

*The Study on Comprehensive Disaster Prevention  
around Mayon Volcano*

**SUPPORTING REPORT (1)**

*(Part I: Master Plan)*

**IV : Land Use Planning**

**SUPPORTING REPORT (1) - IV  
LAND USE PLANNING**

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## **SUPPORTING REPORT (I) – IV**

### **LAND USE PLANNING**

#### **1. PRESENT SITUATION**

##### **1.1 Natural Feature**

###### **(1) Topographic Feature**

The Albay Province, referring to the Provincial Physical Framework Plan/Comprehensive Provincial Land Use Plan – Province of Albay 1993-2002, has a total land area of 255,257 hectares (ha), or 2,552.6km<sup>2</sup>. Oas is the largest municipality, covers 27,130ha, which is 10.63% of the provincial total, while Malilipot, the smallest, has 5,360 ha, 2.10% of the provincial total. The Study Area is 1,442.3km<sup>2</sup>, which is 51.6% of Albay Province.

The province has a total coast length of 354km, broken down as follows : eastern coastline : 153km, western coastline : 55km, Cagraray : 45km, San Miguel : 19km, Batan : 47km, and Rapu-rapu : 35km.

The Albay Province is defined by mountainous terrain and rolling plains and valleys with elevation changing from 500 to 1,000 m. Its interior plains are dissected by rivers of the Yawa, Quinale, Talisay, Cabiogan, and Nasisi, as the major ones. Several springs and creeks also abound the area which provide sources for irrigation. The area of 6km from the crater of Mayon volcano is almost all occupied by the tropical grass and wood and brushwood. The coconut field is circling over the hillside and skirts area between 6km and 10km around Mayon volcano, which is considerably fertile. The palay field surrounds that coconut area and the west part of it is stretching toward the Lake Bato, which has the lowest elevation and, is flat in this area, average 8% slope and 100m elevation. Another coconut belt is surrounding the palay field in the south area of the province, which shapes another hilly land forms toward the south. These areas have the elevation from 100 to 500 meters with a slope limit of 18%. Almost half of Albay is hilly lands.

Being indebted to the Mayon Volcano, the land of the Province of Albay, especially the Study Area, has been enriched and grown fertile. This rich land has done its favor for maintaining this area as the production land, irrigated rice/cultivated annual crops, freshwater and brackishwater fishpond, forestland used for the forestry plantation, perennial trees, vine crops and pastures. These agricultural pastoral scene are found in all the municipalities, even in Legazpi City, with the breathtaking view of Mayon Volcano in its background. Volcanic ashes and mudflows from Mt. Mayon periodically enrich the soil. The soil type varies from clay to sandy loam and silty loam.

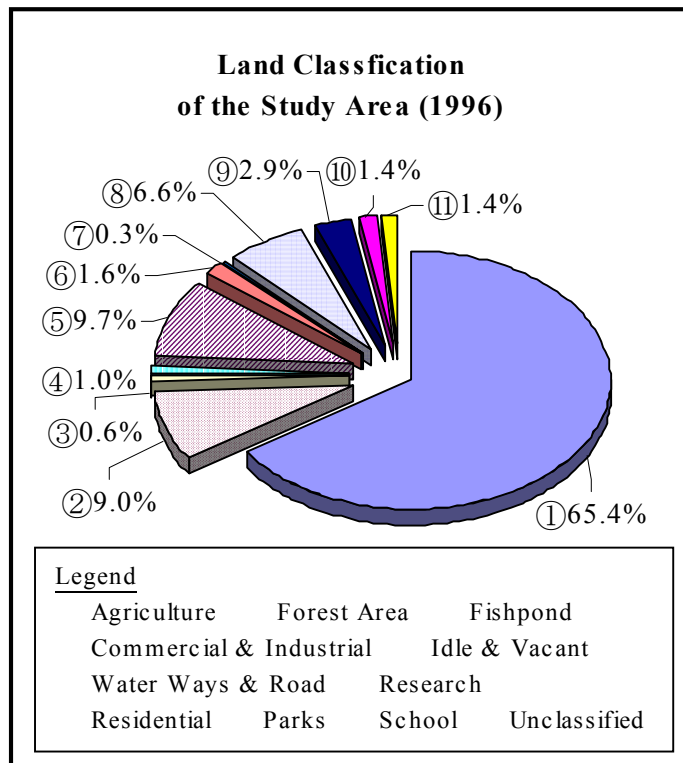
## (2) Soil and Natural Resources

Volcanic ashes and mudflows from Mayon volcano, with types varying from clay to sandy loam and silt loam, periodically enrich the soil. (Table IV 1.1)

Minerals for agricultural and non-agricultural use were found to be abundant in Albay, though the mining activities have not practically attracted much attention. (Table IV 1.2) Mining area is sparsely distributed in some parts but prevalent in Cagraray Island in the municipality of Bacacay. Bountiful source of raw construction materials was found elsewhere in the area. Limestone, marl, siliceous materials suitable for cement manufacturing are very common in Guinobatan, Pioduran, Oas, Ligao, Camalig and Jovella area. Deposits of guano at Oas, Ligao and Camalig particularly in Hoyop-Hoyopan cave and Calabidongan cave has been actively exploited for fertilizer use. Soft limestone at Guinobatan is used to correct soil acidity. Voluminous deposit of white clay used extensively in making valuable ceramics was found in the northeastern part of the province, while clay to be mostly used for industrial was found abundantly. The marble deposits in Bacacay which are estimated to last for a hundred years are being mined/extracted. However, being both a tourism and industrial zone, the extraction of marble requires a special permit. Another mineral deposit is coal. This is the first mineral resource extracted in the province specifically in Batan, Rapu-apu. In fact some areas are suffering from soil erosion because of poor land management. These resources play an important part in the development of the province and also contributes to the economic recovery if proper and wide utilization/exploitation will be employed.

Concerning the Study Area, some perlite south of City of Legazpi is the only mineral that is actively excavated. Perlite has the usage as the lightweight aggregates in concrete mix, abrasives and similar use in industry, and to improve the poor structure of clayey soils over the agricultural fields. The amount of perlite has not been surveyed precisely yet due to the lack of drilling skill. It is, however, estimated about 636,500km<sup>3</sup>.

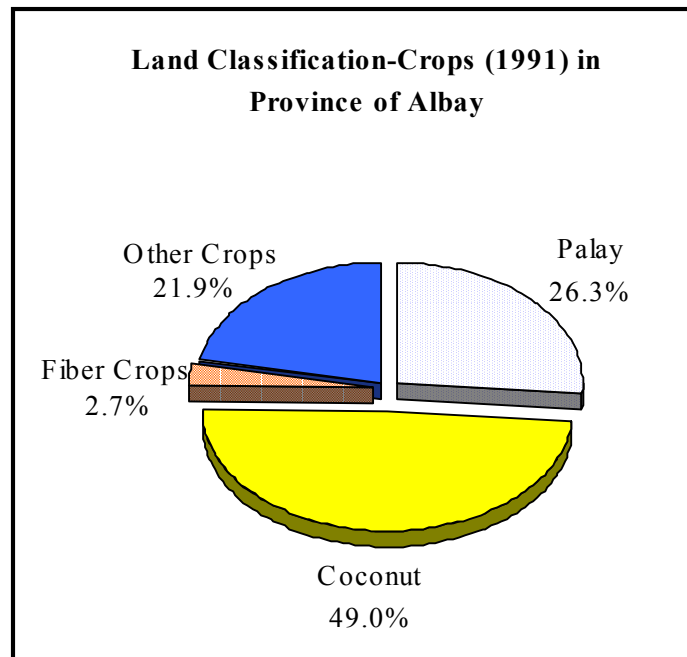
## 1.2 Current Land Use



Source: The Provincial Profile-Province of Albay 1996  
The Census of Agriculture 1991-National Statistics Office

According to the Provincial Agricultural Profile-Province of Albay 1996 and the Census of Agriculture 1991- National Statistics Office, agricultural land use is dominant in the Study Area, which is 65.4% of the total area of Province of Albay, followed by 9.7% of idle & vacant, 9.0% of forest area and 6.6% of residential.

The agricultural land in the Study Area is 65.4% out of the total area. Coconut, palay and abaca are the major products in Albay. These three crop area occupies 78.1% of the total agricultural land, which is 55.3% of the total land of Abaca. Coconut is dominant, which is 49.0% of the total agricultural land. (Table IV 1.3) The coconut fields occupy the area of the elevation from 100 to 500 meters with 18% slope a max. The coconut field is circling over the hillside and skirts area between 6km and 10km, which is considerably fertile. Another coconut belt is surrounding the palay field in the south area of the province.



Source : The Provincial Profile-Province of Albay 1996  
The Census of Agriculture 1991- National Statistics Office

Palay has the share of 26.3%. The palay field surrounds that coconut area and the west part of it is Abaca which share of 2.7%.

The abaca has its field in Municipality of Ligao and Guinobatan, Tabaco, Malinao and Sto Domingo. Domingo. Though On the GIS map abaca does not show much its land occupancy due to its character of not area consuming crop, abaca has the fairly large share of the production, 11.8% of Albay share in the whole county.

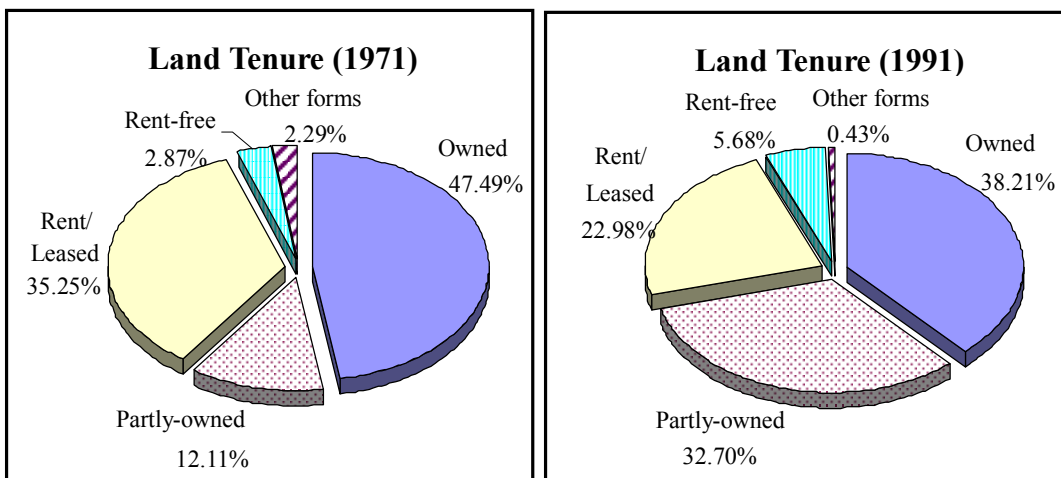
The area of 6km from the crater of Mayon volcano is almost all occupied by the tropical grass, wood and brushwood. In the Study Area, forest area has the share of 9.0%.

The share of residential area is 6.6%, spreading as the major cities in the municipalities around Mayon Volcano are being connected by the main highway, which is the lifeline in this area. Compared above, fishpond area and commercial & industrial land have the small share, which is 0.6% and 1.0%, respectively.

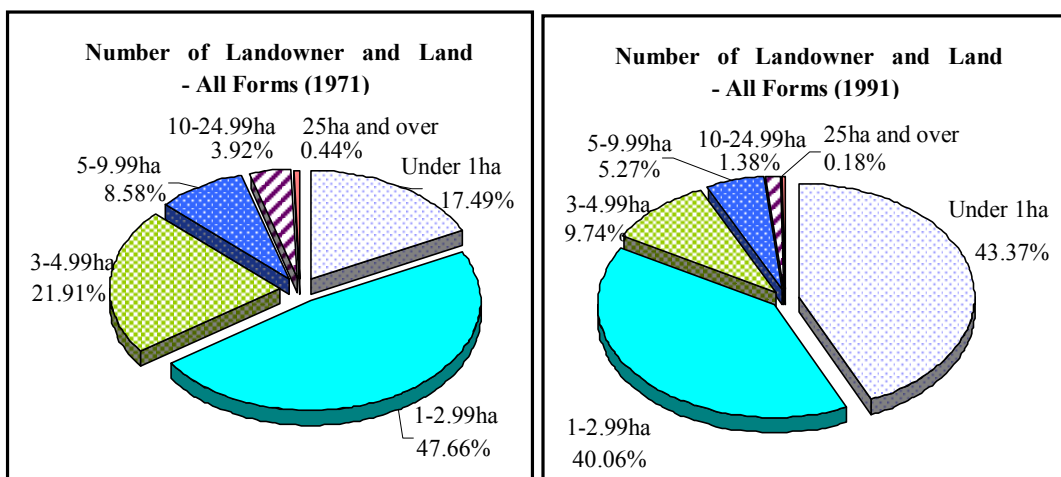
### 1.3 Land Ownership

The situation of the tenure of the farmland shows a significant change in the 20 years since 1971 according to the Census of Agriculture 1991 – National Statistics Office. As the present situation, more than 70% of the total farmland is owned or partly-owned, which was 59.60% in 1971. Compared to the land tenure in 1971, the owned shows a significant decrease, 47.49% to 38.21%. On the other hand the partly-owned has been dramatically increased, 12.11% to 32.70%. According to the Census of Agriculture 1991 – National Statistics Office, the farms partly-owned refer to farms

operated under more than one form tenure. In this situation, the rent/leased notably decreased, 32.25% to 22.98%. (Table IV 1.4)

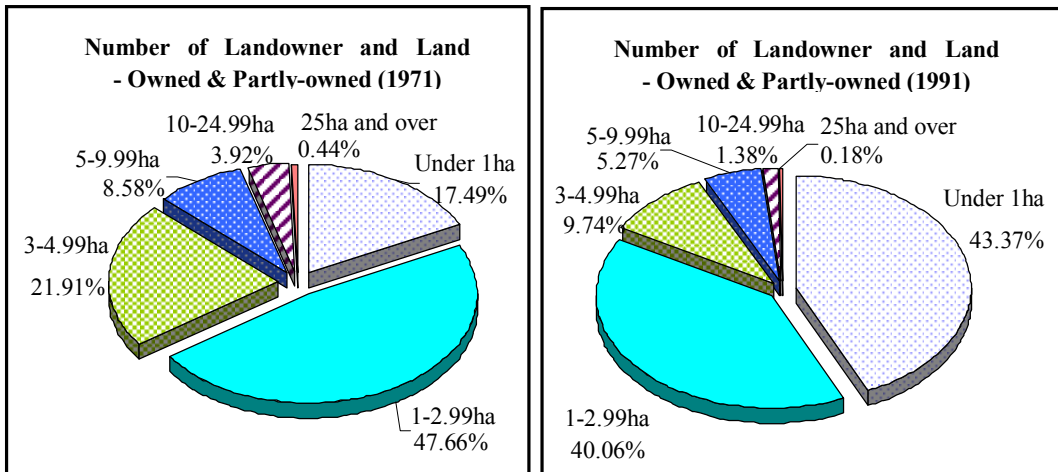


The size of the farm land occupied by each farmer in this area is relatively small in the present situation in general. As the all forms, the number of the farm lands less than 3ha occupies 82.90% in 1991, which used to be 69.66% in 1971. In 1971 the farm land which size is 1-2.99ha was dominant, with a 49.67% share, and under 1ha was 19.99%, 3-4.99ha was 19.24%. Through 1980s and 1990s, however, the portion of these figures have been changed, under 1ha became dominant, with a 43.26% share which is a 23.27% increase, and 1-2.99ha 39.63%, and 3-4.99ha showed a significant decrease, 9.85%.



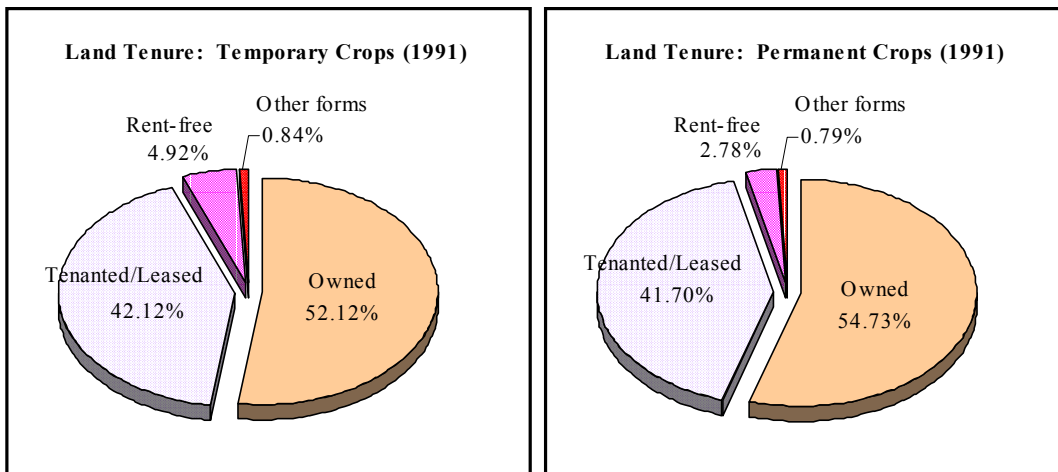
Regarding the owned and the partly-owned, which shows the significant change over the land tenure, the under 1ha shows a large increase, 17.49% to 43.37%. On the other hand the 1-2.99ha shows a slight decrease, and the 3-4.99ha shows the significant decrease, 21.91% to 9.74%.





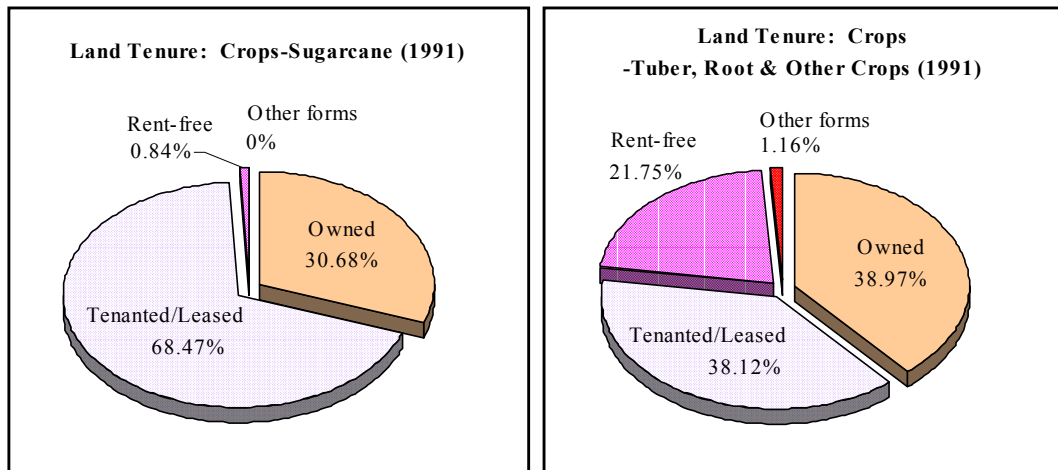
Most of these change and tendency are assumed to be the influence of the Agrarian Reform and this tendency of the land size and tenure will continue at least until 2004 which is the target year of the accomplishment of the Agrarian Reform. The total target area size to be accomplished by 2004 is 37,005ha, which is 27.49% of the total agricultural land in Albay.

Concerning crops, most kinds of crops have been cultivated in the Owned land, more than 50%. Tenant/Leased is 42%. Between Permanent Crops and Temporary Crops there is a slight deference. Permanent Crops are cultivated more in the Owned land compared the Temporary Crops. On the other hand, Temporary Crops shows higher rate on the Rent-free land than Permanent Crops (Figure IV 1.5).















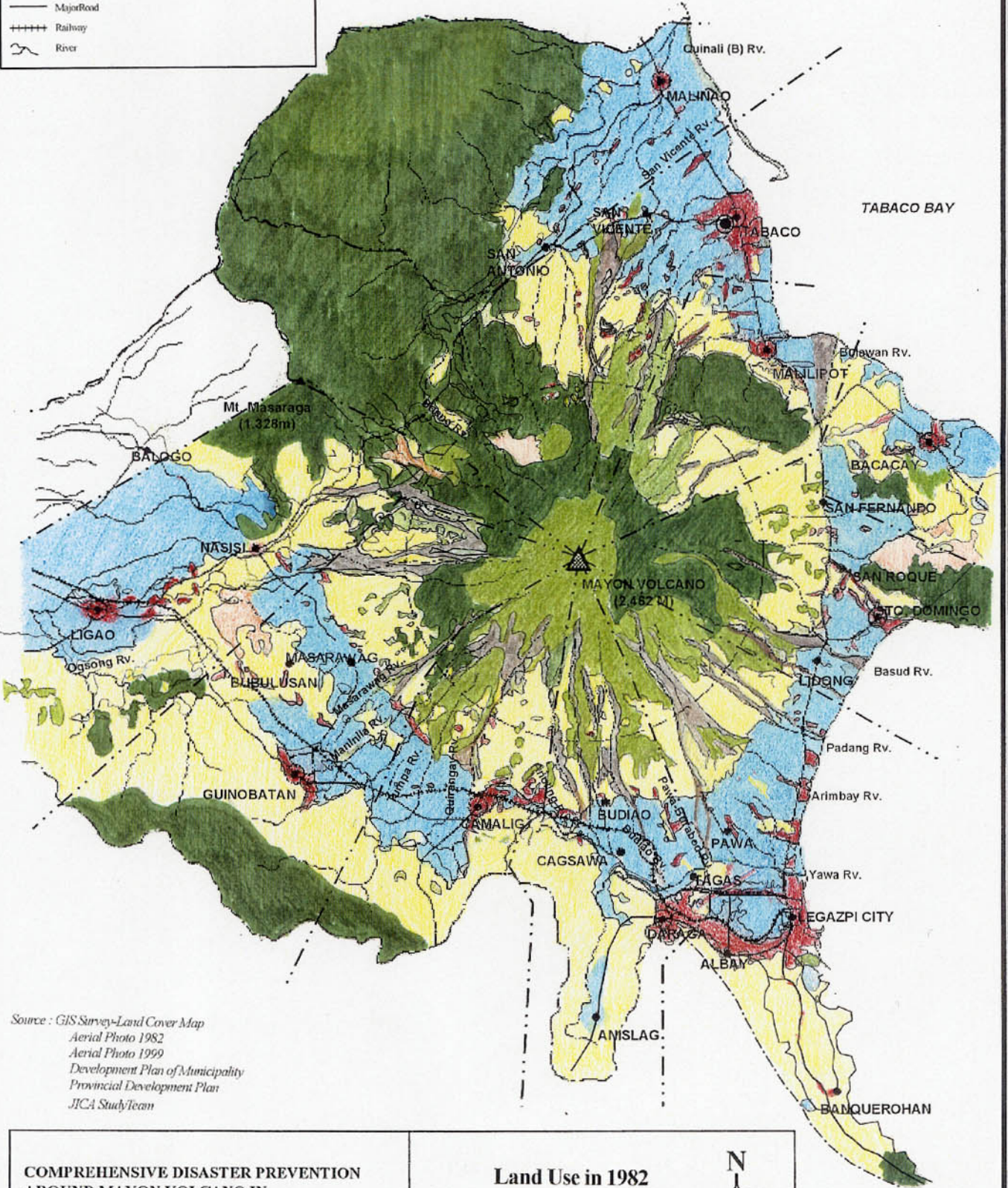
Among the permanent crops, each crop does not show much difference on the share pattern of the land tenure from the total share. However, among the temporary crops, sugarcane has the 68% share of tenant/leased, and tuber, root & other crops has the 22% share of the rent-free. Coconut, palay, and abaca (Fiber crops) show almost the same share pattern as the total of permanent crops. The concept of the rent-free is,

according to the Department of Agriculture, the illegally owned land and the rent/leased from the relatives without any charge. It is assumed that most of the illegally owned lands are situated in the danger zone and the national park, which used to be the originally owned land and has become illegal by setting up the DZ and the NIPAS.



**LEGEND:**

-  Urban Area : Residential, Industrial, Commercial, Institutional
-  Paddy
-  Intercropping : Coconut based
-  Intercropping : Abaca based
-  Bush and Grass
-  Forestry
-  Vacant Area : Lava flow, Sand & Gravel, Inundation Area
-  --- Boundary of Municipality
-  ... Boundary of PDZ
-  — Major Road
-  +++++ Railway
-  ~ River

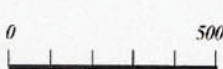


Source : GIS Survey-Land Cover Map  
 Aerial Photo 1982  
 Aerial Photo 1999  
 Development Plan of Municipality  
 Provincial Development Plan  
 JICA Study Team

**COMPREHENSIVE DISASTER PREVENTION  
 AROUND MAYON VOLCANO IN  
 THE REPUBLIC OF THE PHILIPPINES**

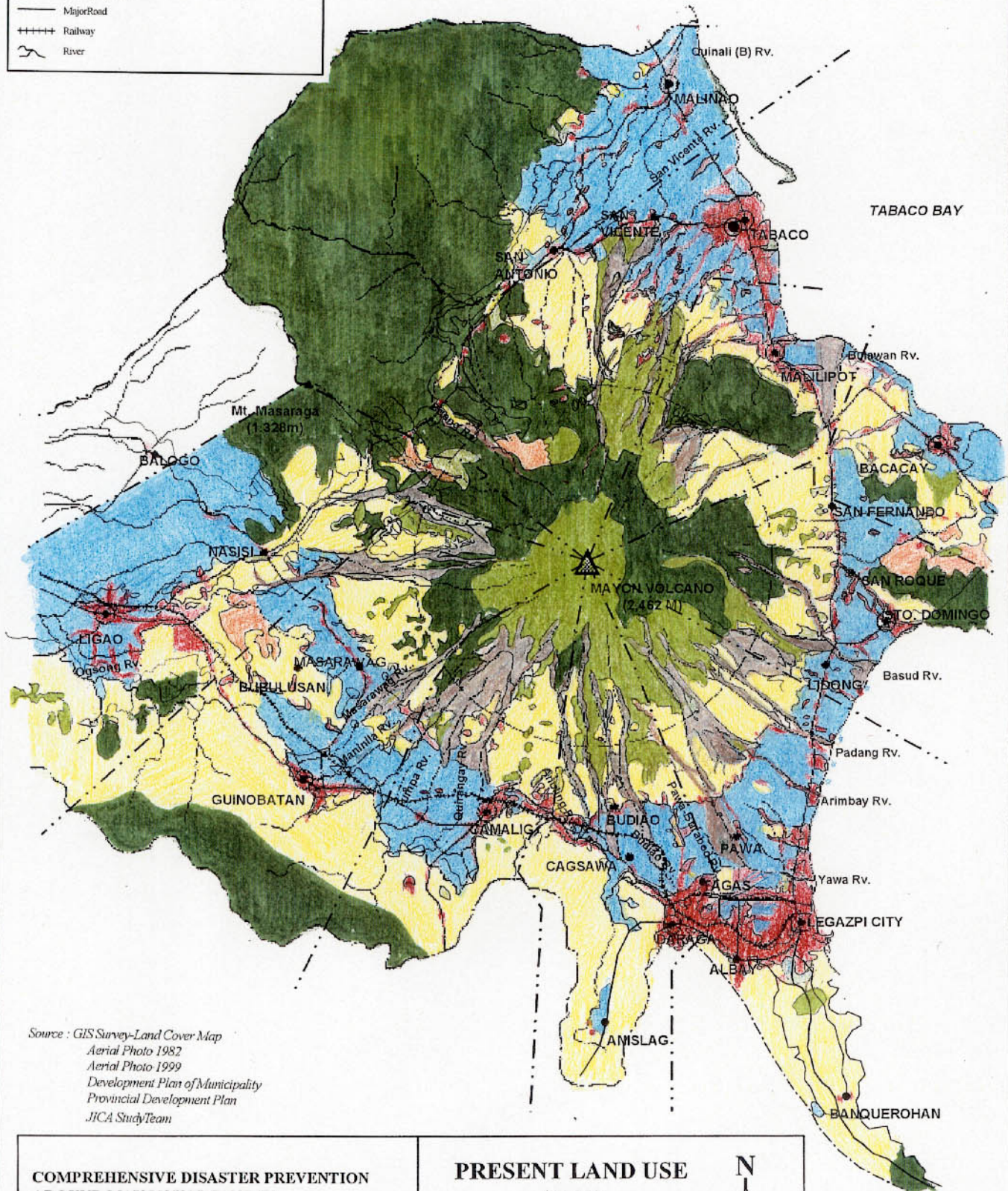
JAPAN INTERNATIONAL COOPERATION AGENCY

Land Use in 1982



**LEGEND:**

- Urban Area - Residential, Industrial, Commercial, Institutional
- Paddy
- Intercropping - Coconut based
- Intercropping - Abaca based
- Bush and Grass
- Forestry
- Vacant Area - Lava flow, Sand & Gravel, Inundation Area
- Boundary of Municipality
- Boundary of PDZ
- Major Road
- Railway
- River



Source : GIS Survey-Land Cover Map  
 Aerial Photo 1982  
 Aerial Photo 1999  
 Development Plan of Municipality  
 Provincial Development Plan  
 JICA Study Team

**COMPREHENSIVE DISASTER PREVENTION  
 AROUND MAYON VOLCANO IN  
 THE REPUBLIC OF THE PHILIPPINES**

JAPAN INTERNATIONAL COOPERATION AGENCY

**PRESENT LAND USE  
 (1999)**

0 5000m

## **1.4 Land Management**

### **1.4.1 Present Land Use Plan**

#### **(1) Province**

The Province of Albay has drawn up a Land Use Plan, which is the Provincial Physical Framework Plan (PPFP)/Comprehensive Provincial Land Use Plan 1993-2002 by Provincial Development Council.

PPFP has set the following general spatial goals related to settlements, land resources management/land use, infrastructure and other categories.

- To improve/provide access to socioeconomic opportunities and basic services.
- To ensure suitable use and development of land resources and protection of critical areas/environmental values.
- To improve/provide access to infrastructure and basic services.
- To establish the institutional capability to ensure that sectoral activities are supportive of broadly based development objectives for the province.

Specifically, to attain these goals, the province identified the following spatial objectives:

- High level of urbanization
- Increased share of employment in secondary/tertiary sectors
- Improved accessibility to major towns and cities
- Provide settlement for urban slum dwellers and settlers at high risk areas
- Minimize conversion of prime agricultural land for industrial development
- Minimize population pressure in protection land
- Maximize accessibility within development opportunity (under-used production land) production land
- Minimize accessibility within non-sustainable (over-used land) production land
- Provision of appropriate infrastructure facilities and utilities and other infra support facilities, such as:
  - a) Water Supply
  - b) Power
  - c) Hospital
  - d) Education
  - e) Recreation
  - f) Leisure
  - g) Irrigation and Flood control
- Sectoral programs support overall provincial development objectives
- Institutional capability responsive to provincial development objectives

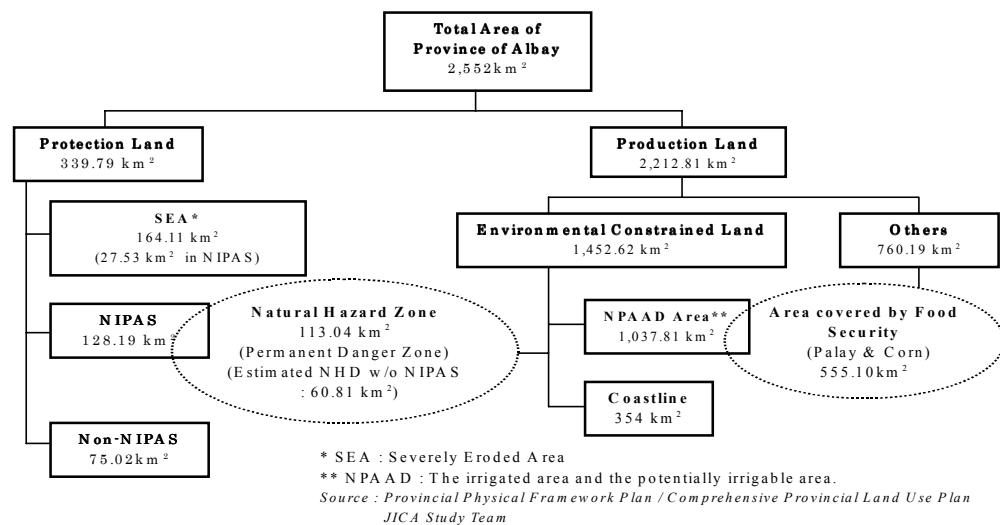
a. Goals and Objectives of the Comprehensive Provincial Land Use Plan in PFP

The goal of the Comprehensive Provincial Land Use Plan in PFP is:

- To ensure sustainable use and development of land resources and protection of critical areas/environmental values.

The objectives are:

- Minimize conversion of prime agricultural land for urban development
- Minimize population pressure on protection land
- Minimize population pressure on NS (Over-used) production lands



**Structure of Land Use Classification around Mayon Volcano  
of Comprehensive Provincial Land Use Plan by PPDO**

b. Land Use Issue to achieve the Plan

To achieve the Province-specific spatial goals and objectives, some land use issues have been defined as follows.

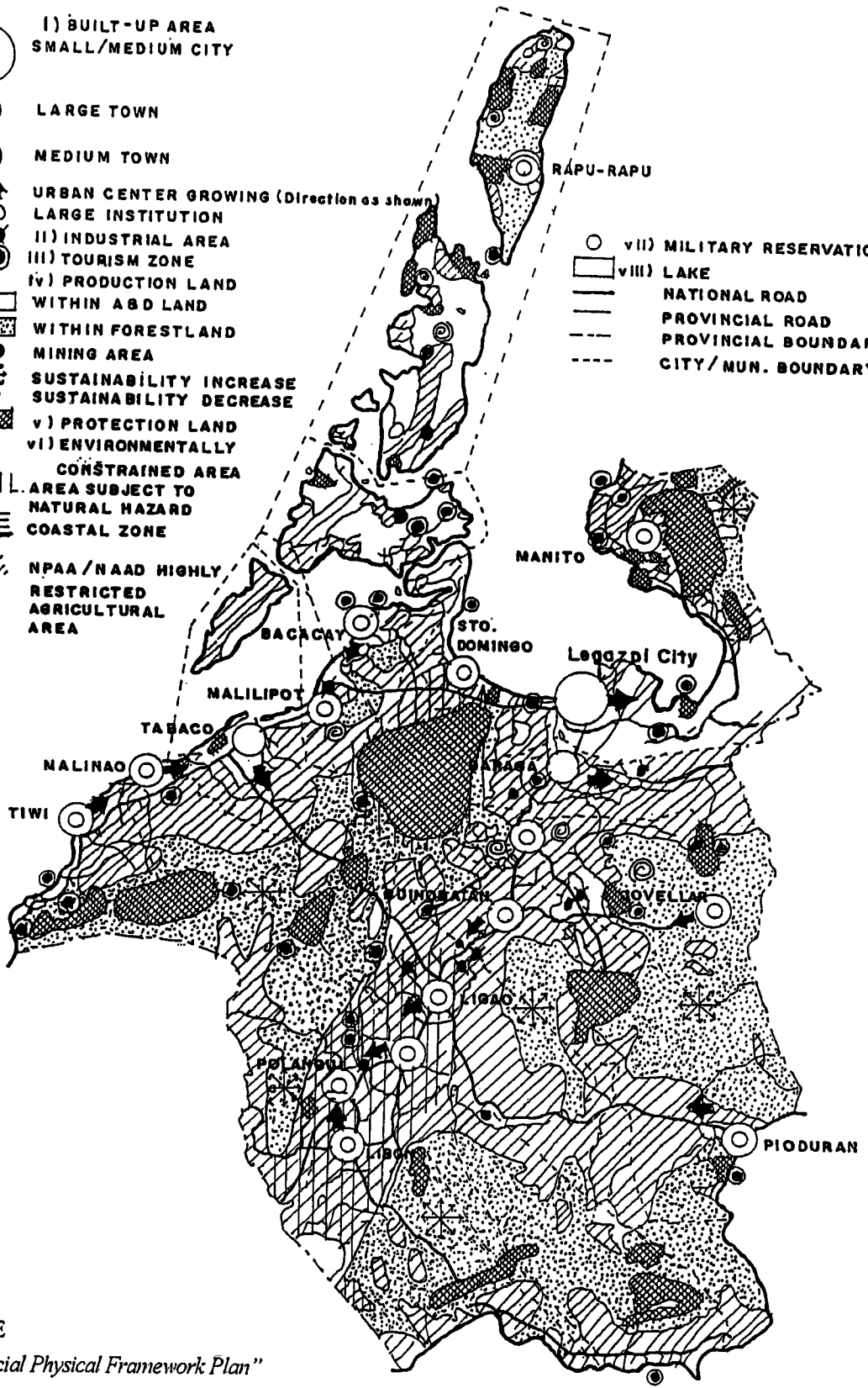
- Continuing conversion of NPAA areas for urbanization
- Settlement in protection areas and buffer zone
- Lack of forest cover in some NIPAS and non-NIPAS protection
- Utilization of some NIPAS areas for agricultural production
- Continuing human intrusion in mangrove areas
- Conflicting interest between tourism and mining in areas suitable for both industries
- Eruption of Mayon Volcano and typhoon

c. Land Use Policy

To overcome these issues and concerns on land use, the following policies are proposed for adoption in Albay.

- Encourage LGUs (Local Government Unit) to fast track the formation/revision of their Comprehensive Land Use Plan (CLUPs) in accordance with Executive Order No. 72 as well as the implementation of Urban Development Housing Act (UDHA), Republic Act 7279.
- The PGA (Provincial Government of Albay) must insure that municipalities strictly implement the CLUPs and their respective zoning ordinances.
- Assist the city and municipal LGUs in the implementation of Administrative Order No. 20 regarding the convention of land through facilitative and coordinate roles in relation to implementation agencies such as Department of Agriculture (DA), Department of Agrarian Reform, National Irrigation Administration (NIA), and Housing and Land Use Regulatory Board (HLURB).
- Provision of investment incentives in the land which has the development opportunity to limit population pressure on non-sustainable lands and protection lands (e.g.; tax holidays, low cost of lands, enhanced accessibility through opening/upgrading of roads).
- Strict implementation of laws on illegal logging/illegal cutting of trees and the laws pertaining to the protection and management of NIPAS areas.
- Encourage LGUs to continuously rehabilitate denuded forest and mangrove areas with the involvement of the private sector.

- I) BUILT-UP AREA  
SMALL/MEDIUM CITY
- LARGE TOWN
- MEDIUM TOWN
- ▲ URBAN CENTER GROWING (Direction as shown)
- LARGE INSTITUTION
- II) INDUSTRIAL AREA
- III) TOURISM ZONE
- IV) PRODUCTION LAND  
WITHIN A&D LAND
- ▨ WITHIN FORESTLAND
- MINING AREA
- ⊕ SUSTAINABILITY INCREASE
- ⊖ SUSTAINABILITY DECREASE
- ▨ v) PROTECTION LAND
- ▨ vi) ENVIRONMENTALLY  
CONSTRAINED AREA
- ▨ AREA SUBJECT TO  
NATURAL HAZARD
- ▨ COASTAL ZONE
- ▨ NPAA/NAAD HIGHLY  
RESTRICTED  
AGRICULTURAL  
AREA
- vii) MILITARY RESERVATION
- viii) LAKE
- NATIONAL ROAD
- PROVINCIAL ROAD
- - - PROVINCIAL BOUNDARY
- - - CITY/MUN. BOUNDARY



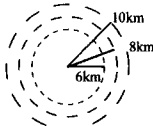
NOT TO SCALE

Source : "Provincial Physical Framework Plan"  
PPDO, Province of Albay

<p>COMPREHENSIVE DISASTER PREVENTION AROUND MAYON VOLCANO IN THE REPUBLIC OF THE PHILIPPINES</p>	<p>Land Use Plan of Province of Albay For 2002</p>
<p>JAPAN INTERNATIONAL COOPERATION AGENCY</p>	



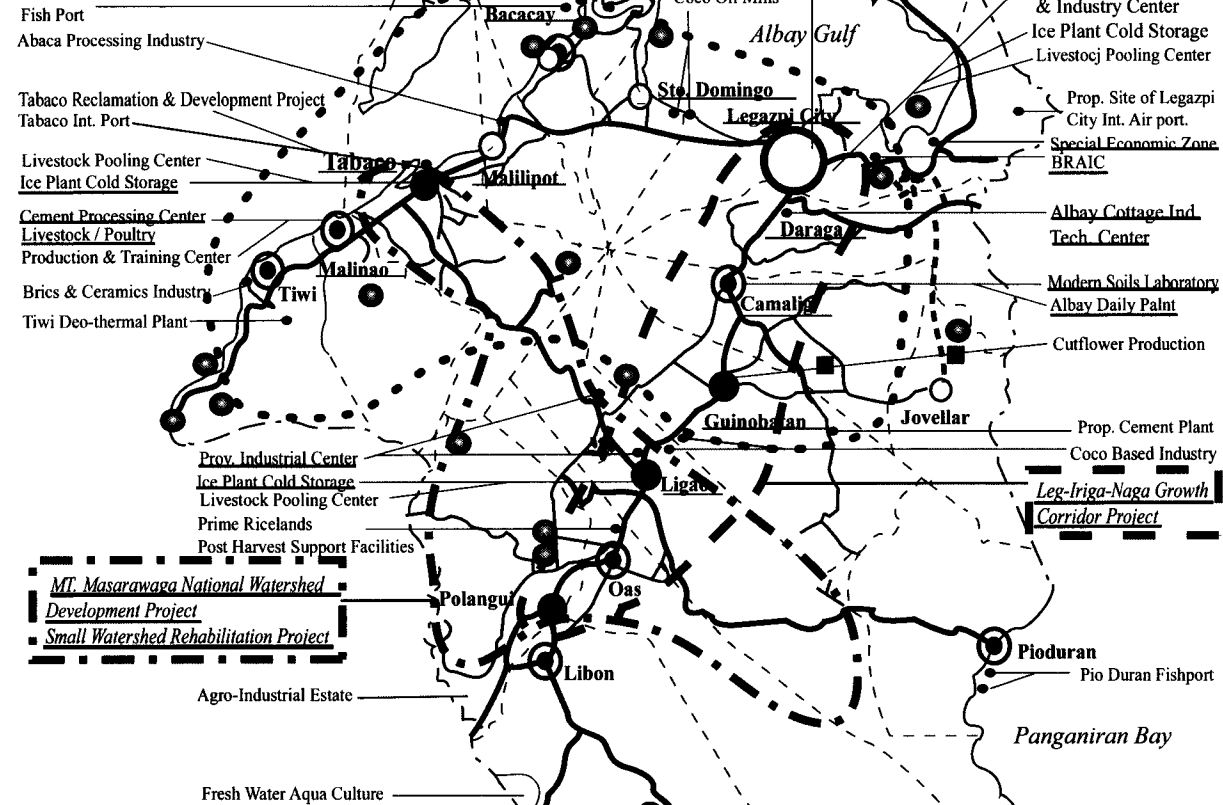
-  Provincewide Project & Plan
-  Area Development Plan & Project
-  Metro Legazpi (Legazpi City & Daraga)
-  Large Town
-  Medium Town
-  Small Town
-  Tourism Spot
-  Mining Spot



- Provincewide Project & Plan
- Natural Parks & Sanctuaries
- Manrove Rehabilitation Project
- Demo Projects on Upland Farming Technologies
- Pili Production
- Coconut Industry
- Abaca Industry

Name of the project & Plan : Project & Plan related to Land Use

-  Albay Province Core Tourism Area
-  Seaweed Industry



Source : National Mapping and Resource Information Authority, May, 1994  
 Land Management Bureau, DENR  
 Provincial Planning and Development Office, 1995  
 Bicol Socio-economic Statistics 1995, NEDA ; Bicol Strategic Plan 1999-2004  
 Albay in Figures (A Factbook), DTI, 1998

<p><b>COMPREHENSIVE DISASTER PREVENTION          AROUND MAYON VOLCANO IN          THE REPUBLIC OF THE PHILIPPINES</b></p>	<p><b>Present Development Plan &amp; Projects          related to Future Land Use</b></p>
<p><b>JAPAN INTERNATIONAL COOPERATION AGENCY</b></p>	

- Prohibit cultivation of in NIPAS areas such as at the Mayon Volcano National Park, Mt. Masaraga Watershed Forest Reserve and the Bac-Man Geothermal Reservation.
- Restrict fishpond operation in the Mangrove Forest Reserve of Manito classified as NIPAS area.
- Intensify information dissemination on appropriate technologies on hillyland farming.
- Strictly monitor the adherence of all NGA's and LGU's to the Provincial Physical Framework Plan.

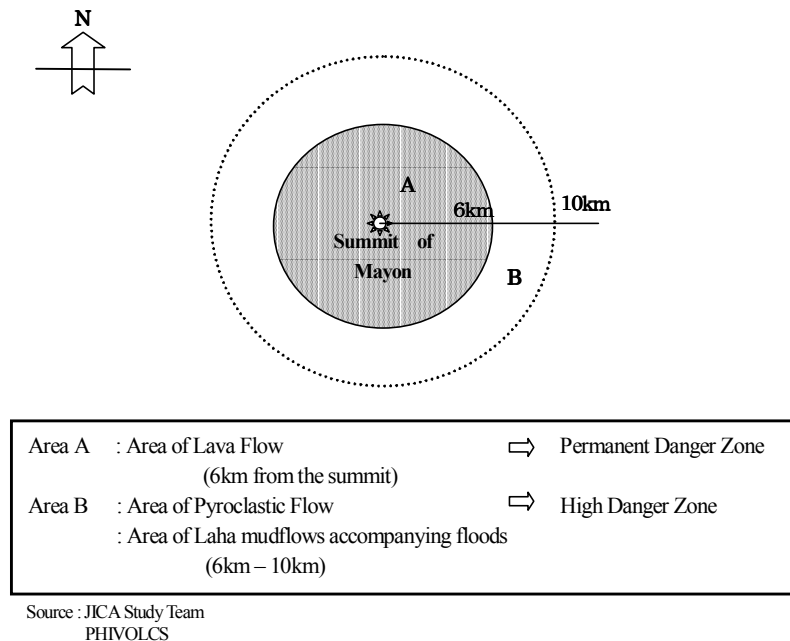
(2) Municipality

The land classification by usage and the land tenure of each municipalities are, referring to the Provincial Agricultural Profile, Province of Albay, 1996 and the Census of Agriculture 1991, National Statistics Office, as followed. (Table IV 1.6, Figure IV 1.1)

#### **1.4.2 Hazard Area by PHIVOLCS**

(1) Hazard Area by PHIVOLCS

The Permanent Danger Zone (PDZ) of Mt. Mayon defined by PHIVOLCS is the area extending 6km downward from the volcano's crater. But this is only the hazard zone pertaining to lava flow. According to PDMO the pyroclastic hazard zone, which is the outward extension of the lava flow hazard zone, extends to the seashore partially in Sto. Domingo and Legazpi City at about 12km from the summit. In addition, laha mudflows accompanying floods are expected to constitute immediate hazard as well as long-term major hazards for downstream areas located from 6 to 13km around Mt. Mayon. In these situation PDMO set up the High Danger Zone (HDZ), which is the area between 6km and 10km downward from the volcano's crater.



### Basic Idea of Zoning around Mayon Volcano by PDMO

#### (2) Residents in the Danger Zone

The residents within PDZ should be relocated to the resettlement site, however, permanent residents and agricultural activities still remain active within 6km PDZ. Also in HDZ there are 70 Barangays, 142,256 people and 26,630 household, resided. Some barangays outside of 10km HDZ have been exposed to the volcanic and natural hazard. (Table IV 1.7, 1.8)

### 1.4.3 Environmental Issue

In the Albay Province there are several considerations over the environmental issues, which are the Protection Land and the Environmentally Constrained Land. (Table IV 1.9)

#### (1) The Protection Land

The Protection Land is a portion of land and water set aside for its unique physical diversity, managed to enhance biological diversity and protected against human influence or impacts. Albay has been blessed with ecosystems featuring high level of biological diversity, and hence must be protected. The categories of protection land applicable for the province are the NIPAS, Non-NIPAS, and the areas subjected to severe erosion. According to these categories, Albay has 339.79km<sup>2</sup> of protection lands. The municipality of Malinao has the biggest share at 78.01km<sup>2</sup> followed by

Tiwi at 34.66km<sup>2</sup>. Also there are 23 barangays, 37,066 people and 6,751 household, sharing this biodiversity.

### 1) NIPAS

The National Integrated Protected Areas System (NIPAS), which was enacted into law by Republic Act 7586, provides for the classification and administration of all designated protected areas. Albay has a total of 128.19km<sup>2</sup> of protection land under NIPAS category.

#### **National Park and Reserve Area in the Protection Land under the NIPAS Act in Albay**

	Area	Municipalities
Mayon Volcano National Park (Proclamation No. 2992)	54.59km <sup>2</sup>	Tabaco, Malilipot, Sto. Domingo. Domingo, Daraga, Camalig, Guinobatan, Ligao, Legazpi City
Mt. Masaaga Watershed Forest Reserve (Proclamation No. 84)	8.10km <sup>2</sup>	Tabaco, Ligao, Oas, Polangui
The Mangrove Forest Reserve (Proclamation No 2152)	2.36km <sup>2</sup>	Manito
The old growth forests in Mt. Malinao-Tiwi and Bacon-Manito Geothermal Reservations (Proclamation No 2036)	22.10 and 19.80km <sup>2</sup>	Malinao, Tiwi, Manito

Source : Comprehensive Provincial Land Use Plan 1993-2002 by Albay Province

### 2) Non-NIPAS

The Protection lands under the Non-Nipas Law category includes second growth forest above 1,000 meter elevation or more than 50% slope sites, mangroves, buffer stripes along rivers and escarpments, freshwater swamps and marshes and lakes and other inland water bodies. In Albay, a total of 75.02km<sup>2</sup> of land area classified as protection land but not covered by the NIPAS Law. These are found in fourteen municipalities of Albay and in Legazpi City.

**The Non-NIPAS Protection Land in Albay**

	Description
Second growth forest with >50% slope and 1,000m elevation	90% forestland and 10% used for agricultural production
Buffer strips	Buffer strips in A & D (Alienable & Disposable) lands are 90% used for agriculture while buffer stripes in forestland are almost 50% intruded. The extent of misuse is, therefore, severe.
Mangrove	Most mangroves are severely degraded or cleared for fishpond operation and fuelwood gathering. Tourism development occurs within some mangrove areas.

Source: Comprehensive Provincial Land Use Plan 1993-2002 by Albay Province

3) Severely Eroded Area (SEA)

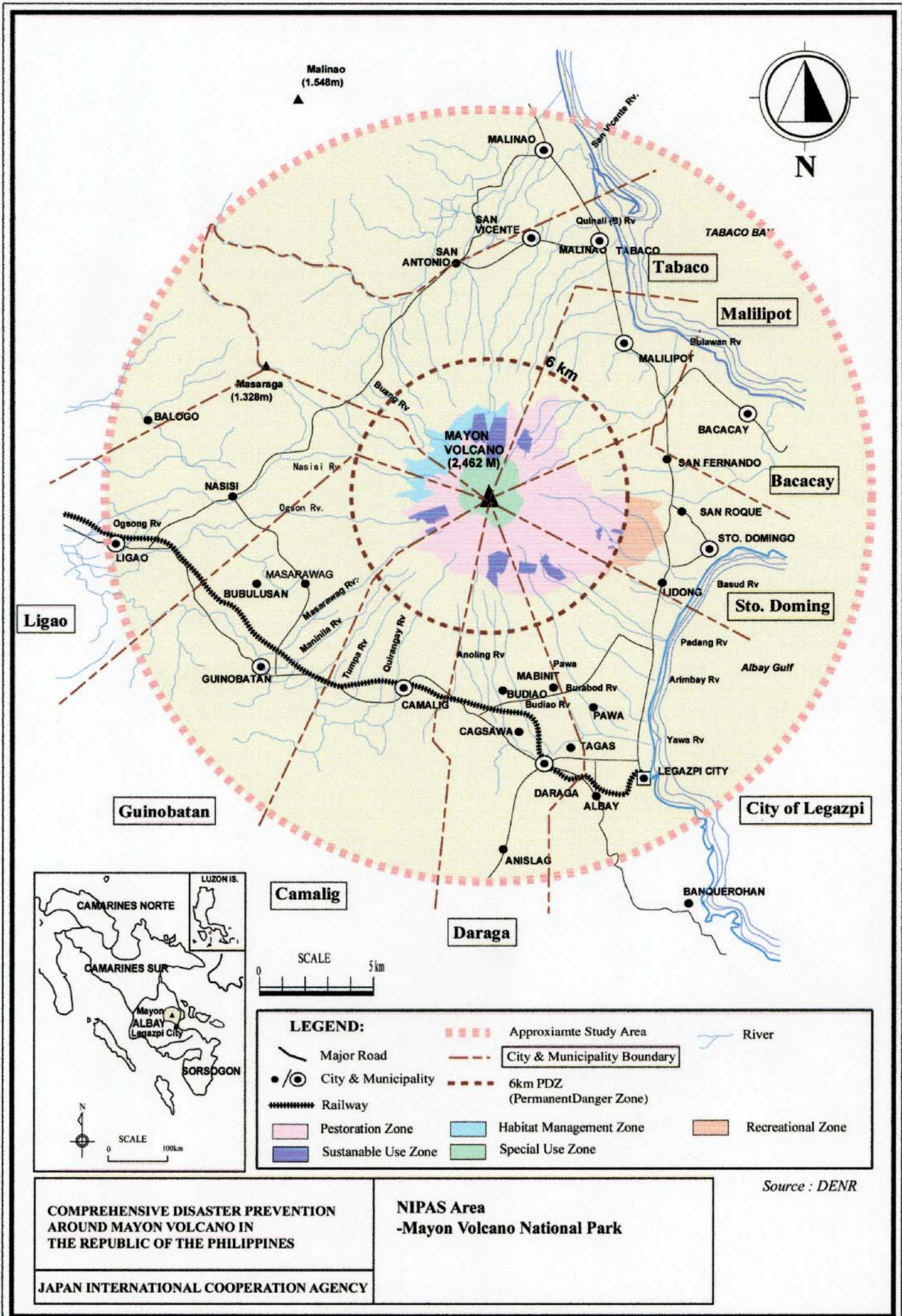
Severely Eroded Area (SEA) is a protection land needing rehabilitation. This classification includes three types of erosion, namely soil erosion, coastal erosion and river bank erosion. The total area of SEA in Albay is very alarming at 164.11km<sup>2</sup>. In this situation the area of 27.53km<sup>2</sup> is found in the NIPAS area. Immediate rehabilitation of SEA must be undertaken before damages of protection lands become irreversible.

Concerning the Study Area, the SEA outside of the area of NIPAS, which can be concerned to be the future use like the eco-tourism, is not a considerable amount. The largest is 17.75km<sup>2</sup> in Guinibatan, Legazpi City 4.32km<sup>2</sup>, Camalig 4.0km<sup>2</sup>.

*Mayon Volcano National Park*

The Mayon Volcano National Park (MVNP) is, referring to the Initial Protected Area Plan – Mayon Volcano Natural Park by DENR, 1997, the protection area, a total of 54.59km<sup>2</sup>, which situated in the Study Area, the municipalities of Tabaco, Malilipot, Sto. Domingo, Daraga, Camalig, Guinobatan, Ligao and in Legazpi City.

This park consists of scattered fertile plains and valleys with rough narrow ridges and deep ravines that serve as a passageway of mud flows during heavy rains. The park is also has many creeks and rivers, which provide water supply for all agricultural and domestic needs of the lowland area.



Concerning to the vegetation and land use, the area eventually reveals by dominating reforestation species such as Norra (*Pterocarpus indicus*), Dapdap, Anonang and other indigenous species thriving within the area. Also shrubs and herbs are dominant, such as Tree Fern, Pitcher Plant, Abaca, Rattan and Lanad-bulan. Also moss, lichena, shrubs and giant fens can be seen at lower and middle elevations.

As the planning zoning, Department of Environment and Natural Resources (DENR) divided the total area of Mayon Volcano National Park into five Different Management Zones which will delineate the area for a different management use.

*a. Restoration zone*

These refer to the denuded portions identified as domicile of wildlife species. These areas necessitate restoration. It is therefore imperative that reforestation projects must be concentrated in this area, particularly denuded portions of the Protected Area. Plantable tree species must be indigenous and are adaptable in the prevailing climate conditioning within the Protected Area.

*b. Habitat Management zone*

These zones refers to identified habitats of wildlife species where management practice are required to periodically to maintain non-climate habitat types on conditions required by rare , threatened, or endangered species.

*c. Sustainable Use zone*

The biodiversity of this area is substantial and should be consistent with the management plans and approval of Protection Area Management Board (PAMB). Indigenous Community members, tenured migrants and buffer zone residents may be allowed to collect and utilize natural resources only though the use of conventional methods following biodiversity conservation requirements. Park visitors may also be allowed the use of resources provided of limited number. No clearing, farming, settlement, commercial use or any other activities detrimental to biodiversity conservation must be undertaken.

*d. Special Use zone*

These define the special applications of the different zones with national significance at MVNP. Among the identified usage of certain portion of MVNP are :

- Monitoring : Buyuan, Legazpi City  
PHIVOLCS Monitoring Station is situated at Buyuan, Legazpi City.

Earthquakes, rumblings, associated with abnormal activity of Mayon Volcano is monitored and recorded here.

- Rosary Mountain : Buang, Tabaco  
Rosary beads, a grotto and a chapel were built on these site intended for devout Catholics who long for serenity and peace of mind.
- Recreation/Convention : Buang, Tabaco  
The Mayon Skyling Hotel is situated there. Conference, convention, seminars and recreation activities are being held.

*e. Recreational Zone*

This zone entails high recreational, tourism, educational or environmental awareness value where sustainable eco-tourism, recreation, conservation, education or public awareness activities may be allowed. Although Mayon Volcano Natural Park does not offer waterfalls and lakes like in other protected areas, the scenic and panoramic view of Mayon Volcano itself is a refreshing on the slope quite accessible to visiting tourist.

*f. Buffer zone*

This zone must be established in order to ensure the full protection of the wilderness areas where endangered species of flora and fauna are allowed to multiply freely. This can be located within or outside the park. This will serve as social fence of “shocked absorber” of all pressures that may be caused by all human intervention.

In MVNP, the proposed buffer zone is the lands inside the 6-km radius danger zone and outside the Protection Area boundary.

The ecological significance of the presence of diverse biological resources of the park will certainly help the awareness and recognition of the importance of protecting and maintaining its ecological and aesthetics values among visitor and barangays which share the protection area.

(2) The Environmentally Constrained Land

The environmentally constrained areas in Albay include the areas subject to natural hazard, the coastal zones, and the Network of Protected Areas of Agricultural Development (NPAAD). Though endowed with rich natural resources, it is a setback for Albay to be situated in the typhoon belt of the country. The province experiences an average of four cyclones annually, ranging from topical depressions of typhoons. Another kind of weather-related hazard is severe flooding which is being experienced in the NPAA areas (irrigated riceland) of Ligao, Oas, Polangui and Libon. Severe



seasonal flooding reaches a depth of 1.0 to 3.0 meters and recedes in a week to one month.

Under the Network of Protected Areas of Agricultural Development (NPAAD), some agricultural lands are “protected” against any forms of irreversible development such as urban use. The main purpose of such protection is to keep and preserve the highly suitable agricultural lands of the long-term food security of the province and the nation as well. A large part of Albay, 1,037.81sq.km or 40% of its total area is suitable for NPAA category. It consists mostly of irrigated and potentially irrigated lands.

#### **1.4.4 Agricultural Category**

##### **(1) Agrarian Reform**

The DAR has adopted and institutionalized the strategy of building viable Agrarian Reform Communities (ARCs) to support the national government’s thrust of redistributing agricultural land ownership based on cultivation and development the countryside to alleviate rural poverty. In Albay 15 ARCs were launched from 1993 to 1996. These ARCs are home to 2,801 AR beneficiaries. One of these is a municipal ARC covering 13 rural barangays, another is a cluster of two barangay and twelve are single-barangay ARCs. The land distribution target area of the Agrarian Reform remains 370.05km<sup>2</sup> more until 2004, which is 23.37% of the total agricultural land in Albay Province. Concerning the land distribution, there is supposed to be no change, but the land tenure. It is considered that the number of landowners is increasing and the area size of the one farmland is getting small over the land of 23.37% of the total agricultural land until 2004.

##### **(2) NPAAD and Food Security Plan**

Although the agricultural sector is a major sector of economy in Albay, the province has low self sufficiency. According to the Provincial Food Security Plan 1999-2002, the self-sufficiency level of the Province of Albay is 44.60% on average. Also, more than 80% of the farm families are classified in the low 30% income bracket. Therefore, it is the one of the urgent issues for the province to achieve the self-sufficiency level at least and improve the living standard of farmers (Table IV 1.10).

### Self Sufficiency Level in Province of Albay in 1998

Commodity	Sufficiency Level (%)
Rice	43.65
White Corn	0.38
Root crop/Tuber	34.92
Vegetables	36.68
Fruit	32.44
Chicken Meat	11.00
Egg(Layers)	41.00
Beef	106.00
Carabeef	67.00
Pork	57.00
Fish	61.50

Source "Provincial Food Security Plan 1999-2002",  
Province of Albay

Under the Network of Protected Areas of Agricultural Development (NPAAD) and Provincial Food Security Plan (1999-2002), some agricultural lands are "protected" against any forms of irreversible development such as urban use. The main purpose of such protection is to keep and preserve the highly suitable agricultural lands of the long-term food security of the province and the nation as well. A large part of Albay, 1,037.81km<sup>2</sup> or 40% of its total area is suitable for NPAAD category. It consists of irrigated and potentially irrigable lands. The area for Provincial Food security is considered as the field of rice and corn, which is 555.09km<sup>2</sup>.

#### (3) Irrigation Project

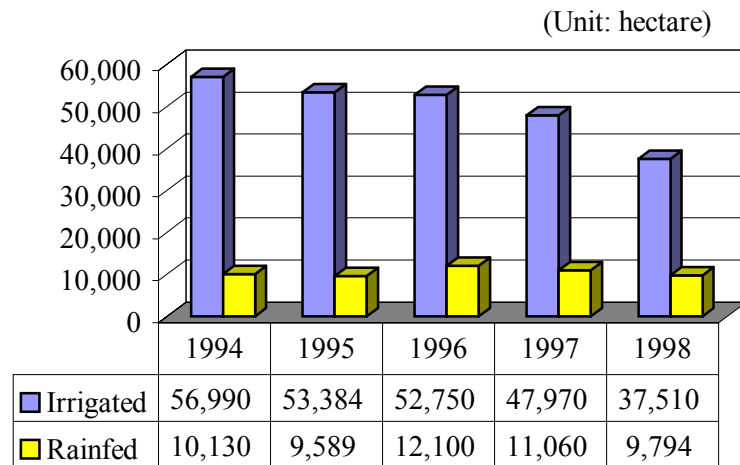
According to NIA and "Provincial Food Security Plan (1999-2002)", the province has a total potential irrigation area of 50,046ha in 1996. The existing system has a service area of 23,741ha and has a potential area of 26,305ha for development. The province assumed that increasing the irrigation service area and grain recovery, the province will attain self sufficiency and moreover experience a surplus of 48,797.48 metric tons of milled rice if the existing irrigation system will be increased by 10,926ha.

#### 1.4.5 Land Conversion

Some agricultural lands are "protected" against any forms of irreversible development such as urban use. According to the "Revised Rule and Regulations on the Conversion of Agricultural Lands to Non-Agricultural Uses, 1999", the criteria of the land which can be subject to the land conversion is as follows.

- a. Not the irrigated area.
- b. Not the Protected Area - NIPAS. (described in Master Plan)
- c. Not classified as the Agricultural Land in the LGU's land use plan<sup>1</sup>.

Land conversion is a typical issue of the agricultural area close to urban area. According to the Provincial Food Security Plan 1999-2002, the latest official data shows that out of the province's total agricultural land of 156,277.00ha, 0.18% or 292.31ha were already converted to other uses such as commercial, residential and industrial areas in a month. Such percentage tends to increase with the growing population. This urbanization is invading mostly the paddy area. (Refer to the Land Use Map in 1982 and 1999 )



Source: Province of Albay

**Palay: Area Harvested by type of farm, Province of Albay (ha)**

<Procedure>

There are three measures to acquire the land. Also under the administrative procedure through DENR there are five procedures.

- a. Legal procedure through the court.
- b. Agrarian Reform by DAR.
- c. Administrative procedure through DENR.
  - Free Patent
  - Homestead
  - Sales
  - Lease

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<sup>1</sup> 500m from the National Rd. can not be classified as Agricultural Land.

(1) Legal procedure through the court.

This is the common procedure in accordance with the related law through the court, which is supposed to be handled by the official lawyer.

(2) Agrarian Reform by DAR.

Refer to 1.4.4. (1).

(3) Administrative procedure through DENR.

1) Free Patent

Free Patent Applications are filed for agricultural lands of the public domain which have been continuously occupied and cultivated by himself or through his predecessors-in-interest, or prior to the proclamation of the related law and regulations.

2) Homestead

Homestead Applications are filed for agricultural lands of the public domain where the entry of the applicants is approved/confirmed through the issuance of orders of approval. Applicants are required to accomplish and file the final proof after the expiration of one year from the date of the approval. A homestead patent is issued after the applicant has satisfactorily complied with the residence and cultivation requirements of the law.

3) Sales

Miscellaneous Sales Application are covering lands of the public domain to be utilized for residential, commercial or industrial or other productive purposes other than agricultural disposable.

4) Lease

- Lease Application : No regulation about the usage.
- Foreshore Lease Application (FLA)

Foreshore land is the space alternately covered and uncovered by the movement of the tide. Its interior or terrestrial limit is the line reached by highest equinoctial tides. Foreshore Lease Application refers to application for lease covering foreshore areas suitable for residential, commercial or industrial purposes other than agricultural disposable.