

CARAGA LAND AND TIMBER ASSET ACCOUNTS:
CHALLENGES AND APPROACHES
By: Rosalinda C. Apura, D.M., Melchor B. Bautista, et. al

Abstract

The Caraga Asset Accounts for Land and Timber Resources are the initial compilation following the United Nation System of Environmental-Economic Accounting (SEEA) 2012 – Central Framework. These provide statistical information that will be significant for the foundation of the region’s data bank for environmental statistics.

Land and timber accounting compiled both physical and monetary accounts using the SEEA 2012 – Central Framework. The Land Asset Accounts for Caraga covered the estimation from the period 2003 to 2015 while the Timber Asset Accounts covered the valuation from the period 2000 to 2015.

The result of the land accounting shows the total hectareage for the crop lands, the forest cover areas (for open and closed forest), the mangrove forest, the built-up areas or the artificial surface, etc. It also reveals how areas shifted from one land category or classification to another as a result of various economic development in the region.

On the other hand, timber accounting shows the area and the volume of timber resources and its monetary value throughout the accounting period. The result confirms major contribution of forest/timber production in Caraga to the country’s total timber production.

During the compilation however, several challenges were encountered by the Technical Working Group (TWG). This paper presents the different challenges and the approaches applied that made the compilation of Land and Timber Accounts in Caraga successful. This may also serve as valuable input for other regions in their journey towards environmental accounting compilation.

INTRODUCTION

The region is rich with natural resources which is considered as vast potential for eco-tourism, industrial, mining and agricultural development. Most productive agriculture areas lie along the Agusan River Basin. The river is the second longest in Mindanao and third in the country. The famous Agusan Marsh is located in Agusan del Sur. Lake Mainit is among the widest lakes in the region, located between the provinces of Agusan del Norte and Surigao del Norte. The region is considered as a “Gold Country” for its wood-based economy, extensive water resources and rich mineral deposits such as iron, gold, silver, nickel, chromite, copper and coal¹. The economy of the region keeps growing as different sectors developed. In 2018, Caraga’s economy is stimulated by the service sector with 51.1% share followed by industry with 32.7% share and agriculture, hunting, forestry and fishing with 16.2% share. But, Caraga is basically an agriculture economy with the leading agricultural commodities such as palay, hog, coconut, corn, banana, oil palm, coffee, abaca, etc., and falcata for forestry production. The labor force survey in 2018 shows, that about 34.3 percent of the employment of the region was absorbed by agricultural sector (30.6% from Agriculture, hunting and forestry and 3.7% from Fishing).

Based on the 2015 Census, the total population of the region was 2,596,709 higher by 501,342 compared with the population of 2,095,367 in 2000. It reflects an annual growth rate of 1.42 percent. The growing population and the economic development of the region led to the conversion of agricultural land and forestland that reduces the availability of land for food and timber production. The changes of land use due to deforestation, urban development and other human activities have substantial effect to the region’s economy. Thus, a necessity to monitor the impacts of land use change. This is to address and manage the negative effect on the massive extraction of our natural resources and to continue the conservation and protection of the prime lands for agriculture and forestry production in order to sustain food security and economic stability.

¹ Caraga Watch (2009). Mining Caraga, Philippines

On the early part of the project, the TWG identified the land cover to work with to help solve the problems that maybe encountered in the Timber accounting. Table 1 below is the listing of Land Cover Classification identified by the technical working group composed of PSA, DENR, DA, DAR, PCA, PhilFIDA, NIA, BSWM and NEDA.

Table 1: TWG Listing of Land Cover Classification	
1	Closed Forest
2	Open Forest
3	Mangrove Forest
4	Plantation Forest
5	Built-up Areas
6	Annual Crop
7	Perennial Crop
8	Barren Land
9	Grassland
10	Fallow
11	Wooden Grassland
12	Shrubs
13	Marshland/Swamp
14	Fish pond
15	Inland Water
16	Sandbars

However, the project team also made a research and presented the Land Cover Classification System (LCCS) of United Nation - Food and Agriculture Organization (UN-FAO) which is an international standard system that can be used to systematically record the biophysical characteristics of all areas of land within territory. It established an interim land cover classification comprising of 14 classes which are presented in Table 2.

Table 2. Land cover classification (Interim)	
1	Artificial Surfaces
2	Herbaceous Crops
3	Woody Crops
4	Multiple or Layered Crops
5	Grassland
6	Tree-covered areas
7	Mangroves
8	Shrub-covered areas
9	Shrubs and /or herbaceous vegetation, aquatic or regularly flooded
10	Sparsely natural vegetated areas
11	Terrestrial barren land
12	Inland water bodies
13	Coastal water bodies and inter-tidal areas
14	Permanent snow and glaciers

The DENR group presented the published Land Cover Classification used by Department of Environment and Natural Resources – National Mapping and Resource Information Authority (DENR-NAMRIA) which are presented in Table 3.

Table 3: DENR-NAMRIA: Land Cover Classification	
1	Closed Forest
2	Open Forest
3	Mangrove Forest
4	Built-up Areas
5	Annual Crop
6	Perennial Crop
7	Barren Land
8	Grassland
9	Fallow
10	Wooden Grassland
11	Shrubs
12	Marshland/Swamp
13	Fish pond
14	Inland Water

With the three tables presented, some issues and concern had been raised on the differences of concepts and the availability of data.

The project team went through the review of the SEEA2012 – Central Framework as shown in Table 4.

Table 4: SEEA2012-Central Framework	
1	Artificial Surface
2	<i>Crops</i>
3	Grassland
4	Tree-covered areas
5	Shrub-covered areas
6	Regularly flooded areas
7	Inland water bodies
8	Terrestrial barren land

Table 6. Comparison of Land Cover Classification

During the discussion, a question was raised if we can deviate from the central framework in doing the environment accounting. The group decided to deviate as long as the concept used is the same with the United Nation-Framework for the Development of Environment Statistics (UN-FDES) from which the UN-System of Environmental-Economic Accounting (UN-SEEA) had been patterned.

The project team match land cover classification of UN-SEEA2012-Central Framework versus UN-FAO Interim and UN-SEEA2012-Central Framework versus DENR-NAMRIA which are shown in Tables 5 and 6, respectively.

Table 5. Comparison of Land Cover Classification

Interim Land Cover Classification		SEEA 2012 – Central Framework	
Artificial surfaces (including urban and peri-urban areas)	Crops	Artificial surfaces	
Herbaceous crops	Grassland	Crops	
Woody crops			
Mixed Cropland			
Grassland		Grassland	
Tree-covered areas		Tree-covered areas	
Table 7a Land Covers, Caraga: 2003, 2010 and 2015 (in Hectares)			
Land Cover	2003	2010	2015
Open/Barren	64,729.7	67,117.7	75,937
Open Forest	431,831.6	558,447.3	571,786
Mangrove Forest	26,730.8	25,897.8	27,050
Inland water	23,652.2	36,161.5	41,753
Terrestrial barren land	4,001.7	21,948.0	26,697
Annual crop	201,655.6	188,098.8	159,251
Perennial crop	461,995.5	469,789.8	438,698
Fishpond	5,842.8	7,392.0	6,329

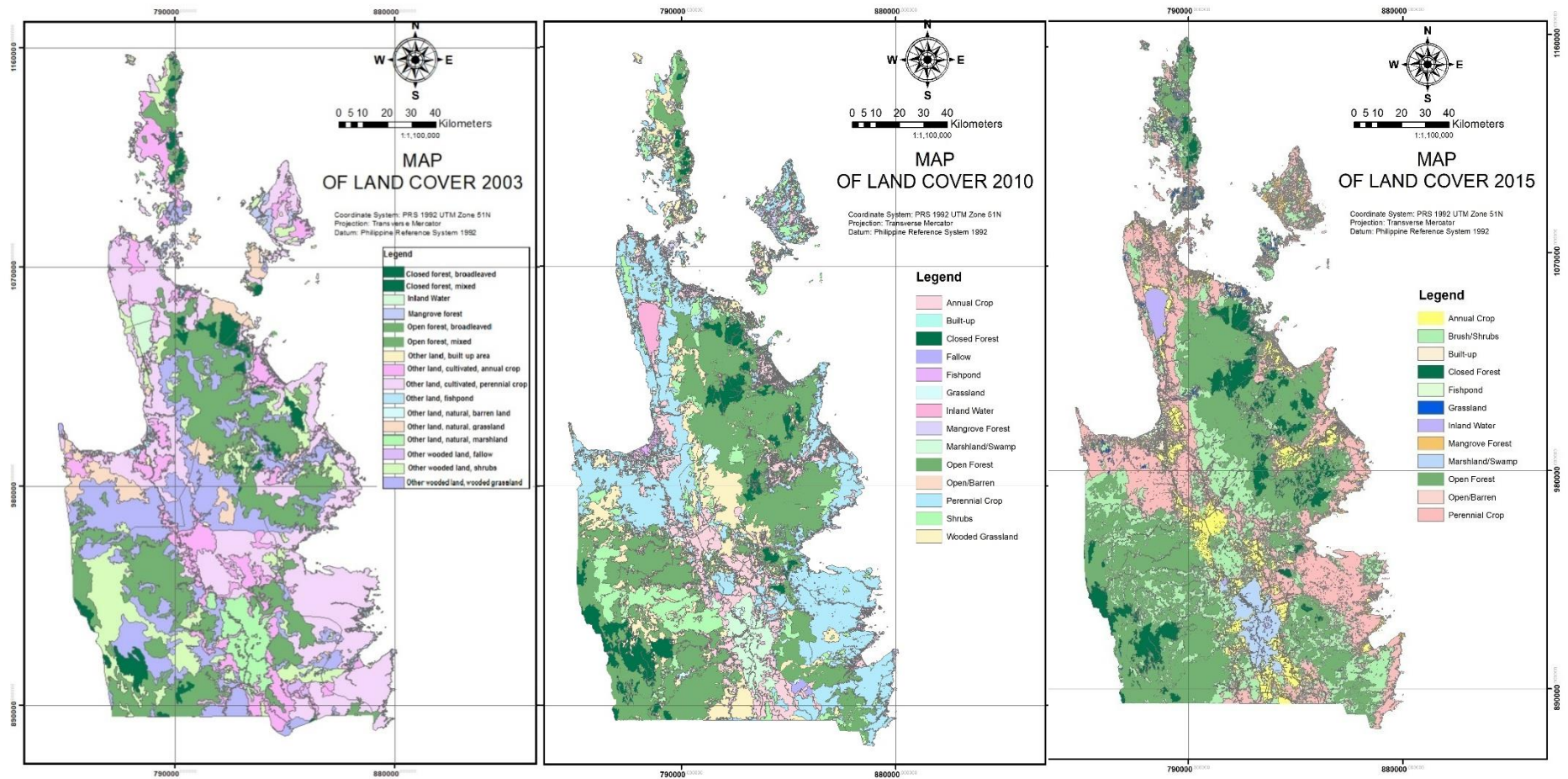
Aligning the FAO-LCCS and DENR-NAMRIA to the SEEA2012 – Central Framework Land Cover Classification gave clear direction to the compilers.

Another issue that cropped up during the compilation was the published data of DENR-NAMRIA that are shown in Table 7a below.

Open/Barren	1,243.7	5,312.8	9,703
Marshland/Swamp	55,700.6	45,269.9	44,921
Grassland	65,487.8	32,265.1	33,426
Fallow	3,484.3	3,395.8	-
Brush/Shrubs	189,988.4	193,565.7	409,313
Wooded grassland	331,146.7	208,163.8	-
Total	1,867,491	1,895,520	1,894,865

As observed, fallow and wooded grassland in 2015 was nil or zero. Aside from that, the law creating Caraga (RA No. 7901) posted the total land area at 2.1M hectares which was also reflected in other publication of PSA but the Regional Development Council (RDC) of Caraga passed a resolution on March 17, 2004 that the total land area of Caraga is 1,913,842 hectares. Compared with the DENR-NAMRIA latest figure that is shown in Table 7, the figure is lower. To address this issue, the project group drafted a letter addressed to the DENR Regional Director seeking for help. The team was advised to use the official published data as point of discussion. So, they requested for the Satellite Map Shape Files as shown in Figure 1.

Source: NAMRIA
Note: (-) Nil or zero



Source: NAMRIA

Figure 1: Land Cover Map, Caraga: 2003, 2010 and 2015

As a result of thorough study, the classification “fallow” and “wooded grassland” in 2003 and 2010 land cover was incorporated into “brush/shrubs” to align the data with the land cover of 2015, as shown in Table 7b.

Table 7b: Re-aligned Land Cover for Comparability

(Published) DENR-NAMRIA				(Re-aligned with 2015) DENR-NAMRIA			
	2003	2010	2015	2003	2010	2015	
Closed Forest	64,728.70	99,811.70	125,937.00	64,728.70	99,811.70	125,937.00	Closed Forest
Open Forest	431,831.60	558,447.30	571,786.00	431,831.60	558,447.30	571,786.00	Open Forest
Mangrove Forest	26,730.80	25,897.80	27,050.00	26,730.80	25,897.80	27,050.00	Mangrove Forest
Built-up	4,001.70	21,948.00	26,697.00	4,001.70	21,948.00	26,697.00	Built-up
Annual Crop	201,655.60	188,098.80	159,251.00	201,655.60	188,098.80	159,251.00	Annual Crop
Perennial Crop	461,995.50	469,789.80	438,698.00	461,995.50	469,789.80	438,698.00	Perennial Crop
Open/Barren	1,243.70	5,312.80	9,703.00	1,243.70	5,312.80	9,703.00	Open/Barren
Grassland	65,487.80	32,265.10	33,426.00	65,487.80	32,265.10	33,426.00	Grassland
Fallow	3,484.30	3,395.80	-	-	-	-	Fallow
Wooded Grassland	331,146.70	208,163.80	-	-	-	-	Wooded Grassland
Brush/Shrubs	189,988.40	193,565.70	409,313.00	524,619.40	405,125.30	409,313.00	Brush/Shrubs
Marshland/Swamp	55,700.60	45,269.90	44,921.00	55,700.60	45,269.90	44,921.00	Marshland/Swamp
Fishpond	5,842.80	7,392.00	6,329.00	5,842.80	7,392.00	6,329.00	Fishpond
Inland Water	23,652.20	36,161.50	41,753.00	23,652.20	36,161.50	41,753.00	Inland Water
Total	1,867,491.00	1,895,520.00	1,894,864.00	1,867,491.00	1,895,520.00	1,894,864.00	Total

For comparability across country, the final output is shown in Table 8. The project team worked on the accounting base on the table below.

Table 8: Comparison of Land Cover for Comparability

(Re-aligned with 2015) DENR-NAMRIA				SEEA 2012 - Central Framework			
	2003	2010	2015	2003	2010	2015	
Built-up	4,001.70	21,948.00	26,697.00	4,001.70	21,948.00	26,697.00	Artificial Surfaces
Annual Crop	201,655.60	188,098.80	159,251.00	663,651.10	657,888.60	597,949.00	Crops
Perennial Crop	461,995.50	469,789.80	438,698.00				
Grassland	65,487.80	32,265.10	33,426.00	65,487.80	32,265.10	33,426.00	Grassland
Closed Forest	64,728.70	99,811.70	125,937.00	523,291.10	684,156.80	724,773.00	Tree-Covered Area
Open Forest	431,831.60	558,447.30	571,786.00				
Mangrove Forest	26,730.80	25,897.80	27,050.00				
Open/Barren	1,243.70	5,312.80	9,703.00	1,243.70	5,312.80	9,703.00	Terrestrial Barren Land
Fallow	-	-	-	524,619.40	405,125.30	409,313.00	Shrub-covered Area
Wooded Grassland	-	-	-				
Brush/Shrubs	524,619.40	405,125.30	409,313.00				
Marshland/Swamp	55,700.60	45,269.90	44,921.00	55,700.60	45,269.90	44,921.00	Regularly Flooded Areas
Fishpond	5,842.80	7,392.00	6,329.00	29,495.00	43,553.50	48,082.00	Inland Water Bodies
Inland Water	23,652.20	36,161.50	41,753.00				
Total	1,867,490.40	1,895,520.00	1,894,864.00	1,867,490.40	1,895,520.00	1,894,864.00	Total

Other issues and challenges were encountered during the compilation.

For Land Accounts:

1. Identification of specific data to be gathered from DA, DENR, BSWM, PCA, PhilFIDA, DAR, and NIA.
2. Unavailable/incomplete data from agencies.
3. Alternative data in case of unrecorded data/ Alternative plan to account the data in case it is not available.
 - √ 2008 BAS – PhilRice Survey on Land Conversion
 - √ 2012 Census on Agriculture Farm Survey (2012 CAF)
 - √ 2011 Barangay Agricultural Profiling Survey (BAPS)
4. Redundancy of the collected data from various sources
 - √ PCA vs PSA or PCA vs LGU
 - √ DA/NIA vs PSA or LGU vs PSA
 - √ Cluster Program/DTI vs PSA
 - √ PhilFIDA vs PSA
5. Data verification on marshland, fallow, inland water and wooded grassland (Unprocessed from the LGU and DENR)
 - Requested for Satellite Map Shape File
6. Source of Land Cover Data (DENR-NAMRIA or DENR-FMB). What to prevail for forest land cover: NAMRIA or FMB. Aside from that, Caraga Cadastral is already finished but not officially available.
7. Difference in the classification of:
 - a. Protected areas,
 - b. forest land areas,
 - c. reclaimed areas with land title from different agencies/bureau (DENR, NCIP, DAR)
 - √ Used the NAMRIA published data and the satellite image. Also, DENR settle the issue on the differences of concepts base on UN-FDES.
8. Valuation of Land or Source of Data for the revaluation (BIR or LBP)
 - √ DEPARTMENT ORDER No. 016-2000 (EFFECTIVITY March 21, 2000) for AGUSAN del NORTE
 - √ DEPARTMENT ORDER No. 013-2015 (EFFECTIVITY April 10, 2015) for AGUSAN del NORTE
 - √ DEPARTMENT ORDER No. 84-96 (August 21, 1996) AGUSAN del SUR
 - √ DEPARTMENT ORDER No. 30-05 (EFFECTIVITY February 26, 2006) AGUSAN del SUR
 - √ DEPARTMENT ORDER No. 80 – 2015 (EFFECTIVITY October 4, 2015) for AGUSAN del SUR

- √ DEPARTMENT ORDER No. 54-95 (May 9, 1995) for SURIGAO del NORTE
- √ DEPARTMENT ORDER No. 60-02 (September 16, 2002) for SURIGAO del NORTE
- √ DEPARTMENT ORDER No. 61-2013 (EFFECTIVITY date December 25, 2013) for SURIGAO del NORTE

- √ DEPARTMENT ORDER No. 52-95 (April 27, 1995) for SURIGAO del SUR
- √ DEPARTMENT ORDER No. 20-02 (September 16, 2002) for SURIGAO del SUR.
- √ DEPARTMENT ORDER No. 30-05 (EFFECTIVITY DATE February 26, 2006) for SURIGAO del SUR
- √ DEPARTMENT ORDER No. 012-2015 (EFFECTIVITY April 10, 2015) for SURIGAO del SUR

For Timber Accounts

1. Key Concept in the Physical Asset Accounts for Forest: Closed Forest, Open Forest, Mangrove Forest, and Plantation Forest
2. Natural Expansion (How to measure or who monitors the natural expansion)
3. Definition of terms for the Physical Asset Account for Timber
 - √ Reviewed and understand the timber account concepts to establish the opening and the closing stocks to start the accounting.
4. Opening Stock for Timber – Establish the opening stock by using the data from the forest cover. Also, DENR supply the TWG with the conversion to solve the problem.
5. Source of Data for Log Production:
 - a. DENR Caraga
 - b. Philippine Forestry Statistics
 - √ The confiscation of illegal logging.
6. Conversion of Seedling Data into Hectares
 - √ The government program
 - √ The private sector program
 - √ The national Greening Program (NGP)

- 60M plus seedlings since 1995 to present (List of Government and Non-government programs – item no. 6)
7. Valuation of timber resources
 - √ due to the unavailability of the stumpage price of timber in the region, the TWG agreed to use the published timber price in the Environment and Natural Resource (ENR) Book of DENR.

Item no. 6. List of Government and Non-Government Programs from 1995 to present.

I. Government sector
A. DENR
1. Regular
Urban Forestry
Contract Reforestation
CBFM
Dipterocarp Plantation
Coastal Environmental Project
USUFRUCT
DEFPPA
Watershed Rehab
CEP
Tree Farming
Mangrove Rehabilitation
Protected Areas Rehabilitation
Regular Contract Reforestation
Agroforestry
Urban Parks
Assisted Natural Regeneration
Ecosystem Research
Rubber Plantation
Integrated Social Forestry
Congressional Initiatives
Roadside/Island Planted (KILOMETER)
2. Foreign Assisted Projects
CFP Quirino
RP German DNSIP
OECD II
WRDP-WMIC
CHARM
LIUCP
SALT
FSL II-JBIC
B. LGUs/OGAs
C. PAF II & III
II. Non-government sector
TLA
IFMA
SIFMA
TFLA
CBFMA
PLA/FLGLA
ITPLA
PRIVATE LANDS
ADOPT A MT. (Mines)
Citizenry
Others
NGP
NGP (timber+indigenous)

Policy Implication

The reconciliation of various data is relevant in the compilation of an asset account to ensure comparability and guarantees reliable statistics aligned with other countries.

Land Accounts

- 1.) The Comprehensive Land Use Plan (CLUP) until now is not yet approved. Massive conversions have been already observed.
- 2.) Many prime lands for agriculture were already converted to other land used. Majority were rice paddies area. The government is spending too much on agriculture and yet they allow land conversions, especially, irrigated areas.
- 3.) The government promoting rural development to promote equity in the distribution of descent works. Massive industrialization development has been done. As a result, the region's environmental tranquility has been destroyed.
- 4.) What really is important in spatial development: to create more job or food sufficiency?

Timber Accounts

1. Log production in the region is now produced from plantation establishment. Many agricultural areas were already planted and intercrop with falcata. Inputs were already incurred from the start of planting up to the harvesting of logs. Now, where to start the estimation for the production of logs? Policy makers should have enhanced laws concerning deregulating the planted trees/timber as for farmers to have more economic benefits.
2. With the log production activity in the region, EO 23 or the logging moratorium in natural forests must be modified and focused on strict implementation of forest protection in areas known with natural grown trees. Preventing trees not to be cut instead of confiscating logs already felled in highways or any means of transportation. Urgent need of policy to consider how forest can be better protected.
3. The account shows that it is paramount to safeguard the remaining natural forest of Caraga with the data provided that the remaining dipterocarp forest are now few to be found in some regions. Forest has the potential to provide not only timber but other ecosystem services, like eco-tourism which Caraga is gaining momentum as the next tourist destination of the country. Thus, this requires continued attention from policy makers.

CONCLUSIONS AND RECOMMENDATIONS

The operationalization of UN SEEA 2012 – Central Framework is mainly a tool that provides relevant information in the preliminary accounting of Land and Timber assets. The following are the conclusions based on the results of compilation:

Land Asset Account

The increasing trend of land conversion reflects dominant land-use from agricultural land to built-up areas. With this, the growing population and socio-economic development caused the livelihoods of the farmers to change, provide an explicit urban perspective on developing a sustainable livelihood as an alternative livelihood activity.

The land valuation tends to fluctuate but exhibit an increasing trend due to the increased price. In particular, the valuation of land draws out the contextual differences. This gives emphasis that there is greater influence of cash economy in built up areas and lower on the natural capital.

To improve the land asset accounts, its methodology and possible policy implications, the following recommendations are made;

a) The DENR, Bureau of Lands and NAMRIA to sit-down and laydown the regional/provincial/municipal/barangay boundaries in order to integrate conflicting report and make necessary solution for the following:

- Clarify the total land area to be adopted for the region. The RDC request the NAMRIA for adoption of 1,913,842 hectares, which is the result of the DENR Caraga ground survey for the political administrative boundary of the region based on 7°55" to 10°00".

- Verify with NAMRIA regarding the actual year the satellite image was taken since it has implication in terms of accounting the stocks.

b) Source agencies should improve and update databases to obtain reliable statistics of land accounting. The data should continuously be updated and record those unavailable data for more precise information of the following:

- Record the area of land conversion that monitor the changes from former land use to where and when it was converted.

- Data implying the changes in the area of grassland, shrub-covered areas, regularly flooded areas and terrestrial barren land for the comparison of the results from land cover areas.

- Availability of the updated price for land valuation that will make way to a more actual basis in determining the property's market value.

c) The National Economic and Development Authority (NEDA) to investigate the massive land conversion.

- d) The Department of Science and Technology (DOST) together with DENR to make a research on the shrinking total land area of Caraga, whether or not, it is the result of climate change or overlaying boundary problem.
- e) DOST to further study on the effect of mining industry, especially, open pit mining on the trees covered area and to the environment.
- f) DOST to study on the increasing area covered by the inland water, whether or not, is the result of faster degradation of soil surface.
- g) DOST to commission further study on the effect of faster conversion or development to the watershed areas of the region.

Timber Asset Account

- Through the years, Caraga remained its mark as the main contributor of logs in the country. With this, the region strives to sustain the abundance of its timber resources.
- The conduct of reforestation projects by both the private and the government sectors contributed to the increase of the Caraga's forest cover.

Herewith are the recommendations to further improve the accounting as follows:

- a) The gathered data for the timber asset accounting has several assumptions due to limited data reported which results to insufficient conduct of reliable statistics. With this, the filling of the data gaps should be focused during the conduct of the next accounting. The following data should be continuously updated and those unavailable data should be recorded and submitted to DENR:
 - i. Updated area reforested by both the private sector and government agencies with the corresponding volume of standing trees incorporated with the type of forest it occupies;
 - ii. Availability of the recorded data on removals and updated volume of illegally logged timber resources through the years with corresponding type of trees and value per cubic meter;
 - iii. Recorded data on "kaingin" which are known to be visible in Caraga yet no recorded data available for it; DENR must seek assistance from the Barangay Local Government Unit (BLGU) on this matter.
 - iv. Updated data on forest fire occurred both in NGP sites and other forest area;
 - v. Recorded data on timber affected by mining, natural losses and catastrophic losses to be submitted to the field offices of DENR;
 - vi. Availability of the updated price per cubic meter of logs per species with diameter size and if possible, with the cost of production area.
- b) The National Economic and Development Authority (NEDA) together with other agencies to conduct detailed study on the effect of Executive Order 23 (EO 23) also known as the logging moratorium in natural forests.

- c) NEDA, with other agencies to conduct a thorough review of National Greening Program being implemented in Caraga.
- d) The Department of Science and Technology (DOST) to further study the effects of mining industry, especially, open pit mining on the trees covered area and to the environment.
- e) NEDA to commission further study on how to combat illegal logging in Caraga.
- f) DOST to commission further study on the effect of log production to the watershed area of the region.

-END-