

CHAPTER 6

ENVIRONMENTAL CONDITIONS

6.1 PHILIPPINE ENVIRONMENTAL LAWS

6.1.1 Environment Basic Laws

Philippine environment basic laws are the Presidential Decree (P.D.) No.1151 and P.D. No.1152. The executing organization of the P.D. No.1151 and 1152 is the Department of Environment and Natural Resources (DENR).

The P.D. No.1151 was established on June 6, 1977 and declared the Philippine Environmental Policy. In the P.D. No.1151, national environmental policy, national environmental goal, right to a healthy environment and environmental impact statement were defined. These statements are the following:

National Environmental Policy:

To create, develop, maintain and improve conditions under which man and nature can thrive in productive harmony, and to fulfill the social, economic and other requirements of present and future generations of the country.

National Environmental Goal:

The nation may: a) recognize and fulfill the responsibilities of each generation as trustee and guardian of the environment; b) encourage the widest exploitation of the environment without degrading it; and c) attain a rational balance between population and resource use as well as preserving important historic and cultural aspects of the Philippine heritage.

Right to a Healthy Environment:

The government recognizes the right of the people to a healthy environment. It shall be the duty of each individual to contribute to the preservation and enhancement of the environment.

Environmental Impact Statement:

All governmental and private agencies, corporations, firms and entities shall prepare, file and include in every project, which significantly affects the quality of the environment, a detailed statement on: a) the environmental impact of the proposed project; b) unavoidable adverse environmental effect; c) alternatives; d) used environmental resources; and e) mitigating measures.

P.D. No.1152 that was established on June 6, 1977 declared the Philippine Environmental Code. The code mentions air quality, water quality, land-use, fisheries and aquatic resources, wildlife, forestry and soil conservation, flood control and natural calamities, energy development, mineral resources, waste management, population, environmental education, environmental research and the preservation of the historic and cultural resources. The code defines the policy of setting environmental standards, the right and role of executing organization, environmental conservation measures and guidelines of environmental conservation plan on each environmental item.

6.1.2 Philippine Environmental Impact Assessment (EIA) System

The EIA is defined in the P.D. No.1151. The Philippine Environmental Impact Statement (EIS) System was enacted under the P.D. No.1586 on June 11, 1978. The system has been refined through a number of laws, proclamations, regulations and guidelines. It mandates that all government agencies, government-owned or controlled corporations and private companies prepare an environmental impact assessment for any project or activity that affects the quality of the environment.

The Philippine EIS system regulates three types of environmental impact assessment: an EIS, an Initial Environmental Examination (IEE) and a brief Project Description. The type of assessment depends on the size, type and location of a proposed project. The Environmental Management Bureau (EMB) of the Department of Environment and Natural Resources (DENR) and DENR regional offices are the principal government agencies implementing the Philippine EIS System. Local Government Units (LGUs) are responsible for administering countryside and barangay (village) business enterprise projects within the EIS system.

- 1) Brief (one page) PD must be prepared for Kalakalan 20 projects (countryside and village business enterprises established through Republic Act 6810). It takes less than one month to prepare and evaluate this type of environmental impact assessment. LGUs are responsible for the brief PD.
- 2) IEE (and sometimes an EIS) is required for projects in Environmentally Critical Areas, which include parks, tourist destinations, habitats for endangered species and areas of unique value. It takes between six weeks and six months to prepare and evaluate the IEE. DENR regional offices review the IEE. An Environmental Compliance Certificate (ECC) is finally required.
- 3) EIS (Environmental impacts statement) is required for Environmentally Critical Projects, which include heavy industries, resource extractive industries and infrastructure projects e.g. major dams, major power plants, major roads and bridges, major reclamation projects. EISs take from three months to one year to be completed. The EMB reviews the EIS, and an ECC is finally required.

Road construction works are classified as Environmentally Critical Projects, EISs are therefore required.

A proponent should begin considering environmental impacts as soon as the project is conceptualized. All projects falling within the scope of the EIS system must obtain an Environmental Compliance Certificate (ECC). The proponent must carry out the EIA study and submit the draft EIS to EMB or DENR regional office. The draft EIS is judged by the EIS review committee, if the project is acceptable and an ECC is issued, the proponent can proceed with project implementation. If unacceptable, the proponent must modify or withdraw the proposed project and revise the EIS. The ECC is used to monitor the environmental impacts throughout the construction and operational phases of the project.

6.1.3 EIS for Protected Areas

The National Integrated Protected Area System (NIPAS) enacted on June 16, 1992 and aims to standardize the procedure for systematic management of all protected areas in the country. NIPAS areas encompass outstandingly remarkable and biologically important public lands that are habitats of rare and endangered species of plants and animals. These also cover biographic zones and related ecosystems, whether terrestrial, wetland or marine. At present, existing protected areas, including national parks, marine parks, game refuge and bird sanctuaries, watershed forest reserves and wilderness areas, pursuant to each law are wholly under reconsideration on the basis of the NIPAS Act (Republic Act No. 7586). Pursuant to the NIPAS Act, eight categories of protected areas are recognized:

- 1) Strict nature reserve;
- 2) Natural park;
- 3) Natural monument;
- 4) Wildlife sanctuary;
- 5) Protected landscape/seascape;
- 6) Resource reserve;
- 7) Natural biotic area;
- 8) Other categories established by law, conventions or international agreements which the Philippine Government is a signatory.

According to the NIPAS Act, the following acts are prohibited within protected areas in principal:

- a. Hunting, destroying, disturbing or simply possession of any plants, animals or products from the area without permit from the Protected Area Management Board (PAMB) that was established for each protected area;
- b. Dumping of any waste product harmful to the area, to the plants or to animals;
- c. Using any motorized equipment without permit from the PAMB;
- d. Mutilating or destroying objects of natural beauty or objects of interest to the communities within the area;
- e. Damaging and leaving roads and trails in damaged condition;
- f. Squatting, locating for minerals or occupying any piece of land within the area;
- g. Constructing or maintaining any kind of structure, fence or enclosures, conducting any business enterprise without permit from the PAMB;
- h. Leaving in exposed or unsanitary conditions refuse or debris, or depositing in ground or in bodies of water; and
- i. Altering, removing, destroying or defacing boundary marks or signs.

Initial Environmental Examinations (IEE) or Environmental Impact Statements (EIS) are required for projects in the protected areas because these areas are included in environmentally critical areas. With regard to new road construction works, because of environmentally critical projects, the EIS is required. In case of road rehabilitation or reconstruction works in protected areas, the PAMB shall determine the required document (IEE, EIS or no document) by the type and location.

6.2 ENVIRONMENTAL CHARACTERISTICS OF THE STUDY AREA

6.2.1 Land Condition

The eastern part of the Study Area, facing the Pacific Ocean, does not have a dry season, the western part however has a clear dry season. For that reason, as natural vegetation, evergreen rain forests dominated by dipterocarp are widely distributed in the eastern part, monsoon forests are distributed in the western part. Semi evergreen rain forests dominate the central part. Mossy forests are distributed in the high elevation over 1,200m above sea level. But due to deforestation, the major natural vegetation zones remain only in mountainous districts. Natural vegetation is untouched in Palawan, Samar and Mindanao, and conversely there is little in Masbate and Cebu.

Most of lowlands are privately owned agricultural lands because lands of 18% in slope or under are classified Alienable and Disposable (A&D) by Presidential Decree 705 (Forestry Law). In general paddy rice, sugarcane and fruits are mainly cultivated in inland areas, coconut plantations are concentrated in coastal areas.

Old growth forest areas are shown in Figure 6.2-1, slope map is shown in Figure 6.2-2.

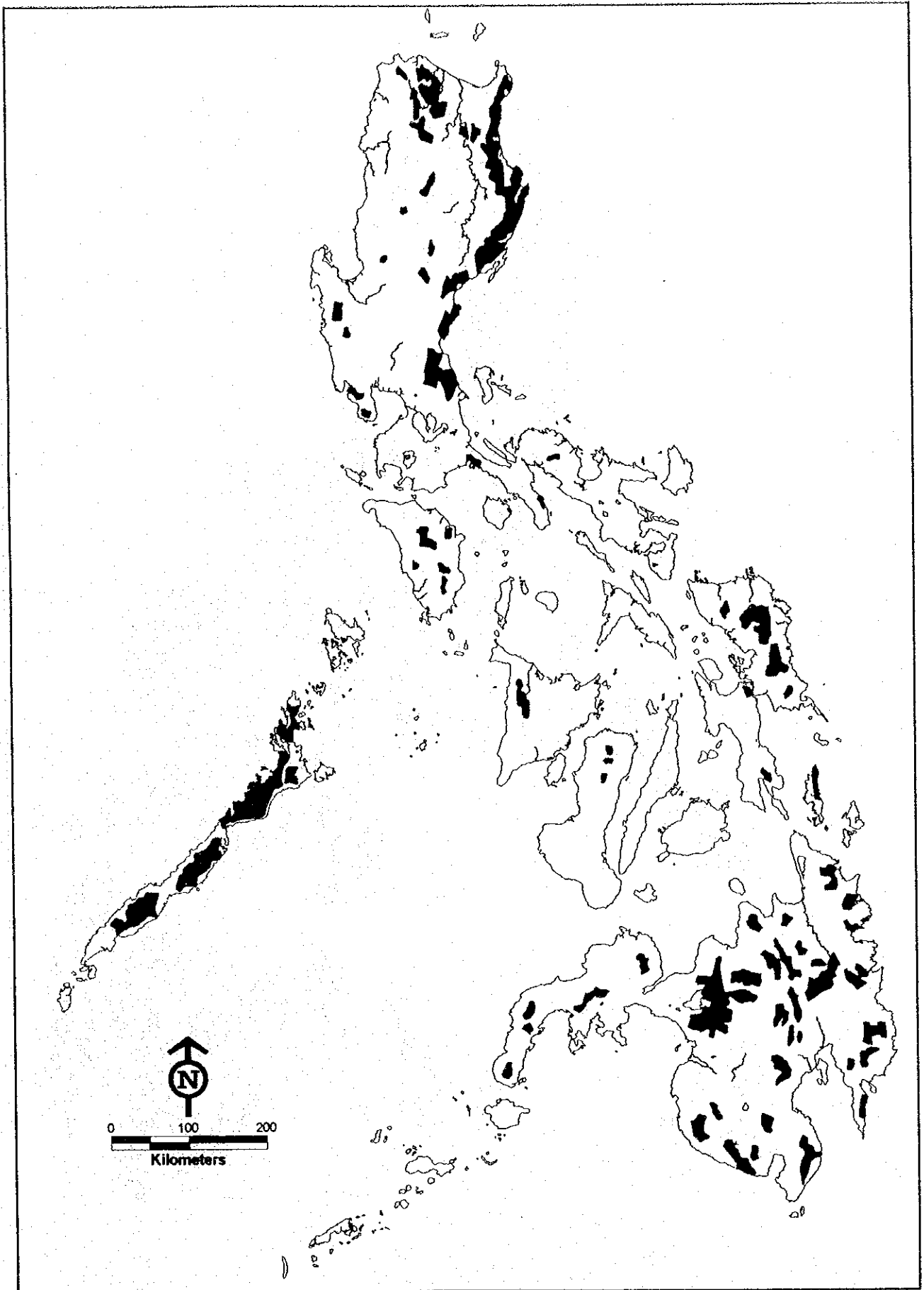
6.2.2 Fauna and Flora

The Philippine archipelago was relatively isolated from the rest of the world for many years, so the existing plants and animals could evolve uniquely in their particular environment. The Philippines is one of the countries high in the number of endemic species of plants and animals, furthermore there is a possibility that other new species may yet be discovered.

In spite of this diversity, the plants and animals in the Philippines can be classified into three groups depending on their place of origin. These are the northern group centered in Luzon; the southern group centered in Mindanao including Visayas; and the western group centered in Palawan. The northern group is an outgrowth from southern China and Taiwan. The southern group (Mindanao and Visayas) includes species that originated in Australia and New Guinea, the western group (Palawan) is an outgrowth from the Malay Peninsula and Borneo.

The flora of the Philippines is composed of at least 13,500 species that represent 5% of the world's flora, of which 32% are endemic. Most of endemic species are found in old growth forests. Of these, 8,000 species are flowering plants, 3,000 species of which are trees, 3,200 species of which are unique to the Philippines. About 4,000 species are ferns or fern allies, mosses, fungi, lichens. A further 5% to 8% of the country's flora are believed to be still unidentified.

Animal species, mostly insects, are estimated at about 170,000, of which about half are believed to be endemic. These are broken down into 558 species of birds, 179 species of mammals, 96 species of amphibians, 252 species of reptiles, 2,782 species of mollusks, 54 species of millipedes, 44 species of centipedes and more than 20,000 species of insects. Terrestrial vertebrate species number about 1,084 species of which 45% are endemic. As of 1991, 89



Source : NAMRIA

FIGURE 6.2-1. OLD GROWTH FORESTS



Source : Philippines Regional Natural Resources Atlas

FIGURE 6.2-2 SLOPE MAP

species of birds, 44 species of mammals and 8 species of reptiles were internationally recognized as threatened.

6.2.3 Environmentally Critical Areas

(1) Ethnic Group Areas

According to the ethnographic map produced by the national council of churches in the Philippines, there are 62 ethnological groups altogether distributed mainly around North Luzon (Igorot tribes, Caraballo/Cagayan valley), central Luzon (Negrito), Mindoro (Mangyan tribes) and western Mindanao and Sulu Islands (Muslim groups). In the study area, there are Mangyan tribes (7 subgroups, 122,101 persons) in Mindoro; Palawan (5 subgroups, 70,800 persons) in Palawan; Negrite (2 subgroups, 30,500 persons) in Panay, Negros, Samar, Leyte and Mindanao; Mindanao Lumad (15 subgroups, 1,995,952 persons) in Mindanao; Muslim groups (14 subgroups, 2,526,300 persons) in Palawan and Mindanao.

Many of these groups are looked after by the Office for Southern Cultural Communities. This agency is responsible for protecting the cultural minorities' way of life and for assisting the government in bringing material and technical aid to these people to assist their integration into mainstream Philippine society.

The distribution of ethnic groups is shown in Figure 6.2-3. The distribution of Ancestral Domain Claims is shown in Figure 6.2-4. But not all Ancestral Domain Claims are entered. Ancestral Domain Claims are defined by DENR Department Administrative Order No.2 (DAO 2), and it recognizes the right of the indigenous cultural communities to their ancestral lands to ensure their economic, social and cultural well being. According to the DAO 2, all government programs shall not be implemented within any ancestral domain without the written consent of the indigenous cultural community.

(2) Squatter Areas

Major squatter areas are mainly located on riversides and old towns of big cities. Squatters are also found along roads and under bridges in rural area. Summary of distribution of major squatters is shown in Table 6.2-1.

(3) Protected Areas

In the study area, there are 28 national parks, 2 marine parks, 7 protected landscapes/seascapes, 9 game refuge and bird sanctuaries, 6 Integrated Protected Area System (IPAS) prioritized protected areas, 11 wilderness areas and 53 watershed forest reserves as of 1996 (The five protected areas are designated into two categories). These protected areas are wholly under reconsideration on the basis of the National Integrated Protected Area System (NIPAS). According to the NIPAS Act, national parks, marine parks, game refuge and bird sanctuaries, wilderness areas and watershed forest reserves are considered as "initial components". Protected landscapes/seascapes and IPAS prioritized protected areas are "later components". Large mangrove swamp forests, major wetland and all old growth forest areas are also designated as protected areas. In the near future, all protected areas shall be standardized to "later components". The distribution of these protected areas is shown in Figure 6.2-5.

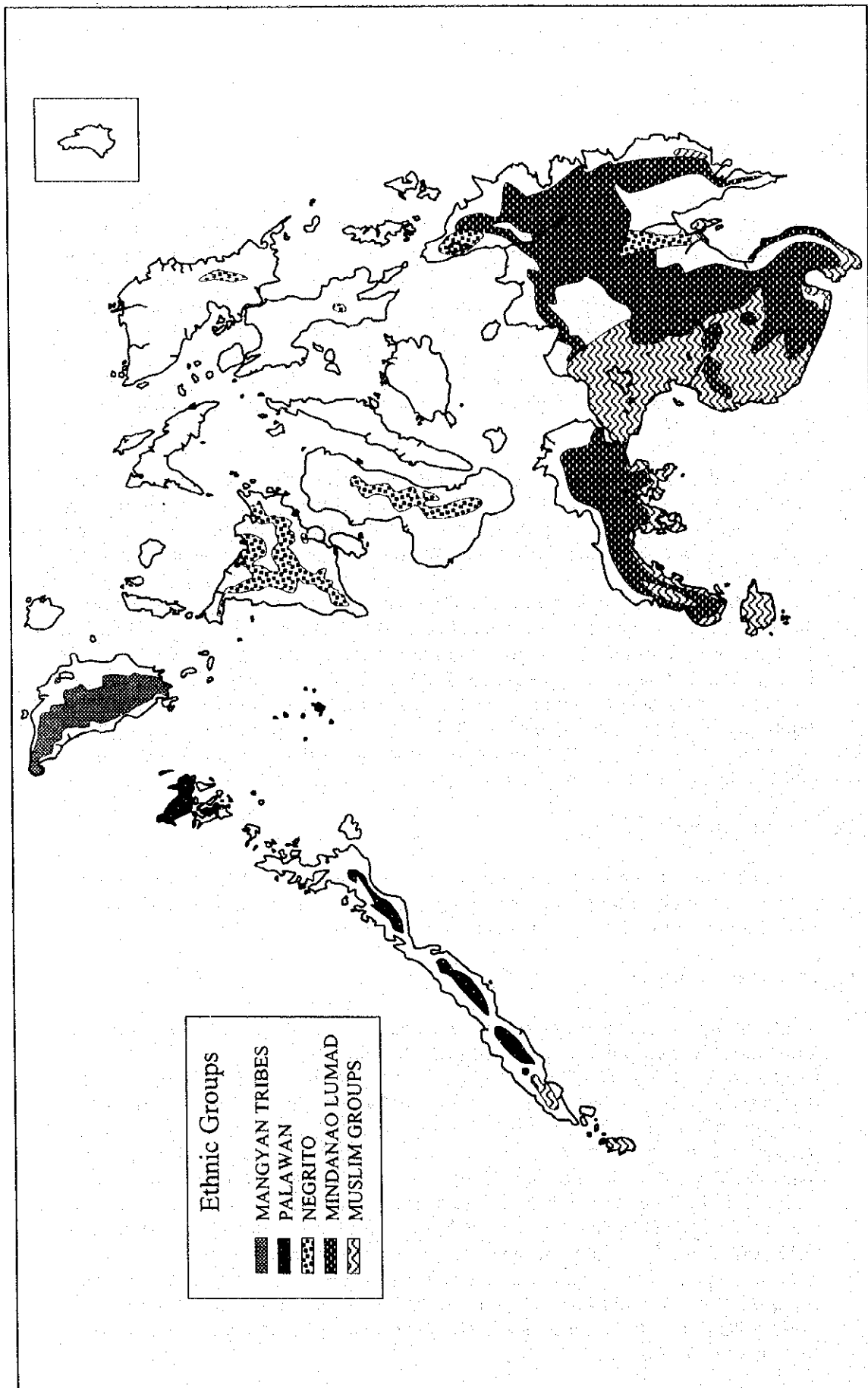


FIGURE 6.2-3 DISTRIBUTION OF ETHNIC GROUPS
 Source : Ethnographic map of the Philippines (National Council of Churches in the Philippines)

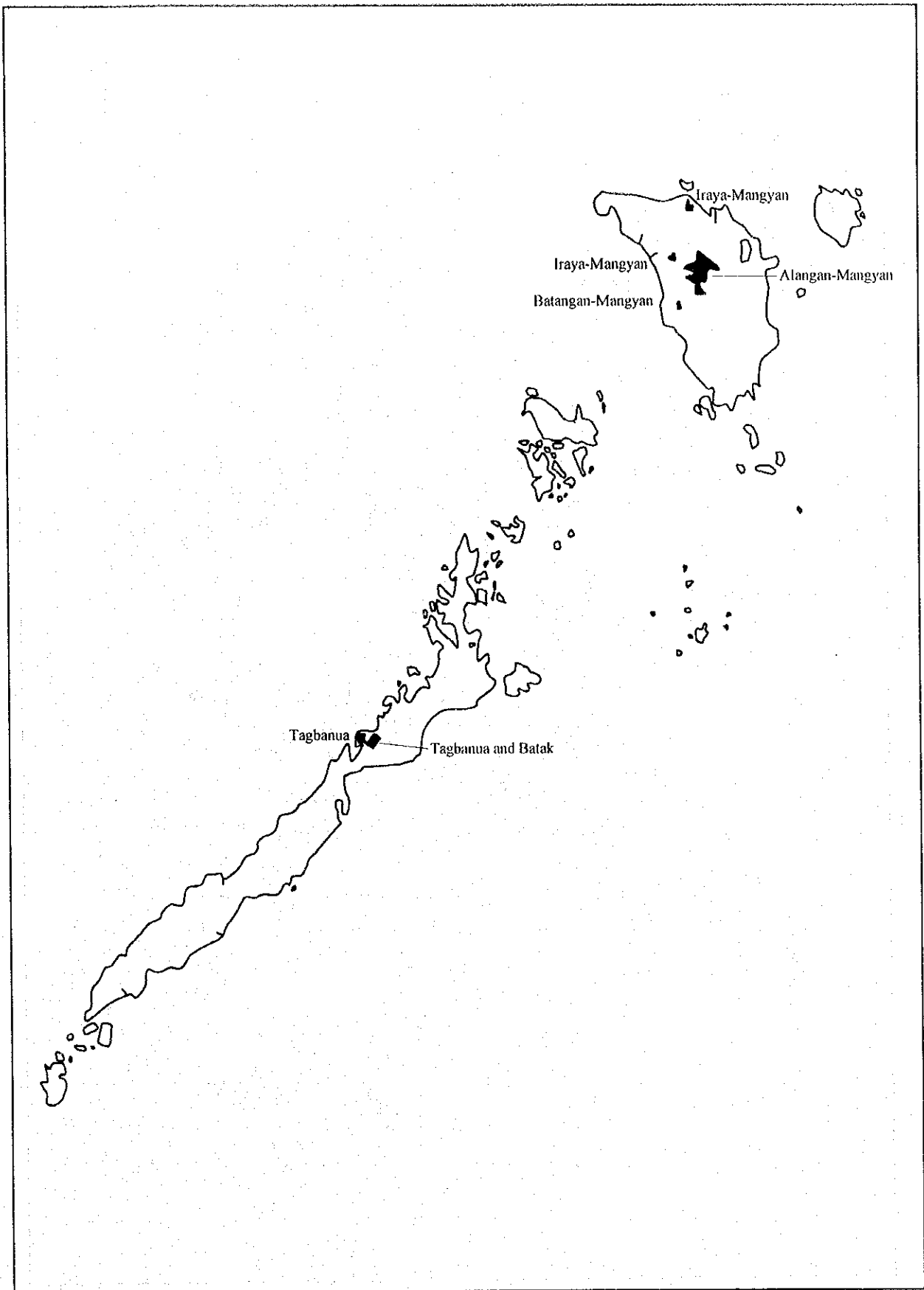


FIGURE 6.2-4(1) DISTRIBUTION OF ANCESTRAL DOMAIN CLAIMS

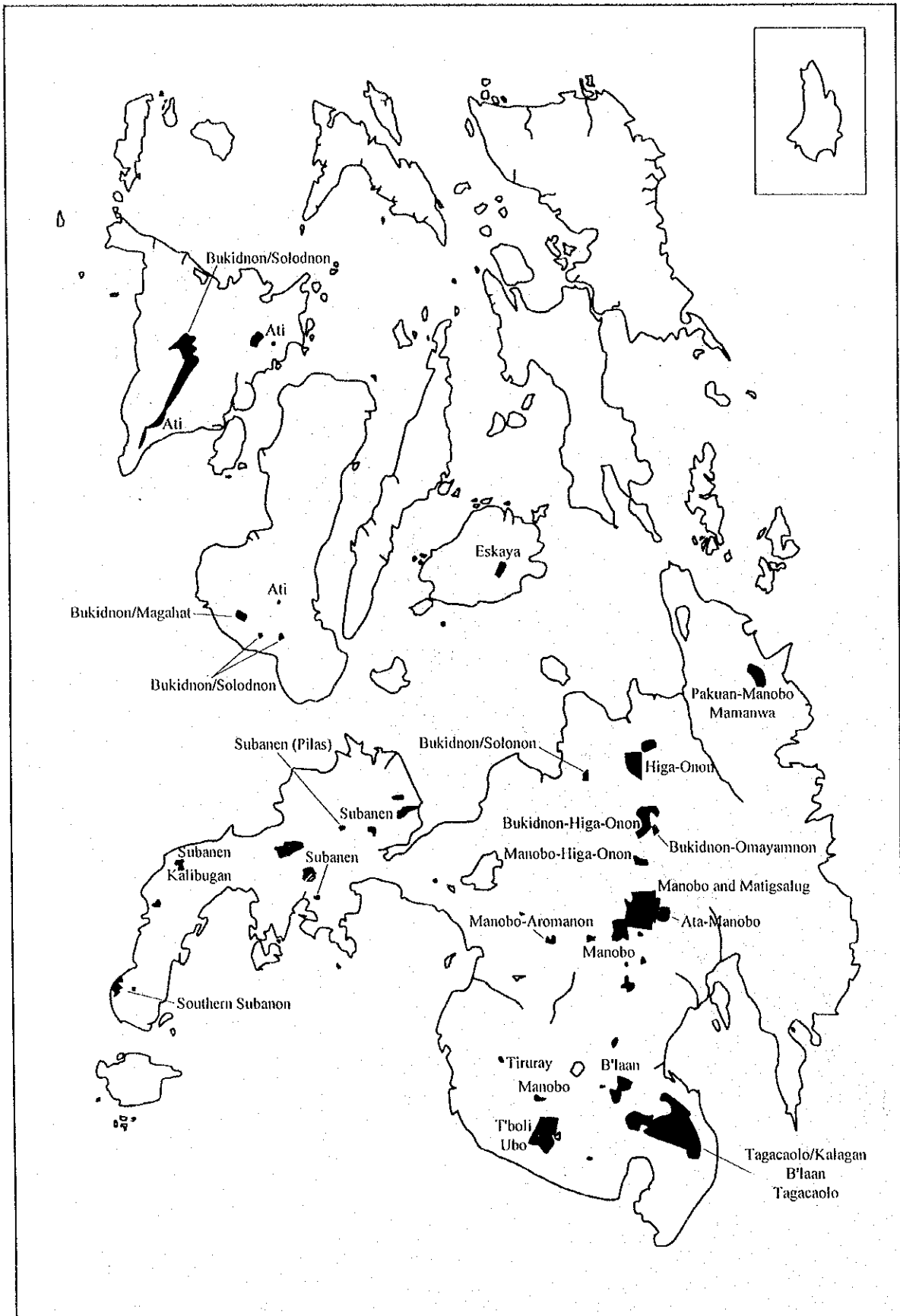


FIGURE 6.2-4(2) DISTRIBUTION OF ANCESTRAL DOMAIN CLAIMS

TABLE 6.2-1 SUMMARY OF SQUATTER AREAS

Region	City Name	Number of Families	Size of Land Occupied (Has.)	Number of Squatter Areas	Main Squatter Location
VI	ILOILO (Panay)	10,079	-	38	Camp Delgado, Jaro, Sangguniang Panglungsod
	ROXAS (Panay)	1,218	-	11	Libas, Sitio Hirupay, Lonoy
	BACOLOD (Negros)	8,291	-	56	Bagong Lipunan, Purok Cereza, Ramylu Village
	BAGO (Negros)	962	20.3	9	Poblacion, Ma-ao, Ma-ao Central
	CADIZ (Negros)	7,929	45.5	22	Banquerohan, Daga, Tinampa-an
	RA CARLOTA (Negros)	956	42.6	7	Masville, Sitio Dulom
	SAN CARLOS (Negros)	3,233	12.9	8	Greenville
VII	DUMAGUETE (Negros)	1,555	-	32	Looc, Purok Sunflower, Calindangan, Tugas, Piapi
	BAYS (Negros)	946	-	5	Burgos St., Olympia
	MANDAUE (Cebu)	4,185	-	60	Jagobiao, Back Matimco, Subangdaku, Pakna-an
	LAPU-LAPU (Cebu)	2,386	-	33	Ibo, Pajo Seaside, Sewage Pusok
	CEBU (Cebu)	28,981	-	269	Camagong St., Salina Drive Ext., Maracas, Sitio Mangga, Apas, Bantlad, Sitio Mabuhay, Sitio Laray
	TOLEDO (Cebu)	1,004	-	10	Magsaysay Hill, Baybay I
VIII	TAGBILARAN (Bohol)	721	-	20	Cogon, 15 CPG East Ave., Sitio Ubos, Turolan
	CALBAYOG (Samar)	1,887	-	16	Matobato, Rawis, Policarpo (Paho St.)
	ORMOC (Leyte)	550	-	8	Cogon, Linao, Punta, Ipil
	TACLOBAN (Leyte)	App. 7,300	-	6	Rimas Colon, Senin, Quarry, Baybay, San Jose
	ZAMBOANGA (Zamboanga del S.)	4,517	-	49	Camino Nuevo, Upper Calarian, Talon-Tolon, Lower Calarian, Kasanyangan, San Roque, Mampang, Cabatagan, Sta. Catalina
	OZAMIS (Misamis Occ.)	App. 4,500	-	11	San Roque, Sta Cruz, Gango, Tinago, San Antonio
IX	TANGUB (Misamis Occ.)	325	6.0	4	Silanga, Maloro, Mantic, Maquilao
	VALENCIA (Bukidnon)	545	3.6	8	Poblacion, Kahaponan
	GINGOOG (Misamis Ori.)	1,629	8.9	9	Brgy. 18, Brgy. 19, Brgy. 24, Brgy. 25
	DAVAO (Davao)	32,199	399.5	193	Bucana, Agdao, Sasa-Panacan, Matina, Catalunan Grande, Pag-asa, Buhangin, Piapi, Ma-a
X	GEN. SANTOS (S. Cotabato)	4,274	-	34	Lagao, Bula, Labangal, Calumpang
	COTABATO City (Cotabato)	8,144 *	-	65	Purok Pinnen, Nayon Sharif Kabunsuan, Purok Pascual, Purok 5, Notre Dam, Fatima Area, Maharlika, Malagapas, Kalanganan
XIII	ILIGAN (Lanao del N.)	2,898	App. 9.54	22	Ma Christina, Santiago, Villaverde, Pugaan, Tambacan, Camague
	SURIGAO (Surigao del N.)	2,359	39.3	23	Washington, Luna, Iaft, San Juan
	BUTUAN (Agusan del N.)	5,240	78.4	64	Brgy. 16, Brgy. 17, Brgy. 18, Maon, Baan

*: Number of Individuals

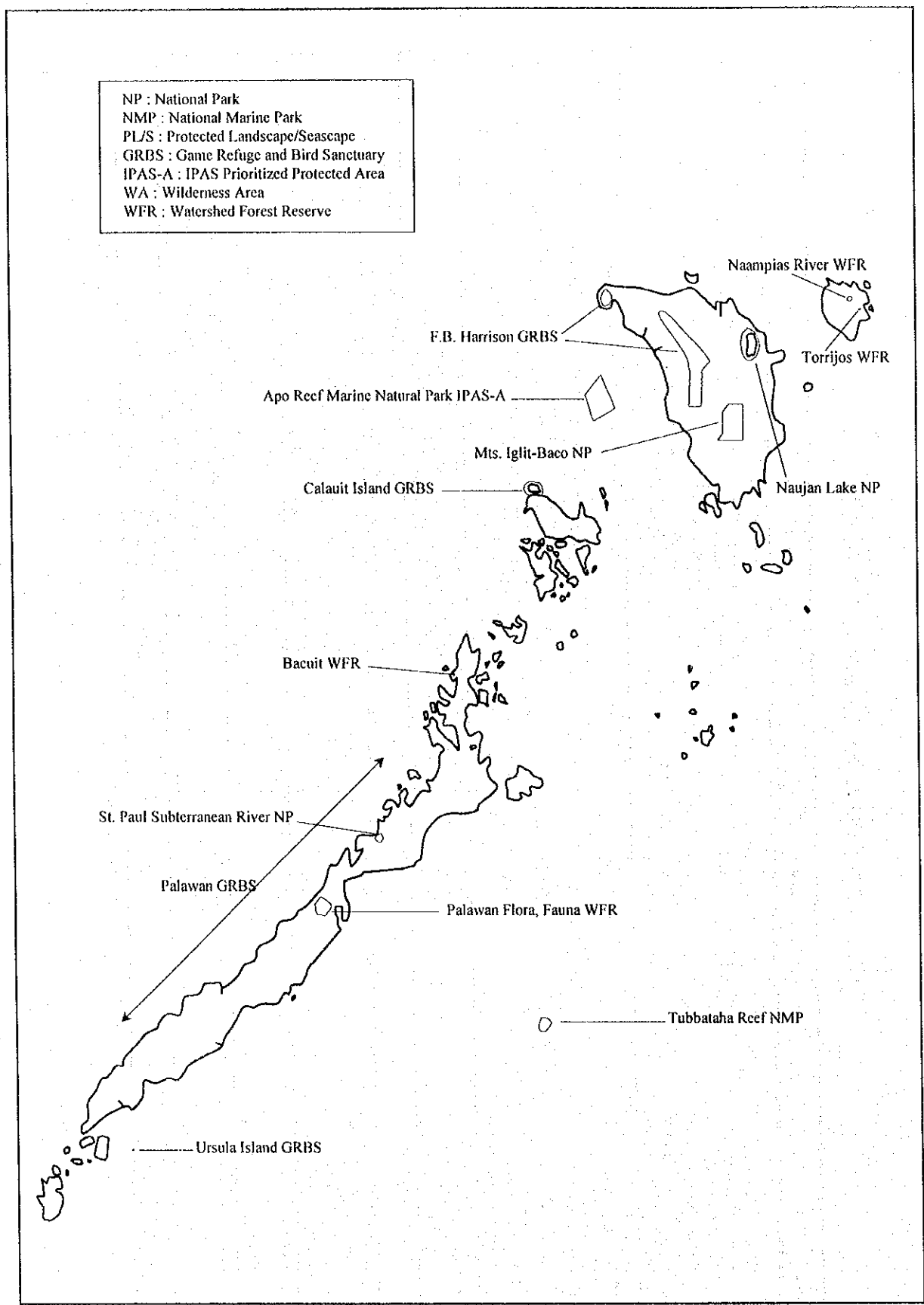


FIGURE 6.2-5(1) DISTRIBUTION OF PROTECTED AREAS

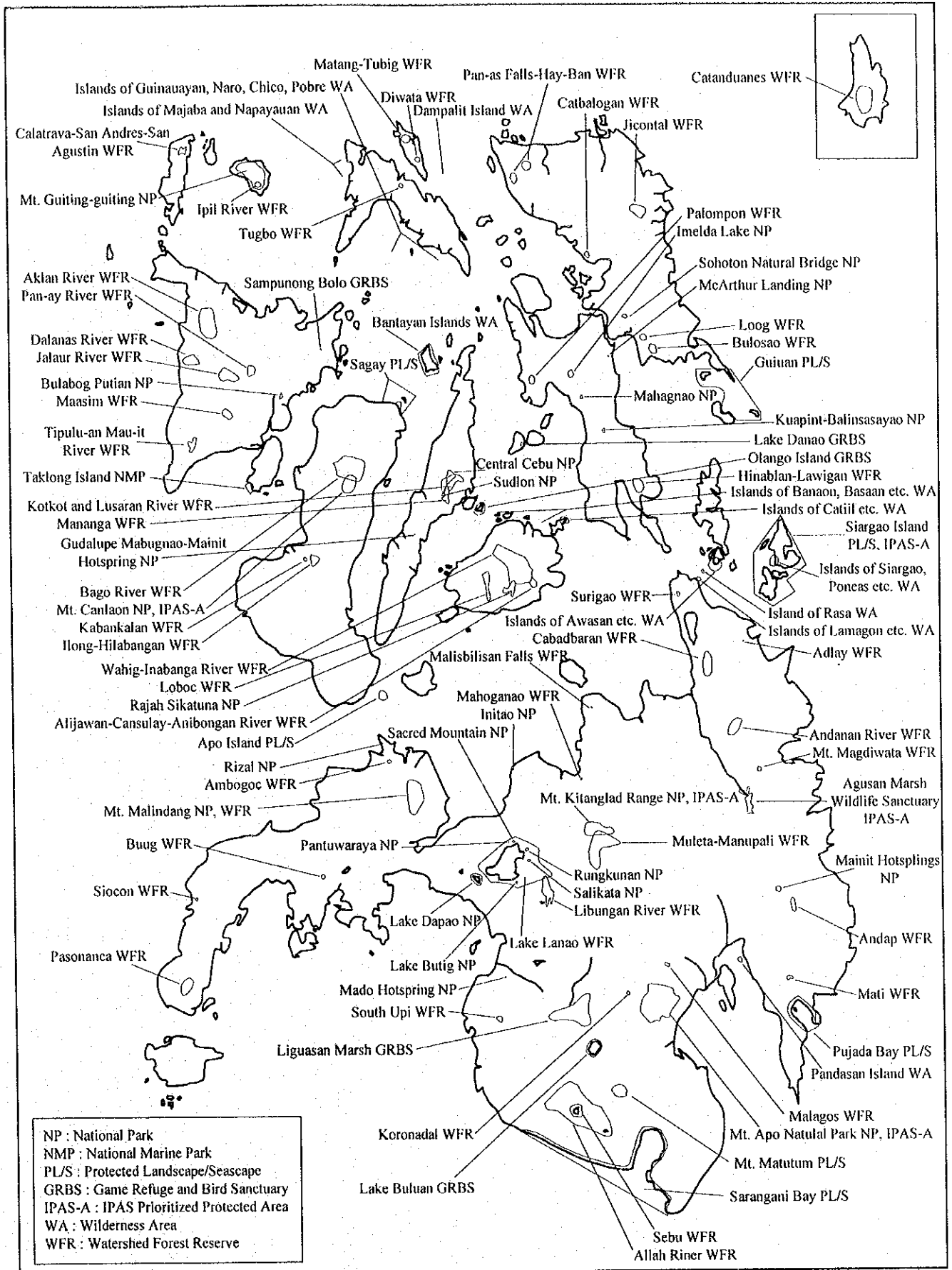


FIGURE 6.2-5(2) DISTRIBUTION OF PROTECTED AREAS

EISs are required for new road construction in the protected areas. In case of road rehabilitation or reconstruction works in protected areas, the Protected Area Management Board shall determine the required documents by the type and location of the road construction.

(4) Soil Erosion Prone Areas

Soil erosion is closely related to the angle of slope, the vegetation, the soil quality, the humidity of the soil and the pattern of rainfall, especially the angle of slope and the vegetation are the more important factors. Inceptisols covering about 13% of the study area has high susceptibility to erosion, but the correlation between the present severely eroded areas and the soil is not as close as the correlation between the present severely eroded areas and the angle of slope or the vegetation. Erosion prone areas where the slope is 18% or over with poor vegetation are shown in Figure 6.2-6.

(5) Hydrological Areas (Rivers, Lakes, Coastal Zone)

Tidelands, inland wetlands and mangrove forests are susceptible to hydrological transitions, where the biodiversity is high in general. Main mangrove forests, inland wetlands and large lakes are shown in Figure 6.2-7.

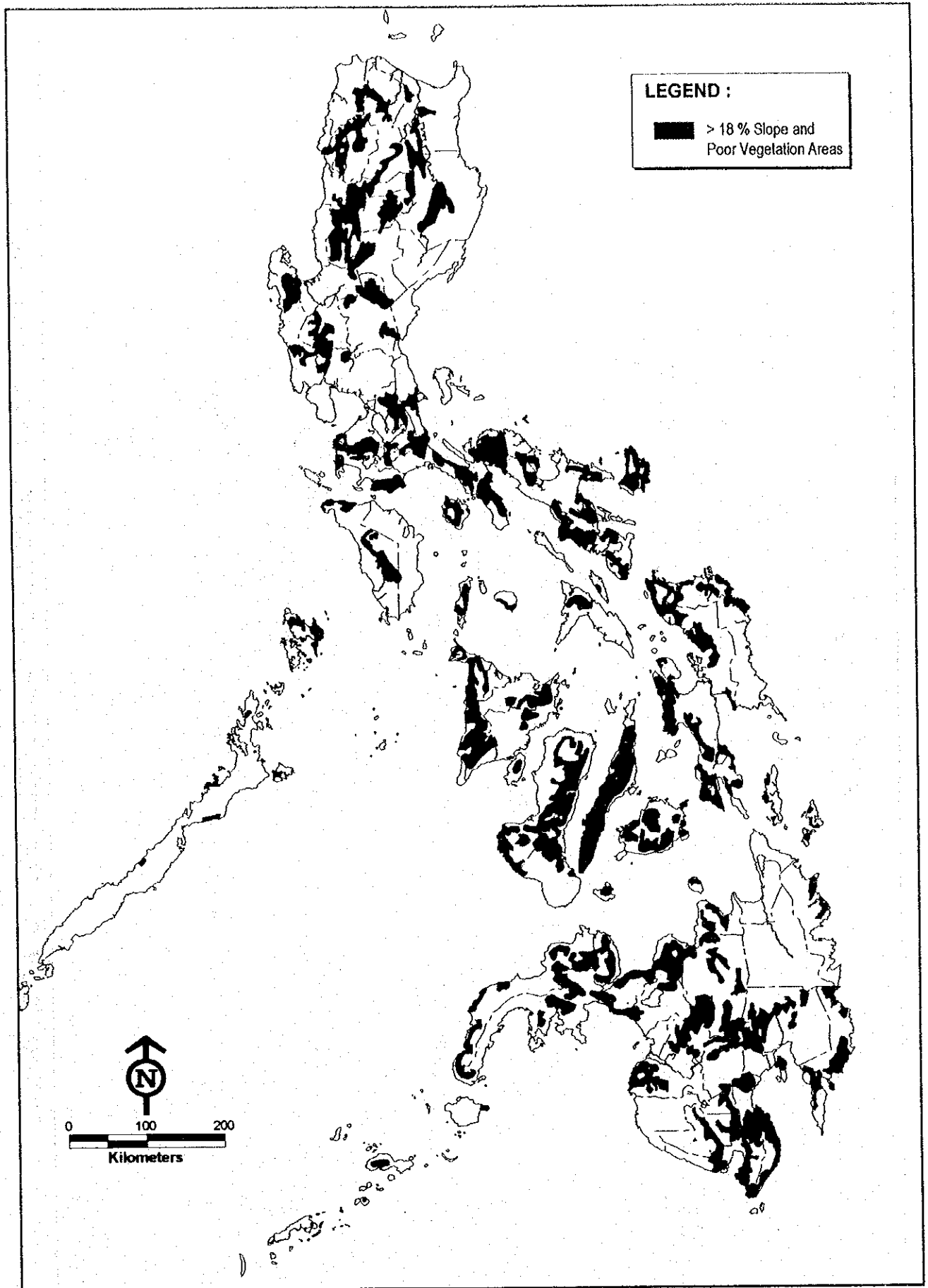


FIGURE 6.2-6 SOIL EROSION PRONE AREAS

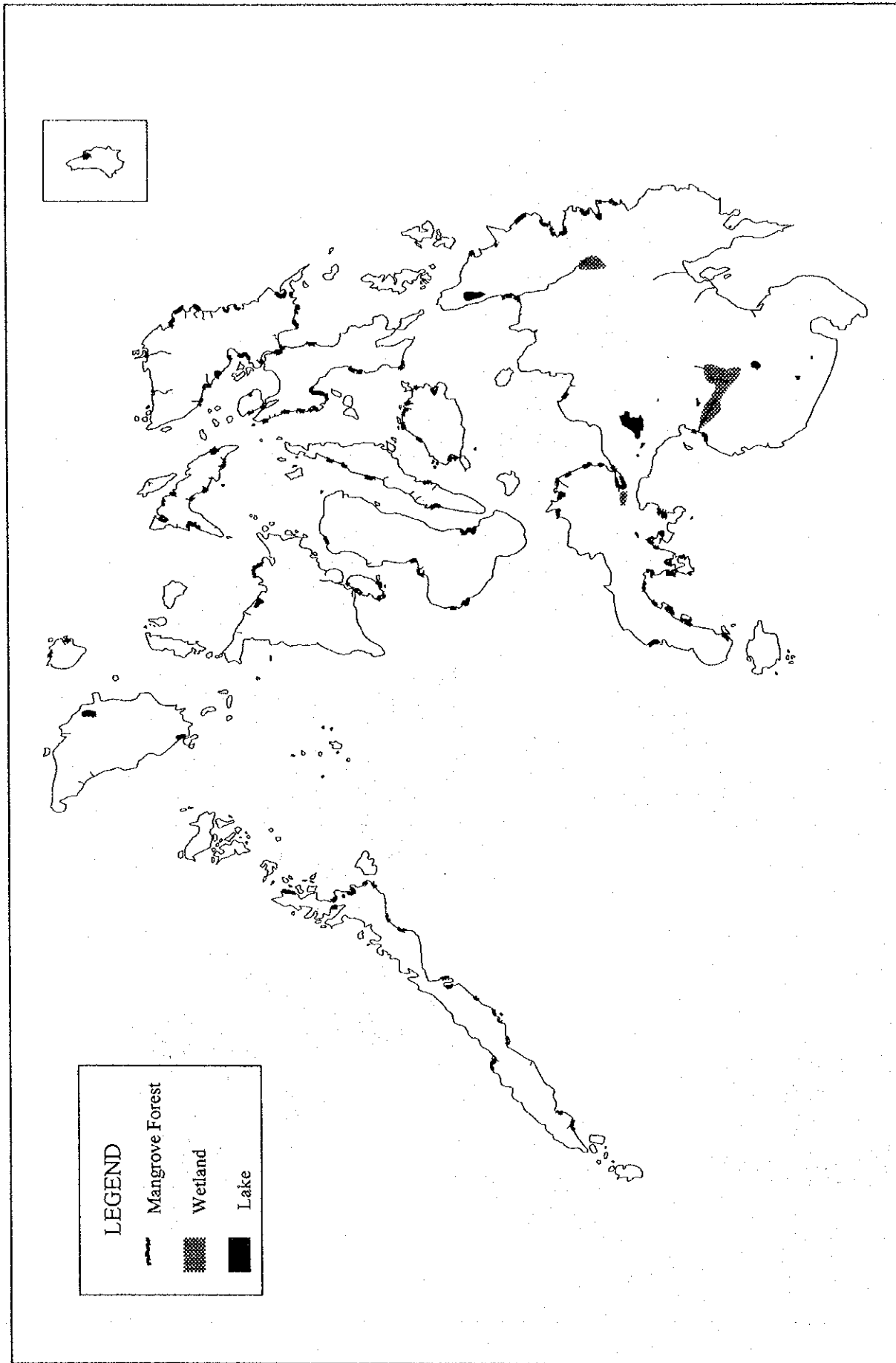


FIGURE 6.2.7 DISTRIBUTION OF MANGROVES, WETLANDS AND LAKES

PART II

FUTURE DEVELOPMENT PLANS AND TRAFFIC DEMAND

CHANGING SPACES OF THE UNIVERSITY IN THE 1970S

CHAPTER 7

REVIEW OF FUTURE DEVELOPMENT PLANS

7.1 OUTLINE OF MEDIUM-TERM PHILIPPINE DEVELOPMENT PLAN, 1993-1998

7.1.1 Assessment of Performance, 1987-1991

The Medium-Term Philippine Development Plan (MTPDP) for 1987-91 was formulated in 1986 aiming at four development goals of alleviation of poverty, the generation of productive employment, the promotion of equity and social justice, and the attainment of sustainable economic growth. The growth of the gross national product (GNP) was targeted at an average of 6.5% per year. While the favorable developments in the initial years of the Plan period were encouraging, these were not sustained. After reaching a peak of 7.2% in 1988, the growth in real output decelerated to 0.2% and 1.2% in 1991 and 1992, respectively. As a result, the overall economic picture over 1987-1992 was less favorable rate of 3.6%/year than the target.

The MTPDP Report, 1993-98 concludes that unexpected external factors such as the Gulf crisis in August 1991 and the economic recession of the industrialized countries and the weakness in the internal economy prevented the attainment of sustained high economic growth. The economy has suffered from import-dependent structure, infrastructure bottlenecks especially in energy, underdeveloped money and capital markets, and unbalanced regional development.

Actually the economic recession was experienced in 1991 and 1992 but it recovered in 1993 and the GRDP has been developing to date in a high rate of 4.2% during 1992 to 1996. The GNP growth rate of the first quarter of 1997 was 6.9% in real term and 7 to 8% growth rate was expected for the full year of 1997.

7.1.2 Goals and Objectives of the Plan, 1993-1998

To set the orientation of the Plan, the following guiding principles were enumerated; (1) Decentralization (2) Reliance on non-government initiative on domestic consultation (3) Full cost recovery (4) Social Equity and, (5) Macroeconomic stability.

The major macroeconomic goals of the Plan were set at: a) a sustained and broad-based growth of output and employment; b) price stability; and c) sound balance of payments position. Economic stabilization was designed to provide a stable and predictable environment for the private sector. Economic restructuring was planned to be undertaken in all sectors of the economy to attain international competitiveness through the following measures:

- (1) Fiscal policy shall shape a revenue and expenditure program that yields a manageable consolidated public sector deficit; accords with sound public debt management; and adheres to the principles of transparency and accountability.
- (2) Monetary policy shall emphasize price stability without unduly sacrificing output and employment; improve the efficiency of financial intermediation; and develop the capital market to improve domestic resource mobilization.
- (3) External policy shall ensure a sustainable balance of payments position; continue the liberalization of the trade and capital accounts; and reduce the burden of external debt.

- (4) Macroeconomic policies shall be consistent with the vision of attaining international competitiveness by accommodating, continued trade liberalization and tariff reform, increased investments in infrastructure, and increased investments in human capital.
- (5) Regional development policies shall ensure the maximization of production potentials and geographic advantages by eliminating the policy and investment bias for the National Capital Region, reducing socio-economic disparities within and among the regions, providing the regions and localities with opportunities to develop on the basis of their potentials and advantages, and widening the access of the population to productive resources and social services.

Population management, preservation of the environment, political stability, peace and order, and an efficient bureaucracy were taken as the complementary strategies.

7.1.3 Macro-economic Targets

The annual growth of Gross Domestic Product (GDP) was targeted at an average of 5.7~7.4% over the Plan period from 1994 to 1998. The GDP was estimated to increase from a rate of 2.4% in 1993 to 8.5~10.0% in 1998. The target growth of Gross Regional Domestic Products (GRDP) was set as shown in Table 7.1-1.

TABLE 7.1-1 GRDP GROWTH TARGET, 1994-98

Región	GRDP Total	
	Low	High
IV	7.2	8.9
V	4.8	6.2
VI	5.9	7.3
VII	7.5	9.3
VIII	4.5	6.0
IX	5.3	6.7
X	5.2	6.7
XI	7.2	6.7
XII	5.3	6.7
ARMM	3.9	5.1
Philippines	5.6	7.2

(Medium-Term Philippine Development Plan, 1993-1998)

Real per capita income was targeted to increase at an annual rate of 5.2% from the estimated P11,361 in 1993 to P14,636 by 1998 (in constant 1985 price). Inflation is to decline from 9.0~10.0% in 1994 to 4.0% in 1998. The population growth rate was projected to decline from 2.36% in 1990 to less than 2.0% by 1998. Employment generation was planned to achieve average 1.1 million jobs annually from 1994 to 1998. The unemployment rate was targeted to decline from 9.1% in 1994 to 6.6% by 1998.

7.1.4 Government Revenue and Expenditure

The national government revenue policy was to improve revenue from 17.3% of GNP in 1993 to 17.8% by 1998. The ratio of national government expenditure in GNP was planned to increase from 18.6% in 1993 to 17.4% by 1998 as shown in Table 7.1-2.

TABLE 7.1-2 GOVERNMENT EXPENDITURE PROGRAM (1993-98) (P BILLION)

Item	Actual 1993	Targets 1998	Growth Rate (%) (1994 ~ 1998)
I. Total Revenues (% of GNP)	260.3 (17.3)	493.6 (17.8)	(18.1)
II. Total Disbursements (% of GNP)	280.9 (18.6)	483.6 (17.4)	(17.6)
III. Deficit Financing	20.6	10.0	

* : Average annual growth rate from 1993 to 1998

The average annual public investment was targeted at P128.8 billion for the period 1994-1998 as shown in Table 7.1-3. The bulk of investments was allocated for infrastructure development.

TABLE 7.1-3 SECTORAL ALLOCATION OF MEDIUM-TERM PUBLIC INVESTMENT PROGRAM (1993-98)

Annual	Item	Annual Average (1987-92)	Estimate 1993	Targets		Average
				1994	1998	
I.	Total Public Investment (Billion Pesos)	169.3	83.3	98.0	160.7	128.8
II.	Sectoral Distribution (%)	100	100	100	100	100
	1. Agro-Industrial Development	7.9	13.7	8.9	15.6	13.1
	2. Human Development	11.3	9.2	13.8	18.7	17.7
	3. Infrastructure Development	78.3	75.7	75.5	62.3	66.2
	4. Development Administration	2.4	1.1	1.5	1.9	1.9
	5. Disaster Mitigation	-	0.3	0.3	1.6	1.1

Source: Medium-Term Philippine Development Plan, 1993-1998

7.2 AGRO-INDUSTRIAL DEVELOPMENT PLAN

7.2.1 Assessment of Performance, 1987-92

The agricultural sector grew annually at 2.0% on average over the previous Plan period and contributed an annual average share of 23.2% to GDP from 1987 to 1992. It was the source of employment for 46% of the labor force during the period. Despite several policy reforms, the productivity and income of majority of farmers and fisherfolks remained low. Productivity differentials between urban and rural households continued to be wide with a ratio of 2.13. It was reviewed that the general weakness of the agricultural sector was attributed to its poor linkages with the rest of the economy.

The industrial sector exhibited a modest growth of 3.2% during the period 1987-92, which was 5.6% lower than the target growth rate of the previous Plan. This was due to unfavorable domestic and international conditions. The sector, however, contributed an average of 35.1% to GDP from 1987 to 1992.

The MTPDP Report concluded that the past development plan treated the agriculture and industry sectors as separate sectors, thus an agriculture sector dominated by the production of primary products and an industry sector dominated by import-dependent manufacturing and processing industries, with no structural shifts occurring in either over time. Agriculture and industry must be treated under a common framework in order to emphasize the links between them.

7.2.2 Goals and Objectives of the Plan, 1993-1998

Development goals for the agro-industrial sector established were as follows:

- Industrial restructuring for worldwide competitiveness and expanded production of goods and services for the domestic and export markets;
- Strong productive and ecologically sound links between agriculture and industry; and
- Increasing incomes, productivity and access to resources among small entrepreneurs, farmers, fisherfolks and workers.

The following specific objectives were listed up in the Plan:

- Modernization of the production sectors through technology upgrading;
- Enhancement and adaptation of information technology systems in all sectors.
- Rural agri-industrialization including the dispersal of industries to regions outside of the National Capital Region (NCR);
- Rehabilitation and sustainable utilization of the country's natural resources;
- Economic empowerment of men and women workers and employers as partners in the development process.
- Speedy and effective implementation of the Comprehensive Agrarian Reform Program (CARP);
- Greater contribution of tourism to economic growth and regional development

Based on the economic restructuring concept through the acceleration of regional development and a location-specific approach to agro-industrial development, Regional Agro-Industrial Centers (RAICs) were identified in the order of priority as presented in Table 7.2-1.

TABLE 7.2-1 REGIONAL INDUSTRIAL CENTERS (RICS) TARGET (1993-98)

Region by Priority	Regional Agro-Industrial Center (RAIC)	Site of Existing/ Proposed Agro-Industrial Area
VII	Metro Cebu	Mactan EPZ
X	Cagayan de Oro	PHIVIDECE IE
XI	Davao City	Panacan, Ilang
VI	Iloilo City	Pavia
IX	Zamboanga City	Ayala-Recodo
VIII	Tacloban City	New Kawayan
ARMM	Parang	Prang, Maguindanao
XII	Cotabato	(Cotabato City)
XII (Proposed)	Iligan City	Ma. Cristina-Fuentes
XI (Proposed)	General Santos City	Hacienda Espina

In addition to the RAICs, the following development networks/cores which link two or more growth centers in the Study Area were identified in the order of priority:

- Cagayan de Oro - Iligan (Reg. X)
- South Cotabato - Davao Zamboanga (Reg. XI)
- Cebu - Iloilo - Tacloban (Reg. VII)

The promotion of tourism development in the Study Area was recommended as follows:

- Panglao Island (Reg. VII)
- Northern Palawan (Reg. IV-B)
- Boracay Island (Panay) (Reg. VI)
- Samal Island (Reg. XI)

The following was identified by the Presidential Council for Countryside Development in the Study Area: Romblon, Masbate, Antique, Biliran, Eastern Samar, Guimaras, Agusan del Sur, Southern Leyte, Surigao del Sur.

7.2.3 Targets in Agro-Industrial Sector

(1) Agriculture, Fishery and Forestry Sector

Gross value-added (GVA) in the agriculture, fishery and forestry sectors was targeted to grow annually at an average of 2.7%~3.4% over the Plan period. The share of the agriculture sector in GDP was expected to decline from about 22.5 percent in 1994 to 19.8 percent in 1998 as the economy gradually shifts to greater agri-industrialization.

TARGET GROWTH RATES IN AGRICULTURE SECTOR (1993-1998)

	Annual Growth Rate %
GVA in agriculture sector	2.7 ~ 3.4
Palay production	3.4
Corn production	5.6
Livestock production	4.2 ~ 5.0
Poultry production	4.4 ~ 5.1
Fishery production	1.6

(2) Industrial Sector

The industrial GVA was planned to grow at an average of 6.6~8.8% per annum over the Plan period. Industry's share in GDP was expected to increase from 34.8 percent in 1994 to about 36 percent in 1998.

TARGET GROWTH RATES IN INDUSTRIAL SECTOR

	Annual Growth Rate %
GVA in industrial sector	6.6 ~ 8.8
Manufacturing	6.5 ~ 9.0
Construction	7.3 ~ 9.0

7.3 INFRASTRUCTURE DEVELOPMENT PLAN

7.3.1 Assessment of Performance, 1987-92

The MTPDP reports reviewed that the delivery of infrastructure services was inadequate during the Plan period 1987-1992. The country experienced acute power supply shortage. Transportation, communications, and water resource facilities were insufficient in keeping up with their growing demand. The report indicated the following major problems hampered the development efforts in infrastructure sector:

- Insufficient coordination among agencies/units in the implementation of infrastructure plans, policies, programs, and projects;
- Tight budgetary constraints to support capital investments and Operation and Maintenance expenditures; and
- Inadequate project preparation and lack of clear procedures for resolving environmental and community related issues that affect project implementation.

Regarding land transportation development, about 64% (about 99,600 km) out of the total road network with around 160,843 km. have been upgraded for all-weather use from the 49% coverage in 1986.

7.3.2 Goals and Objectives of the Plan, 1993-1998

Major goals for the infrastructure sector established were as follows:

- Provide the primary needs of the population such as reliable and adequate water, health facilities and transportation; and
- Provide facilities to support the productive sectors and act as catalyst of development.

The goals and objectives of the transportation development in the Plan were put on: 1) to strengthen inter-regional and urban-rural linkages to ensure people's mobility and continuous flow of goods; and 2) to ensure the safety and efficiency of transport services to meet the needs of an increasing population and dynamic market demand. The following strategies for the transportation development related to the road sub-sector were included in the Plan:

- Identify and provide basic transport infrastructure to ensure access and allow the integration of depressed communities;
- Maintain existing transportation facilities properly to prolong their use;
- Continuously upgrade transport facilities and service standards to make sure that their quality and quantity are responsive to traffic growth;
- Promote multimodal transport to facilitate trade;
- Develop the arterial road network consisting of a north-south backbone, east-west laterals, and other strategic roads;
- Provide the transport facility requirements of agriculture, fishing, and agrarian reform areas, regional industrial centers, and tourism areas;
- Proceed with the development of feeder ports under the Nationwide Feeder Ports Program in preparation for the devolution of their O & M to LGUs;
- Establish specialized handling facilities for grains and bulk cargo in selected ports and construct additional fishing ports through the Nationwide Fishing Ports Development Program;

- Implement urban transport management measures and develop alternative modes of transport in coordination with LGUs to alleviate traffic congestion. Expand existing mass transit systems to provide affordable means of transport, and pursue new projects, including expressways and tollways;
- Intensity transport safety programs to minimize accident risks and protect lives through the implementation of relevant recommendations of the Civil Aviation Master Plan, Maritime Safety Master Plan, and the Road Safety Program;
- Strictly enforce environmental protection measures controlling vehicle emissions, water pollution, and noise pollution to safeguard the health of the population;
- Strengthen institutional and interagency coordination of planning and project implementation to ensure effective and efficient inter-modal linkage and reduce disruption of services;
- Promote private sector participation in transport development, e.g. construction, maintenance, and operations of roads, expressways, mass transit systems, ports, railways, and terminals;
- Enhance the capability of LGUs in administering, implementing and developing infrastructure facilities, e.g., local roads, municipal ports, as embodied in the Local Government Code;
- Pursue efficiency-and competition-enhancing measures such as deregulation, decentralization, appropriate pricing mechanisms, and rationalization of user charges;
- Adjust truck load limits along with road design standards to achieve a proper balance between trucking and infrastructure costs, and strictly enforce load limits;
- Rehabilitate the PNR Mainline South, study the rehabilitation and possible extension of the northern line in Luzon and explore the feasibility of adopting rail as a means of transportation in other areas of the country; and
- Upgrade the NAIA and explore the use of the reverted baselands for its relocation or as a site for transport-related industrial complexes.

The government investment required for infrastructure development during 1993-1998 accounted for P594,703 million as shown in Table 7.3-1. The transportation sector and the land transportation investments were planned to be P186,681 million (31% of the total investment) and P135,955 million (23%), respectively.

TABLE 7.3-1 GOVERNMENT INFRASTRUCTURE INVESTMENT PROGRAM (1993-1998)

Item	Annual 1993	Disbursement 1998	Total (1993-1998)	Share by Sector (%)
1. Energy and Power	36,668	56,517	269,032	5.24
2. Transportation (Land Transportation)	18,660 (13,808)	49,599 (39,664)	186,681 (135,955)	31.39 (22.86)
3. Communication	2,202	680	9,382	1.58
4. Water Resources	8,354	21,432	89,215	15.00
5. Social Infrastructure	4,192	6,641	40,393	6.79
Total	70,076	134,869	594,703	100.0

7.4 REVIEW OF REGIONAL DEVELOPMENT PLANS, 1993 - 1998

The Regional Development Plans, 1993 - 1998 in the Study Area are summarized Table 7.4-1.

TABLE 7.4-1 (1) REGIONAL DEVELOPMENT PLANS

Region	Characteristics of the Region	Development Framework, Policies and Strategy	Infrastructure Development	Priority Projects of Road Sub-sector in Transportation Sector
IV (VI-A & VI-B) Southern Tagalog	<ul style="list-style-type: none"> - Region IV-A: Strategic area in relation to NCR - Region IV-B: Rich and precious marine environment and low density 	<ul style="list-style-type: none"> - Linear Urban growth corridor of CALABARZON - Agricultural modernization - Modernize the production system - Expand natural resources management and conservation - Promote industrial competitiveness - Integrate tourism development with agriculture and with resource protection - Improve support Infrastructure to enhance agricultural productivity - Ensure active participation of the community 	<ul style="list-style-type: none"> - Rehabilitate, upgrade and expand the existing network of roads, ports, railroads and airports - Upgrade and expand communication facilities - Provide enough water supply - Provide power services 	<ul style="list-style-type: none"> - Circumferential all-weather road to link Occidental Mindoro and Oriental Mindoro
V Bicol (only Catanduanes and Masbate are included)	<ul style="list-style-type: none"> - Catanduanes and Masbate are small islands near the south end of Luzon Island. 	<ul style="list-style-type: none"> - Intensive use of land - Growth of manufacturing and services sub-sector led by agro-industries - Urban functions and Rural Development Approach 	<ul style="list-style-type: none"> - Tertiary Growth Centers are to be located in Mandaon, Cataingan and Pacer 	<ul style="list-style-type: none"> - Rural Road Network Development Project - Phase I (Masbate) (on-going) - 6th and 7th Road Improvement Project (Masbate) - Tawad-Balud Road Project
VI Western Visayas	<ul style="list-style-type: none"> - Leading sugar producer 	<ul style="list-style-type: none"> - Development of region's hierarchy of settlements (Regional agri-industrial center, Integrated area for development, District agri-industrial center) - Integration and interlinkage of infrastructure - Rational and sustainable utilization of resources 	<ul style="list-style-type: none"> - Intensify the provision of water and power supply to meet the primary needs - Strengthen the continued provision of transportation, communication and energy requirements 	<ul style="list-style-type: none"> - Construction of a total of 1,428 km of major national road by 1998 - Paving of 4,543 km of roads - Construction of 2,044 m and improvement of 2,257 m of bridges
VII Central Visayas	<ul style="list-style-type: none"> - Industrial and tourism center - Concentration in MetroCebu 	<ul style="list-style-type: none"> - Dispersed, balanced and sustainable industrialization - Promotion of a hierarchy of urban settlement - Regional industrial center - Metro Cebu - Provincial Industrial center - Tagbilaran and Dumaguete (plus Argao, Balamban and Bago) - Micro enterprise areas 	<ul style="list-style-type: none"> - Basic Infrastructure including access roads shall be provided responding to the demographic shift. - Priorities on non-basic infrastructure including highways will be based on their returns on investments, growth potential and hierarchy of growth centers. 	<ul style="list-style-type: none"> - To adopt a more dispersed but integrated and articulated road network system - To improve and upgrade a total of 700 km of roads

TABLE 7.4-1 (2) REGIONAL DEVELOPMENT PLANS

Region	Characteristics of the Region	Development Framework, Policies and Strategy	Infrastructure Development	Priority Projects of Road Sub-sector in Transportation Sector
VIII Eastern Visayas	- Growth corridor of RP-Japan Friendship Highway	- Develop an acceptable land use mix - Rationalize provision of basic services and infrastructure facilities	- Provide sufficient basic infrastructure - Complete and upgrade circumferential / secondary road network and develop an efficient inermodal transport system - Provide / upgrade supportive infrastructure facilities	- Maximum use of the existing RP-Japan Friendship Highway - Improvement / enhancement of road network to institute local accessibility.
IX Western Mindanao	- Located outside typhoon belt - Rich agricultural and fishery resources - Gateway of neighboring ASEAN countries	- Countryside agri-industrial development strategy	- Promote stronger rural and urban linkage to facilitate urban-rural industry dispersal and growth	- To construct 410 km of roads - To repair / rehabilitate 1,740 km of roads and bridges
X Northern Mindanao	- Gateway to Mindanao - Resource- rich	- Countryside agri-industrial development strategy - Urban development corridor and rural focused strategy	- Support development effort aimed at alleviating poverty and inequality and generating employment opportunities, attracting private sector to invest by providing the necessary infrastructure support facilities	- To construct new roads to open up new agricultural areas - To improve existing roads especially in Bukidnon - Mount Malindang Circumferential Road Including Pangul Bay Bridge - Improve major highways
XI Southern Mindanao	- Located outside typhoon belt - Rich agricultural and fishery resources - Gateway of neighboring ASEAN countries	- Countryside agri-industrial development strategy - Dispersed concentric strategy - 11 Provincial agri-industrial centers - Regional agri-Industrial center in Davao City - Industrial estate in General Santos City	- Expand infrastructure facilities to support the efforts in the economic and human development sectors	- To establish a road traversing the region from east to west - To construct and improve a total of 2,190 km of roads - To implement 2,249 m of bridges
XII Central Mindanao	- Located outside typhoon belt - Rich agricultural and fishery resources - Gateway of neighboring ASEAN countries	- Enhancing urban-rural linkage - Strengthening socio-economic integration of the region with other regions of Mindanao - Promotion of Greater Cotabato Development Area and Cagayan-Iligan Corridor	- Upgrade transport facilities, develop water resources, provide communication facilities and expand energy supply - Construction / improvement of roads for intra- and inter-regional linkage and countryside development	- Rehabilitation of Matampay bridge and Quirino bridge - Asphaltting Makilala-Matalam road and Bagontapay-marbel road - Concreting Catabato-Bukidnon road
ARMM	- Located outside typhoon belt - Rich agricultural and fishery resources - Gateway of neighboring ASEAN countries	- To make accessible to the people, resources and opportunities. - To attain sustainable development - To promote agro-industrial development - To enhance tourism potentials	- Helate and maintain the economic link one another and neighboring regions in the mainland - Development of the Regional Industrial Center in Parang and Maguindanao - Establishment of Provincial Investment Estates in Malabang, Lanao del Sur and Maganoy, Maguindanao.	- Construct / improve roads and bridges linking the mainland (Especially Marawi - Malabang - Cotabato road, Malanbang - Sultan Gumander - Pagadian road, Lanao Lake Circumferential road) - Construct / improve farm to market roads

7.5 REVIEW OF NATIONAL PHYSICAL FRAMEWORK PLAN, 1993 - 2022

(1) Goals

The goals of the National Physical Framework Plan 1993-2022 established are as follows:

- To help maintain and strengthen regional cohesion and integration
- To facilitate efficient production and land utilization
- To promote the physical environmental integrity of the country
- To guide the location of public and private investment
- To provide spatial direction to the provision of basic services and urban development

(2) National Integrated Protection Areas System (NIPAS)

In order to protect and maintain the natural biological and physical diversities of the environment to sustain human life and development, National Integrated Protection Areas System (NIPAS) was enacted in 1992. The following categories of protected areas were established:

- Strict nature reserve
- Natural park
- Natural monument
- Wildlife sanctuary
- Protected landscapes and seascapes
- Resource reserve
- Natural biotic areas
- Other categories established by law, etc.

National Park refers to a forest reservation essentially of natural wilderness character. The other protected areas include Game refuge and bird sanctuary, Wilderness area, Municipal forest tree parks and Barangay forest tree parks.

(3) Agriculture

The Network of Protected Areas for Agriculture (NPAA) (production land) has been identified by the Bureau of Soils and Water Management (BSWM) and should not be converted to non-agricultural use. The NPAA includes the following:

- All irrigated and potentially irrigable lands
- All alluvial plain lands highly suitable for agricultural production
- All sustainable lands that are traditional sources of food
- All croplands that support the existing economic scale of production

(4) Production Forest and Pasture Land

Production forests were designated by the Plan to enhance forest productivity through sustainable management. Unproductive pasture lands were proposed to be converted to sustainable production forest.

(5) Settlement Development

Urbanization increased significantly during the 1970 - 1990 period. Region XI, X and VII had the highest levels of urbanization, reflecting the rapid growth of Davao City, Cagayan de Oro City and Metro Cebu, respectively.

Metro Cebu and Davao City were distinguished from the rest of the country's other cities by much larger populations, more varied market services. After Metro Cebu and Davao City, the regional administrative, market and educational centers are Iloilo, Bacolod, Dumaguete, Tacloban, Zamboanga, Cagayan de Oro, Cotabato City and General Santos.

Metro Cebu and the Iloilo City - Pavia - Santa Barbara corridor in Region VII were expected to draw investments and population movements, together with Tacloban and Bacolod City. In Mindanao, Davao City, General Santos, Cotabato City and Zamboanga City in the south, and the Metro Cagayan de Oro - Iligan City corridor in the north were expected to expand their urban functions.

(6) Industrial Development Area

The linkage of industries through emphasis on local resource utilization was recommended to be strengthened. The establishment of Regional Industrial Centers (RICs) or Regional Agro-Industrial Centers (RAICs) and the Peoples Industrial Estates (PIEs) have been pursued to promote agro-based industries and open up employment opportunities in the rural areas.

(7) Infrastructure Development

The settlement policy of regional concentration toward national dispersal was recommended to be supported by infrastructure plans to strengthen lateral, interregional linkage within the hierarchy of settlements.

(8) Mining

Mining industry was proposed to promote balance between ecology and economy.

(9) Transportation

The transportation system was aimed to be geared toward the promotion of efficient and cost effective services.

The construction and improvement of inter-regional road linkages shall be pursued connecting the country's provinces and regional centers.

Priority should be given to routes that:

- provide significant improvements in production and marketing activities
- serve as alternative routes for other regions in emergency situations
- respect protected areas

(10) Communication

Telecommunication services was proposed to be expanded to all unserved municipalities at reasonable rate.

(11) Energy

The interconnection of Luzon, Visayas and Mindanao grids to form a single integrated grid was proposed to be pursued.

(12) Water Resources

1) Water Supply

The coverage served with adequate water was proposed to be expanded.

- 2) Irrigation
The Accelerated Irrigation Program was proposed to irrigate the remaining irrigable land in the next 10 years.
- 3) Flood Control and Drainage
Flood control and protection works in the critical areas were scheduled to be completed. Flood control and drainage supports to agricultural development shall be constructed.

7.6 OTHER DEVELOPMENT PLANS

7.6.1 Updated Mindanao Development Framework Plan, 1994 - 1998

The Plan was prepared by the Mindanao Economic Development Council and NEDA by integrating five Regional Development Plans in Mindanao. In order to achieve balanced development among Regions in Mindanao, inter-regional development projects were planned to be consistently implemented. Development emphasis was placed on the agro-industrial sector in line with the Government's goal.

7.6.2 Medium Term Agricultural Development Plan, 1993-1998

The Plan provided the basis for development of the agricultural sector and adopted the Key Production Area development approach designating the key or priority areas for specific products according to the agro-climatic and market conditions. It encouraged farmers to produce specific crops, livestock and fishery products in areas that have the advantage.

The following programs were promoted:

- Grain Production Enhancement Program : aims to increase irrigated rice lands and corn areas, their yield and production.
- Medium-Term Livestock Development Program : seeks to lay foundation for a productive, efficient and sustainable livestock and poultry industry.
- Key Commercial Crops Development Program : aims to increase existing productivity level of commercial crops, the income of commercial crop farmers and the value of commercial crops exports, and to diversify marginal rice and corn area to commercial crop areas.
- Medium-Term Fisheries Management and Development Program : aims to enhance the productivity of the fisheries resources, increasing aquaculture productivity and the number of coastal resource management bays, and improving efficiency of the commercial fishing fleet.

7.6.3 Tourism Master Plan, 1991-2010

The main goals of the Plan are:

- optimize the contribution of tourism to economic growth at a national and regional level,
- enhance and contribute to social cohesion and cultural preservation at a local level,
- develop tourism on an environmentally sustainable basis, and
- develop diversity of destinations, attractions and markets to minimize exposure to major internal and external threats to tourism activity.

In addition, the Department of Tourism is preparing Regional or Sub-Regional Tourism Development Master Plans.

7.7 DEVELOPMENT PROJECTS

7.7.1 Irrigation Projects

Irrigation projects are managed by National Irrigation Administration (NIA). The total irrigated area was 1.3 million ha in 1995, which formed 42% of the estimated potential irrigable area of 3.1 million ha. In Region-VI,X,XI and XII the ratio of irrigated area is below the national average and there are left the rooms for development, especially in Mindanao Island.

They are classified into the following three systems;

- National irrigation system (50% in 1995) is constructed and managed by NIA.
- Communal irrigation system (36%) is constructed by NIA and turned over to farmers and managed by them.
- Private irrigation system (14%) is constructed and managed by private farmers or organization.

TABLE 7.7-1 IRRIGATION AREA AND DEVELOPMENT

Region	Estimated Potential Irrigable Area a/	Irrigation Area (ha)						Irrigation Development %
		1993	1994	1995	1995			
					National	Communal	Private	
CAR	99,650	-	56,413	58,228	11,444	18,871	27,913	58
I	277,180	184,182	152,253	152,843	42,498	79,881	30,464	55
II	472,640	262,237	196,005	196,005	143,060	29,850	23,095	41
III	482,230	285,711	247,427	253,076	172,889	63,625	16,562	52
VI	263,590	159,993	117,478	120,062	52,228	44,010	23,824	46
V	239,660	89,994	97,117	109,554	23,412	63,432	22,710	46
VI	197,250	109,921	76,711	76,711	52,235	18,977	5,499	39
VII	50,740	23,350	18,639	19,066	0	16,544	2,522	38
VIII	84,380	57,606	48,333	49,585	15,842	28,812	4,931	59
IX	76,500	38,174	31,347	32,702	14,282	16,448	1,972	43
X	230,150	82,591	58,010	63,765	29,540	28,344	5,881	28
XI	290,280	131,349	85,145	85,355	46,983	27,841	10,531	29
XII	362,090	114,933	83,550	90,058	47,399	37,654	5,005	25
TOTAL	3,126,340	1,540,041	1,268,428	1,307,010	651,812	474,289	180,909	42
		117.8%	97.0%	100.0%	49.9%	36.3%	13.8%	

a/ - Estimated potential irrigable area (PIA) is based on the 3% slope criteria.

(Source : National Irrigation Administration)

The Irrigation Development Program (1997 - 2006) by NIA encompasses new irrigation development of 425 thousand ha and rehabilitation of 951 thousand ha including on-going projects and proposed projects.

TABLE 7.7-2 ON-GOING / PROPOSED IRRIGATION PROJECT

Project / Program	unit	New	Rehabilitation	Restoration	Sustained O & M	Drainage	Road Repair
		ha	ha	ha	ha	km	km
Total (On-going Projects, Priority and Other Pipeline Projects and Other Programs)		424,673	951,351	211,000	390,696	2,996	6,061
On-going Projects (Projects in the Study Area)		127,221	771,807	-	390,696	2,996	6,061
R-IV Palawan		4,125	1,316	-	-	-	-
R-VII Bohol		4,960	-	-	-	-	-
R-VI,VII,VIII Visayas Communal		3,250	7,700	-	-	-	-
R-XIII Agusan del Norte		7,922	-	-	-	-	-
R-VIII Northern Leyte		809	12,648	-	-	-	-
R-XII, ARMM North Cotabato & Maguindanao		10,840	-	-	-	-	-
ARMM Maguindanao		11,500	-	-	-	-	-
Nationwide		14,181	16,563	-	-	-	-
Priority Pipeline Project		102,720	79,140	211,000	-	-	-
(Projects in the Study Area)							
R-XIII Agusan del Sur		2,900	-	-	-	-	-
R-VI Aklan		380	3,620	-	-	-	-
R-VI Bohol		5,300	-	-	-	-	-
R-VI Western Visayas		11,300	24,700	-	-	-	-
R-VIII Northern Samar		4,550	-	-	-	-	-

Source: National Irrigation Administration

7.7.2 Flood Control Projects

The DPWH has 14 on-going / proposed flood control projects, among which 8 projects are in the Study Area. The outline of the projects are shown in Table 7.7-3.

TABLE 7.7-3 ON-GOING / PROPOSED FLOOD CONTROL PROJECTS

Project Name	River System	Location	Area	Scope of Work
Flood Mitigation Project in Ormoc City	Malbasag - Anilao Rivers	Ormoc City, R-8	Ormoc City	5 bridges, 3 silt dams, 4 km dikes both banks
Iloilo City Flood Control and Environmental Improvement Project	Jaro - Iloilo Rivers	Iloilo City, R-6	Iloilo City, Pavia, Leganes	5 km Jaro flood way, river - drainage improvement
Panay River Basin Development Project	Panay River	Panay R-6	Capiz, part of Iloilo and Aklan	flood control, irrigation, water supply
Ilog - Hilabangan River Basin Flood Control Project	Ilog - Hilabangan Rivers	Negros Island, R-6,7	Negros Oriental, Negros Occidental	river improvement
Water Sources Development of Cotabato River Basin	Cotabato, Allah, Pulangi Rivers	Mindanao R-10, 11, 12, ARMM	Bukidnon, Agusan del Sur, Davao, Cotabato, Maguindanao, Sultan Kudarat	flood control, irrigation, water supply, hydro power, drainage improvement
Flood Control and Urban Drainage Project in Cagayan de Oro City	Agusan, Tagoloan, Ipona, Biga-an, Cagayan de Oro Rivers	Misamis Oriental, R-10	Cagayan de Oro City, Tagoloan	flood control, storm water drainage, tidal control
Flood Control and Related Water Use Development in Davao Area	Agusan, Libuganon Rivers	Davao, R-11	Davao City, Buawan, Carmen, Asuncion, New Carella, Tigum, Sto. Tomas	flood control, water resources development
Occidental Mindoro Integrated River Basin Development Project	Amnay-Patrick, Pagalungan, Busuanga Rivers	Occidental Mindoro, R-4-B	Occidental Mindoro	flood control, water resources development

Source : DPWH

7.7.3 Electricity

The on-going / proposed projects include the following.

TABLE 7.7-4 MAJOR ON-GOING / PROPOSED ELECTRICITY PROJECT

Project	Area
Luzon - Leyte interconnection	R-V, VIII
Cebu - Leyte interconnection	R-VII, VIII
Negros - Cebu interconnection	R-VII
Negros - Panay interconnection	R-VI
Mindanao - Leyte interconnection	R- VIII, XIII
880 MW Tongonan geothermal power plant	Leyte, R-VIII
40 MW diesel power plant	Bohol, R-VIII
40 MW Mambucal geothermal power plant	Negros Occidental, R-VI
80 MW Palipinon power plant	Negros Oriental, R-VII
100 MW Nasipit diesel power plant	Agusan del Norte, R-XIII
98 MW Tomen diesel power plant	Misamis Oriental, R-X
135 MW Orbeta power plant	Misamis Oriental, R-X
100 MW Maco diesel power plant	Davao, R-XI
240 MW Minanao geothermal power plant	North Cotabato, R-XII
200 MW Leyte-Cebu geothermal power plant	R-VII, VIII
440 MW Leyte-Luzon geothermal plant	R-V, VIII
240 MW Leyte-Mindanao geothermal plant	R- VIII, XIII
58 MW Iligan City diesel plant	Lanao del Norte, R-XII
40 MW Iligan City diesel plant	Lanao del Norte, R-XII
50 MW General Santos diesel plant	South Cotabato, R-XI
200 MW Mindanao Power Barges plant	Davao, Agusan del Norte
200 MW Mindanao coal-fired thermal plant	
100 MW Zamboanga Diesel power plant	National Power Corporation

Source : MTPDP 1993 - 1998

CHAPTER 8

FUTURE SOCIO-ECONOMIC FRAMEWORK

8.1 DEMOGRAPHIC FRAMEWORK

8.1.1 Projection of Population

"1995-based National and Regional Population Projection" was prepared by the Technical Advisory Group and NSO Population Projections and approved by NSCB in 1997 as the official figures to be utilized for planning and programming purpose.

"Philippine Population Projections: 1980-2030" (PPP 1980-2030) is the sole projection which includes projection by municipality by urban/rural. Therefore, the population projection of "1995-based National and Regional Population Projection" in the medium assumption was broken down to municipality level using the data of the PPP 1980-2030. The urban population was also obtained in proportion to the ratio of the PPP 1980-2030 each year. Adjustment was made in 1990 urban population data. The method as shown in the flow chart (Figure 8.1-1)

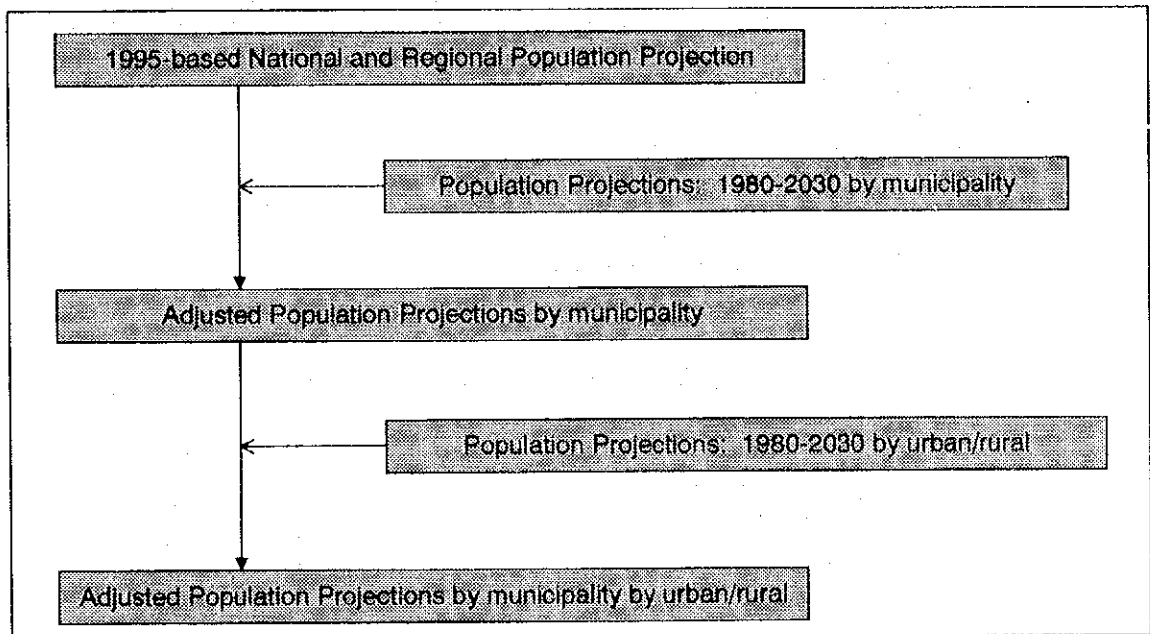


FIGURE 8.1-1 FLOW OF POPULATION PROJECTION

The average annual geometric growth rates for the projection is shown in Table 8.1-1. The growth rates of the regions in Mindanao, except ARMM, are higher than the national average, while those of the regions in Visayas except Region VII are lower than the average. The growth rate of Region XI during 1995-2000 is 2.51 during 1995-2000 and 1.45 during 2015-2020. Region VI has the low rate of 1.83 during 1995-2000 and it declines to 1.05 during 2015-2020.

**TABLE 8.1-1 AVERAGE ANNUAL GEOMETRIC GROWTH RATE BY REGION:
1995-2020**

	1995-2000	2000-2005	2005-2010	2010-2015	2015-2020
Philippines	2.15	1.99	1.75	1.51	1.28
NCR	1.94	1.64	1.26	0.93	0.68
CAR	2.22	2.09	1.84	1.54	1.29
I	1.71	1.60	1.39	1.16	0.93
II	2.09	1.88	1.60	1.28	0.99
III	2.09	1.85	1.55	1.26	1.02
IV	2.60	2.54	2.43	2.37	2.15
V	1.92	1.67	1.49	1.26	1.03
VI	1.83	1.71	1.51	1.27	1.05
VII	2.01	1.84	1.59	1.34	1.10
VIII	2.15	2.00	1.82	1.60	1.38
IX	2.44	2.25	1.97	1.66	1.39
X	2.29	2.16	1.93	1.69	1.43
XI	2.51	2.33	2.04	1.72	1.45
XII	2.43	2.24	1.91	1.55	1.27
ARMM	1.77	1.78	1.60	1.32	1.03
XIII	2.50	2.35	2.08	1.79	1.54

(NSCB, NSO, distributed by JICA Study Team)

8.1.2 Population Projection in the Study Area and Distribution

The trend of the population is shown in Figure 8.1-2. The national population was estimated to increase from 68.6 million in 1995 to 105.5 million in 2020 while the population in the Study Area amounted 31.1 million in 1995 and 48.5 million in 2020. The share of the Study Area showed slight increase from 45.4% in 1995 to 46.0% in 2020.

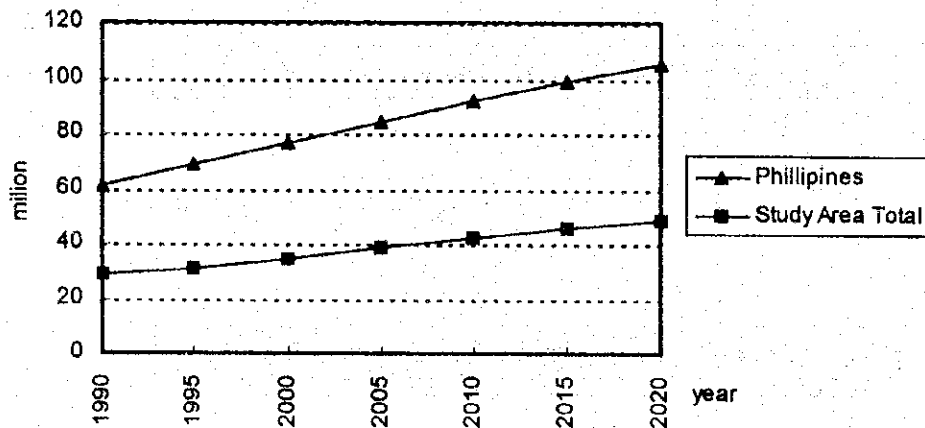


FIGURE 8.1-2 POPULATION PROJECTION OF PHILIPPINES AND STUDY AREA

Table 8.1-2 shows the population by region and by province both for the whole population and population within the Study Area. Urban population projection is shown in Table 8.1-3. Table 8.1-4 summarizes the population in the Study Area by island.

TABLE 8.1-2 POPULATION PROJECTION (TOTAL POPULATION)

Region/Province	1995		1997		2000		2004		2005		2010		2015		2020	
	Total	Study Area	Total	Study Area	Total	Study Area	Total	Study Area	Total	Study Area	Total	Study Area	Total	Study Area	Total	Study Area
Philippines	68,614,162	31,167,764	71,538,597	32,518,222	76,320,141	34,730,970	82,636,723	37,698,432	84,214,778	38,439,383	91,851,291	42,062,279	99,007,597	45,451,456	100,269,915	46,050,990
NCR	9,454,040	-	9,814,977	-	10,405,479	-	11,112,687	-	11,289,368	-	12,020,405	-	12,590,106	-	12,675,924	-
CAR	1,254,838	-	1,309,811	-	1,400,490	-	1,522,654	-	1,553,173	-	1,701,556	-	1,836,951	-	1,860,608	-
ABRA	195,964	-	203,957	-	217,113	-	235,135	-	239,611	-	261,837	-	282,383	-	286,042	-
BENGUET	540,716	-	566,291	-	608,482	-	664,676	-	678,782	-	747,459	-	810,622	-	821,601	-
IFUGAO	149,598	-	155,807	-	166,029	-	179,916	-	183,365	-	199,829	-	214,593	-	217,193	-
KALINGA APAYAO	237,805	-	249,684	-	269,306	-	295,933	-	302,663	-	335,059	-	364,608	-	369,809	-
MT. PROVINCE	130,755	-	134,072	-	139,560	-	146,994	-	148,752	-	157,372	-	164,745	-	165,963	-
I	3,803,890	-	3,931,281	-	4,140,531	-	4,413,599	-	4,481,820	-	4,802,027	-	5,086,178	-	5,133,705	-
ILOCOS NORTE	482,651	-	498,024	-	523,281	-	556,363	-	564,597	-	603,852	-	638,608	-	644,302	-
ILOCOS SUR	545,385	-	566,419	-	600,962	-	646,619	-	658,148	-	714,084	-	766,752	-	776,192	-
LA UNION	597,442	-	621,073	-	659,889	-	710,740	-	723,594	-	785,052	-	841,752	-	851,573	-
PANGASINAN	2,178,412	-	2,245,745	-	2,356,399	-	2,499,877	-	2,535,481	-	2,699,039	-	2,839,066	-	2,881,638	-
II	2,536,035	-	2,640,554	-	2,812,589	-	3,031,999	-	3,086,812	-	3,341,083	-	3,560,659	-	3,596,051	-
BATANES	14,180	-	14,667	-	15,468	-	16,500	-	16,754	-	18,004	-	19,216	-	19,930	-
CAGAYAN	895,050	-	925,789	-	976,294	-	1,040,286	-	1,055,999	-	1,128,751	-	1,189,745	-	1,199,223	-
ISABELA	1,160,721	-	1,211,077	-	1,293,924	-	1,425,411	-	1,456,463	-	1,546,463	-	1,650,498	-	1,667,139	-
NUEVA VIZCAYA	334,965	-	350,008	-	374,772	-	406,596	-	414,600	-	452,476	-	486,333	-	492,027	-
QUIRINO	131,119	-	139,013	-	152,131	-	169,545	-	174,048	-	195,389	-	215,042	-	218,446	-
III	6,932,570	-	7,218,813	-	7,686,845	-	8,278,712	-	8,426,578	-	9,101,473	-	9,687,897	-	9,786,860	-
BATAAN	491,459	-	511,172	-	542,799	-	595,440	-	608,859	-	671,116	-	727,735	-	737,568	-
BULACAN	1,784,441	-	1,841,978	-	1,933,792	-	2,096,119	-	2,136,960	-	2,325,335	-	2,490,357	-	2,518,066	-
NUEVA ECJA	1,505,827	-	1,542,866	-	1,601,805	-	1,712,689	-	1,740,075	-	1,864,351	-	1,971,013	-	1,989,170	-
PAMPANGA	1,635,767	-	1,774,189	-	2,006,177	-	2,169,530	-	2,210,515	-	2,397,401	-	2,561,300	-	2,589,472	-
TARLAC	945,810	-	963,821	-	992,514	-	1,050,703	-	1,064,865	-	1,127,791	-	1,179,153	-	1,187,464	-
ZAMBALES	569,266	-	584,887	-	609,758	-	654,251	-	665,304	-	715,479	-	765,139	-	785,120	-
IV	9,940,722	1,832,348	10,463,047	1,923,713	11,301,272	2,069,957	12,508,472	2,281,798	12,810,064	2,334,488	14,441,165	2,617,843	16,233,025	2,929,355	16,582,194	2,990,864
AURORA	159,621	-	170,759	-	186,960	-	214,991	-	218,689	-	256,945	-	285,995	-	303,803	-
BATANGAS	1,658,567	-	1,728,360	-	1,838,786	-	1,999,450	-	2,038,528	-	2,253,902	-	2,489,821	-	2,535,515	-
CAVITE	1,610,324	-	1,712,317	-	1,877,736	-	2,114,767	-	2,152,109	-	2,502,109	-	2,864,873	-	2,935,964	-
LAGUNA	1,631,082	-	1,719,657	-	1,861,811	-	2,064,728	-	2,115,462	-	2,390,209	-	2,692,022	-	2,750,541	-
MARINDUQUE	199,910	199,910	208,035	208,035	220,866	220,866	239,480	239,480	243,987	243,987	268,406	268,406	284,919	284,919	300,069	300,069
OCCIDENTAL MINDORO	337,231	304,381	353,024	319,935	378,283	344,829	415,180	380,951	424,321	389,950	474,087	438,578	529,098	492,153	539,998	502,742
OCCIDENTAL MINDORO	608,616	608,616	640,132	640,132	690,618	690,618	764,258	764,258	782,642	882,253	882,253	992,933	992,933	1,015,066	1,015,066	
PALAWAN	640,486	503,353	677,193	532,535	736,379	579,637	821,781	647,300	843,321	664,384	958,111	755,043	1,084,172	854,306	1,109,031	873,833
QUEZON	1,537,742	-	1,608,319	-	1,720,478	-	1,883,898	-	1,924,198	-	2,144,023	-	2,387,728	-	2,436,090	-
RIZAL	1,312,489	-	1,392,654	-	1,522,330	-	1,706,851	-	1,753,593	-	2,001,129	-	2,287,027	-	2,317,005	-
ROMBLON	244,654	216,088	252,597	223,076	265,025	234,007	282,990	249,809	287,215	253,523	310,008	273,563	334,437	295,044	339,112	289,154
V	4,325,307	711,713	4,488,068	736,731	4,755,820	777,940	5,083,404	827,844	5,165,243	840,255	5,560,622	899,860	5,920,227	953,899	5,981,033	963,163
ALBAY	1,005,315	-	1,038,487	-	1,093,038	-	1,158,820	-	1,175,060	-	1,253,502	-	1,322,909	-	1,334,135	-
CAMARINES NORTE	439,151	-	457,197	-	486,881	-	523,454	-	532,651	-	577,665	-	620,117	-	627,690	-
CAMARINES SUR	1,432,598	-	1,490,656	-	1,586,145	-	1,703,965	-	1,733,581	-	1,876,436	-	2,006,637	-	2,028,515	-
CATANDUANES	202,464	202,464	208,126	209,128	220,085	220,085	233,340	233,340	236,614	236,614	252,457	252,457	268,815	268,815	289,291	289,291
MASBATE	653,852	509,249	676,886	527,605	714,831	557,855	760,694	594,504	772,102	603,641	826,734	647,403	876,146	687,084	884,585	693,872
SORSOGON	591,927	-	615,716	-	654,840	-	703,131	-	715,255	-	773,828	-	827,603	-	836,817	-
VI	5,776,938	5,759,837	5,983,675	5,965,638	6,324,098	6,304,527	6,772,424	6,750,751	6,884,429	6,862,214	7,421,267	7,396,368	7,905,982	7,878,490	7,988,687	7,960,724
AKLAN	410,538	410,538	425,409	425,409	449,498	449,498	482,165	482,165	490,321	490,321	531,036	531,036	569,411	569,411	576,303	576,303
ANTIQUE	431,713	414,612	449,130	431,093	477,405	457,834	525,457	503,242	537,021	503,242	573,021	548,122	625,637	590,157	617,649	597,674
CAPIZ	624,469	624,469	650,253	650,253	692,112	692,112	748,221	748,221	762,368	762,368	831,574	831,574	896,851	896,851	908,852	908,852
GUIMARAS	126,470	126,470	130,881	130,881	138,012	138,012	147,472	147,472	149,823	149,823	161,232	161,232	171,490	171,490	173,210	173,210
ILOILO	1,749,561	1,749,561	1,807,675	1,807,675	1,906,343	1,906,343	2,037,351	2,037,351	2,069,839	2,069,839	2,227,978	2,227,978	2,370,674	2,370,674	2,394,816	2,394,816
NEGROS OCCIDENTAL	2,434,186	2,434,186	2,520,327	2,520,327	2,660,728	2,660,728	2,841,437	2,841,437	2,868,621	2,868,621	3,096,426	3,096,426	3,279,907	3,279,907	3,310,069	3,310,069
VII	5,014,588	4,803,825	5,214,527	4,996,189	5,539,177	5,308,961	5,962,484	5,717,051	6,068,238	5,819,059	6,566,845	6,300,277	7,018,122	6,736,203	7,095,561	6,811,055
BOHOL	994,440	975,344	1,030,901	1,010,955	1,068,233	1,066,939	1,164,151	1,141,066	1,182,947	1,159,410	1,271,957	1,248,278	1,350,755	1,323,137	1,363,674	1,335,731
CEBU	2,921,145	2,729,478	3,038,643	2,840,451	3,233,704	3,024,782	3,488,981	3,264,633	3,550,402	3,324,760	3,849,524	3,608,635	4,122,924	3,868,623	4,170,882	3,914,299
NEGROS ORIENTAL	1,025,247	1,025,247	1,068,169	1,068,169	1,136,128	1,136,128	1,224,303	1,224,303	1,246,366	1,246,366	1,349,796	1,349,796	1,442,549	1,442,549	1,458,071	1,458,071
SIIQUIJOR	73,756	73,756	76,614	76,614	81,112	81,112	87,049	87,049	88,523	88,523	95,568	95,568	102,894	102,894	102,894	102,894
VIII	3,366,917	3,216,323	3,511,714	3,355,487	3,743,899	3,578,796	4,055,416	3,878,360	4,133,242	3,953,220	4,523,762	4,328,869	4,898,176	4,689,152	4,965,662	4,754,116
BILIRAN	132,209	124,356	138,126	129,947	147,425	138,739	159,865	150,496	162,958	153,421	178,461	168,082	193,140	181,972	195,739	184,433
EASTERN SAMAR	362,324	362,324	381,929	381,929	413,205	413,205	454,877	454,877	465,467	465,467	518,172	518,172				

TABLE 8.1-3 POPULATION PROJECTION (URBAN POPULATION)

Region/Province	1995		1997		2000		2004		2005		2010		2015		2020			
	Total	Study Area	Total	Study Area	Total	Study Area	Total	Study Area	Total	Study Area	Total	Study Area	Total	Study Area	Total	Study Area		
Philippines	32,350,035	10,648,689	34,429,638	11,476,723	37,944,245	12,921,353	42,850,882	14,951,245	44,139,262	15,490,393	50,492,131	18,236,455	56,861,659	21,054,056	58,047,475	21,586,875	63,100,627	23,872,528
NCR	8,454,040	-	9,814,977	-	10,405,479	-	11,112,687	-	11,289,568	-	12,020,405	-	12,590,106	-	12,875,924	-	13,025,085	-
CAR	317,784	-	342,020	-	383,170	-	438,168	-	452,759	-	519,581	-	587,664	-	600,606	-	656,130	-
ABRA	34,074	-	35,747	-	38,507	-	42,347	-	43,319	-	48,157	-	52,753	-	53,591	-	57,077	-
BENGUET	215,391	-	230,412	-	255,577	-	286,471	-	294,443	-	325,965	-	355,122	-	360,208	-	381,278	-
IFUGAO	18,608	-	20,248	-	23,032	-	27,184	-	28,304	-	34,204	-	40,599	-	41,897	-	47,520	-
KALINGA APAYAO	42,990	-	48,439	-	58,082	-	73,019	-	77,236	-	100,147	-	128,309	-	131,669	-	155,475	-
MT.PROVINCE	6,701	-	7,176	-	9,147	-	11,112	-	11,683	-	15,108	-	18,881	-	19,241	-	22,480	-
I	1,279,694	-	1,381,979	-	1,555,052	-	1,786,434	-	1,863,932	-	2,190,288	-	2,520,827	-	2,582,606	-	2,845,489	-
ILOCOS NORTE	151,863	-	160,630	-	175,164	-	195,413	-	200,704	-	227,262	-	253,819	-	258,773	-	279,567	-
ILOCOS SUR	108,893	-	115,248	-	125,786	-	140,436	-	144,265	-	163,573	-	183,210	-	186,986	-	202,878	-
LA UNION	142,172	-	155,670	-	178,793	-	212,641	-	221,920	-	270,573	-	323,697	-	334,266	-	380,097	-
PANGASINAN	876,766	-	950,431	-	1,075,309	-	1,249,944	-	1,297,043	-	1,528,860	-	1,760,101	-	1,802,581	-	1,982,947	-
II	582,463	-	634,893	-	724,521	-	853,094	-	887,942	-	1,068,919	-	1,254,835	-	1,291,044	-	1,446,776	-
BATANES	4,327	-	4,592	-	5,030	-	5,637	-	5,794	-	6,605	-	7,387	-	7,515	-	8,055	-
CAGAYAN	164,780	-	176,253	-	195,461	-	222,380	-	229,469	-	265,391	-	301,802	-	308,711	-	337,948	-
ISABELA	281,356	-	308,188	-	354,185	-	438,341	-	450,341	-	530,796	-	628,245	-	647,054	-	728,069	-
NEUEVA VIZCAYA	96,436	-	106,432	-	123,707	-	148,733	-	155,607	-	191,223	-	229,214	-	236,577	-	268,463	-
QUIRINO	35,564	-	39,428	-	46,138	-	56,003	-	58,731	-	72,904	-	88,187	-	91,187	-	104,241	-
III	4,057,684	-	4,297,362	-	4,688,758	-	5,300,031	-	5,460,327	-	6,201,635	-	6,891,533	-	7,014,124	-	7,527,137	-
BATAAN	259,753	-	304,610	-	364,600	-	439,610	-	461,557	-	549,874	-	639,582	-	664,582	-	753,311	-
BULACAN	1,243,951	-	1,321,174	-	1,447,594	-	1,645,627	-	1,697,781	-	1,938,523	-	2,161,902	-	2,200,500	-	2,361,854	-
NEUEVA ECUIJA	509,015	-	540,334	-	591,578	-	699,353	-	726,794	-	851,242	-	924,035	-	945,721	-	1,037,649	-
PAMPANGA	1,436,104	-	1,520,963	-	1,659,469	-	1,884,928	-	1,918,510	-	2,154,784	-	2,363,656	-	2,399,711	-	2,549,449	-
TARLAC	199,944	-	208,501	-	222,258	-	246,137	-	252,281	-	282,006	-	310,543	-	315,889	-	338,201	-
ZAMBALES	406,917	-	429,685	-	463,259	-	516,935	-	530,845	-	595,228	-	653,625	-	663,721	-	705,673	-
IV	4,853,624	357,636	5,227,642	384,466	5,844,756	428,722	6,736,267	495,153	6,968,802	512,548	8,211,303	607,095	9,595,715	716,759	9,868,830	738,828	11,041,937	834,517
AURORA	44,119	-	48,226	-	55,119	-	65,386	-	68,131	-	82,977	-	100,198	-	103,780	-	119,419	-
BATANGAS	357,789	-	385,852	-	431,609	-	501,223	-	519,490	-	621,441	-	740,396	-	765,048	-	872,084	-
CAVITE	1,182,577	-	1,286,079	-	1,458,709	-	1,773,195	-	1,797,457	-	2,123,814	-	2,515,875	-	2,593,057	-	2,928,935	-
LAGUNA	1,230,297	-	1,325,925	-	1,483,633	-	1,707,150	-	1,765,301	-	2,071,529	-	2,407,290	-	2,472,622	-	2,751,985	-
MARINDUQUE	33,251	33,251	35,575	35,575	39,374	39,374	45,070	45,070	46,544	46,544	54,658	54,658	63,959	63,959	65,879	65,879	74,146	74,146
OCCIDENTAL MINDORO	60,871	44,170	64,348	46,692	69,946	50,754	78,183	56,732	80,259	58,238	91,503	66,397	103,996	75,461	106,434	77,400	116,784	85,658
OCCIDENTAL MINDORO	91,448	91,448	96,986	96,986	105,928	105,928	119,088	119,088	122,432	122,432	140,490	140,490	160,676	160,676	164,752	164,752	182,092	182,092
OCCIDENTAL MINDORO	193,966	152,799	211,888	166,917	241,950	190,598	287,585	226,556	299,813	236,181	366,990	288,507	445,991	350,664	461,993	362,959	532,252	416,902
OCCIDENTAL MINDORO	487,180	-	516,858	-	584,309	-	634,864	-	652,806	-	750,846	-	861,685	-	884,188	-	980,255	-
OCCIDENTAL MINDORO	1,133,972	-	1,215,681	-	1,349,554	-	1,539,844	-	1,588,690	-	1,846,545	-	2,125,858	-	2,179,116	-	2,405,683	-
OCCIDENTAL MINDORO	38,154	35,968	40,624	38,296	44,625	42,068	50,607	47,707	52,141	49,153	60,510	57,043	70,011	65,999	71,961	67,838	80,322	75,719
OCCIDENTAL MINDORO	1,288,253	180,222	1,394,786	173,408	1,575,633	195,766	1,825,702	227,028	1,893,215	235,445	2,239,266	279,291	2,601,295	326,237	2,670,690	335,524	2,967,454	375,412
ALBAY	328,503	-	360,946	-	416,755	-	494,683	-	515,985	-	624,819	-	738,061	-	759,274	-	850,584	-
CAMARINES NORTE	152,928	-	163,489	-	181,169	-	205,010	-	211,300	-	243,470	-	278,821	-	283,290	-	310,704	-
CAMARINES SUR	424,247	-	454,691	-	505,765	-	575,353	-	593,786	-	687,991	-	784,987	-	803,447	-	881,715	-
CATANDUANES	61,277	61,277	65,608	65,608	72,863	72,863	82,763	82,763	85,385	85,385	98,826	98,826	112,802	112,802	115,518	115,518	127,043	127,043
MASBATE	140,669	98,945	153,259	107,800	174,729	122,903	205,100	144,285	213,338	150,060	256,564	180,465	303,438	213,435	312,779	220,006	353,100	248,369
SORSOGON	180,629	-	196,793	-	224,352	-	262,961	-	273,421	-	327,596	-	385,188	-	395,382	-	444,508	-
VI	2,075,218	2,073,536	2,207,532	2,205,712	2,433,647	2,431,594	2,748,208	2,746,819	2,832,683	2,830,203	3,251,953	3,249,004	3,675,610	3,672,162	3,755,416	3,751,870	4,094,260	4,090,290
AKLAN	66,370	66,370	71,252	71,252	79,389	79,389	91,256	91,256	94,421	94,421	111,153	111,153	129,180	129,180	132,812	132,812	148,334	148,334
ANTIQUE	110,492	108,810	117,814	115,994	130,028	127,975	147,449	145,600	152,075	149,595	175,774	172,825	200,396	196,918	205,145	201,599	225,506	221,536
CAPIZ	112,204	112,204	121,223	121,223	136,354	136,354	158,395	158,395	164,316	164,316	195,419	195,419	229,063	229,063	235,850	235,850	265,019	265,019
GUIMARAS	13,450	13,450	14,735	14,735	16,921	16,921	20,867	20,867	21,602	21,602	25,160	25,160	29,646	29,646	30,515	30,515	34,250	34,250
ILOILO	646,311	646,311	685,737	685,737	757,276	757,276	866,777	866,777	883,149	883,149	1,015,819	1,015,819	1,180,062	1,180,062	1,175,311	1,175,311	1,282,454	1,282,454
NEGROS OCCIDENTAL	1,126,391	1,126,391	1,196,771	1,196,771	1,313,679	1,313,679	1,475,309	1,475,309	1,517,855	1,517,855	1,728,628	1,728,628	1,937,283	1,937,283	1,975,783	1,975,783	2,138,697	2,138,697
VII	2,009,168	1,951,519	2,151,174	2,087,861	2,401,507	2,328,637	2,747,724	2,658,176	2,839,515	2,745,486	3,296,514	3,183,162	3,768,258	3,625,700	3,846,745	3,709,217	4,219,617	4,085,015
BOHOL	186,437	186,437	197,422	197,422	215,181	215,181	239,362	239,362	245,524	241,733	277,549	273,176	308,820	303,949	314,692	309,710	339,374	333,926
CEBU	1,499,770	1,442,121	1,599,251	1,535,936	1,777,832	1,704,962	2,021,962	1,935,439	2,086,096	1,995,858	2,401,082	2,282,083	2,714,757	2,586,069	2,773,821	2,641,275	3,023,037	2,873,883
NEGROS ORIENTAL	311,056	311,056	341,512	341,512	393,692	393,692	468,920	468,920	489,690	489,690	595,863	595,863	709,452	709,452	731,165	731,165		

TABLE 8.1-4 POPULATION BY ISLAND IN THE STUDY AREA

Island	1995	1997	2000	2004	2005	2010	2015	2016	2020
Study Area Total	31,167,764	32,518,222	34,730,970	37,698,432	38,439,383	42,062,279	45,451,456	46,050,990	48,532,659
Marinduque	199,910	208,035	220,866	239,480	243,987	268,406	294,919	300,069	321,574
Mindoro	912,997	960,067	1,035,447	1,145,209	1,172,592	1,320,831	1,485,086	1,517,808	1,656,046
Palawan	503,353	532,535	579,637	647,300	664,384	755,043	854,306	873,833	956,482
Romblon	216,088	223,076	234,007	249,809	253,523	273,563	295,044	299,154	316,150
Catanduanes	202,464	209,126	220,085	233,340	236,614	252,457	266,815	269,291	279,434
Masbate	509,249	527,605	557,855	594,504	603,641	647,403	687,084	693,872	721,728
Panay	3,199,181	3,314,430	3,505,787	3,761,842	3,825,770	4,138,710	4,427,093	4,477,445	4,684,028
Guimaras	126,470	130,881	138,012	147,472	149,823	161,232	171,490	173,210	180,250
Negros	3,459,433	3,588,496	3,796,856	4,065,740	4,132,987	4,446,222	4,722,456	4,768,140	4,955,925
Bohol	975,344	1,010,955	1,066,939	1,141,066	1,159,410	1,246,278	1,323,137	1,335,731	1,387,257
Cebu	2,729,478	2,840,451	3,024,782	3,264,633	3,324,760	3,608,635	3,868,623	3,914,299	4,102,455
Siquijor	73,756	76,614	81,112	87,049	88,523	95,568	101,894	102,954	107,298
Leyte	1,922,445	2,006,342	2,141,932	2,323,821	2,369,152	2,597,538	2,816,228	2,855,569	3,017,870
Samar	1,293,878	1,349,145	1,436,864	1,554,539	1,584,068	1,731,331	1,872,924	1,898,547	2,005,131
Mindanao	14,775,679	15,471,377	16,620,162	18,169,781	18,556,830	20,443,100	22,185,994	22,492,315	23,760,730
Camiguin	68,039	69,087	70,627	72,847	73,319	75,962	78,363	78,753	80,301

8.1.3 Age Structure and Migration

The age and sex structure is thought to change to so-called "bell type" in 2010-2015 from the current "pyramid type", that is, the population of each age group under 25 year old will keep same level due to high survival rate; the population of old ages will increase; the rate of dependent population to working age (not less than 15 and less than 65) population will decrease from 0.72 in 1995 to 0.53 in 2015, will contribute to the development of the economy.

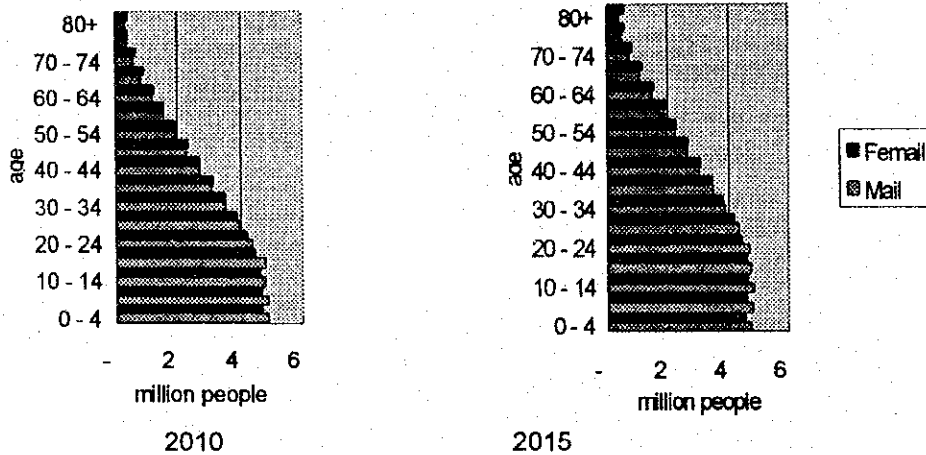


FIGURE 8.1-3 AGE STRUCTURE IN 2010 AND 2015

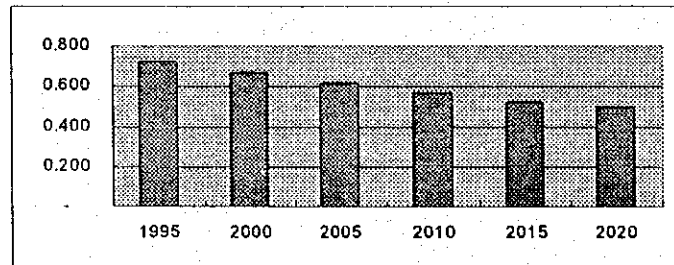


FIGURE 8.1-4 RATE OF DEPENDENT POPULATION TO WORKING AGE (NOT LESS THAN 15 AND LESS THAN 65) POPULATION

8.1.4 Labor Force and Employment

The population 15 years old and over was projected to 72 million in 2016. The rate of the population in the labor force or the economically active population has been about 65% in these 10 years and is supposed to be constant. The employment rate was assumed to be gradually enhanced to 95% in 2016 or the unemployment rate would be 5%. In this condition, the total employment in 2016 was estimated to be 44,482 thousand people.

The rate of agricultural employment to rural population was 31.3% in 1995 and would increase to 36.2% in 2016 or the agricultural employment would become 15,523 thousand. The rates of industries and services employment to urban population were 12.4% and 32.0%, respectively. The rate would be 13.5% and 37.0% in 2016 with a slight shift to the services sector. The industries and services employment would be 7,747 thousand and 21,212 thousand people, respectively in 2016.

The result of the projection was that the composition of employment in agricultural, industries and services sectors was 44%, 16% and 40%, respectively in 1995 and would be 35%, 17% and 48% in 2016. The agricultural employment would reduce the share but the number would increase by more than 4 million. Employment projection by sector is summarized in Table 8.1-5.

TABLE 8.1-5 EMPLOYMENT PROJECTION BY SECTOR

	1995	1997	2000	2004	2005	2010	2015	2016
Population	68,616,528	71,538,597	76,320,141	82,636,723	84,214,778	91,851,291	99,007,597	100,269,915
Urban Population	32,425,950	34,190,677	37,635,754	42,451,179	43,717,011	49,958,656	56,218,757	57,383,678
Rural population	36,190,578	37,347,920	38,684,387	40,185,544	40,497,767	41,892,635	42,788,840	42,886,237
Population over 15 years	42,320,322	44,122,554	48,719,809	52,752,069	55,786,968	63,271,321	70,652,036	72,034,860
In labor force	65.6%	65.5%	65.5%	65.3%	65.3%	65.2%	65.0%	65.0%
Employment rate	92.6% *1	92.8%	93.1%	93.6%	93.7%	94.3%	94.9%	95.0%
Total employment	25,698,000	26,836,090	29,704,404	32,266,590	34,150,262	38,886,199	43,593,535	44,481,526
Agricultural employment / rural population	31.3%	31.0%	32.0%	32.0%	33.3%	34.6%	36.0%	36.2%
Industries employment / urban population	12.4%	12.5%	12.6%	12.8%	12.9%	13.2%	13.4%	13.5%
Services employment/ urban population	32.0%	32.4%	33.2%	34.1%	32.3%	35.5%	36.7%	37.0%
Agriculture	11,324,000 44.1%	11,565,695 43.1%	12,382,298 41.7%	12,865,817 39.9%	13,466,487 39.4%	14,505,598 37.3%	15,383,037 35.3%	15,523,000 34.9%
Industry	4,007,000 15.6%	4,262,261 15.9%	4,753,184 16.0%	5,453,736 16.9%	5,640,145 16.5%	6,581,323 16.9%	7,558,943 17.3%	7,746,797 17.4%
Service	10,367,000 40.3%	11,008,115 41.0%	12,568,922 42.3%	13,947,037 43.2%	15,043,630 44.1%	17,799,278 45.8%	20,651,554 47.4%	21,211,730 47.7%

(NSO, JICA Study Team)

*1:91.6% (NSO), 92.6% calculation in this table

8.2 FUTURE LAND USE

"Crop Development and Soil Conservation Framework (1990), Agricultural Land Management and Evaluation Division (ALMED), BSWM" proposed the development cluster analyzing comprehensively existing land use, slope, elevation, climate, crop production, soil erosion, water resources and other conditions. The development cluster consists of production zone, agricultural expansion zone, rehabilitation zone, conservation/protection zone and miscellaneous area. (Table 8.2-1, 2)

TABLE 8.2-1 DESCRIPTION OF DEVELOPMENT CLUSTER (FUTURE LAND USE) (BSWM)

Zone / Area	Description
Production Zone	Suitable for agricultural production
Agricultural Area (Less Limitation)	Lands devoted to intensive agricultural production with less land degradation
Agricultural Area (Land Degradation)	Lands generally utilized for agricultural production subject to land degradation
Pasture	Grazing lands mostly for raising livestock
Fishpond	Ponds for commercial production of prawns, fishes, mussels
Agricultural Expansion Zone	Mostly grassland or burning on low hills and lower slopes of mountains shifting cultivation
Rehabilitation Zone / Reforestation and Afforestation Area	Mostly slopes more than 18 degree subject to soil erosion
Preservation/Conservation Zone	Lands adequately covered with woods on slopes
Woodland	Primary and second growth forests
Wet-land Forest	Mangrove forests, marshes and swamps with bio-diversity
Miscellaneous Zone	Other man-made land use
Built-up Area	Urban and rural settlement, commercial and industrial area, etc.
Others	Barren land, river, lakes, etc.

TABLE 8.2-2 DEVELOPMENT CLUSTER BY ISLAND IN THE STUDY AREA

(unit : ha)

Island	Agricultural Zone		Forest Zone		Built-up & Others	Total
	Agriculture	Expansion Zone	Rehabilitation Zone	Protection Zone		
Marinduque	14,695	23,440	41,447	14,274	2,069	95,925
Mindoro	266,686	84,099	239,338	390,593	43,741	1,024,457
Palawan	151,775	172,400	275,828	861,618	28,005	1,489,626
Romblon	34,802	5,736	50,823	42,690	1,542	135,593
Masbate	271,450	52,599	57,601	13,654	9,465	404,769
Panay (Gulmaras)	474,587	101,193	390,880	189,255	69,245	1,225,160
Negros	677,150	209,716	321,037	95,342	29,656	1,332,810
Bohol	184,874	66,811	89,698	60,507	9,840	411,730
Cebu (Siquijor)	244,192	39,806	227,548	42,959	19,290	573,795
Leyte (Biliran)	414,617	30,645	189,368	85,839	24,291	744,760
Samar	510,263	79,713	222,083	516,638	14,163	1,342,860
Mindanao	3,221,209	1,566,846	1,394,721	3,463,255	57,977	9,704,008
Camiguin	13,849	2,232	1,978	5,276	248	23,583
Study Area Total	6,480,149	2,435,236	3,502,350	5,781,900	309,441	18,509,076

SOURCE: ALMED, Bureau of Soils and Water Management

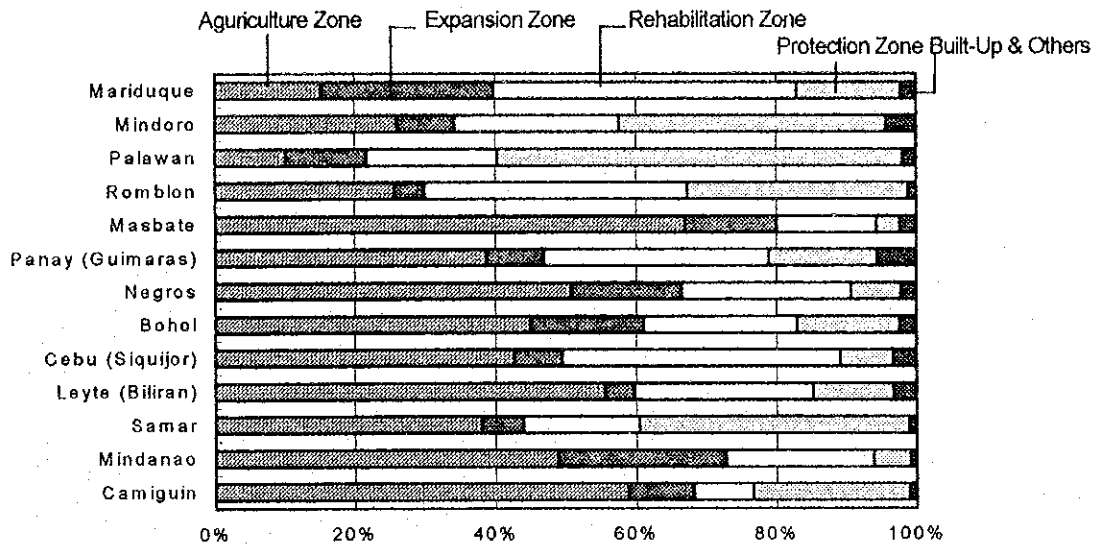


FIGURE 8.2-1 FUTURE LAND USE BY ISLAND

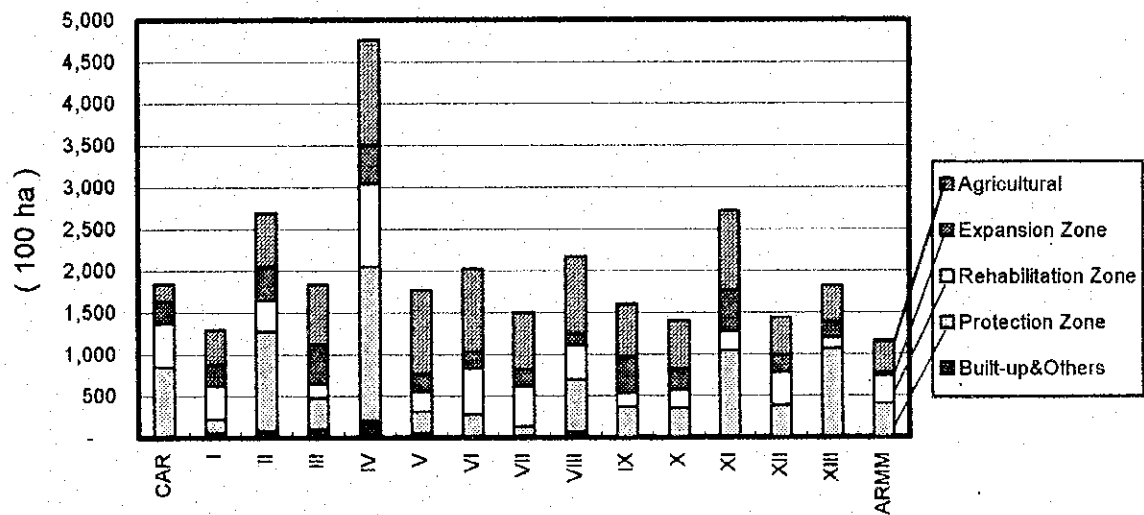


FIGURE 8.2-2 FUTURE LAND USE BY REGION

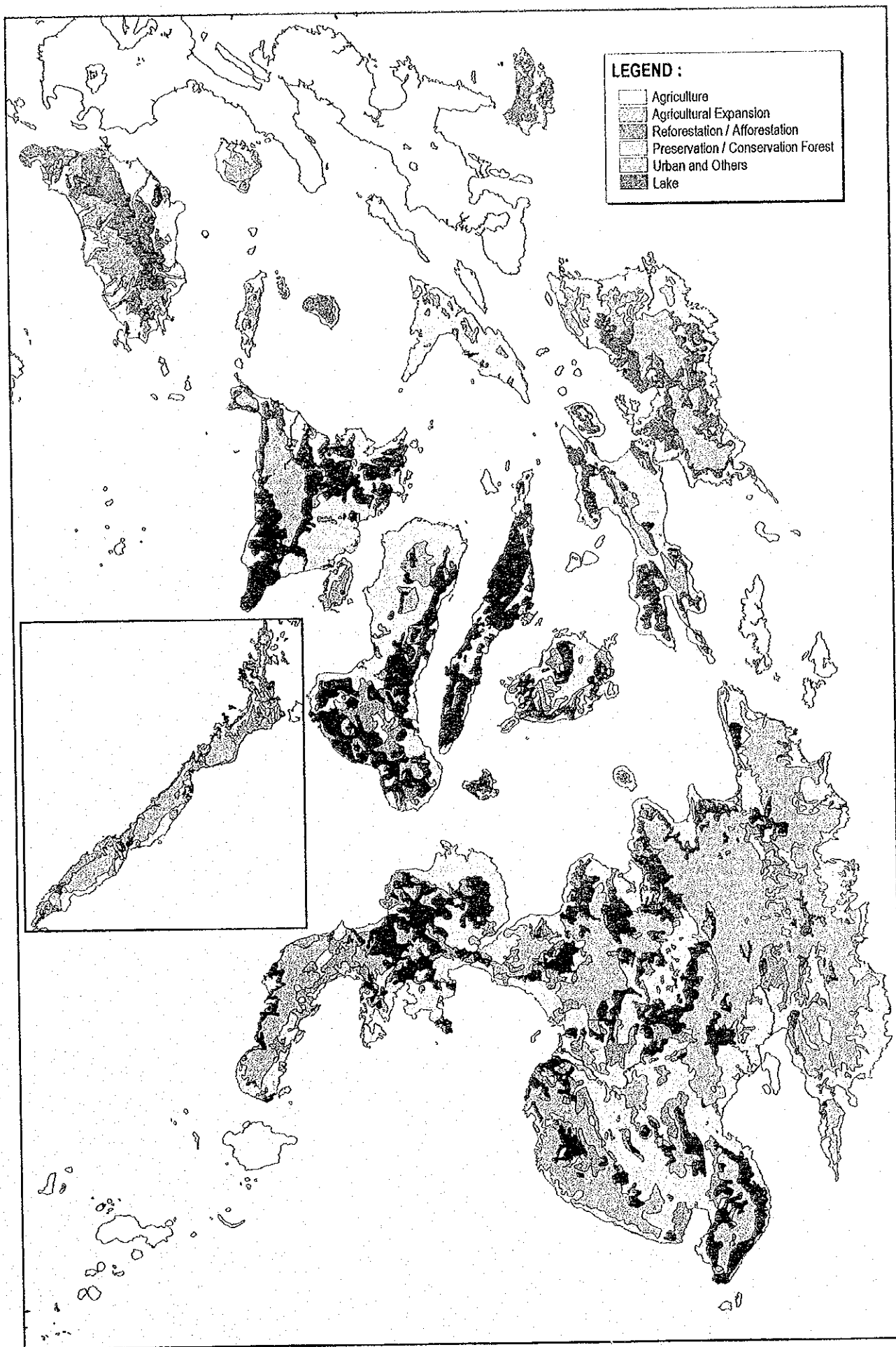
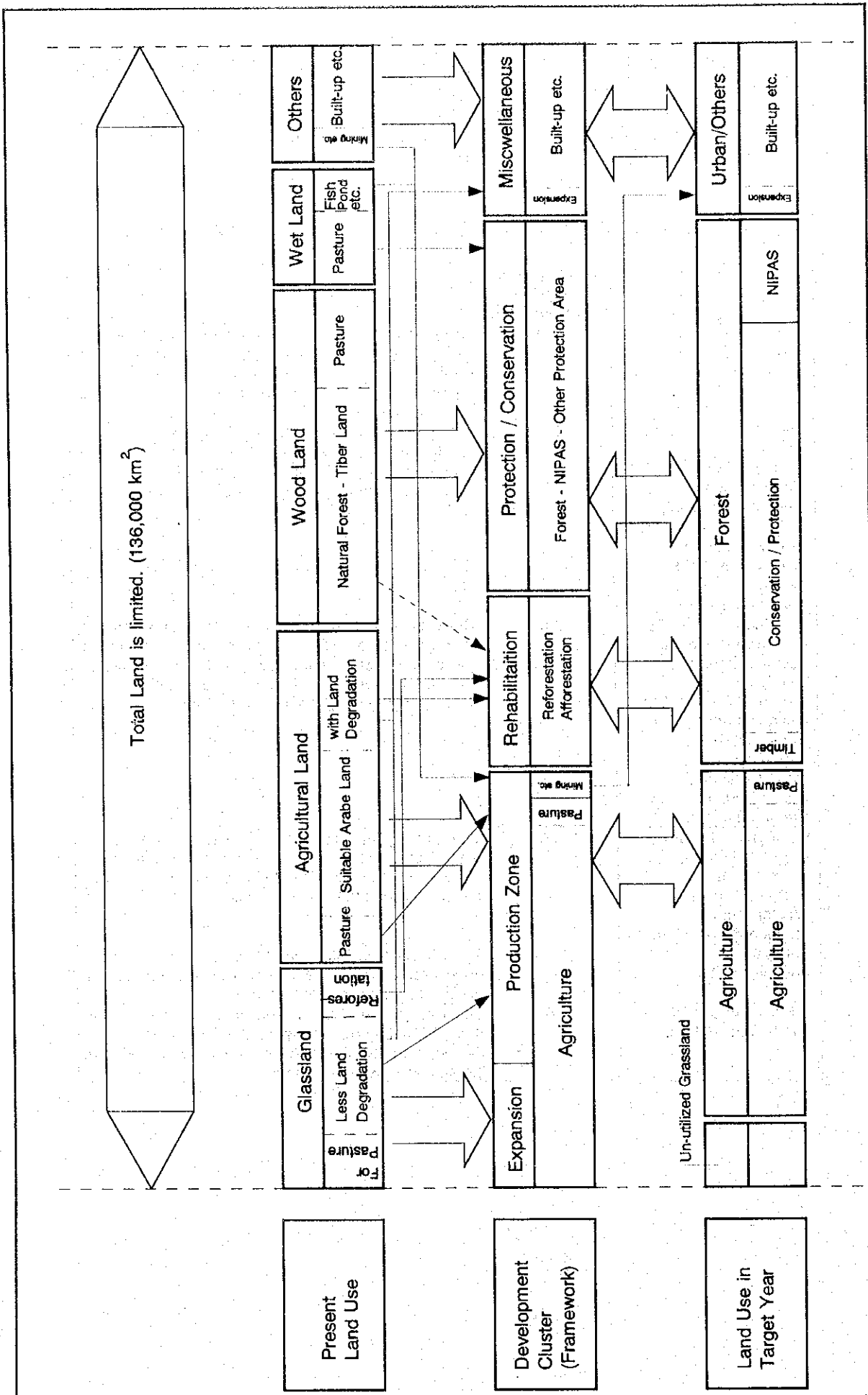


FIGURE 8.2-3 FUTURE LAND USE

In the target year of the Study (2016), the Production Zone was assumed to be fully utilized with measures against land degradation. The Agricultural Expansion Zone was assumed to be developed. The development target in each province by 2016 is set as Table 8.2-3 with consideration of the conditions. The total agricultural land in the target year is shown in Table 8.2-4.

TABLE 8.2-3 DEVELOPMENT TARGET IN AGRICULTURAL EXPANSION ZONE

Province	Development Target in Expansion Zone	Description
Romblon Antique Leyte (Biliran)	1.0	The existing agricultural land already covers most of arable land and extending marginal areas. The expansion zone should be utilized as a whole with afforestation and agro-forestry in the land subject to land degradation.
Marinduque, Masbate Aklan Capiz, Iloilo (Guimaras) Negros Oriental, Negros Occidental, Bohol, Cebu (Siquijor) Southern Leyte Agusan del Norte Lanao del Sur Maguindanao	0.9	The existing agricultural land already covers most of arable land and extending marginal areas. The expansion zone should be utilized to 90% with afforestation and agro-forestry in the land subject to land degradation.
Bukidnon, Misamis Occidental, Misamis Oriental, Camiguin Davao, Davao del Sur Davao Oriental, South Cotabato, Lanao del Norte, North Cotabato, Sultan Kudarat, Surigao del Norte	0.8	The existing agricultural land covers a large part of the arable land. The expansion zone should be utilized 80% with afforestation and agro-forestry in the land subject to land degradation with development priority in Mindanao Island.
Occidental Mindoro, Oriental Mindoro, Eastern Samar, Northern Samar, Western Samar, Zamboanga del Norte	0.7	The existing agricultural land covers a large part of the arable land. The expansion zone should be utilized to 70% with afforestation and agro-forestry in the land subject to land degradation.
Palawan, Agusan del Sur	0.6	The existing agricultural land has not reached a total good arable land. The potential of development to the expansion zone is to be large.
Surigao del Sur Zamboanga del Sur	0.4	The existing agricultural land is still much smaller than a total good arable land. The potential of development to the rest of arable area and the expansion zone is to be large.



Source : Crop Development and Soil Conservation Framework, BSWM

FIGURE 8.2-4 LAND USE FRAMEWORK AND LAND USE IN TARGET YEAR

TABLE 8.2-4 LAND USE PROJECTION

(unit: ha)

REGION/PROVINCE	Agricultural Zone		Forest Zone		Built-up & Others	Total	Development Target (C)	Future	Present	Development Index
	Agriculture (A)	Expansion Zone (B)	Rehabilitation Zone	Protection Zone				Agriculture (A)+(B)+(C)	Agriculture	
CAR, I, II, III	1,990,369	1,376,228	1,470,976	2,559,285	269,446	7,666,304	0.6	2,816,106	1,855,146	1.52
Region 4										
Total	1,251,970	460,203	992,801	1,843,676	207,366	4,756,018	0.7	1,574,112	1,410,315	1.12
Study Area Total	467,958	285,675	607,436	1,309,175	75,357	2,745,601	0.7	657,099	515,891	1.27
Marinduque	14,695	23,440	41,447	14,274	2,069	95,925	0.9	35,791	35,083	1.02
Occidental Mindoro	121,652	55,950	164,672	223,807	21,904	587,985	0.7	160,817	123,596	1.30
Oriental Mindoro	145,034	28,149	74,666	166,786	21,837	436,472	0.7	164,738	154,389	1.07
Palawan	151,775	172,400	275,828	861,618	28,005	1,489,626	0.6	255,215	154,250	1.65
Romblon	34,802	5,736	60,823	42,690	1,542	135,593	1.0	40,538	48,673	1.00
Region 5										
Total	990,619	200,373	242,954	264,325	52,978	1,763,249	0.9	1,182,655	999,020	1.18
Macbate	271,450	52,699	57,801	13,654	9,465	404,769	0.9	318,789	270,680	1.18
Region 6										
Total	985,630	205,844	552,693	250,621	27,622	2,022,310	0.6	1,101,977	893,722	1.23
Aklan	55,867	7,614	50,299	51,107	17,832	182,719	0.9	62,720	54,234	1.16
Antique	50,770	13,606	121,934	59,420	2,865	248,595	1.0	64,376	67,893	1.00
Capiz	87,776	20,225	87,981	42,356	30,424	268,762	0.9	105,979	94,758	1.12
Iloilo (Gimaraes)	280,174	59,748	130,666	36,372	18,124	525,084	0.9	333,947	216,887	1.54
Negros Occidental	440,770	104,651	161,813	61,366	24,000	792,600	0.9	534,956	459,948	1.16
Region 7										
Total	672,963	211,682	476,470	109,374	27,178	1,497,687	0.9	855,960	665,446	1.29
Bohol	184,874	66,811	89,698	60,507	9,840	411,730	0.9	245,004	184,074	1.33
Cebu	227,063	36,000	216,040	13,193	19,081	511,377	0.9	259,463	227,063	1.14
Negros Oriental	236,380	105,065	159,224	33,976	5,665	540,210	0.9	330,939	236,380	1.40
Siquijor	17,129	3,806	11,508	29,766	209	62,418	0.9	20,554	17,129	1.20
Region 8										
Total	924,880	137,353	414,958	626,867	66,107	2,170,165	0.6	1,010,825	965,102	1.05
Leyte (Dairan)	324,070	25,654	141,851	59,510	20,195	571,280	1.0	349,724	352,529	1.00
Southern Leyte	90,547	4,991	47,517	26,329	4,096	173,480	0.9	95,039	90,512	1.05
Eastern Samar	159,485	33,304	95,961	141,561	3,849	433,960	0.7	182,798	167,335	1.09
Northern Samar	199,422	10,855	23,909	111,518	4,096	349,800	0.7	207,021	199,422	1.04
Western Samar	151,356	35,554	102,213	263,559	6,418	559,100	0.7	176,244	155,304	1.13
Region 9										
Total	635,194	430,383	167,355	361,062	5,736	1,599,730	0.5	850,386	638,491	1.33
Study Area Total	569,238	420,942	132,366	339,274	5,190	1,467,010	0.5	794,668	546,874	1.45
Zamboanga del Norte	214,373	189,843	81,081	175,811	702	681,810	0.7	347,263	212,256	1.64
Zamboanga del Sur	354,865	231,099	51,285	163,463	4,468	805,200	0.4	447,305	334,618	1.34
Region 10										
Total	574,966	260,481	212,938	346,925	7,880	1,403,290	0.8	783,351	576,507	1.36
Bukidnon	306,007	160,326	146,548	241,086	2,180	855,147	0.8	433,268	269,962	1.60
Misamis Occidental	115,139	17,781	23,347	35,277	2,388	193,932	0.8	129,364	118,933	1.09
Misamis Oriental	140,971	80,142	41,065	65,286	3,164	330,628	0.8	205,085	174,286	1.18
Comiguin	13,849	2,232	1,978	5,276	246	23,583	0.8	15,635	13,326	1.17
Region 11										
Total	945,984	493,663	234,001	1,019,933	20,494	2,714,075	0.8	1,340,914	960,000	1.40
Davao	248,155	160,631	64,007	336,409	1,152	810,354	0.8	376,660	234,028	1.61
Davao del Sur	268,358	107,035	71,912	149,118	7,355	603,778	0.8	353,986	282,876	1.25
Davao Oriental	185,929	30,009	29,137	269,703	1,639	516,446	0.8	209,959	159,294	1.32
South Cotabato	243,542	195,959	68,945	264,703	10,348	783,497	0.8	400,309	283,602	1.41
Region 12										
Total	450,943	208,474	390,770	373,627	7,456	1,437,270	0.8	617,722	444,999	1.39
Lanao del Norte	74,266	43,628	77,162	109,407	4,737	309,200	0.8	109,169	68,629	1.59
North Cotabato	242,950	105,948	187,866	118,521	1,315	656,590	0.8	327,706	242,950	1.35
Sultan Kudarat	133,727	58,898	131,752	145,699	1,404	471,480	0.8	180,845	133,420	1.36
Region 13										
Total	430,856	185,518	128,943	1,058,895	11,684	1,813,896	0.7	551,883	341,728	1.61
Agusan del Norte	45,328	31,527	8,473	102,325	577	188,230	0.9	73,702	70,366	1.05
Agusan del Sur	131,883	127,702	34,884	601,627	954	896,550	0.6	208,004	116,839	1.80
Surigao del Norte	95,603	13,789	25,426	132,428	6,654	273,900	0.8	106,634	75,991	1.40
Surigao del Sur	158,542	12,500	60,160	220,515	3,499	455,216	0.4	163,542	79,532	2.06
ARMM										
Total	388,376	29,377	331,916	404,489	6,572	1,160,830	0.8	411,878	386,778	1.06
Study Area Total	263,071	0	291,681	331,877	5,421	892,050	0.9	263,071	261,473	1.01
Lanao del Sur	102,655	0	94,274	188,286	2,075	387,290	0.9	102,655	102,652	1.00
Maguidanao	160,416	0	197,407	143,591	3,346	504,760	0.9	160,416	158,821	1.01
Study Area Total	6,480,149	2,435,236	3,502,350	5,781,900	309,441	18,509,076	0.7	8,286,160	6,442,525	1.29
Philippines	10,251,650	4,202,579	5,622,775	9,217,079	710,719	30,004,802	0.7	13,097,768	10,137,254	1.29

SOURCE: ALMED, Bureau of Soils and Water Management