PART II
The Planning Environment
Map 1. Location of Central Visayas
Central Visayas (Region 7) is situated at the geographical center of the Philippine archipelago. (see Map 1) It is strategically located midway between the major islands of Luzon and Mindanao. It is bounded in the north by the Visayan Sea; in the east by the Camotes Sea and Camiguin Channel; in the south by the Mindanao Sea; and in the west by Negros Occidental Province.

Four island provinces compose the region: Bohol, Cebu, Oriental Negros, and Siquijor. At the center of the region is the island province of Cebu where Cebu City, the region’s premier urban center, is located. Cebu is flanked on its southeastern end by the islands of Bohol and Siquijor, and on the western side by Negros Island. Bohol Strait and Tañon Strait separate the four island provinces from one another.

Central Visayas is the sixth smallest region in the country with a total land area of 1.49 million hectares (14,951 square kilometers). It constitutes about five percent of the country's land area. Oriental Negros accounts for the largest share of the regional land (36 percent), followed by Cebu (34 percent), Bohol (28 percent) and Siquijor (2 percent).

Bohol. Bohol island lies between Southern Leyte in the east and Cebu in the west. Its northern shores face the Camotes Sea and its southern shores face the Mindanao Sea. Bohol has an area of 411,726 hectares (4,117.3 square kilometers). The province is the 10th largest island in the country.

Cebu. Cebu province is composed of 167 islands and islets, the largest of which are Mactan, Bantayan, and Camotes. The province has a total land area of 508,840 hectares (5,088.4 sq. kms.) which is 34 percent of the region's total area. It is bordered on the north by the Visayan Sea; on the south by the island province of Siquijor and the Mindanao Sea; on the west by Tañon Strait and the island of Negros; on the east by the island province of Leyte and the Camotes Sea; and on the southeast by the island province of Bohol and the Bohol Strait.

Oriental Negros. The southeastern portion of Negros Island constitutes the province of Oriental Negros. It is separated from its sister province, Negros Occidental, by mountain ranges that run along the center of the island. The Tañon Strait separates the eastern part of the province from Cebu. The province has a total area of 540,230 hectares (5,402.3 sq. km.).

Siquijor. Siquijor is the region's smallest province. Located southeast of Negros Island, Siquijor used to be a sub-province of Oriental Negros until it became an independent province in 1971 by virtue of Republic Act No. 6398.

Metro Cebu. Metro Cebu is located in the central eastern seaboard of Cebu province. (see Map 2) The metropolis occupies a total area of 74,209 hectares or the area with a 25 km radius centered on Cebu City. It is composed of four cities and six municipalities, namely: Cebu City, Mandaue City, Lapulapu City, Talisay City, Cordova, Liloan, Consolacion, Compostela, Minglanilla and Naga. Recently, the Cebu City South Reclamation Project was opened to accommodate the urban space requirement of the city of Cebu. The newly opened reclaimed area approximately covers 320 hectares.

Aside from being the regional center for government services, Metro Cebu is a major hub of business and trade in the Visayas and Mindanao. The metropolis also prides itself as the premier educational center next to Manila. Shipping and trade, tourism, manufacturing, and services are the leading economic sectors.
Map 2. Defined Area of Metro Cebu
Topography

With the exception of Bohol, the topography of Central Visayas is rugged and is characterized by highlands dominating the interior of the provinces, with narrow strips of arable land lining the coast. (see Map 3) Of the region’s total land area, the hilly to mountainous areas (those with slopes above 18%) constitute about 62 percent and the level to rolling lands account for the remaining 38 percent. This implies that a larger portion of the region is not suitable for agriculture production, settlements and general development. (see Map 4)

Bohol. Unlike the other three provinces, Bohol is generally flat. Forty-seven (47) percent of the area has a slope of between 0-18 percent. It is not surprising, thus, that Bohol should have vast tracts of agricultural lands which are found mostly in the interior of the province. Bohol is ringed on its eastern, western and southern coastlines by steep mountains. In the interior region are found numerous haycock hills popularly known as the “Chocolate Hills”, which have become tourism attractions. Each hill, formed by fossiliferous and coralline limestone, rises by some 30 meters above the flat terrain.

The province has an almost regular coastline except for the Anda Peninsula which juts towards the east. Surrounding the west, north and northeast coasts are coral reefs and 75 small islands and islets. One of the larger islands is Panglao located off Tagbilaran City. Panglao is of coralline limestone. It is now connected to Tagbilaran by two causeways.

Cebu. Cebu stretches by some 250 kilometers from north to south. The width at the widest point, which is in the center of the province (Asturias-Danao), is approximately 41 kilometers. The province’s terrain is rugged and mountainous with low peaks forming a mountain range that stretches in the center of the island from the southern tip of Santander to Medellin in the north. The surface is characterized by sharp ridges. Osmeña Peak at 1,034 meters is the highest point of the island.

The hilly to mountainous areas (slope of 18 percent and above) account for 68 percent of the province’s total land area. These upland areas are almost entirely denuded except for a few hectares of established protected areas and forest plantations. Except for a wider expanse of flat lands in the north, the plains along the coastline are narrow, thus making reclamation projects attractive as a land expansion option. The two major islands in the province, Mactan and Bantayan, are old raised coral reefs.

Oriental Negros. The area along the province’s coastline is mostly made up of plains and valleys. Towards the interior are found volcanic peaks, hills, and occasional plateaus. In the south of the province is a group of volcanic mountains, the highest of which is Cuernos de Negros with an elevation of 1,903 meters. In the north is Mount Kanlaon, the province’s highest peak which towers some 2,450 meters above sea level. Mt. Kanlaon, an active volcano, also marks the northern boundary of Oriental Negros with Negros Occidental. A much larger section of Mount Kanlaon is under the jurisdiction of Negros Occidental. The presence of small crater lakes (Lake Danao and Lake Balinsasayao) confirms the volcanic character of the province. The province is therefore one vast space for agricultural production.

Siquijor. Siquijor is mostly made up of limestone rock material. The island is fringed with coral reefs. The interior is either hilly or mountainous, the highest point of which is Mount Bandilaan with an elevation of 557 meters. On its northern and southern coasts are found level lands consisting of narrow flood plains and deltas.
Map 3. Elevation

Legend:
- 0 - 100 meters
- 100 - 300 meters
- 300 - 500 meters
- 500 - 1000 meters
- 1000 above meters
- Lake
- Municipal Boundary

Source: DENR 7
Map 4. Slope

Legend:
- 0 - 18% (Level to rolling)
- 18 - 50% (Rolling to steep)
- 50% and above (Steep to very steep)

Source: DENR 7
Climate and Weather

The climate of the region is tropical-monsoonal. The tropical condition can be attributed to the location of Region VII which is about 10° to 11° north of the equator. The monsoonal condition, on the other hand, refers to two seasonal wind regimes, the northeasterly winds and the southwesterly winds. From November to May the wind blows on a northeasterly direction with an average wind velocity of eleven kilometers per hour. From June to October the southwesterly winds prevail with an average wind velocity of seven kilometers per hour. As far as wind speed is concerned, thus, this does not possess risks to crop production as most crops can withstand wind speed up to 5 meters/second without sustaining mechanical injuries.

Map 5 shows the geographical distribution of the following three types of climate found in the region based on the seasonal distribution of rainfall as categorized under the Corona Climate Classification System.

Type I – This is characterized by two pronounced seasons, dry and wet, with maximum rain period occurring from June to September due to prevalence of southwest monsoon. The dry season lasts from three to six to seven months.

This type of climate is peculiar to the southern part of Oriental Negros which is open to the southwest monsoon. Areas located in Type I climate are typhoon and drought prone and are generally vulnerable to El Niño.

Type III – This is characterized by the absence of a pronounced maximum rain period, with short dry season lasting from one to three months. This type closely resembles Type I with its short dry season.

This type of climate is prevalent in the northern half of Oriental Negros, the southern half of Cebu and the whole of Siquijor.

Type IV – Under this type, rainfall is more or less evenly distributed throughout the year. Bohol and the northern part of Cebu have this type of climate.

With regard to the suitability of the region’s climate to agricultural production, the region has three agro-climatic zones as identified by the Bureau of Soils and Water Management: wet, moist (intermediate) and dry. (see Map 6) Agro-climatic zones are contiguous areas sufficiently similar in their land and climatic characteristics. Specifically, the variables considered under this climatic classification are rainfall, temperature, elevation, landforms and vegetation. The region’s agro-climate zones are as follows:

Wet - Annual rainfall is greater than 2,500 millimeters and occurs mainly in the mountainous to highland areas. Moisture deficit during the dry season is slight. In the region, this zone covers an area of 323,783 hectares or 21 percent of the region’s land area.

Moist – Annual rainfall ranges from 1,500-2,500 mm and occurs mostly in upland to hilly/mountainous to highland areas. Moisture deficit during the dry season is moderate. Most of the region’s present agricultural and expansion areas fall under this zone. This covers around 640,359 hectares or 42.7 percent of the regional land.

Dry – Annual rainfall is less than 1,500 mm and occurs mainly in lowland and upland/low hill areas in the region. These areas experience significant moisture deficit during the dry season. It represents some 9,545 hectares or 36.4 percent of the region’s land.

The mean annual temperature in the region is 27 degrees Celsius. Average temperature readings at various stations were as follows: 27.5 degrees Celsius for Cebu: 27.9 degrees for Dumaguete (Oriental Negros) and 27.8 degrees for Tagbilaran (Bohol). The hottest months are February, March and April and the coldest month is January. Due to high temperature and the surrounding bodies of water, the region has a high relative humidity.

Relative humidity (RH) is at mean 82 percent. The RH in Cebu is 77 percent, Bohol is 76.6 percent, and Oriental Negros and Siquijor is 78 percent.

Located between the islands of Negros in the west and Leyte in the east, Region VII is relatively well protected from the destructive effects of tropical cyclones.
Map 6. Agro-climatic Zones

Legend:
- Dry
- Moist
- Wet

Source of Data: BSWM
Land Classification

Of the region's total land area of 1.49 million hectares, 959,223 hectares (64 percent) are alienable and disposable (A & D) lands, and 535,919 hectares (36 percent) are forestlands. (see Map 7)

Of the total forestland, 87 percent is classified forest and only 13 percent is still unclassified. More than half or 54 percent of the region's forestlands are found in Oriental Negros, 27 percent in Cebu, 19 percent in Bohol and less than 1 percent in Siquijor. (see Figure 1)

Soils

Due to the region's varied geological formations, the soils that were formed exhibit different characteristics. A larger portion of the region's soils are of the clay group. (see Map 8)

Clay soils are fine textured; hence, they have the ability to retain high amount of water and to store plant nutrients at the surface. Soils of this type are suited to agriculture. One disadvantage, however, is that clay soils become very hard when dry, and sticky when wet. Tillage is therefore difficult at extremely low and high levels of moisture.

Mineral Resources

Central Visayas is endowed with abundant mineral resources. These mineral resources may be classified into metallic and non-metallic.

**Metallic.** Nationally, the region accounts for a substantial portion of the country's mineral ore production. The metallic ore reserve of the region is estimated at 1,140 million metric tons. A sizeable portion of this is found in Cebu.

Copper, gold and manganese are three of the more important metallic mineral resources of the region. Most of these are found in Toledo City in Cebu and Basay in Oriental Negros. Cebu province has an estimated 847 million metric tons of copper reserves while Oriental Negros has 184 million metric tons.

The Atlas Consolidated Mining and Development Corporation (ACMDC) mine in Toledo City, Cebu is considered one of the largest copper mine in Asia. As of January 1994, the total mineable ore reserve of ACMDC’s Carmen Orebody at 0.30% copper cut-off grade is 276,043,000 Dry Metric Tonnes (DMT) with an average grade of 0.41% Cu. The Carmen orebody has pyrite, gold and silver for its by-products. Other gold prospects in the region include Trinidad and Talibon in Bohol, Consolacion and Balamban in Cebu.

Deposits of manganese ore are also found in the municipalities of Guindulman and Anda, Bohol and in the municipalities of Larena, Enrique Villanueva and Maria, Siquijor. Prospects of chromite deposits are reported in Duero, Bohol.

**Non-metallic.** Non-metallic mineral reserves are found throughout the region. The non-metallic mineral reserves are categorized according to their use as follows: industrial materials, bauxite and ceramics, construction materials, fertilizer, and cement raw materials.

Industrial materials are the most abundant non-metallic resource in the region. The bulk of these is found in Cebu and is estimated at 2.1 billion metric tons. Cement raw materials come next and are also concentrated in Cebu province, particularly in the southeastern part, with estimated reserves of 1.5 billion metric tons.
Map 7. Land Classification

Legend:
- Alienable & Disposable Land
- Forestland
- National Park
- Reservation
- City/Municipal Boundary
- Negros Occidental Coastline

Source: DENR 7
Map 8. Soils

Legend:
- Lugo clay
- Medellin clay
- Mandaue clay
- Mandawe silt loam
- Mantalongan clay loam
- Mountain soil (undifferentiated)
- Rough Mountainous land
- Rough stony land
- San Manuel-Taal Complex
- San Manuel fine sandy loam
- San Manuel loam
- Sevilla clay
- Siaton sandy loam
- Taal sandy loam
- Tupi fine sandy loam
- Ubay clay
- Ubay clay loam
- Ubay sandy loam
- Zamboanguita clay loam

Source: Bureau of Soil and Water Management
**Water Resources**

Data from the National Water Resources Board (NWRB) shows that the total water resources potential of Central Visayas is 2,939 million cubic meters (mcm), of which 2,060 mcm (70 percent) is from surface water sources and 879 mcm (30 percent) is from groundwater sources. The surface water potential of Central Visayas comprises only 2 percent of the total surface water potential of the country. Groundwater, which is the main source of water for domestic consumption in the region, also represents only 4 percent of the total groundwater potential in the country.

On a per capita basis, water available, both from surface and groundwater sources, is only 425 cubic meters per capita per year. This is far below the standard 1,000 cubic meters per capita water requirement (scarcity level) set by the World Resources Institute.

**Surface Water.** Rivers are the region's major sources of surface water. There are about 30 major rivers in the region that are potential water supply sources. Of these 30 major rivers, 14 are in Oriental Negros, 11 are in Bohol, and 4 are in Cebu. At present, most of these rivers are utilized for irrigation purposes except in Cebu where rivers are used for both irrigation and industrial uses.

While Siquijor has no major river, it has 3 minor rivers. These rivers have not yet been properly evaluated and considered as possible sources of future water supply. However some rivers and creeks are presently being utilized for irrigation purposes. These are Sapang Daku, Gabayan and Tag-ibo Rivers and Capalasan Creek.

The region has also a number of lakes, dams and reservoirs which are potential sources of water for irrigation, domestic and industrial use. Some lakes are being developed for eco-tourism.

**Groundwater.** Groundwater is the most exploited source of water for domestic, agricultural and industrial use. Most of the groundwater sources in the region (87 percent) consist of shallow and deep wells. There are about 28,504 shallow and deep wells in Central Visayas. Oriental Negros has the most number of shallow wells but these are mostly private owned. Cebu, on the other hand, has the most number of deep wells that are public owned. Most of the groundwater extractions are being done without water-right permits, resulting in indiscriminate withdrawal and over extraction of water.

Map 9 shows the groundwater potential of Region 7. Around 46 percent (680,483.72 has.) have local and productive aquifers or deep well areas. Thirty-five (35) percent are considered difficult areas --- fractures and controlled groundwater zone, and 18 percent (262,814.23 has.) have no significant or limited pumpable groundwater and are potential of salt water intrusion. Only 1 percent (13,833.07 has.) are considered potential areas or areas with high yielding wells.

Water from springs is also widely used in the region. Bohol has the most number of springs being developed as sources of water.

**Coastal and Marine Waters**

The region, being composed of island provinces and a number of smaller islands, has approximately 31,498 sq. kms. of coastal waters. This is 211 percent bigger than the total land area of the region. For this reason, the region should place as much importance to the preservation of the integrity and productivity of its coastal and marine resources in addition to its land resources.

The total length of the region's coastline is 1,988 kms. This reflects great potentials for fishery activities, port facilities, and coastal tourism.

Of the total area of coastal water, 66 percent is within municipal waters which is under the jurisdiction of the local governments. The remaining 32 percent is part of the national waters administered by the Bureau of Fisheries and Aquatic Resources (BFAR).

The region's total reef area is also estimated at 1,560 sq. km. of which 41 percent is located in the Danajon Bank within the coastal waters of Cebu, Bohol, and Leyte. In terms of the quality of these reefs, however, a survey of 186 reefs in the region in 1995 under the Coastal Resource Management Project (CRMP) revealed that only 11 percent of the reefs had good quality coral cover (51-75 percent hard coral cover). Forty-six (46) percent had 26-50 percent hard
Map 9. Groundwater Potential

Legend:
- Extensive and highly productive aquifers
- Fractures or karst controlled groundwater zone
- Local and productive aquifers
- No significant or limited pumpable groundwater

Source: Bureau of Agricultural Research Spatial Analysis and Information Laboratory
Map 10. State of Live Coral Cover

Legend
- Live coral cover
  - Poor
  - Fair
  - Good
  - Excellent
- Reef area

Sources:
- Coral reef survey data:
  - FITC-Bohol, CRMP, UP-MAI
- Coral reef locations:
  - Environmental Science for Social Change, Inc.
- Surveys conducted from 1995 to present

Physical Environment
coral cover and 43 percent had 0-25 percent hard coral cover. (see Map 10)

The Regional Fisheries Framework of Central Visayas has adopted a fisheries ecosystems approach in coastal resource management. Under this approach, the coastal and marine areas of the region are divided into seven distinct marine ecosystems, namely: Bohol Sea, Camotes Sea, Cebu Strait, Danajon Bank, East Sulu Sea, Tañon Strait, and Visayas Sea. (see Table 1) Within each fisheries ecosystem are various marine habitats such as mangrove forests, coral reefs, seagrass, mudflats, sandy beaches and others. These habitats are the main feeding and spawning grounds and nursery areas of coastal and marine aquatic organisms. Rehabilitation/development activities are planned and implemented by ecosystem.

Table 1. Major Marine Ecosystems of Central Visayas *

<table>
<thead>
<tr>
<th>Ecosystem</th>
<th>Coastline Length (in km)</th>
<th>Total Area (in sq. km.)</th>
<th>Municipal Waters</th>
<th>Total Waters (15 km) (in sq. km.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>0-10 km</td>
<td>10.1-15 km</td>
</tr>
<tr>
<td>Bohol Sea</td>
<td>273.30</td>
<td>7,968.00</td>
<td>2,490.00</td>
<td>1,248.00</td>
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<tr>
<td>Camotes Sea</td>
<td>248.20</td>
<td>4,310.00</td>
<td>2,693.00</td>
<td>1,065.00</td>
</tr>
<tr>
<td>Cebu Strait</td>
<td>342.40</td>
<td>3,933.00</td>
<td>2,808.00</td>
<td>1,030.00</td>
</tr>
<tr>
<td>Danajon Bank</td>
<td>301.00</td>
<td>2,476.00</td>
<td>2,476.00</td>
<td>-</td>
</tr>
<tr>
<td>East Sulu Sea</td>
<td>128.00</td>
<td>5,878.00</td>
<td>986.00</td>
<td>516.00</td>
</tr>
<tr>
<td>Tañon Strait</td>
<td>452.70</td>
<td>3,108.00</td>
<td>2,829.00</td>
<td>279.00</td>
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<tr>
<td>Visayan Sea</td>
<td>242.10</td>
<td>4,116.00</td>
<td>2,250.00</td>
<td>804.00</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,987.70</td>
<td>31,498.00</td>
<td>16,532.00</td>
<td>4,942.00</td>
</tr>
</tbody>
</table>

Source: CRMP-GIS, 2004
Note: * based on computer derived model calculating area of marine waters and municipal waters

Table 2. Production Land Use Area Coverage

<table>
<thead>
<tr>
<th>Land Use/Sector</th>
<th>Area (in hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture Area (2003 data)</td>
<td>644,619</td>
</tr>
<tr>
<td>Production Forest Area (2004)</td>
<td>65,149</td>
</tr>
<tr>
<td>Mining &amp; Quarrying Area (1992)</td>
<td>7,317</td>
</tr>
<tr>
<td>Industrial Development Area (2003)</td>
<td>4,300</td>
</tr>
<tr>
<td>Tourism Development (1992)</td>
<td>210</td>
</tr>
</tbody>
</table>

Note: Other tourism devt areas, tourist spots and zones declared by virtue of presidential, executive and other legislative issuance are not delineated. These areas likewise overlap and/or are part of other land uses.

LAND USE

The land resource of the region can be categorized into four general land uses: (i) production, (ii) protection, (iii) built up areas, and (iv) infrastructure and utilities development. Map 11 shows the existing land use of the region.

Production Land Use

Production land use refers to the direct or indirect utilization of land resources for crop production, fishery, livestock and poultry production, timber production, agroforestry, mining, industry and tourism. Lands under this category include agricultural areas, coastal and marine zones, production forests, mineral lands, and industrial and tourism development areas.

About 721,595 hectares or 48 percent of the region's land is presently under production land use. (see Table 2) The bulk of this area is found in Oriental Negros and Cebu. These provinces account for 36 percent and 34 percent, respectively, of the regional land used for production.

Agricultural Lands

Agricultural lands are areas devoted to or suitable for agricultural activity that is not classified as mineral, forest, residential,
Map 11. Existing Land Use

Legend:
- Cropland
- Forest Plantation
- Secondary Forest
- Mangrove Forest
- Brushland mixed with cultivated land
- Grassland
- Mine Quarry
- Barren Land
- Built-up Area
- Fishpond
- Inland Water
- Reclamation area

Data Sources: NAMRIA 2003 Land Cover Map, SIRMAP 2004 Land Use Map, PPDO Or. Neg. Land Use Map
commercial or industrial. Agricultural activity is the cultivation of the soil, planting of crops, growing of fruit trees, raising of livestock, poultry, fish or aquaculture products. It also covers the harvesting and immediate processing of such farm products and other farm activities and practices performed in conjunction with such farming operations.

Some 644,619 hectares or 43 percent of the region's land are agricultural lands. Of this area, 579,132 hectares or almost 90 percent of the agricultural lands are under the Network of Protected Areas for Agricultural and Agro-industrial Development (NPAAAD).

The areas under the NPAAAD were identified by the Department of Agriculture through the Bureau of Soils and Water Management in coordination with the National Mapping and Resource Information Authority (NAMRIA) in order to ensure the efficient utilization of land for agriculture and agro-industrial development and to promote sustainable growth. The NPAAAD covers all irrigated areas and all irrigable lands already covered by irrigation projects; all alluvial plain land highly suitable for agriculture whether irrigated or not; agro-industrial croplands or lands presently planted to industrial crops that support the viability of existing agricultural infrastructure and agro-based enterprises; highlands, or areas located at an elevation of 500 meters or above and have the potential for growing semi-temperate and high-value crops; all agricultural lands that are ecologically fragile, the conversion of which will result in serious environmental degradation, and; mangrove areas and fish sanctuaries.

Within the NPAAAD are strategic agriculture and fisheries development zones (SAFDZ). The SAFDZ is one strategy adopted by the government to increase agricultural productivity and production.

The SAFDZ in the region covers 534,502 hectares or 92 percent of the total agricultural lands under the NPAAAD. These zones have been identified for agricultural production, agro-processing and marketing activities. They serve as centers where development in the agriculture and fisheries sectors is catalyzed in an environmentally and socio-culturally sound manner.

The seven (7) zones composing the SAFDZ are the following: strategic crop sub-development zone, strategic livestock sub-development zone, strategic fishery sub-development zone, strategic integrated crop/livestock sub-development zone, strategic integrated crop/fishing sub-development zone, strategic integrated crop/livestock/fishery sub-development zone, and strategic integrated fishing/livestock sub-development zone.

The remaining 44,630 hectares of agricultural lands under the NPAAAD (but not included under SAFDZ) are the expansion areas for strategic agriculture and fisheries development.

The specific roles of agricultural land in physical planning can be described through the various production activities that take place in croplands, livestock and poultry areas, and fishing grounds.

**CROPLANDS.** Croplands are areas primarily used for the production of adapted, cultivated, close growing fruit or nut crops for harvest, alone or in association with other crops. Croplands under intensive cultivation cover 592,924 hectares or almost 92 percent of the total agricultural land of the region. Most of these lands are cultivated to common base crops such as corn (244,699 hectares), coconut (140,808 hectares), palay (79,898 hectares), sugarcane (33,257 hectares), and root crops (33,903 hectares). Other crops grown in the region, although not in large quantities but definitely of economic significance are bananas, vegetables, cutflowers, and mangoes.

Bohol is the major producer of palay in the region, accounting for 59 percent and 50 percent of rainfed and irrigated farms, respectively. Other major crops grown in the province are coconut, root crops and fruits.

Cebu accounts for majority or 52 percent of the region's corn area. Other major crops raised in Cebu are coconut, sugarcane, mangoes, banana and other fruits, palay, rootcrops and cutflowers.

Oriental Negros is the leading producer of sugarcane and coconut. Its sugarcane area covers 26,563 hectares and is almost four times the size of the sugarcane area of Cebu. Its coconut area covers 52,460 hectares, almost 10
hectares more than Cebu's 42,589-hectare coconut area. In terms of area devoted to corn, though, Oriental Negros is only second to Cebu.

Siquijor has very limited arable land. Hence, the province's land devoted to agricultural crops is very small compared to the rest of the provinces in the region. Crops grown in the province include coconut, romblon, corn and palay.

Central Visayas is basically a deficit area in terms of palay and corn production. The region relies on the rice stocks of the National Food Authority (NFA) and of the private sector bought from outside the region to cover demand-supply gaps for grains and to stabilize rice prices. Due to its strategic location, the region has been able to draw in and to keep stocks of rice available in the market to meet demand.

Increasing productivity seems to be the only way for the region to minimize dependence on imported agricultural products, especially in the light of limited agricultural land resources. For the past years, many of the region's limited agricultural lands had been subjected to conversion to residential, industrial/commercial and recreational uses. Because of conversion, the region's agricultural land has shrunk to the present area of 644,619 hectares, from 648,290 hectares in 1992.

The 2002 Census of Agriculture revealed that the number of farms in the region decreased by 14.9 percent to number just 361,277 farms, from 424,825 farms in the agriculture census of 1991. These farms cover a physical area of 417,365 hectares. Compared to other regions in the country, Central Visayas had the biggest decline in the number of farms. Moreover, the average physical area of farms in the region declined to 1.16 hectares, lower than the national average of 2.04 hectares.

LIVESTOCK AND POULTRY AREAS. Livestock and poultry areas refer to grazing lands and areas where animals such as cattle, carabao, hog and goat, and fowl, such as chicken and duck, are raised. BSWM estimates this area to be 36,990 hectares, comprising 6.4 percent of the region's agricultural lands. Among the provinces, Oriental Negros has the largest area where livestock and poultry are raised (14,726 hectares), while Siquijor has the smallest area (4,259 hectares).

Although Bohol has only the second largest livestock and poultry area (13,031 hectares), it is the only province where the Lone Forest Land Grazing Management Agreement (FLGMA) in the region exists. This FLGMA covers 816 hectares.

FISHING GROUNDS. Fishing grounds, in general, cover the marine waters, inland bodies of water including lakes, ponds, reservoirs, swamps and other man-made impoundments, rivers, irrigation canals and mangrove estuaries in coves and inlets.

In the region, fishing is widely undertaken along the coastal waters. Central Visayas has 1,988 kilometers of coastline. Cebu has the longest coastline at 690 kilometers or 47 percent of the region's total.

Commercial Fishing Grounds. The more important fishing grounds where large-scale or commercial fishing is undertaken include: (a) the waters off the island of Bantayan in the northern part of Cebu (which is part of the Visayan Sea); (b) Tañon Strait between western Cebu and eastern Oriental Negros; (c) Bohol Strait between eastern Cebu and western Bohol, and (d) Camotes Sea on the northeastern portion of Cebu. East Sulu Sea, which bounds the region in the south, is also a popular fishing ground. Of these, the major sources of fish landings in the region are the Visayan and Camotes Seas. The Visayan Sea, which lies north of Cebu, is considered the richest fishing ground in the country.

Studies conducted by the Department of Environment and Natural Resources, the USAID-funded Coastal Resource Management Project, the Bureau of Fisheries and Aquatic Resources and the Department of Agriculture reveal that the Visayan and Camotes Seas are already overfished. There has been a constant decrease of production in the Visayan Sea since the 1980's, indicating ecological overfishing. Likewise, the decreasing sizes of catch in both the Visayan and Camotes Seas indicate biological overfishing.

In short, current trends show that the productivity of the region's fishing grounds is now low compared to historical information. Moreover, the region's fisheries ecosystems appear to have gone beyond their maximum sustainable yields.
Despite the deteriorating state of the region's fishing grounds, three (3) belong to the top ten fishing grounds in the country in terms of commercial production (BFAR, 2001). These are the Visayan Sea with an annual production of 137,942 tons comprising 17.2 percent of the country's production; the Bohol Sea with an annual production of 34,263 tons comprising 4.3 percent of the country's production; and the East Sulu Sea with an annual production of 29,071 tons comprising 3.6 percent of the national commercial fishery production.

**Municipal Fishing Grounds.** The municipal waters or fishing grounds in the region encompass streams, lakes, inland bodies of water and tidal waters that are not included within public forest, timber lands, forest reserves or fishery reserves and other protected areas as defined under the NIPAS Law. Municipal waters also include marine waters between two lines drawn perpendicular to the general coastline from points where the boundary lines of a municipality touch the sea at low tide and a third line parallel with the general coastline including offshore islands and 15 kilometers from such coastline.

**Municipal marine fishing grounds.** In the region, many municipalities are so situated on opposite shores that there is less than 30 kilometers of marine waters between them. This has made the delineation of municipal marine waters difficult for municipalities in Oriental Negros, Cebu and Bohol. To date, only 22 of the region's 132 municipalities have completed the delineation of their respective municipal marine waters, complete with corresponding ordinances. These 22 municipalities are distributed as follows: 11 out of 53 municipalities in Cebu; 10 out of 48 municipalities in Bohol; and 1 out of 25 municipalities in Oriental Negros.

Of the region's 132 municipalities, 109 (83 percent) are situated along the coast. Some 100,000 to 200,000 families of the 5.1 million coastal population practice municipal fishing in almost all of the municipal waters. With the population growing at an average rate of 2.4 percent per annum, there will be an uptrend in fishing pressure on the municipal waters.

The declining production and increasing pressure on municipal fishing grounds indicate a need for zoning municipal water use.

**Municipal inland fishery resources.** The inland fishery resources of the region include swamplands, fishponds, lakes, dams, water reservoirs and river basins. Lakes, dams and reservoirs occupy about 1,023 hectares of the region's land. All in all, the region's inland water/fishery resources cover an area of 7,539 hectares. Cebu accounts for 75 percent of the total area devoted to inland fishery, while Bohol and Oriental Negros account for 14 percent and 11 percent, respectively, of the total area.

Records of DENR (2002) show that some 4,335 hectares or 0.29 percent of the region's total land area of 1,495,142 hectares are classified as fishponds. The largest area classified as fishpond is in Bohol (3,407 hectares). Cebu, Oriental Negros and Siquijor have fishpond areas of 799 hectares, 101 hectares and 28 hectares, respectively.

BSWM data, which indicate a much larger fishpond area in the region, shows the total area devoted to fishponds declining over the years. From 6,425 hectares in 1992, the total fishpond area decreased to 4,966 hectares in 2003.

Records further show that BFAR issued 53 fishpond lease agreements (FLA) covering a total area of more than 4,966 hectares to 449 lessees. Around 3,367 or 68 percent of the area covered by fishpond lease agreements have been developed, while 700 hectares have yet to be developed. The bulk of the fishponds covered by FLA can be found in Bohol (1,711.6 hectares), where 430.6 hectares are still undeveloped.
Production Forest Areas

Forestlands located in areas with slopes ranging between 18% and 50% and with elevation of less than 1,000 meters above sea level can be used for timber production and non-timber uses. Production forest areas include range lands for grazing, manmade forests, watersheds not yet proclaimed as watershed reserves, multiple-use zones and buffer zones under the NIPAS, and other forest lands subject to or intended for special land uses based on the 18 percent slope and above criterion.

A total of 65,149 hectares or 9 percent of the total area under production land use are production forest areas. (see Map 12) Bohol accounts for almost 39 percent of the region’s production forest areas and Oriental Negros 30 percent. Table 3 enumerates the region’s production forest areas and their coverage, and the activities undertaken therein.

Table 3. Production Forest Areas and their Area Coverage, 2004

<table>
<thead>
<tr>
<th>Production Forests</th>
<th>Area Coverage (In hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular reforestation plantation</td>
<td>19,835</td>
</tr>
<tr>
<td>Reforestation plantation under Forestry Sector Project I</td>
<td>17,524</td>
</tr>
<tr>
<td>Area developed under the Integrated Social Forestry Program</td>
<td>7,735</td>
</tr>
<tr>
<td>Plantation under the Industrial Forest Mgt Program/ Socialized Integrated Forest Management Agreement/ Tree Farm</td>
<td>3,430</td>
</tr>
<tr>
<td>Area developed through watershed rehabilitation</td>
<td>5,443</td>
</tr>
<tr>
<td>Area developed under the Forestry Sector Project II—Comprehensive Site Dev't</td>
<td>10,073</td>
</tr>
<tr>
<td>Mangrove rehabilitation under the Coastal Environment Program</td>
<td>1,109</td>
</tr>
</tbody>
</table>

Source: DENR 7, Forest Management Bureau

Almost all of the region’s production forests are plantation forests established through public and private sector reforestation programs. These consist of areas for the Community-Based Forest Management projects, areas under the Industrial Forest Management Program, and tree farms.

Cebu and Oriental Negros are involved in the Industrial Forest Management Program. Three areas in Cebu with an aggregate total of 1,436 hectares are covered with an Industrial Forest Management Agreement (IFMA). In Oriental Negros, 1,371 hectares are covered with the same agreement. Cebu and Bohol also have areas used for tree farms. Cebu has two tree farms covering an area of 266 hectares, and Bohol has a 20-hectare wide tree farm.

Areas for special uses include all other legal uses of public forests such as the establishment of sawmills, lumber yards, timber depots, logging camps, rights-of-way or other similar purposes. In 2002, Central Visayas had one active regular sawmill without timber concession. Located in Cebu, this sawmill had a daily rated capacity of four cubic meters and an annual log requirement of 1,333 cubic meters. Also in Cebu is a veneer plant that has a daily rated capacity of 5 cubic meters and an annual log requirement of 2,500 cubic meters.

Oriental Negros and Bohol have annual log production of 4,005 cubic meters and 4,237 cubic meters, respectively. Logs produced in these provinces are mostly Gmelina arborea, mahogany, ipil-ipil, acacia and others. Non-timber forest products of Bohol include bamboo poles, nipa shingles and unsplit rattan.
Map 12. Production and Protection Forests
Mining Areas

Mining areas are those areas where non-metallic and metallic minerals are explored, developed and/or extracted. In the region, a total of 7,317 hectares or 0.5 percent of the regional land is under this category. This excludes those lands under mixed use where some mining is also being undertaken.

A larger proportion of the region’s mining area is devoted to the extraction of non-metallic minerals. These include dolomite, silica sand, sulfur, feldspars, limestone, rock aggregates, sand and gravel, guano, bentonite clay, marbleized limestone, rock phosphate, and mudstone.

Central Visayas used to account for a substantial portion of the country’s mineral ore production before the Atlas mines closed down in the early nineties due to low world price of metal and labor problems. The Atlas mines in Toledo City, Cebu was considered one of the largest copper mine in Asia then.

Copper and gold are some of the more important metallic mineral ores produced by the region. Gold and silver are by-products of the region’s copper mines.

The Supreme Court decision that upheld the 1995 Mining Act is expected to help boost the local mining industry. The Atlas mine, for instance, is set to be reopened soon with foreign investments providing the impetus. Lately, an increase in applications for mining permits and in extraction investments have been noted. The aggregate area covered by mining rights and applications for mining rights has reached 415,358 hectares. (see Table 4)

The Province of Oriental Negros has the largest area covered by mining rights applications (159,664 hectares). One application alone filed by a foreign investor covers 123,500 hectares.

A fairly recent phenomenon observed in Cebu and Bohol is the application for exploration in offshore mineral reservations. More than 104,267 hectares are involved in these applications for offshore exploration — 77,355 hectares in Bohol and 26,912 hectares in Cebu. (see Map 13)

Table 4. Mining Rights and Application for Mining Rights *

<table>
<thead>
<tr>
<th>Province</th>
<th>Mining Rights</th>
<th>Application for Mining Rights</th>
<th>Total Area Covered by Mining Rights and/or Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Area (hectares)</td>
<td>Number</td>
</tr>
<tr>
<td>Bohol</td>
<td>2</td>
<td>755.2000</td>
<td>57</td>
</tr>
<tr>
<td>Cebu</td>
<td>38</td>
<td>20,548.0846</td>
<td>150</td>
</tr>
<tr>
<td>Oriental Negros</td>
<td>7</td>
<td>14,775.0967</td>
<td>19</td>
</tr>
<tr>
<td>Siquijor</td>
<td>1</td>
<td>392.8031</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48</strong></td>
<td><strong>36,471.1844</strong></td>
<td><strong>228</strong></td>
</tr>
</tbody>
</table>

* as of July 2005
Source: Bureau of Mines and Geo-Sciences, DENR 7
Map 13. Mining Rights and Applications

**Physical Environment**

**Industrial Development Areas**

From one industrial estate in 1986 to the mid 1990's, the region is now home to 16 special economic zones in various stages of development. In all, these special economic zones cover an aggregate area of 4,290 hectares.

The Mactan Export Processing Zone, now Mactan Economic Zone (MEZ) 1, was the first industrial estate in Central Visayas. Located in Lapulapu City, Cebu, MEZ 1 covers 119.37 hectares. Firms engaged in the manufacture of electronic parts, watches, optical equipment, garments and other light industries make up majority of the companies operating inside the zone.

More than two kilometers from MEZ 1 is the Mactan Economic Zone (MEZ) 2, the region's second industrial estate. MEZ 2 covers 63.3 hectares. It is being developed and operated by Acoland Inc., a member of the Aboitiz group of companies, under the Build-Operate-Transfer scheme for the landowner, Mactan Cebu International Airport Authority. Like MEZ 1, MEZ 2 is regulated by the Philippine Economic Zone Authority.

Other PEZA-regulated economic zones operating in the region are the: Cebu Light Industrial Park (62.5 hectares) in Basak, Lapulapu City, Mactan, Cebu; Mitsumi Realty, Inc. Ecozone (28.3 hectares) in Danao City, Cebu; New Cebu Township (122.8 hectares) in Naga, Cebu; and the West Cebu Industrial Park (25.3 hectares) in Balamban, Cebu. The latter is a joint venture of the Aboitiz Group and Tsuneishi Holdings, Inc. of Japan. It is host to medium and heavy industries, especially shipbuilding and allied activities.

Recently proclaimed economic zones include the Asiatown Information Technology (IT) Park in Barangay Apas, Cebu City, which covers 23.7 hectares, and the Polambato-Bogo Economic Zone (41.7 hectares) in Polambato, Bogo, Cebu. (see Map 14)

Under development are eight other economic zones that cover an aggregate of 3,813 hectares. These include Panglao Island Tourism Economic Zone in Bohol, the Bais City Ecozone in Oriental Negros, and the Polo Ecocity Special Ecozone also in Oriental Negros.

The region is actually home to numerous industries. But for lack of a general land use plan, these industries are located in residential, commercial and built-up areas of highly urbanized cities and capital cities.

**Tourism Development Areas**

The tourism development areas in the region are the priority sites for tourism development identified in the national and regional tourism master plans, and legislative and executive issuances. These areas aim to encourage and focus investments in tourism estates or integrated resort, leisure and recreation complexes and other tourism-related activities. It also seeks to manage the concentration of people and economic activities in the identified priority sites for tourism to prevent the destruction or use of resources beyond their carrying and assimilated capacities.

Central Visayas is fast becoming a premier tourist destination and a gateway for foreign and domestic tourism in the country. The region's domestic and foreign tourist arrivals posted an average growth of 5.72 percent for the 10 year period from 1993 to 2003 despite the 1997-1998 Asian economic crisis and the September 11, 2002 World Trade Center bombing in the US which affected tourism. Currently, tourist arrivals are continuing to show positive growth. While Cebu has captured the most number of tourist arrivals, it is the province of Bohol which has registered the highest growth rate in tourist arrivals, both domestic and international, in the
Map 14. Special Economic Zones

- Polambato-Bogo Ecozone (41.7 hectares)
- Arcenas Estates IT Building (1.28 hectares)
- AsiaTown IT Park (23.70 hectares)
- Mitsumi Realty, Inc. Ecozone (25.29 hectares)
- Talis IT Park (5.69 hectares)
- Cebu South Reclamation (330 hectares)
- Mactan Economic Zone (119.57 hectares)
- Mactan Economic Zone II (83.36 hectares)
- Cebu Light Industrial Park (62.5 hectares)
- Panglao Is. Tourism Ecozone (42.92 hectares)
- Mira Nila Ecozone (25.3 hectares)
- New Cebu Township (122.83 hectares)
- West Cebu Industrial Park (25.3 hectares)

Data Source: DTI 7
last 5 years. This was followed by Cebu, Oriental Negros and Siquijor, respectively.

The region’s natural resources, historic and cultural sights, superior tourist facilities and services are the primary draw factors that lure domestic and international tourists to come to the region. Central Visayas’ attraction especially lies in its extensive coastline which is dotted with beautiful white beaches. Accredited beach resorts in the region totaled around 179 in 1997. The region has also 23 famous diving sites, 323 magnificent caves, a number of areas for mountain trekking, numerous waterfalls and natural landmarks and historical and cultural sites.

For purposes of spatial planning, tourist areas can be classified into the following major groups: agri-tourism sites, recreational and leisure areas, eco-tourism sites, and historical and cultural heritage sites. Considered under production land use are the recreational and leisure areas and agri-tourism areas. Tourist areas under protection land use, by the nature of their function, are the eco-tourism areas and historical and cultural heritage sites.

**AGRI-TOURISM SITES.** Agri-tourism, sometimes referred to as “farm tourism”, acknowledges the appeal of the common and everyday happenings of a rural community. It is tourism conducted on working farms where the working atmosphere forms part of the tourist product. Its purpose is to promote an appreciation of local culture, heritage and traditions through personal association with local people. The Guidebook for Developing Agri-Tourism in the Philippines states that this is a fast expanding tourism product which acts as a supplemental activity to the main activity of farming characterized by a link between travel and products, services and experiences of the agriculture and food systems.

In the region, the potential sites for agri-tourism activities can be found mostly in Bohol and Oriental Negros. They include the Ubay Stock Farm in Bohol and the OISCA Model Farm in Canlaon City, Oriental Negros. Agriculture-based festivals in the region which can promote agri-tourism include: a) Ubi Festival in Tagbilaran City, conducted in the 3rd week of January, b) Cassava Festival in Camotes Island, and c) Banig festival in Badian, Cebu held in July.

**RECREATIONAL AND LEISURE AREAS.** Recreation and leisure activities include those that provide entertainment, adventure, amusement, and pleasure to those persons who engage in them. These leisure and recreational activities can be classified into land-, water- and air-based. Land-based activities include both outdoor and indoor sports and leisure activities such as golf, ballgames, cycling, trekking, hiking and car-racing, among others. Water-based recreational and sports activities include swimming, diving, fishing, boat racing, canoeing or kayaking. Air-based sports include aviation/flying, skydiving, hang gliding, air ballooning. All these recreational and leisure activities require spaces for specialized facilities and amenities corresponding to each mode.

In Cebu, some of the water-based recreational and leisure activities are provided by the beach resorts located in the islands of Mactan, Bantayan, Camotes and Malapascua and in the municipalities of Moalboal, Badian, Argao, Borbon and San Remegio. Within Cebu province are also found 10 of the famous diving sites in the Philippines. These are the area off the coasts of Moalboal, Badian, and in the islands of Mactan, Bantayan, Gato, Malapascua, Olango and Sumilon.

A land-based recreational activity that extensively uses land is golf. There are seven (7) golf courses in Cebu province with an estimated area of 300 hectares. Specifically, the golf courses in Cebu are located in Cebu City (3), Lapulapu City (1), Danao City (1), San Remegio (1) and Bogo (1). Cebu has also developed certain areas as viewing decks for some of the province’s beautiful sceneries. Some of the existing viewing areas or corridors in the province include Tops in Barangay Busay, Cebu City, a
section of the Boljoon road, Cebu Transcentral Highway, and the newly opened Cebu South Coastal Road and Cebu South Reclamation Project. Common recreational areas found in each municipality are public plazas and parks. Some municipalities have sports gyms and sport complexes. Recent development in leisure and recreation are theme parks such as the MCWD Family Park (Cebu City), Crocolandia (Talisay City), and Mountain View Nature's Park (Cebu City).

In Bohol, the famous beaches are found in the islands of Panglao and Balicasag, and along the coastline of Anda, Alburquerque, Dimiao, Clarin, Loon and Tubigon. Along these beaches can be found 23 beach resorts and facilities. Famous dive sites in Bohol are Pamilican and Balicasag islands. The most famous natural attraction in Bohol is the 1,268 perfectly-coned shape Chocolate Hills, two of which have been developed into a resort complex offering accommodation, conference rooms, restaurant and view deck. Other hills such as Banat-i and Elly Hills in Tagbilaran, Bicag Hill in Panglao Island, Himontagon in Loay, Sampoanong Hill in Calape and the Sagbayan Peak in Sagbayan, with elevations ranging from 100 meters to 150 meters above sea level, afford scenic views overlooking the seas of Mindanao, Negros, Siquijor and Cebu.

Oriental Negros has around 38 beach resorts including the famous 12 hectare Apo Island in Dauin, an internationally acclaimed dive site. The province also has 32 parks, which generally include plazas, playground and leisure parks, both government and private. Public and private sports and cultural centers can also be found in the province including the Macias Sports and Cultural Center and the Teves Memorial Aqua Center in Dumaguete City. The province also has 2 golf courses located in Sibulan and Pamplona. Popular sites for mountain climbing and trekking are Cuernos de Negros, where Mt. Talinis and the Balinsasayao Twin Lakes are located, Mt. Kanlaon and the caves in Mabinay.

White sand beaches can be found all over the coast of Siquijor. The province also has two famous dive sites located in E. Villanueva and San Juan. Sites for mountain climbing, trekking and spelunking are Camp Bandilaan, Lazi; Cantabon and Cambiasia, Siquijor.

**Protection Land Use**

Protection land use refers to the rehabilitation, conservation, sustainable development, and management of land for ecological purposes. These include: a) areas declared as belonging to the National Integrated Protected Areas System (NIPAS); b) areas outside the NIPAS (non-NIPAS areas) requiring equivalent amount of protection; and, c) the areas prone to natural hazards termed as environmentally constrained areas.

**NIPAS Areas**

The system of integrated protected areas in the country was established by law (RA 7586) to maintain and protect the natural biological and physical diversities of the environment, notably in areas with biologically unique features, from the profound impact of man's activities. The use and enjoyment of these protected areas must be consistent with the principles of biological diversity and sustainable development. Effective administration of these areas is possible only through cooperation among national government, local governments and concerned private organizations.

The NIPAS areas include: a) national parks, b) natural parks/monuments, c) protected landscapes and seascapes, d) wildlife

<table>
<thead>
<tr>
<th>Area</th>
<th>Total Area (in hectares)</th>
<th>% of Total NIPAS Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Parks</td>
<td>24,615.50</td>
<td>3.9</td>
</tr>
<tr>
<td>Natural Monuments/Parks</td>
<td>19,910.00</td>
<td>3.2</td>
</tr>
<tr>
<td>Protected Land/Seascapes</td>
<td>498,211.75</td>
<td>79.3</td>
</tr>
<tr>
<td>Wildlife Sanctuaries</td>
<td>920.00</td>
<td>0.2</td>
</tr>
<tr>
<td>Wilderness Areas</td>
<td>10,353.00</td>
<td>1.6</td>
</tr>
<tr>
<td>Critical Watersheds</td>
<td>48,605.00</td>
<td>7.7</td>
</tr>
<tr>
<td>Mangrove Swamp Forest Reserve</td>
<td>25,438.40</td>
<td>4.1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>628,053.65</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: CY 2004 DENR 7 Statistical Profile
Map 15. Proclaimed Protected Areas

Source: DENR 7
sanctuaries, e) wilderness areas, f) critical watersheds, and, g) mangrove swamp forest reserve. (see Map 15)

In Central Visayas, a total of 628,053.65 hectares is under NIPAS. (see Table 5) Majority of the area is water-based and only a little more than one fourth is actually land-based. With the establishment of the Tañon Strait Protected Seascapes, the Provinces of Oriental Negros and Cebu have the largest coastal and marine protected area covered under the NIPAS law. The whole protected area of the Tañon Strait is around 450,000 hectares or 72 percent of the region's total NIPAS area. The remaining 28 percent of NIPAS areas are mainly land based and accounts for only 12 percent of the total area of the region.

NATIONAL PARKS. National parks are forest reservation, essentially of wilderness character, which have been withdrawn from settlement, occupancy or any form of exploitation, except in conformity with approved management plan, and set aside exclusively to conserve the area or preserve the scenery, natural and historic objects, wild animals and plants therein.

Central Visayas used to have five national parks, namely: Sudlon National Park and Central Cebu National Park located in Cebu City; Guadalupe Mabugnao-Mainit Hot Springs in Carcar, Cebu province; Rajah Sikatuna National Park in Bohol; and, Mount Kanlaon National Park in Oriental Negros. On August 13, 2003, Sudlon National Park and Central Cebu National Park were incorporated to form part of the Central Cebu Protected Landscape per Presidential Proclamation No. 441. The Rajah Sikatuna National Park was also declared a protected landscape.

NATURAL PARKS/MONUMENTS. Areas declared as natural parks are relatively large areas not materially altered by human activity where extractive resource use are not allowed. These areas are maintained to protect outstanding natural and scenic areas of national or international significance for scientific, educational and recreational uses. The Balinsasayao twin lakes in Oriental Negros with an area of 8,016 hectares is one of the region's natural park.

The Chocolate Hills of Bohol, considered of national significance due to its unique characteristics, was declared a natural monument in July 1997. Originally, it had a total area of 14,145 hectares. However, this was recently reduced to 11,894 hectares with the exclusion of the areas once declared as alienable and disposable lands. The reduction of the area is covered by Presidential Proclamation No. 333 issued in February 2003.

PROTECTED LANDSCAPES AND SEASCAPES. These are areas protected because of their national significance and characterized by the harmonious interaction of man and land while providing opportunities for public enjoyment through recreation and tourism within the normal lifestyle and economic activity of these areas.

Presidential Proclamation No. 441 issued in 2003 merged the three critical watersheds in Cebu --- the Kotkot-Lusar an, Mananga and Buhisan watersheds --- and the two national parks into the Central Cebu Protected Landscape. Although these areas have been declared as one protected landscape, all contracts, permits and licenses for the extraction or utilization of natural resources already existing prior to the proclamation are still respected until their expiration. The total area of the Central Cebu Protected Landscape is 29,062 hectares and covers 3 cities and 5 municipalities in Cebu, namely: Cebu City, Talisay City, Toledo City, Liloan, Compostela, Consolacion, Minglanilla and Balamban.

About 106,000 people live inside the protected landscape area. The NIPAS law provides tenured migrant status of occupancy to people living inside protected areas. However,
the tenurial status of the people living in the Central Cebu Protected Landscape will still be evaluated based on the requirement for tenure migrant under the NIPAS law. The Central Cebu Protected Landscape is managed by only one protected area management board (PAMB). It is sad to note that while the three critical watersheds in the Central Cebu protected landscape are the primary sources of water in Metro Cebu, these are deforested and degraded due to human incursions.

The Tañon Strait Protected Seascapes was established in 1998 to secure the habitat and safety of whales and dolphins along the Tañon Strait. Studies made by the Silliman University Marine Laboratory in 1991 indicate that there are at least nine species of dolphins and whales in the Tañon Strait. These include the Spinner dolphin, Spotted dolphin, Pygmy killer whale, Dwarf whale and Pilot whale, among others. The protected seascapes covers municipalities and cities of Oriental Negros, Negros Occidental and Cebu located along Tañon Strait. Recently, the local governments of municipalities/cities straddled by the Tañon Strait Protected Seascapes expressed their desire for the de-establishment of the protected seascapes and for the management of the area to be given back to the LGUs.

The Apo Island Protected Landscape and Seascapes located off the coast of Dauin, Oriental Negros has a total area of 691.5 hectares. The area is protected under municipal law and managed by the Marine Management Committee of the Apo Island community with support from the Dauin Municipal Government, Protected Area Management Board-DENR, and Philippine National Police and technical assistance from Silliman University.

**WILDLIFE SANCTUARIES.** Under the NIPAS law, wildlife sanctuaries are areas that are the natural habitat, feeding and breeding grounds of animals and birds. As such, they are closed to hunting and fishing in order to protect the natural conditions necessary for these nationally significant species or groups of species of animals and birds to reproduce. The region has only one (1) proclaimed wildlife sanctuary. Comprising 920 hectares, the Olango Island Wildlife Sanctuary, off Mactan Island in Cebu, was established in 1992 to protect the natural habitat of migratory birds.

**WILDERNESS AND OTHER PROTECTED AREAS.** Letter of Instruction (LOI) No. 917 defines a wilderness area as that land of the public domain which has been reserved as such to preserve its natural condition and maintain its hydrologic quality. The development of these areas is therefore restricted. Most of the areas declared as wilderness in the region are small islands located in Cebu and Bohol.

LOI 917 further includes the following as wilderness/protected areas: 1) critical watersheds and proclaimed watershed reservations, and, 2) critical mangrove forest essential for foreshore protection and for the support and maintenance of estuarine and marine life. There are four (4) declared critical watersheds in the region. These are the Wahig-Inabanga, Alijawan-Cansuhay-Anibogan, and Loboc watersheds in Bohol and the Argao-Dalaguete watershed in Cebu. Presidential Proclamation No. 223 issued in July 2003 reduced the area of the Wahig-Inabanga River watershed forest reserve to exclude those areas previously classified as A & D lands. Proclamation 223 allows lands that were previously classified as A & D lands but became part of the reserve due to the proclamation to be restored as A & D lands.

The group of islands in Bohol and Bantayan Island in Cebu comprise the protected wilderness areas of Central Visayas totaling 10,353 hectares. Declared mangrove forest reserves in the region are mangrove forests in the Camotes islands and the Bohol Island Group facing Mindanao Sea and the Cebu Strait which total 25,438 hectares.
Non-NIPAS Areas

Non-NIPAS areas are those areas that have outstanding physical and aesthetic features, anthropological significance and biological diversity but have not yet been included under the NIPAS. These areas include protected rice and coconut lands, reserved second growth forest, watersheds which have not been proclaimed as watershed reserves, mangroves, coastal and freshwater wetlands, buffer strips and easements, ecotourism sites, heritage and cultural sites and geothermal reserve areas. Equal protection is accorded these areas even if they do not fall within the NIPAS category.

PROTECTED AGRICULTURAL LANDS. Prime areas for agricultural production such as the SAFDZ areas are protected for their food security function. In Central Visayas, this area covers an aggregate of 534,502 hectares or 36 percent of the total regional land. There is a need for LGUs to identify the specific location and boundaries of SAFDZs within their respective jurisdictions and to designate these as key production areas to be protected from conversion. Because prime agricultural lands are used primarily for production purposes, these areas are discussed in-depthly under production land use.

RESERVED SECOND GROWTH FORESTS. This refers to residual forests located in slopes of 50 percent and above and with elevation of 1,000 meters and higher. As of 2003, the reserve second growth forest total only around 21,689 hectares. The largest of these lands are found in Oriental Negros (43 percent) and Bohol (36 percent). Mangrove areas considered as also reserved second growth forests is only about 2,100 hectares.

WATERSHED RESERVES. Watershed reserve areas not covered by the NIPAS law total 28,401 hectares. These watershed reserves are located in Cebu, Bohol and Oriental Negros. The largest watershed reserve is located in Asturias, Cebu. (see Table 6)

COASTAL AND FRESHWATER WETLANDS. Wetlands are areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salty including marine areas where water depth during low tide does not exceed six meters. Coastal and freshwater wetlands are major categories of natural wetlands.

Major wetlands of international importance in the region, such as Olango Island and the Cabilao Islands, are already under NIPAS. Wetlands not covered by the NIPAS but are equally important include the Inabanga coast which has the largest mangrove area in Bohol, and the Talabong Island and Bais Bay in Oriental Negros. Inabanga coast is the wintering area of the rare Asiatic Dowitcher. Talabong island is a mangrove island within Bais Bay, making the area unique from the other bays in the area.

GEOTHERMAL RESERVES. The geothermal reserve in the region is located exclusively in Palipinon, Valencia, Oriental Negros. It is under the jurisdiction of the Philippine National Oil Company (PNOC).

<table>
<thead>
<tr>
<th>Watershed Area</th>
<th>Municipalities Covered</th>
<th>Total Area (hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cebu</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Asturias Watershed</td>
<td>Asturias, Cebu</td>
<td>5,575.00</td>
</tr>
<tr>
<td><strong>Bohol</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Bohol Watershed</td>
<td>Dagsohoy, San Miguel, Danao</td>
<td>2,919.00</td>
</tr>
<tr>
<td>3. Wahig Watershed</td>
<td>Pilar, Sierra Bullones, Guindulman</td>
<td>1,428.00</td>
</tr>
<tr>
<td>4. Cabidian Watershed</td>
<td>Candijay, Alicia, Guindulman</td>
<td>2,287.00</td>
</tr>
<tr>
<td>5. UMA-Watershed</td>
<td>Ubay, Alicia, Mabin</td>
<td>2,718.00</td>
</tr>
<tr>
<td><strong>Oriental Negros</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Basay Watershed</td>
<td>Basay</td>
<td>3,505.00</td>
</tr>
<tr>
<td>7. Bayawan Watershed</td>
<td>Bayawan</td>
<td>3,350.00</td>
</tr>
<tr>
<td>8. Mabinay Watershed</td>
<td>Mabinay</td>
<td>4,230.00</td>
</tr>
<tr>
<td>9. Bais City Watershed</td>
<td>Bais City</td>
<td>1,129.00</td>
</tr>
<tr>
<td>10. Tayasan Watershed</td>
<td>Tayasan</td>
<td>1,260.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>28,401.00</td>
</tr>
</tbody>
</table>

Source: DENR 7
BUFFER STRIPS AND PUBLIC EASEMENTS. Buffer strips refer to areas immediately adjacent to and outside the boundaries of NIPAS and other forest areas. Public easements, on the other hand, are narrow strips of land running along entire lengths of banks of rivers and streams, shorelines and lakes that should remain untouched and free from any form of development except structural soil conservation techniques such as roadside stabilization and landslide control. Although their provision is specified under existing laws, i.e., PD 705 and PD 1067, these have been largely ignored especially in urban centers and other heavily populated areas.

Easements are set at 3 meters along rivers banks in urban areas, 20 meters along river banks in A & D lands and 40 meters along river banks in forest lands. Twenty meter easements are also required from the right-of-way of national roads or highways.

ECOTOURISM SITES. Joint DOT-DENR Memorandum Circular No. 98-02 defines ecotourism as a “low impact, environmentally-sound and community participatory tourism activity in a given natural environment that enhances the conservation of bio-physical and cultural diversity, promotes environmental understanding and education, and yields socio-economic benefits to the concerned community”. The National Ecotourism Strategy (NES) has identified five (5) key ecotourism sites in Region 7. These are: Apo Island in Dauin, Oriental Negros; Olango Island in Lapulapu City, Cebu; Mt. Kanlaon in Canlaon City, Oriental Negros; Tañon Strait, the channel between the provinces of Oriental Negros and Cebu; and, the whole island province of Bohol. These key sites will be the focus of concerted efforts to develop ecotourism in the region. From these key ecotourism sites, banner sites were chosen to set an image and to position the Philippines in the international and domestic markets. In Region VII, the selected banner sites include Mt. Kanlaon, Tañon Strait and Bohol.

HISTORICAL AND CULTURAL HERITAGE SITES. Cultural heritage refers to monuments, groups of buildings, and properties with historical, aesthetic, archaeological, scientific, ethnological or anthropological value. Natural heritage refers to outstanding physical, biological and geological formations, habitats of threatened species of animals and plants, and areas with scientific, conservation or aesthetic value.

In Central Visayas, efforts are being undertaken by the national and local governments and the private sector to protect and preserve historical and cultural sites. However, rapid urbanization and increasing population have put pressure on these sites and buildings. Some of the sites are at risk of being overtaken by development or of deteriorating due to high cost of restoration. The natural heritage sites in the region such as the Chocolate hills in Bohol are better off since these are mostly covered by the NIPAS law.

Cebu province particularly Cebu City has a number of historical and cultural sites and buildings, most of which are located in the central business district along Colon and Magallanes Streets, Parian district, Pier 1 and Barangay San Nicholas. These include the Magellan’s Cross, Basilica Minor del Santo Niño, Cebu Cathedral, Casa Gorordo, Fort San Pedro, and Tres de Abril Monument. Historical and cultural buildings and sites are also found along Osmeña Boulevard such as Fuente Osmeña, Cebu Provincial Capitol, Cebu City Museum and Library, and the Pres. Sergio Osmeña ancestral home now the CAP Building. Other sites of equal historical and
cultural importance outside Cebu City include the Lapulapu Monument in Lapulapu City, the Spanish baroque churches in Boljoon and Argao, the American liberation marker in Talisay City, the Liloan Lighthouse, and the ancestral houses and other cultural and historical buildings in Carcar.

In Bohol, famous historical and cultural landmarks include the Blood Compact site in Tagbilaran City, the Baclayon Church and Museum in Baclayon and other old colonial churches in Dauis, Dimiao, Loboc, Loon, Maribojoc and Alburquerque. Other famous historical sites include the 11 hectare - C.P. Garcia Memorial Park, and war memorial sites in Antibogan (Duero), Ubujan (Tagbilaran City), and Matangtang (Danao).

The Silliman University campus in Dumaguete City is a historical and cultural landmark of the province of Oriental Negros. Within the campus are turn-of-the-century American colonial buildings and the Luce Auditorium. The Dumaguete Belfry built in 1811 as bell tower of St. Catherine Cathedral and which also served as watchtower during the Spanish era is a popular architectural landmark. Other historical and cultural landmarks in the province include the Church of St. Augustine in Bacong and the Central Azucarera de Bais.

In Siquijor, San Antonio Village is the famous site for folk and herbal medicine. Cang-isok House in E. Villanueva is a centuries-old house made of bamboo and “tugas”. Centuries-old catholic churches can be found in the towns of Siquijor, Maria, San Juan and Lazi. The San Isidro Labrador Church and Convent in Lazi, Siquijor, is reputed to be the biggest and among the oldest convents in the country and has been declared a historical landmark by the Philippine Historical Commission.

Areas Prone to Environmental Hazards

Central Visayas is vulnerable to the following geologic hazards: (1) climate and water-related hazards, (2) volcanic hazards, and (3) earthquake-induced hazards.

CLIMATE AND WATER-RELATED HAZARDS. Climate and water-related hazards consist of droughts, floods/flashfloods, strong winds, landslide, and storm surges.

Due to its geographic location, the region in general is less vulnerable to extreme climate events such as droughts, tropical cyclones, strong winds, and storm surges. Only about one tropical cyclone per year directly cross the region. During the last 35 years, only two cyclones were disastrous to cause damage to human lives and properties. Floods are more common occurrences especially in cities. These are induced by heavy rainfall associated with monsoon surges as well as slow-moving tropical cyclones that do not necessarily directly hit the region. Recently, occurrences of tornadoes were observed in Cebu Island and Bohol (San Isidro) which were not commonly reported in the region in the past.

Only the southern part of Oriental Negros which is open to the southwest monsoon is typhoon and drought prone and is vulnerable to El Niño. El Niño is a climatic condition characterized by drier than normal weather condition due to delayed onset or early termination of the rainy season, weak tropical cyclone activity as reflected in lesser number and intensity of tropical cyclones, below normal rainfall, and above normal temperature.

Floors probably injure more people and damage more property than any type of natural disaster. The coastal zones and low-lying areas beside major rivers are the areas in the region prone to flooding. The Mines and Geo-sciences Bureau (MGB) has identified at least 80 flood-prone areas in Central Visayas. Bohol has a greater portion of flood prone areas. These are located in the municipalities of Loboc, Loay, Inabanga, Guindulman, Candijay, Jagna, Valencia, Danao, Dagohoy, Trinidad, Maribojoc, and Garcia-Hernandez.

In Cebu, the identified flood prone areas are located in the cities of Cebu, Mandaue, Talisay and Danao, and in the municipalities of Balamban, Asturias, Consolacion, Liloan, Compostela, Carcar, Naga, Minglanilla, Tuburan, Argao, Carmen, Badian, Dumanjug, Barili and Pinamungahan. Given the extent of urbanization in Cebu City and its neighboring cities, and without investments in flood control projects, flooding will be a common occurrence in Metro Cebu during the rainy season.

In Oriental Negros, the flood prone areas include certain portions in Siaton, Bayawan, Sta. Catalina, Zamboanguita, La Libertad, Basay,
Map 16. Flood Prone Areas

Legend:
- Approximate location of flood prone areas.

Note: Areas along creeks and river banks and coastal areas are also considered flood prone zones.

Data Source: Mines and Geosciences Bureau 7, DENR
Landslide or slope/ground failure is also not uncommon in the region due to its topography which is rugged and mountainous. More than half (62%) of the region's land is made up of hills and mountains. There is always the possibility then that landslide, slope or ground failure will occur in these areas under the right conditions.

Landslide or slope/ground failure in the region is induced by heavy and/or continuous rainfall. The landslides however have not been and will not likely be disastrous or big as the one, for example, in St. Bernard, Southern Leyte since the region does not have active fault zones, only minor faults. Still as the region's population grows, more development is taking place near mountain fronts and on slopes. The potential for property damage and loss of life thus increases as people move into steeper areas more prone to slope failure.

The Mines and Geo-sciences Bureau has identified at least 25 landslide-prone areas in Central Visayas although all hilly and mountainous areas can experience landslides or slope and ground failures.

Aside from the rugged topography, the soil composition of the region's land, which is a combination of shale, siltstone and limestone, also render extensive areas in Central Visayas prone to ground failure or collapse during heavy rain. Limestone can be dissolved by rainwater. Hence, during heavy and continuous rainfall, there is always the likelihood that certain areas especially if these are located in mountainous sections will give way and lead to ground failure or landslide. Limestone underlain zones are characterized by presence of caves, sink holes, and surface depressions that can restrict use of the land.

**VOLCANIC HAZARDS.** Central Visayas is site of two volcanoes -- Kanlaon and Cuernos de Negros -- all located in Oriental Negros. Mt. Kanlaon is an active volcano while Cuernos de Negros is inactive.

Mount Kanlaon is located in the northern tip of Oriental Negros and forms a natural boundary between the provinces of Oriental Negros and Negros Occidental. It is part of the volcanic arc related to subduction along the Negros Trench, which includes Mt. Silay and Mt. Mandalagon (Negros Occidental) in the north and Mt. Cuernos de Negros (Oriental Negros) in the south.

The area surrounding Mount Kanlaon is directly affected by any seismic activity and volcanic debris that are produced from the eruption of the volcano. Specifically, the direct danger zone of Mount Kanlaon encompasses approximately 14,000 hectares in the Oriental Negros side. This zone mainly covers Canlaon City. Lahar, ground shaking, ashfall, and lava flow are possible occurrence in these areas. The Philippine Institute of Volcanology and Seismology (PHIVOLCS) has marked a 40 km radius around Mount Kanlaon as the likely areas that will be affected by any ashfall. (see Maps 17 and 18)

Kanlaon Volcano, one of the six most active volcanoes in the Philippines, has had at least 23 episodes of historical activities since 1866. Except in the 1902 activity during which a description of lava flow effusion was reported, most of Mt. Kanlaon’s recent historical activities were described as mild to moderate ash ejections, which generated column heights of 0.5-3.0 km. The short ash explosions were accompanied by loud "booming sound" while explosion type earthquakes were sometimes recorded. The last episode of volcanic activity
Map 17. Kanlaon Volcano Lava Flow Hazard

Generation of this hazards map for Kanlaon is based on the assumption that the activity/eruption will occur from the present active cone. Hazard zonation is subject to change in the event of migration of eruption site. If the eruption occurs outside the presumed eruptive vent, hazard zonation boundaries will change.

City, municipal and barangay boundaries are approximate and were delineated based on municipal maps that are available from the local municipality/city planning offices as of March 1999.

November 1999

PHILIPPINE INSTITUTE OF VOLCANOLOGY AND SEISMOLOGY (PHIVOLCS)
Map 18. Kanlaon Volcano Pyroclastic Flow and Lahar Hazards

Generation of this hazards map for Kanlaon is based on the assumption that the activity/eruption will occur from the present active cone. Hazard zonation is subject to change in the event of migration of eruption site. If the eruption occurs outside the presumed eruptive vent, hazard zonation boundaries will change.

City, municipal and barangay boundaries are approximate and were delineated based on municipal maps that are available from the local municipalities/planning offices as of March 1999.
was in March-July 2003 where a series of ash explosions were recorded.

Though a large segment of the volcano is considered a forest reservation, settlers have already encroached on the area. Several sugarcane haciendas are located on Kanlaon's slopes.

**EARTHQUAKE-INDUCED HAZARDS.** Active faults and trenches are the major earthquake generators in the Philippines. Central Visayas is located outside the Philippine Fault Zone and its many branches, the Mindanao Fault Zone, the Philippine Trench, Sulu Trench, Negros Trench, and other active faults and trenches. For this reason, Central Visayas is relatively free from the dangers of earthquakes. The distribution of shallow, intermediate and deep-focus earthquakes in the region has been minimal.

Active volcanoes, of which Central Visayas specifically Oriental Negros has one, are also earthquake generators when they are in state of unrest, especially when erupting. However, quakes of volcanic origin are generally of very low magnitude with no felt intensity and therefore non-destructive.

Still, there are indications of the presence of minor faults in Central Visayas. Specifically, Oriental Negros, Central and Southern Cebu, and Southern Bohol are transected by minor faults. (see Map 19) Thus, some episodes of earthquake-related hazards may occur from time to time. They are not likely to be very destructive and life-threatening though with low intensities.

For the last 100 years, the region had been affected by only six (6) significant or damaging earthquakes with magnitude not reaching 7.0. All of the recent earthquakes (1990s up) occurred in Bohol. Observed geologic phenomena related to the Bohol earthquakes ranged from minor cracks in walls and floors to ground fissures, landslides, rockfalls, ground subsidence and collapse, sand/mud fountaining and sudden increase in the sea level. Table 7 shows the record of significant earthquakes in the region.

Among the earthquake-related hazards, landslides are more likely to be experienced and are likely to result to greater damage to the people in Central Visayas as a result of the topography of the region.

Tsunami is another hazard that the region may experience during certain earthquakes. The possibility of tsunamis occurring however is low since the region’s provinces are surrounded by numerous islands which act as natural barriers. Still, there had been episodes of tsunamis hitting the region. Most of the tsunamis were locally generated.

Based on historical trend, the areas most likely to be hit by tsunamis due to earthquakes are: a) the coastal areas of Metro Cebu; b) the coast running from Talibon to Jetafe and Loay to Anda in Bohol, and; c) the coastal areas from Basay to Sta. Catalina and Siaton to Dumaguete in Oriental Negros. (see Map 20) Anticipated wave height of tsunamis at the coast will be less than 5 meters.

### Table 7
**Significant Earthquakes in Central Visayas: 1900-2004**

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Magnitude</th>
<th>Intensity¹/</th>
<th>Geologic Phenomena</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. January 1922</td>
<td>Cebu Island</td>
<td>-</td>
<td></td>
<td>Generated tsunami; deaths reported</td>
</tr>
<tr>
<td>2. February 1922</td>
<td>Cebu Island</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. March 1922</td>
<td>Siaton, Zamboanga, in Oriental Negros</td>
<td></td>
<td></td>
<td>Reported to have generated a tsunami (questionable)</td>
</tr>
<tr>
<td>4. February 1990</td>
<td>Southeast Bohol</td>
<td>6.8</td>
<td>Intensity VIII: Jagna, Duero, Guindulman, in Bohol</td>
<td>Ground fissures, landslides, rock falls, ground subsidence, sand/mud fountaining, sudden rise in sea level; deaths reported; damages to houses and infra</td>
</tr>
<tr>
<td>5. May 1996</td>
<td>Northwest Bohol</td>
<td>5.6</td>
<td>Intensity VI: Clarin, Inabanga, in Bohol; Intensity V: Dumaguete City, Or. Neg.</td>
<td>Minor cracks in walls and floors, falling objects; no major damage to properties</td>
</tr>
<tr>
<td>6. May 2004</td>
<td>Bohol</td>
<td>4.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹/ Intensity – based on Rossi-Forel Intensity Scale
Map 19. Distribution of Active Faults, Fault Zones and Trenches

Source: PHIVOLCS
Map 20. Location of Tsunami-Prone Areas

Legend:

- Areas hit by Tsunamis from local earthquakes

Source: PHIVOLCS