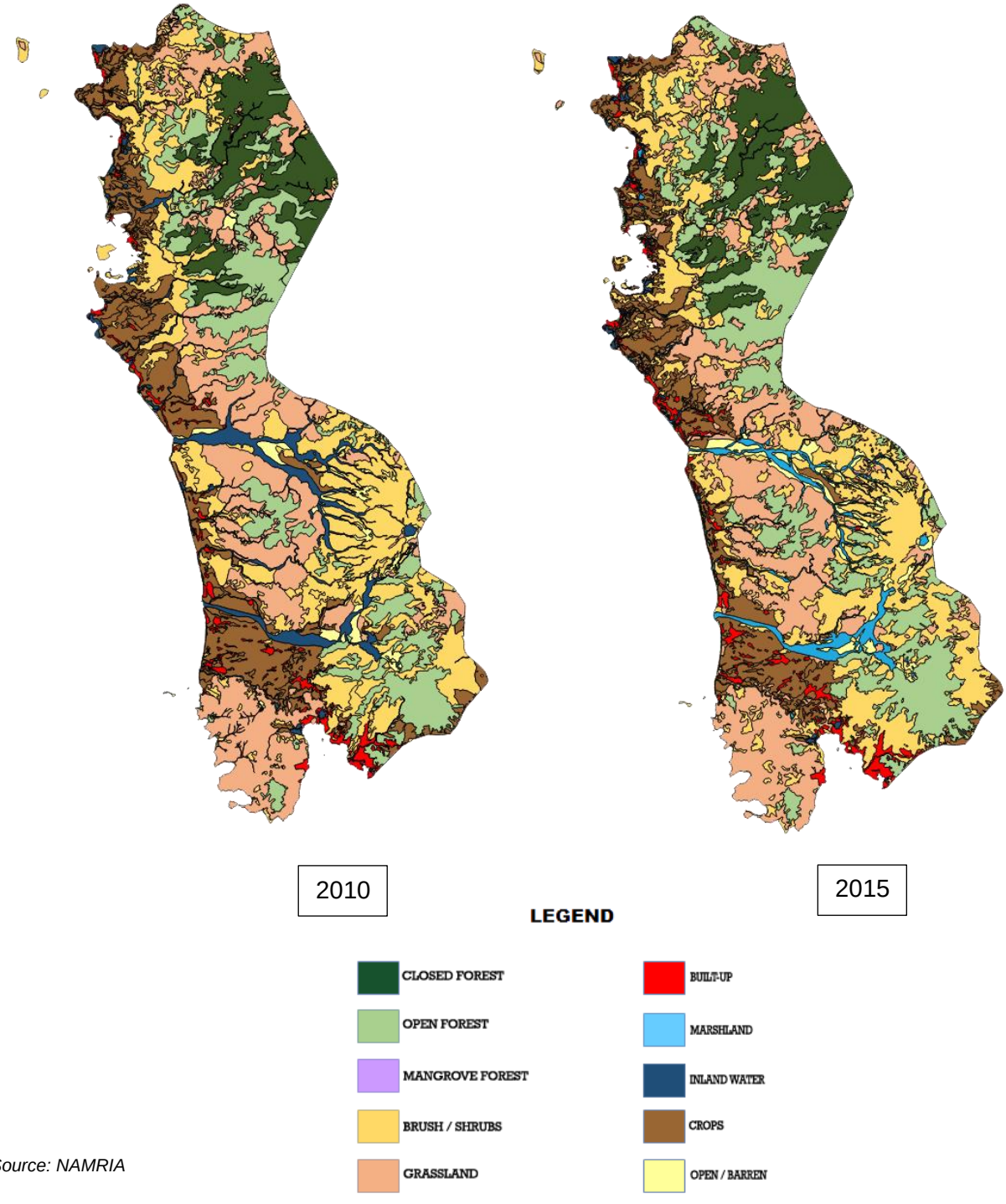


Souce: NAMRIA

Land Cover Images of Zambales Province

Some inland water bodies in Zambales were converted to croplands in 2015. Just like in other provinces, some brush/shrublands were changed to grasslands. In addition, area covered by mangroves and open/barren lands also increased from 2010 to 2015. (Figure 12)

Figure 12. Land Cover Images of Zambales: 2010 and 2015



Source: NAMRIA

About 52,951 ha of open forests were converted into closed forests in 2015

The land cover change matrix shows the detailed changes on the land cover by land classification. Row entries represent the amount of reduction to stock for the land classification in the row header while the column entries symbolize the addition to stock for the land classification in the column header. The values on the diagonal entries (highlighted in gray) signify the unconverted lands.

A reduction of 38,341 ha was listed for closed forest as some closed forests were converted to open forests in 2015 whereas, 52,951 ha of open forests were converted into closed forests in 2015. In addition, 20,546 ha of open forests were converted to brush/shrublands in 2015. On the other hand, 40,419 ha of brush/shrublands were developed into open forests in 2015. Likewise, brush/shrublands were also converted to annual and perennial croplands equivalent to 11,093 ha and 21,383 ha, respectively. Moreover, 10,637 ha of annual croplands and 22,811 ha of perennial croplands were converted into brush/shrublands in 2015. In the same manner, 12,929 ha of annual croplands and 7,987 ha of perennial croplands were also converted into grasslands. (Table 11)

Furthermore, 37,153 ha of annual croplands were converted into perennial croplands and 32,369 ha into built-up lands in 2015. Perennial croplands recorded a decrease of 12,329 ha which were converted into annual croplands in 2015. Moreover, 523 ha of marshlands/swamps were developed into mangrove forests in 2015. (Table 11)

Table 11. Land Cover Change Matrix by Classification, Central Luzon: 2010 and 2015
(In Hectare)

LAND COVER CLASSIFICATION (2010)	LAND COVER CLASSIFICATION (2015)						
	Closed Forest	Open Forest	Mangrove Forest	Brush/ Shrubs	Grassland	Annual Crop	Perennial Crop
Closed Forest	177,708	38,341	0	2,648	618	212	4,897
Open Forest	52,951	210,795	5	20,546	4,234	369	3,634
Mangrove Forest	-	-	510	17	0	37	286
Brush/Shrubs	2,076	40,419	71	243,817	44,577	11,093	21,383
Grassland	766	6,042	8	27,926	119,268	3,551	3,850
Annual Crop	43	592	185	10,637	12,929	621,277	37,153
Perennial Crop	245	1,910	279	22,811	7,987	12,329	54,112
Open/Barren	65	324	17	1,502	1,239	495	407
Built-up	25	139	40	1,089	899	19,306	3,944
Marshland/Swamp	-	-	14	-	8	699	0
Fishpond	-	-	523	40	180	2,267	158
Inland Water	907	1,031	112	2,536	2,577	4,674	912
No Data	53	234	136	409	254	70	568
TOTAL	234,839	299,826	1,900	333,977	194,769	676,379	131,305

Source: NAMRIA

Table 11. Land Cover Change Matrix by Classification, Central Luzon: 2010 and 2015
(In Hectare) concluded

LAND COVER CLASSIFICATION (2010)	LAND COVER CLASSIFICATION (2015)						TOTAL
	Open/ Barren	Built-up	Marshland/ Swamp	Fishpond	Inland Water	No Data	
Closed Forest	208	77	-	-	575	68	225,352
Open Forest	377	288	-	-	1,071	62	294,332
Mangrove Forest	0	44	-	39	32	56	1,021
Brush/Shrubs	2,246	1,463	8	29	2,904	146	370,230
Grassland	1,017	899	1	15	1,087	100	164,529
Annual Crop	1,997	32,369	1,461	4,748	6,021	10	729,421
Perennial Crop	568	4,075	-	68	994	77	105,455
Open/Barren	5,220	151	0	21	1,976	290	11,706
Built-up	258	76,192	43	844	988	96	103,861
Marshland/Swamp	-	9	91	271	38	-	1,129
Fishpond	108	1,426	179	54,393	1,783	457	61,513
Inland Water	8,215	867	11	1,214	23,986	97	47,140
No Data	534	337	-	132	138	-	2,867
TOTAL	20,748	118,196	1,794	61,774	41,592	1,458	**2,118,557**

Source: NAMRIA

Annual croplands reduced by about 53,000 ha in 2015

Most of the land cover classifications increased from 2010 to 2015 except for brush/shrublands, annual croplands, and inland water bodies. Annual croplands reported the largest decrease of 53,042 hectares followed by brush/shrublands at 36,253 hectares and inland waters at 5,548 hectares decrease. (Figure 13)

As of 2015, annual croplands accounted for 31.9 percent of the total land cover of Central Luzon – the highest percent share among the land cover classifications. It was followed by brush/shrubs, open forests and closed forests with shares of 15.8 percent, 14.2 percent and 11.1 percent, respectively. Grasslands comprised 9.2 percent, perennial croplands contributed 6.2 percent and 5.6 percent for artificial surfaces. The remaining 6.0 percent was attributed by the combined share of mangrove forests, open/barren lands, marshlands/swamps, fishponds and inland water bodies. (Figure 13)

Central Luzon was able to expand its mangrove forests to 1,900 ha in 2015 from 1,021 ha in 2010 recording an increment of 878 ha. Moreover, open/barren lands listed an increase of 77.2 percent (9,041 ha) while annual croplands were reduced by 7.3 percent (53,042 ha) from 2010 to 2015. Likewise, a decrease of 11.8 percent (5,548 ha) was recorded for inland water bodies. (Table 12)

Figure 13. Percent Distribution of Land Cover Classification, Central Luzon: 2015

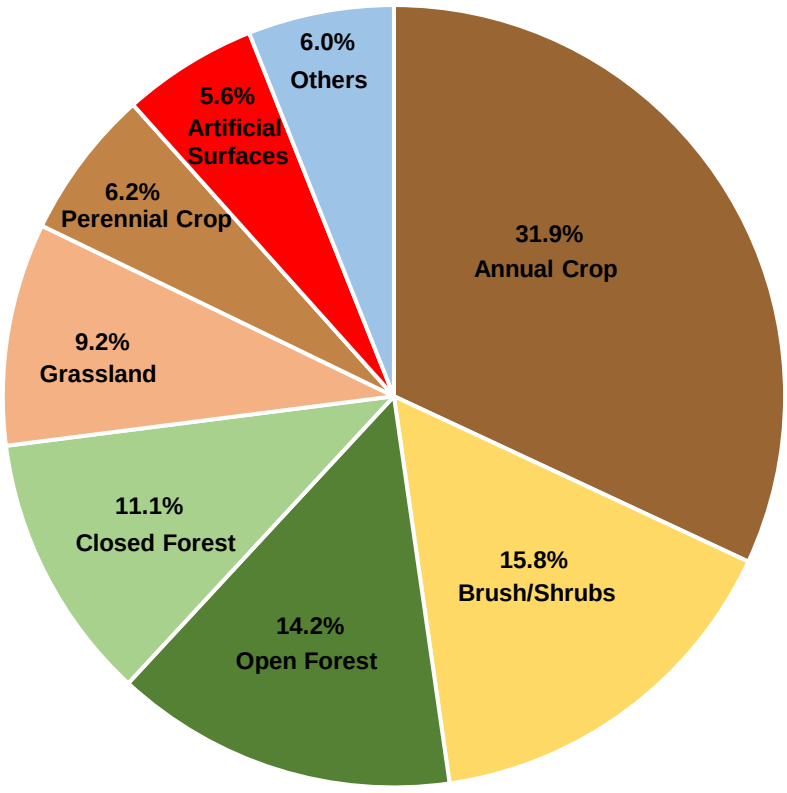


Table 12. Physical Asset Account for Land Cover, Central Luzon: 2010 to 2015
(In Hectare)

	Closed Forest	Open Forest	Mangrove Forest	Brush/ Shrubs	Grassland	Annual Crop
Opening Stock	225,352	294,332	1,021	370,230	164,529	729,421
Additions to Stock						
Managed expansion	57,132	89,032	1,389	90,160	75,501	55,102
Natural expansion						
Upward apparaisals						
Total additions to stock	57,132	89,032	1,389	90,160	75,501	55,102
Reductions to Stock						
Managed regression	47,645	83,537	511	126,413	45,261	108,144
Natural regression						
Downward reappraisals						
Total reductions to stock	47,645	83,537	511	126,413	45,261	108,144
Closing Stock	234,839	299,826	1,900	333,977	194,769	676,379
Relative change (ha)	9,487	5,495	878	-36,253	30,240	-53,042
Relative change (%)	4.2	1.9	86.0	-9.8	18.4	-7.3

Source: PSA RSSO III

Table 12. Physical Asset Account for Land Cover, Central Luzon: 2010 to 2015
(In Hectare) concluded

	Perennial Crop	Open/ Barren	Artificial Surfaces	Marsh-land/ Swamp	Fishpond	Inland Water
Opening Stock	105,455	11,706	103,861	1,129	61,513	47,140
Additions to Stock						
Managed expansion	77,193	15,527	42,005	1,703	7,381	17,606
Natural expansion						
Upward apparaisals						
Total additions to stock	77,193	15,527	42,005	1,703	7,381	17,606
Reductions to Stock						
Managed regression	51,343	6,486	27,670	1,038	7,120	23,154
Natural regression						
Downward reappraisals						
Total reductions to stock	51,343	6,486	27,670	1,038	7,120	23,154
Closing Stock	131,305	20,748	118,196	1,794	61,774	41,592
Relative change (ha)	25,850	9,041	14,335	665	261	-5,548
Relative change (%)	24.5	77.2	13.8	58.9	0.4	-11.8

Source: PSA RSSO III

Built-up areas average zonal value reached PhP 1,103.0 from PhP 444.3

Built-up area has the highest average zonal value among the types of land use. In 2015, its average zonal value was posted at PhP 1,102.97 per square meter (sq.m.) while forest, agriculture, and aquaculture were valued at PhP 71.28, PhP 69.36, and PhP 62.95 per sq.m., respectively. Built-up area was valued 15 to 17 times higher than the other types of land use. It recorded an increase of 148.2 percent in 2015 from its value of PhP 444.34 per sq.m. in 2000.

Forest land has the second highest average zonal value in 2015 at PhP 71.28 but has the lowest value of PhP 4.89 per sq.m. in 2000. This translates to a 15-fold increase from the posted value in 2000. Forest land was valued the least from year 2000 to 2009 but was at par with agricultural and aquaculture lands from 2010 to 2015. Agricultural land was priced at PhP 24.39 per sq.m. in 2000 and went up to PhP 62.77 in 2010. Aquaculture land amounted to PhP 14.55 per sq.m. in 2000 which quadrupled to PhP 57.01 per sq.m. in 2010. (Table 13)

Table 13. Regional Zonal Value Estimates, Central Luzon: 2000-2015
(In PhP per Square Meter)

Year	Agriculture	Aquaculture	Built-up	Forest
2000	24.39	14.55	444.34	4.89
2001	24.39	14.55	444.34	4.89
2002	24.39	14.55	444.34	4.89
2003	27.23	24.81	521.89	8.98
2004	27.23	24.81	521.89	8.98
2005	27.67	25.51	577.24	8.98
2006	28.68	26.52	585.77	9.72
2007	28.68	26.52	585.77	9.72
2008	30.73	27.56	679.98	12.05
2009	44.05	40.40	806.58	32.31
2010	62.77	57.01	878.53	63.52
2011	62.77	57.01	878.53	63.52
2012	62.77	57.01	878.53	63.52
2013	62.77	57.01	878.53	63.52
2014	62.77	57.01	878.53	63.52
2015	69.36	62.95	1,102.97	71.28

Source: BIR

Total land asset of Central Luzon was valued at PhP 2.31 trillion in 2015

The total land asset of Central Luzon rose to PhP 2,310.05 billion in 2015 from PhP 332.54 billion in 2000. Of the total land asset in 2015, 56.4 percent was attributed to built-up area, 24.3 percent for agriculture, 16.5 percent for forest, and 2.8 percent for aquaculture. However, some of the land classifications, namely: grassland, mangroves, shrubland, regularly flooded area and open/barren area were not valued given that no zonal value was sourced from BIR as of 2015. (Table 14)

Table 14. Value of Land by Land Use Classification, Central Luzon: 2000-2015
(In Billion PhP)

Year	Agriculture	Aquaculture	Built-up	Forest	TOTAL
2000	179.97	8.85	112.56	31.15	332.54
2001	183.91	9.48	130.95	30.83	355.16
2002	187.42	10.12	151.90	30.43	379.87
2003	212.73	18.37	206.44	54.94	492.49
2004	215.88	19.52	238.37	53.98	527.75
2005	222.22	21.28	303.74	52.92	600.16
2006	232.84	23.41	354.41	56.06	666.71
2007	235.02	24.72	406.76	54.76	721.25
2008	253.73	27.08	540.96	66.21	887.98
2009	366.03	41.79	733.82	172.81	1,314.45
2010	524.02	61.94	912.45	330.08	1,828.49
2011	520.93	61.42	937.80	332.47	1,852.61
2012	517.46	60.83	962.74	334.49	1,875.53
2013	513.98	60.22	987.84	336.36	1,898.41
2014	510.48	59.59	1,013.08	338.07	1,921.20
2015	560.23	65.07	1,303.67	381.09	2,310.05

Source: PSA RSSO III

The total value of land in the province of Tarlac increased by 484.7 percent

As seen from Table 15, Aurora's estimated total land value increased by 32.4 percent or PhP 5.50 billion from 2010 to 2015. In 2015, built-up area in the province was valued at PhP 17.20 billion, PhP 5.19 billion for agricultural land, and PhP 126.11 million for aquaculture land. However, no zonal value was indicated for forest land.

Bataan's total land asset was posted at PhP 79.98 billion in 2010 and rose to PhP 197.81 billion in 2015. Majority or 74.6 percent of land value was contributed by built-up areas followed by agricultural land with 14.6 percent. (Table 15)

The estimated total value of land in Bulacan decreased from PhP 812.46 in 2010 to PhP 792.71 billion in 2015. Nevertheless, its built-up areas amounted to PhP 418.00 billion in 2015 – the highest among the land use classifications, whereas the least was that of aquaculture reported at PhP 48.53 billion.

The estimated total value of land in Nueva Ecija recorded PhP 6.59 billion increment from 2010 to 2015. Built-up areas amounted to PhP 151.22 billion in 2015 comprising 89.2 percent of the total land value. On the other hand, no zonal value was recorded for forest land.

Pampanga's estimated total land value increased from PhP 601.95 billion in 2010 to PhP 632.66 billion in 2015. The total value of its agricultural lands went down by PhP 12.57 billion while its built-up area rose by PhP 41.29 billion.

An upsurge of PhP 133.99 billion was reported for the total land value of Tarlac from 2010 to 2015 which was brought about by the updating of zonal values. Hence, the total amount of its land rose by 177.0 percent for agriculture, 94.3 percent for aquaculture, and 674.2 percent for built-up area. However, no zonal value was recorded for forest land.

The total land value of Zambales increased by PhP 16.65 billion from year 2010 to 2015. The total value of agricultural and aquaculture lands decreased by 16.4 percent and 23.0 percent, respectively. On the other hand, 27.7 percent increment was recorded for built-up area and 8.1 percent for forest land. (Table 15)

Table 15. Value of Land by Land Use Classification and Province, Central Luzon: 2010, 2015 *(In PhP)*

Region/Province Land Use Classification	Year		Percent Change
	2010	2015	
Aurora			
Agriculture	3,550,137,252	5,189,368,634	
Aquaculture	116,032,000	126,108,972	
Built-up	13,344,421,657	17,198,690,497	
Forest	--	--	
TOTAL	17,010,590,909	22,514,168,103	32.4%
Bataan			
Agriculture	9,937,927,025	28,884,977,746	
Aquaculture	4,088,205,479	6,157,991,628	
Built-up	61,832,642,193	147,578,377,683	
Forest	4,121,924,078	15,189,164,758	
TOTAL	79,980,698,776	197,810,511,814	147.3%
Bulacan			
Agriculture	278,318,633,014	226,894,316,180	
Aquaculture	48,323,840,571	48,533,600,447	
Built-up	393,558,733,072	418,003,157,531	
Forest	92,262,362,439	99,283,696,737	
TOTAL	812,463,569,097	792,714,770,894	-2.4%
Nueva Ecija			
Agriculture	17,517,570,813	17,328,375,792	
Aquaculture	1,044,103,778	917,162,246	
Built-up	144,310,000,742	151,219,802,000	
Forest	--	--	
TOTAL	162,871,675,333	169,465,340,038	4.0%
Pampanga			
Agriculture	152,476,107,412	139,907,708,679	
Aquaculture	42,757,896,134	44,895,833,896	
Built-up	401,202,026,042	442,494,596,720	
Forest	5,516,608,070	5,361,475,786	
TOTAL	601,952,637,659	632,659,615,081	5.1%
Tarlac			
Agriculture	9,912,668,133	27,454,037,069	
Aquaculture	533,470,000	1,036,694,337	
Built-up	17,196,978,961	133,140,986,292	
Forest	--	--	
TOTAL	27,643,117,095	161,631,717,698	484.7%
Zambales			
Agriculture	11,067,508,779	9,257,150,076	
Aquaculture	3,190,640,690	2,458,365,614	
Built-up	66,438,310,048	84,856,748,244	
Forest	9,486,869,185	10,257,650,225	
TOTAL	90,183,328,702	106,829,914,159	18.5%

Note: -- no zonal value available
Source: PSA RSSO III

Total value of built-up areas increased by 42.9 percent in 2015

Central Luzon Monetary Asset Account for Land Cover table shows that built-up areas have the highest value among the land use type in 2010 amounting to PhP 912.45 billion while the lowest was that of land used for aquaculture at PhP 61.94 billion. The total value of land in Central Luzon in 2010 was posted at PhP 1,828.49 billion. With regards to changes in stock, built-up areas recorded the highest change of 42.9 percent from 2010 to 2015 equivalent to PhP 463.30 billion additions to stock and PhP 305.19 billion reductions in stock.

On the other hand, the lowest change was that of land use for aquaculture registered at 5.1 percent attributed by PhP 15.73 billion additions to stock and PhP 19.06 billion reductions in stock. Moreover, revaluations were also taken into account wherein the highest amount was that of the built-up areas amounting to PhP 233.11 billion, while the lowest revaluation was posted at PhP 6.46 billion for land use for aquaculture. The total revaluation from 2010 to 2015 was recorded at PhP 315.33 billion. The total relative change – considering both additions and reductions to stock and revaluations, was registered at PhP 481.56 billion.

The total value of land in Central Luzon in 2015 was estimated at PhP 2,310.05 billion. Built-up area has the highest contribution of 56.4 percent (PhP 1, 303.67 billion) followed by agricultural land with 24.3 percent (PhP 560.23 billion). Land use for forestry and aquaculture constituted 16.5 percent and 2.8 percent, respectively. (Table 16)

Table 16. Monetary Asset Account for Land Cover, Central Luzon: 2010 to 2015
(In Billion PhP)

	Types of Land Use				Total
	Agriculture	**Forestry**	**Land use for aqua-culture**	**Use of built-up and related areas**	
Opening value of stock of land	524.02	330.08	61.94	912.45	1,828.49
Additions to stock					
Acquisition of land	91.76	104.18	15.3	463.30	675.97
Reclassifications					
Total additions to stock	91.76	104.18	15.73	463.30	675.97
Reductions in stock					
Disposal of land	90.99	93.50	19.06	305.19	508.74
Reclassifications					
Total reductions of stock	90.99	93.50	19.06	305.19	508.74
Revaluation	35.43	40.33	6.46	233.11	315.33
Closing value of stock of land	560.23	381.09	65.07	1,303.67	2,310.05
Relative change (PhP)	36.21	51.00	3.13	391.22	481.56
Relative change (%)	6.9	15.5	5.1	42.9	26.3

Note: No available land value for the following land classification:
Land use for maintenance and restoration of environmental functions
Other uses of land n.e.c.
Land not in use
Inland water
Source: PSA RSSO III

Chapter 5

CONCLUSION AND RECOMMENDATIONS

Conclusion

Central Luzon land cover estimates notably increased from 2000 to 2015. Upward trends were observed in the land cover estimates of mangrove forest, perennial crop, built-up area, and marshland. On the other hand, closed and open forest, barren land, and grassland showed decreasing trends from 2000 to 2010 but eventually exhibited increasing trends from 2011 to 2015. Moreover, other wooded land and inland water body increased from 2000 to 2010 but decreased from 2011 to 2015. Meanwhile annual crop displayed a downward trend from 2010 to 2015.

Nine (9) out of 12 land classifications in the physical asset account for land cover increased from year 2010 to 2015. The changes in the land cover classification from 2010 to 2015 are as follows:

- Annual crops had the largest portion of land cover in Central Luzon at 31.9 percent share. It decreased by 7.3 percent from the 2010 land cover estimates of 729,421 ha to 676,379 ha in 2015.
- Brush/Shrublands decreased by 9.8 percent from 2010 to 2015 but still contributed the second largest portion of land cover in the region.
- Forest cover (closed, open, and mangrove forest) comprised more than one fourth (25.3 %) of the total land cover in the region. Open forest and closed forest constituted 14.2 percent and 11.1 percent to the total land cover, respectively, while mangrove forest had only 0.1 percent share. From 2010 to 2015, forest cover increased by 15,860 ha from 520,705 ha to 536,565 ha.
- Grassland's total land cover in 2015 was reported at 194,769 ha, it increased by 18.4 percent from 164,529 ha in 2010.
- Total land cover of perennial crops increased by 24.5 percent or an equivalent of 25,850 ha in 2015 compared with the 2010 estimate of 105,455 ha.
- Artificial surface or built-up area expanded from 103,861 ha in 2010 to 118,196 ha in 2015. It contributed 5.6 percent to the total land cover of the region.

- Fishpond area in the region slightly grew by 261 ha in 2015 from 2010 land cover area of 61,513 ha. On the other hand, inland water bodies decreased by 11.8 percent from 47,140 in 2010 to 41,592 ha in 2015. Fishpond and inland waters contributed 2.9 percent and 2.0 percent, respectively to the total land cover of Central Luzon.
- Open/barren lands posted an increase of 77.2 percent or an additional 9,041 ha from the 11,706 ha in 2010. Likewise, marshland/swamps grew by 58.9 percent from 1,129 ha in 2010 to 1,794 ha in 2015.

The overall land value of Central Luzon increased by 26.3 percent from PhP 1,828.49 billion in 2010 to PhP 2,310.05 billion in 2015. Built-up area accounted more than half (56.5 %) of the total value of land in Central Luzon in 2015, valued at PhP 1,303.67 billion. The total value of agricultural lands was estimated at PhP 560.23 billion, contributing 24.2 percent to the total land value of the region. Forestry and aquaculture were valued at PhP 381.09 billion and PhP 65.07 billion, respectively.

Recommendations

To further improve the land asset accounts of Central Luzon the following are hereby recommended:

- Environmental account compilers should have continuous coordination with the data providers and help them improve their data management. A databank for the environmental statistics may help the compilers to have updated and consolidated data that are readily available;
- Harmonization of concepts and definitions used to ensure the comparability of the data from different sources;
- Derivation of monetary value for none zonal value land classification to provide a more comprehensive monetary asset account;
- Actual land use classification in valuing land may be more appropriate than land cover classification;
- Comparative analysis of Land Valuation between Zonal Value and Fair Market Value;
- Inclusive compilation of data on natural expansion and regression and upward/downward reappraisal;
- Conduct of ground validation with DENR, and
- Annual updating of the land physical and monetary asset accounts.

GLOSSARY OF TERMS

Agriculture refers to land under temporary crops, land under temporary meadows and pastures, land with temporary fallow, land under permanent crops, land under permanent meadows and pastures, and land under protective cover.

Aquaculture refers to land used for aquaculture facilities and fish-farming activities.

Artificial Surfaces refers to any type of areas with a predominant artificial surface. It includes any urban or related feature, industrial areas, waste dump deposit and extraction sit.

Built-up refers to land affected or adapted by man, under buildings, roads, mines and quarries and any other facilities, including their auxiliary spaces, deliberately installed for the pursuit of human activities.

Forestry refers to land used for forestry (forestland and other wooded land). Excludes land that is predominantly under agricultural or urban use.

Grassland is any geographical area dominated by natural herbaceous plants (grasslands, prairies, steppes and savannahs) with a cover of 10% or more.

Herbaceous crops refer to non-perennial crops that do not last for more than two growing seasons, where the upper part of the plant is regularly harvested while the root system can remain for at least one year.

Inland water bodies includes any area covered for most of the year by inland water bodies.

Land is a unique environmental asset that delineates the space in which economic activities and environmental processes take place and within which environmental assets and economic assets are located.

Land Cover refers to the observed physical and biological cover of the Earth's surface and includes natural vegetation and abiotic(non-living) surfaces.

Land Use reflects both (a) the activities undertaken and (b) the institutional arrangements put in place for a given area for the purposes of economic production, or the maintenance and restoration of environmental functions.

Mangroves is any geographical area dominated by woody vegetation (trees and/or shrubs) with a cover of 10% or more that is permanently or regularly flooded by salt and/or brackish water located in the coastal areas or in the deltas of rivers

Shrub-covered areas include any geographical area dominated by natural shrubs having a cover of 10% or more. It also includes shrub-covered areas permanently flooded by inland freshwater but excludes shrubs flooded by salt of brackish water in coastal areas

Shrubs and/or herbaceous vegetation, aquatic or regularly flooded refer to any geographical area dominated by natural herbaceous vegetation (cover of 10% or more) that is permanently or regularly flooded by fresh or brackish water (swamps, marsh areas, etc.) Flooding must persist for at least two months per year to be considered regular.

Terrestrial barren land is any geographical area dominated by natural abiotic surfaces (bare soil, sand, rocks, etc.), where the natural vegetation is absent or almost absent (covers less than 2%). Includes areas flooded by inland water but excludes coastal areas affected by the tidal movement.

Tree-covered areas are dominated by natural trees with cover of 10% or more. It includes areas planted with trees for afforestation purposes and forest plantations and areas seasonally or permanently flooded with freshwater but excludes coastal mangroves.

Zonal Value is the value of real properties which can more or less approximate the present fair market values of real properties as basis for computing the Property Tax (capital gains tax, documentary stamp tax, estate tax when the property is sold or transferred).

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APPENDIX A

Table 16. Provincial Zonal Value Estimates: 2010, 2015
(In PhP)

Region/Province Land Use Classification	Year	
	2010	2015
Aurora		
Agriculture	8.60	8.60
Aquaculture	4.90	4.90
Built-up	644.10	644.10
Forest	--	--
TOTAL		
Bataan		
Agriculture	18.08	53.00
Aquaculture	68.77	99.11
Built-up	903.20	1,804.90
Forest	13.04	44.08
TOTAL		
Bulacan		
Agriculture	248.40	248.40
Aquaculture	165.99	165.99
Built-up	1,484.02	1,484.02
Forest	157.12	157.12
TOTAL		
Nueva Ecija		
Agriculture	5.97	5.97
Aquaculture	9.77	9.77
Built-up	685.40	685.40
Forest	--	--
TOTAL		
Pampanga		
Agriculture	133.13	133.13
Aquaculture	125.75	125.75
Built-up	1,433.18	1,433.18
Forest	73.90	73.90
TOTAL		
Tarlac		
Agriculture	6.18	17.44
Aquaculture	7.00	18.27
Built-up	148.63	818.02
Forest	--	--
TOTAL		
Zambales		
Agriculture	19.00	19.00
Aquaculture	16.86	16.86
Built-up	851.22	851.22
Forest	10.00	10.00
TOTAL		

Note: -- no zonal value available
Source: BIR

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ANNEX A

(Excerpts from the Minutes of the Third Quarter Meeting of the RDC III Regional Statistics Committee (RSC) held on 14 August 2019 at NEDA Regional Office 3, DMGC, Maimpis, City of San Fernando, Pampanga)

RSC-III Resolution No. 04
Series of 2019

APPROVING THE CREATION OF THE CENTRAL LUZON ENVIRONMENT AND NATURAL RESOURCE ACCOUNTING STEERING COMMITTEE (CL-ENRASC)

WHEREAS, Section 6.c of RA 10625 mandates the Philippine Statistics Authority (PSA) to collect compile, analyze, abstract and publish statistical information relating to the country's economic, social, demographic, political affairs and general activities and condition of the people;

WHEREAS, Section 6.f of RA 10625 requires the PSA to collaborate with departments of the national government including GOCCs and their subsidiaries in the collection, compilation, maintenance and publication of statistical information, including special statistical data derived from the activities of those departments, corporations and their subsidiaries;

WHEREAS, PSA Board Resolution No. 4, series of 2014 established the Committees on Statistics of the PSA;

WHEREAS, one of the committees established was the Committee on Environment and Natural Resources Statistics;

WHEREAS, PSA Board Memorandum Order No. 2, series of 2014 established the Inter-Agency Committee on Environment and Natural Resources Statistics (IACENRS);

WHEREAS, the said memorandum order states therein the composition and terms of reference of the IACENRS;

WHEREAS, to answer the need for sufficient and reliable information for environmental-economic planning at all paces, the United Nation System of Environmental-Economic Accounting (SEEA) 2012 – Central Framework was formulated;

WHEREAS, to pursue the objectives of SEEA 2012 – Central Framework, PSA Regional Statistical Services Office III (RSSO III) compiles Land and Timber Accounts for Central Luzon starting July 2019;

WHEREAS, PSA RSSO III conducted a three-day Training-Workshop for identified agencies on the Physical and Monetary Asset Accounts for Land and Timber Resources of Central Luzon on the first week of July 2019;

WHEREAS, the training-workshop briefed participating agencies on the salient concepts of the System of Environmental-Economic Accounting 2012 and trained them on the compilation, estimation and analysis of data on asset accounts for land and timber resources;

WHEREAS, during the training-workshop the group identified the need for the creation of Central Luzon Environment and Natural Resource Accounting Steering Committee (CL-ENRASC);

WHEREAS, the creation and establishment of CL-ENRASC is deemed necessary particularly in enjoining the participation of all concerned agencies and institutions in the compilation and estimation of environment accounting;

WHEREAS, the CL-ENRASC will serve as venue for the discussion and resolution of issues, review and validation of outputs of the ENRA projects and recommend policies for the improvement of environment and natural resources statistics and accounting;

WHEREAS, PSA RSSO III will lead the CL-ENRASC in the compilation and estimation of the region's environment and natural resource accounting by virtue of Sec. 6 of RA 10625;

WHEREAS, the composition of the CL-ENRASC shall mirror the composition of the Subcommittee on Ecological Integrity, Clean and Healthy Environment of the Regional Planning on Economic Development for the Mid-Term Updating of the CL Regional Development Plan 2017-2022 shown on Annex R03-20190814-02 which forms an integral part of this resolution;

NOW, THEREFORE, ON A MOTION DULY SECONDED, be it

RESOLVED AS IT IS HEREBY RESOLVED, That RSC III approves the creation and establishment of the Central Luzon Environment and Natural Resource Accounting Steering Committee (CL-ENRASC); and,

RESOLVED FINALLY, That copies of this resolution be furnished to all concerned;

UNANIMOUSLY APPROVED.

Done this 14th day of August 2019, in the City of San Fernando, Pampanga.

Approved:

LEON M. DACANAY, JR.
RSC III Chairperson
(NEDA 3 Regional Director)

Attested by:

EDGARDO G. PARE
RSC III Vice-Chairperson
(PSA-RSSO 3 Regional Director)

Annex R03-20190814-02

CENTRAL LUZON ENVIRONMENT AND NATURAL RESOURCE ACCOUNTING STEERING COMMITTEE (CL-ENRASC)

Chairperson	:	Philippine Statistics Authority (PSA)
Vice-Chairperson	:	Department of Environmental and Natural Resources (DENR)
Members	:	Bureau of Soils and Water Management (BSWM) Central Luzon – League of Local Planning and Development Coordinates of the Philippines Inc. (CL-LLPDCPI) Central Luzon Bloc (CLuB)/Chief of Staff (COS) Department of the Interior and Local Government (DILG) Department of Tourism (DOT) DENR-Environmental Management Bureau (EMB) DENR-Mines and Geosciences Bureau (MGB) National Commission on Indigenous Peoples (NCIP) Pampanga River Basin Committee (PRBC) Local Government Unit (LGUs) Private Sector Representative/Civil Sector Organization (PSRs/CSOs) State Universities and Colleges/Higher Education Institutes (SUCs/HEIs)

Republic of the Philippines

Central Luzon Regional Development Council (RDC III)

(Excerpts from the Minutes of the First Quarter Meeting of the Central Luzon Regional Statistics Committee (CLRSC) held on 18 February 2021 via videoconferencing)

RSC III Resolution No. 01
Series of 2021

APPROVING AND ADOPTING THE CENTRAL LUZON LAND ASSET ACCOUNTS (CLLAA) 2000-2015

WHEREAS, Section 6.e of RA 10625 mandates the Philippine Statistics Authority (PSA) to collect, compile, analyze, abstract and publish statistical information relating to the country's economic, social, demographic, political affairs and general activities and condition of the people;

WHEREAS, Section 6.f of RA 10625 requires the PSA to collaborate with departments of the national government including GOCCs and their subsidiaries in the collection, compilation, maintenance and publication of statistical information, including special statistical data derived from the activities of those departments, corporations and their subsidiaries;

WHEREAS, PSA Board Memorandum Order No. 2, series of 2014 established the Inter-Agency Committee on Environment and Natural Resources Statistics (IACENRS);

WHEREAS, recognizing the need to create and establish a Central Luzon Environment and Natural Resource Accounting Steering Committee (CLENRASC) to 1) oversee the compilation and estimation of environment accounts; and, 2) serve as venue for discussion and resolution of issues, review current techniques/methodologies, and recommend policies towards the improvement of environment and natural resources and other related statistics, RSC III passed RSC III Resolution No. 04 series of 2019 establishing the Central Luzon Environment and Natural Resource Accounting Steering Committee (CLENRASC);

WHEREAS, PSA Regional Statistical Services Office III led the compilation of the draft Central Luzon Land Asset Account (CLLAA) for Year 2000-2015

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from July 2019 to September 2020 through a series of consultative meetings and workshops;

WHEREAS, the CLLAA contains statistics on physical and monetary asset accounts of land in the region from year 2000 to 2015 that are essential in formulating policies, programs and projects that will address the current and emerging environmental concerns in the region; and,

WHEREAS, on 10 December 2020, the CLENRASC reviewed and agreed to endorse the draft CLLAA 2000-2015 to CLRSC;

NOW THEREFORE, ON A MOTION DULY SECONDED, be it

RESOLVED AS IT IS HEREBY RESOLVED, That CLRSC approves and adopts the CLLAA 2000-2015 (Annex A);

RESOLVED FINALLY, that copies of this resolution be furnished to all concerned;

UNANIMOUSLY APPROVED;

Done this 18th day of February 2021, in the City of San Fernando, Pampanga.

Approved:

AGUSTIN C. MENDOZA
CLRSC Chairperson
OIC – Regional Director, NEDA 3

Attested by:

ARLENE M. DIVINO
CLRSC Vice-Chairperson
OIC-Regional Director, PSA-Regional Statistical Services Office 3

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ANNEX B: PHOTO GALLERY

Training on Land and Timber Asset Accounts

July 2019

PSA RSSO III conducted a three-day training-workshop which was led by OIC-ENRAD Virginia M. Bathan together with her staff. The said event was attended by selected staff from PSA RSSO III together with the representatives from DENR, DAR, NEDA and DA.

1st CL-ENRASC Consultative Meeting

September 2019

The 1st CL-ENRASC consultative meeting was attended by selected PSA staff and representatives from DA, DENR, NEDA, DILG, MGB, NCIP and Landbank. The learnings during the July 2019 training-workshop were re-echoed to the group along with the planning of the objectives and timeline of the land and timber compilation.

Consultative Meeting with NAMRIA

July 2020

The discrepancies found in NAMRIA's data concerning the summation of entries in the tables were presented. It was agreed that NAMRIA would verify the discrepancies and will send the updated file once validated.

Consultation with DENR

July 2020

PSA RSSO III visited DENR Region 3 and had a discussion. The mapping specialist of DENR 3 suggested to try using the production and protection forest map to gather more comprehensive data.

Writeshop

September 2020

A two-day writeshop was conducted wherein the draft Land Asset Account publication was prepared and assessed by the Land and Timber Asset Account team in terms of interpretation of tables and figures. The accomplished the draft report contains five chapters.

3rd CL-ENRASC Consultative Meeting

October 2020

The results of the analysis on Land Asset Accounts were presented and further approved by CL-ENRASC.

Consultative Meeting with FMB

November 2019

PSA RSSO III visited FMB Central Office for a consultative meeting on timber resources. The team also presented a brief introduction of the SEEA Framework. Vital data and reading materials on timber accounting were acquired.

2nd CL-ENRASC Consultative Meeting

November 2019

The preliminary analysis on Land Asset Accounts were presented together with the updates on the Physical Asset Account for Timber Resources both in terms of area and volume during the 2nd CL-ENRASC Consultative meeting.

Consultative Meeting with DENR and PENROs

January 2020

A consultative meeting with DENR Region 3 and its PENROs was conducted to have a common understanding on the classification of forests land. It was highlighted that not all timber resources are in the forests some could be found in other land classification.

Consultative Meeting with BIR

November 2019

A consultative meeting with BIR was conducted to inquire the process on how zonal values are formulated as it would be helpful in constructing the Physical Asset Account for Land.

Presentation of Result to DENR and NS

December 2020

OIC Divino presented the Central Luzon's Land Asset Account result to NS Mapa. The status of timber asset account was also presented which is scheduled to be published in 2021.

Presentation of Result to CL RSC

January 2021

The Land Asset Account result was presented to CL-RSC wherein the rationale, road map, methodology, summary, and way forward of the project were highlighted. Without further comments and clarifications, Central Luzon Land Asset Account was approved and adopted by the committee.

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