

## ***4. Case Study for Busuanga West***



## 4. Case Study for Busuanga West

### 4.1 Profile of the Study Area

The case study area of Busuanga West maintains unique and diverse marine terrestrial characteristics as well as socioeconomic conditions. The current situation, regarding both the natural and socioeconomic environments as well as the issues related to them, was assessed by the Study Team.

#### 4.1.1 Location and Coverage of the Study Area

The case study area is located in the western part of Busuanga Island in the province of Palawan. The inland area, characterized by low to moderately elevated rolling hills, was once covered by primary lowland evergreen forest. Logging and kaingin destroyed many parts of that forest; however, patchily distributed primary forests and secondary forests still remain. The coral and other marine resources in Busuanga West were found to be well-preserved. (Refer to Figure 4-1).

The case study area includes portions of the following barangays: Salvacion; San Rafael; New Busuanga; Old Busuanga; and Buluang. Islands are excluded. For the purpose of analyzing environmental conditions and land use, larger areas outside of the Study Area are covered; however, the major tourism development areas are limited to coastal sections.

#### 4.1.2 Socioeconomic Conditions

##### 1) Population

The total population of the study area is 4,704, in 1995 assuming that all of the population is living in the coastal areas. Barangay Salvacion, the municipal capital, and San Rafael, the adjacent barangay have higher growth rates. The population growth rates of Old Busuanga, New Busuanga, and Buluang are relatively low.

Table 4-1 Area and Population for Busuanga West (1990-1995)

Barangay	Area (ha) <sup>''</sup>	1990	1995	1995 / 1990	% annual increase
Salvacion	4,600	1,163	2,376	2.04	15.4
Old Busuanga	5,375	607	648	1.07	1.3
New Busuanga	3,040	825	696	0.84	-3.3
Buluang	1,785	511	514	1.01	0.1
San Rafael	1,660	315	470	1.49	8.3
Study Area	16,460	3,421	4,704	1.38	6.6

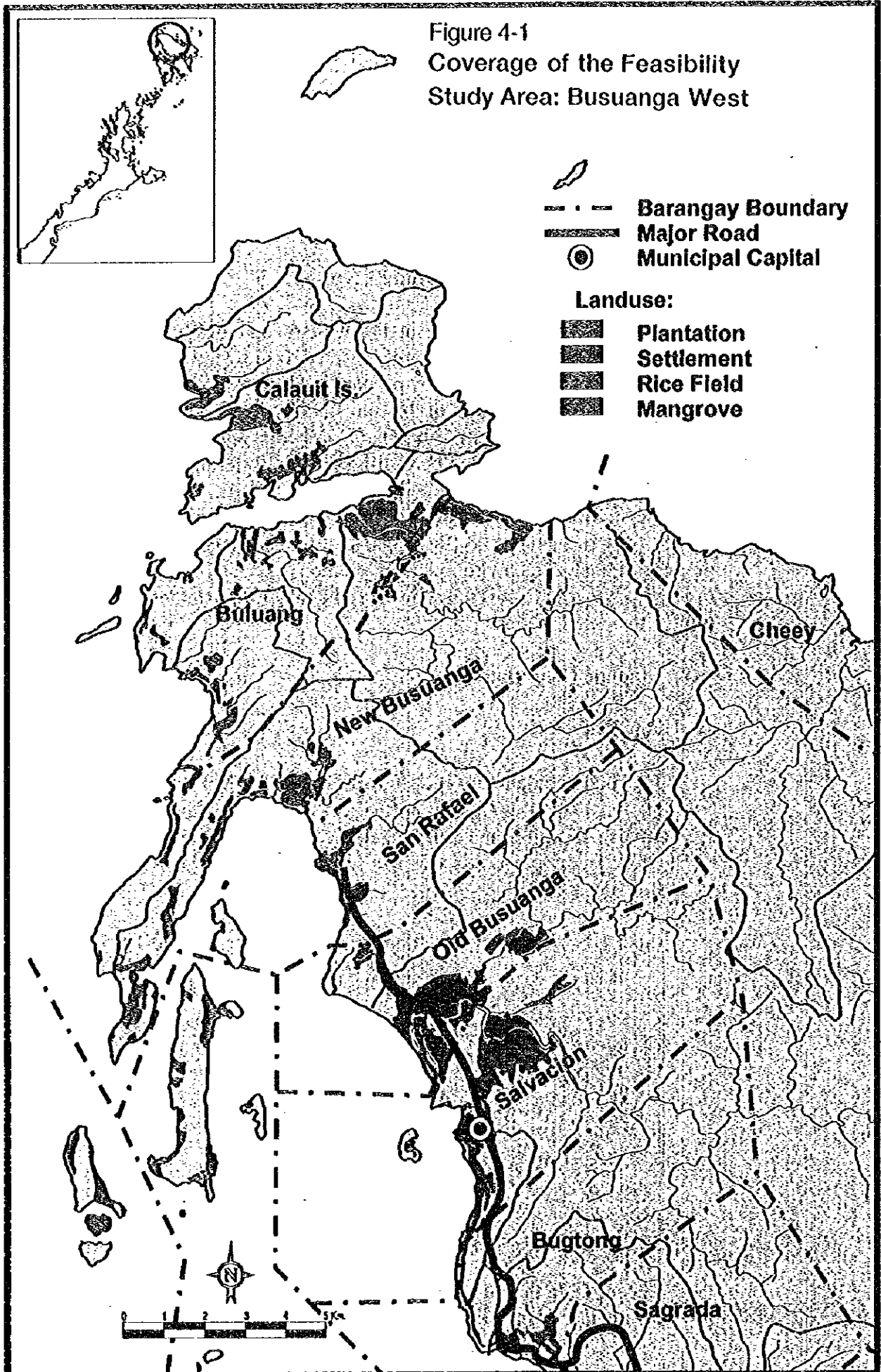
Source: Study Team

<sup>''</sup> Barangay areas are approximate

##### 2) Employment and Industry

According to the socioeconomic profile of the municipality of Busuanga and the Socioeconomic Household Survey and Focus Group Discussion by the

Figure 4-1  
 Coverage of the Feasibility  
 Study Area: Busuanga West



Source: Study Team

Study Team, the majority of people are self-supporting farmers and fishermen. In Salvacion, there is a concentration of government employees and the only industry which registers substantial revenue for the municipality is the pearl farms run by SUMAPI.

Alternative livelihood is needed as the Survey shows that the average monthly household income is ₱2,641, which is considerably low even with the self-consumption factors taken into consideration.

### 3) Land Administration

The capability of the municipality to manage its jurisdiction is limited due to shortages in human and financial resources in the government.

**Land Ownership:** Within Alienable and Disposable lands, some areas are predominantly owned by the national government and some are owned by municipal and barangay governments for schools and other public service facilities.

Tax declaration forms showed that Busuanga West is characterized by landowners with relatively large land holdings. Government ownership basically includes the Salvage Zone area, which is 40 meters inland from the coastline at high-tide, and river banks with set back requirements of 20 meters. The coastal areas are mostly owned by private individuals.

Table 4-2 Land Ownership: Private vs. Government by Barangay in Busuanga West

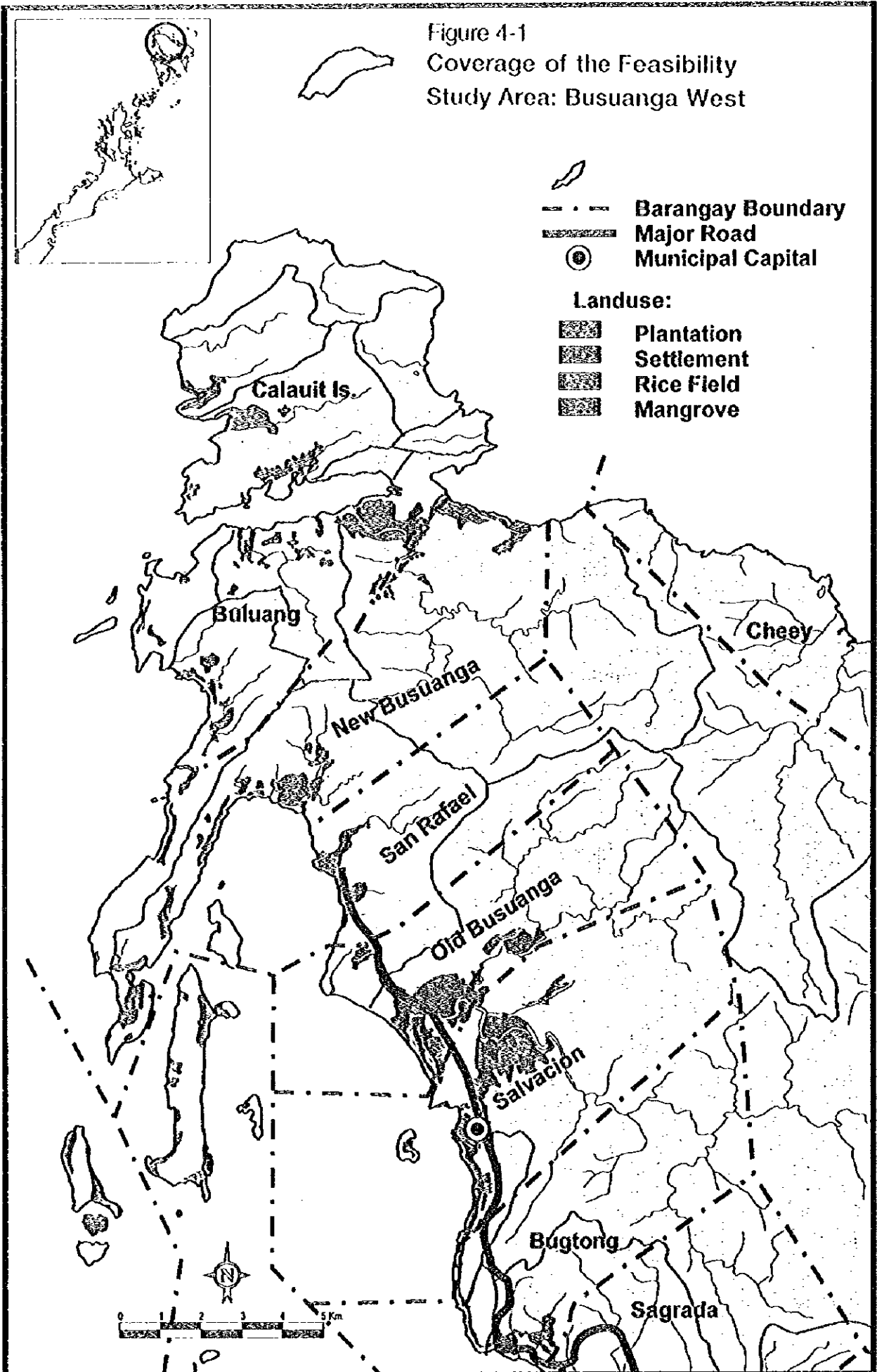
Barangay	Private Total		Government				Total (ha)	% to the Total	Assessed Area Total (ha)
			National Gov't (ha)		Other Gov'ts (ha)				
	No <sup>11</sup>	(ha)	Forest	Others	Forest	Others			
Salvacion	373	765	245	176	1	6	428	36	1,193
Old Busuanga	179	807	646	113	25	2	785	49	1,592
New Busuanga	413	828	637	230	0	2	870	51	1,698
Buluang	301	776	565	215	0	2	783	50	1,558
Panlaitan	20	137	16	8	0	2	26	16	163
San Rafael	144	427	83	37	0	1	122	22	548
<b>Total</b>	<b>1,430</b>	<b>3,739</b>	<b>2,192</b>	<b>780</b>	<b>26</b>	<b>17</b>	<b>3,014</b>	<b>45</b>	<b>6,753</b>

Source: Provincial Assessors Office

<sup>11</sup>Number of lots

**Land Classification:** The areas classified as Timberland, which are mainly inland areas, are not suitable for tourism facility development. Private land ownership is permitted in lands classified as Alienable and Disposable. Since these areas are large, they are not crucial inhibiting factors for tourism development. (See Table 4-3 and Figure 4-2).

Figure 4-1  
 Coverage of the Feasibility  
 Study Area: Busuanga West



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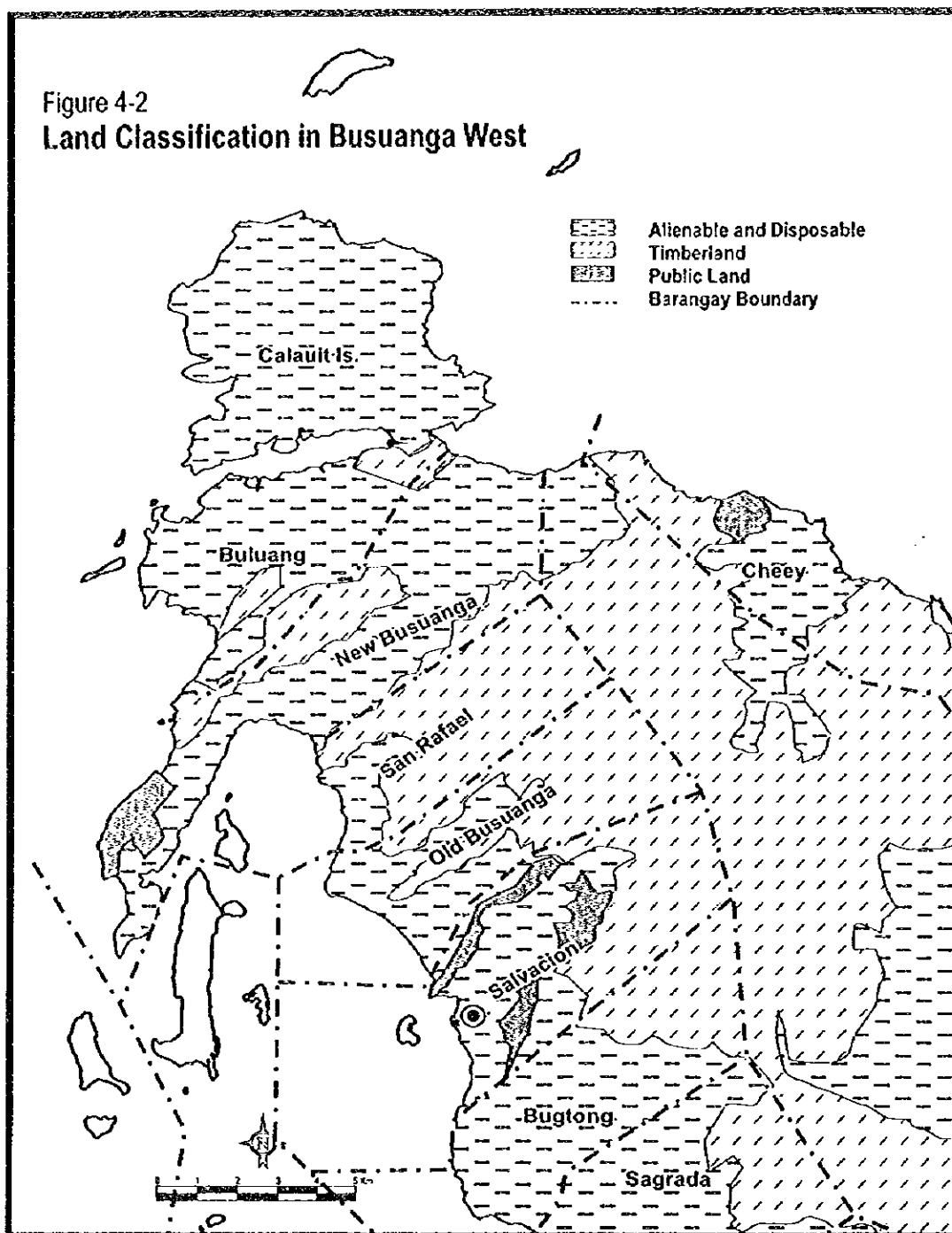
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			No <sup>1/</sup>	(ha)	Forest	Others				Forest
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Figure 4-2  
Land Classification in Busuanga West



Source: NAMRIA

Table 4-3 Alienable & Disposable Areas in Busuanga West

Name	Area
Calauit Island	2,707
Buluang <sup>1/</sup>	1,506
New Busuanga <sup>1/</sup>	2,240
San Rafael <sup>1/</sup>	314
Old Busuanga <sup>1/</sup>	815
Slavacion <sup>1/</sup>	700
Total	9,135

Source: Provincial Assessor's Office

1/ Within the case study area



**Barangay Boundaries:** Barangay boundaries are not clearly defined, and discrepancies in data provided by DENR and the Assessor's office exist. Maps with barangay boundaries based on tax maps prepared by the assessor's office are available, but they excluded the Quarantine Area.

**The Quarantine Area:** The quarantine area operated by the Bureau of Animal Industry, and the Department of Agriculture covers 40,000 hectares of inland area, was established on February 3, 1975 in pursuant of P.D. 619 for large-scale ranching activities. Right now, only 18,000 hectares near the Busuanga Airstrip is being utilized. The provincial government as well as the municipality of Busuanga would like alternative or more intensive usage of the area and the Director of the Bureau of Animal Industry has called for more coordination to flesh out possible property use arrangements under BAI before utilization other than that of cattle breeding is allowed.

#### **4.1.3 Infrastructure**

##### **1) Transportation Infrastructure**

**Road:** The extension of the national road between Coron and Sto. Niño by DPWH/SPIADP, has been suspended for financial reasons. The New Busuanga-Cheey Road project is on-going; about 60% was completed by July 1996. Other than these roads, land accessibility is limited.

**Airport:** The SUMAPI owned airstrip (800x30m) is not well-maintained and is without appropriate drainage facilities.

**Port:** Busuanga has one port located at Putod Point and other private and public wooden piers in Barangay Salvacion. Although additional ports are not listed in the socioeconomic profile, team members observed one port near Cheey. The port of Conception was reported to be operational; however, the damage to the rock pier only allows small banca boats.

##### **2) Irrigation**

The SPIADP Sto. Niña CIP, (100 ha), exists but, is outside of the study area. Therefore it is considered that there are no irrigation projects in the area.

##### **3) Power**

The barangays shown in the case study area are served 24 hours by NAPOCOR and BESELCO. The power plant in Coron has the capability of generating 1MW, or serving 2,256 consumers.

Table 4-4 Number of NAPOCO/BESELCO Consumers

Barangay	Number
Salvacion	158
Old Busuanga	31
New Busuanga	53
Buluang	12
Total	254

Source: BESELCO

4) Utilities (Water and Sewer)

According to Rural Water Supply Component by DPWH/PMO/SPIADP, 1995, the island of Busuanga has good groundwater potential. Geologically, the anticline and syncline beds favor infiltrated rain water. Level III facilities are available only in the town center of Salvacion.

Table 4-5 Water Source (Level I) for Busuanga West

Barangay	Untapped Spring	Elevation above barangay proper	Distance from barangay proper (km)
Buluang	Buluang	10 m	1.5
Old Busuanga	Banaba	10 ft.	2.5
Sagrada	Mahiralan	4 ft.	0.3
Salvacion	Lubao	50 ft.	2.0
	Narakan	50 ft.	2.5
San Rafael	Bangkal	40 ft.	0.1

Source: Municipal Profiles

Level 1: pointsource usually a protected spring or well without distribution system (coverage 100 persons)  
 Level 2: Communal faucet system intended for rural areas (100 households per system)  
 Level 3: piped system with individual house connections suited for dense urban areas

5) Telecommunication

Currently, only one unreliable telephone is operational. A single-band radio at the municipal hall is the only reliable mode of communication.

4.1.4 Environment

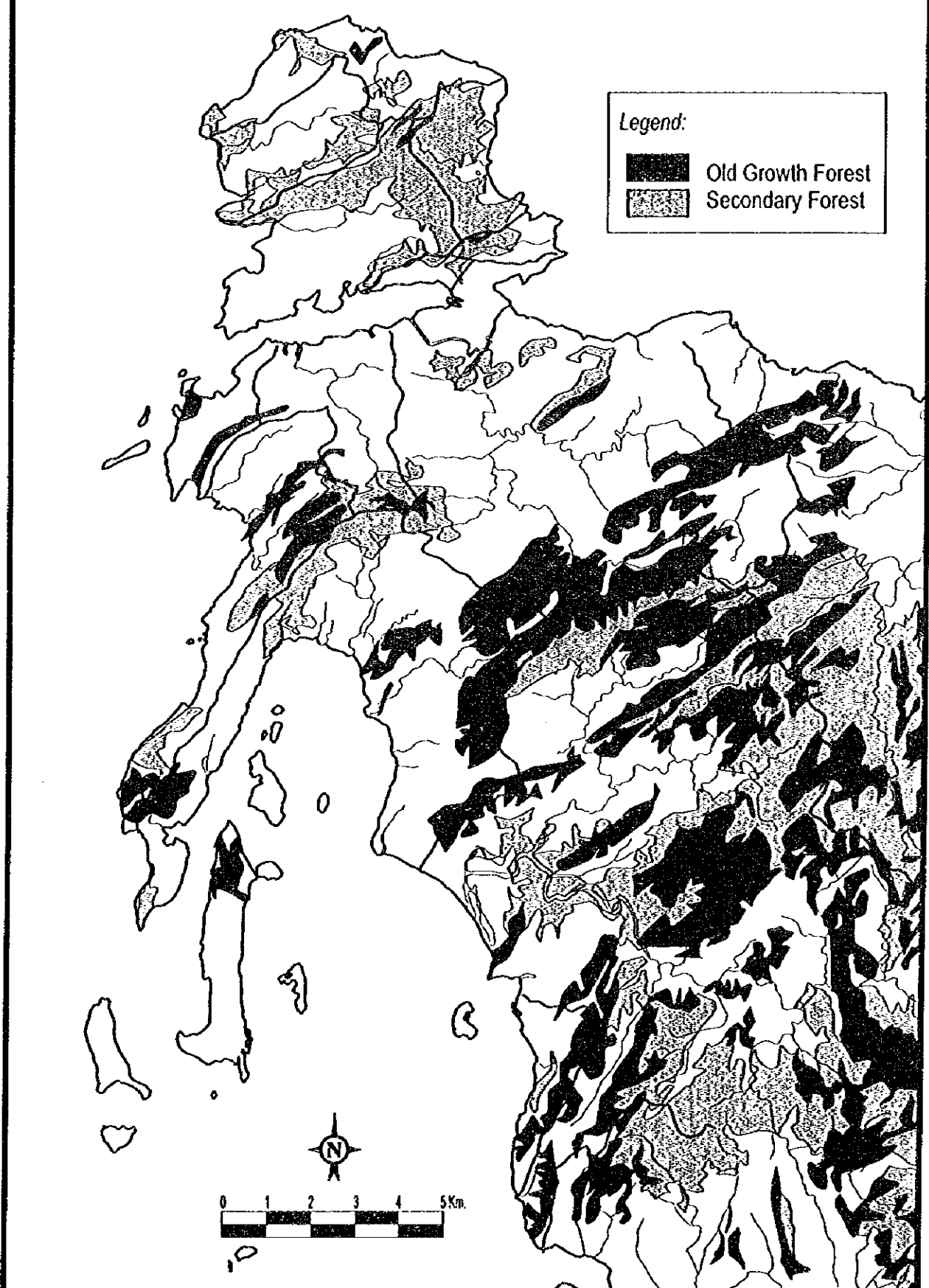
1) Terrestrial Environment

(1) Vegetation

Estimated present forest types interpreted from the aerial photos are shown in Figure 4-3. Old growth and secondary forests are delineated based on the JAFTA map. Recent interviews suggest that only limited forest areas have Dipterocarps sp. and other areas are composed of Molave forest. This indicates limestone formation in the substrata. Aerial photographs show that between 1992 and 1996, old growth, secondary growth forest changed by negative 2.8% and negative 9.0% respectively.

Significant conversion to grass/agriculture land from forest land is seen in Calauit Island, where the most effective environment controls are

Figure 4-3  
Estimated Forest Type in Busuanga West:  
Old Growth and Secondary Growth as Judged by JAFTA Map



Source: Study Team

enforced and where recent reports suggests that over-population of Calamian deer is having a significant impact on island vegetation.

## (2) Important Environmental and Biological Features of Ecosystem

Two types of vegetation with high conservation value have been found in the area: Dipterocarps and Molave Forests. The present survey clearly indicates the importance of conservation of old growth (Dipterocarps and Molave) forests and well-developed second growth forest which include Calamian deer habitats.

## (3) Present Distribution of Key Species

The results from interviews on the distribution of valuable and endangered species are summarized and shown in Table 4-6. The results revealed that composition of fauna in Busuanga is clearly different from that in Palawan Island. The Philippine Cockatoo and Calamian Deer have been effected most by human pressure on the ecosystems. Habitats of Calamian deer have been reduced and split into smaller areas (refer to Figure 4-4).

## (4) Issues and Recommended Actions

Calamian Deer: A practical management program of Calamian deer must be developed not only for Calauit Island but also for other terrestrial management areas. Recent aerial photographs indicate that the increased population of herbivore wildlife has had adverse effects on the vegetation in Calauit Island. This, coupled with the reports of the migration of the deer to Busuanga Island, strongly suggests the need for terrestrial environment management which can provide an original habitat for these animals. Such an area would also designate culling program areas for future sustainable use by local communities.

Permanent Structure Construction: Construction of permanent structures, such as roads or fences which limit movement of animals, shall be permitted only with a strict Environment Impacts Statement (EIS). Acquisition of Environment Compliance Certificate (ECC) must be obliged and implementation of careful mitigation measures and environmental monitoring must be enforced on these constructions.

Environmentally Damaging Activities: Environmentally damaging activities, such as logging and kaingin, in the remaining forest must be prohibited in the Preservation areas of the Terrestrial Environment Management Area or in Core Zones of ECAN Zoning.

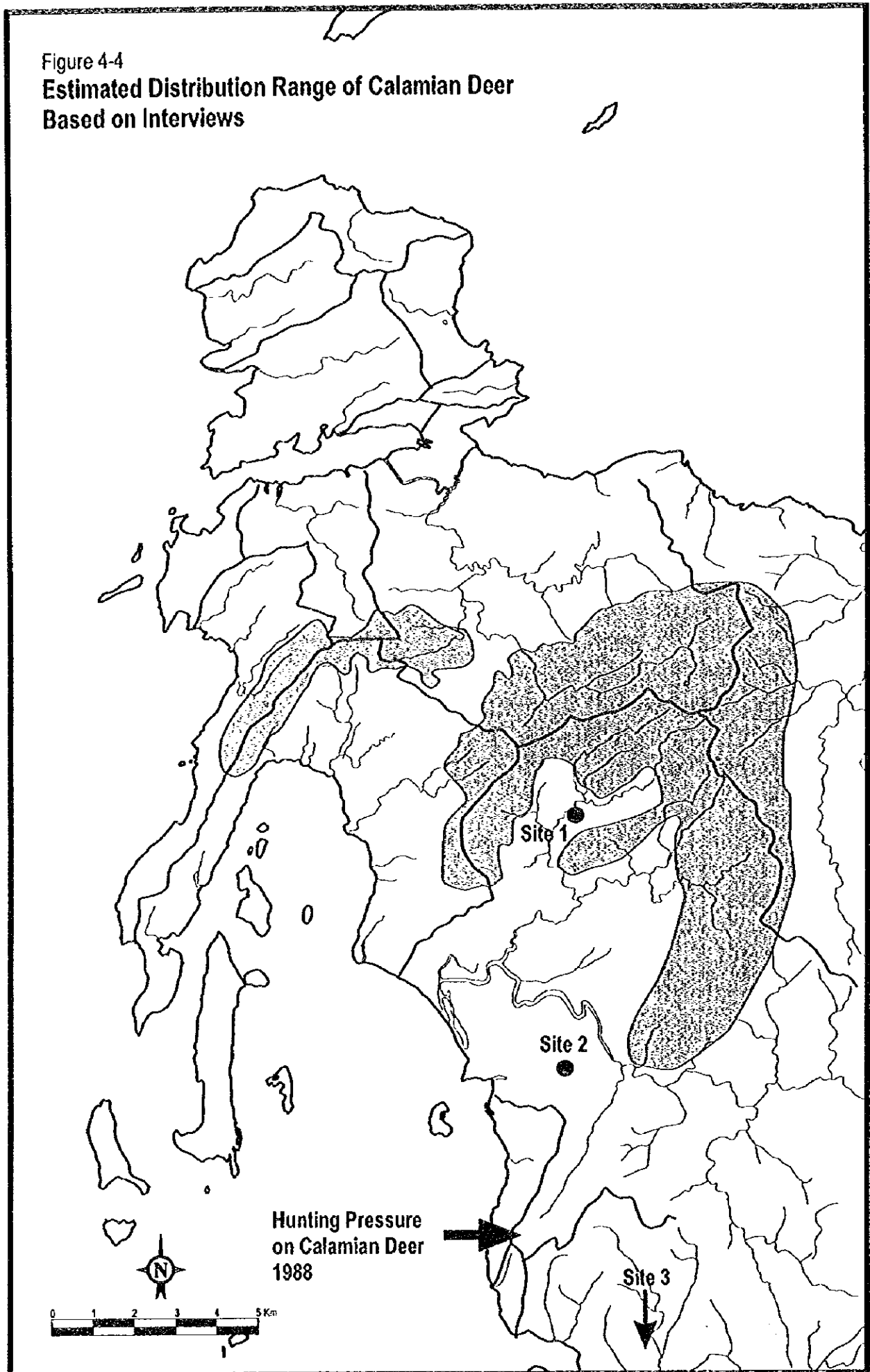
Table 4-6 Results of Interview Survey on Endangered and Important Species

Species	Common Name	Site 1 <sup>1/</sup>	Site 2 <sup>1/</sup>	Site 3 <sup>1/</sup>
<b>Avian Species</b>				
1) Megapoius freycinet	Incubator Bird	common	uncommon	absent
2) Cactua haematuropygia	Philippine Cockatoo	rare especially in lowlands	absent	absent
3) Polyplectron emphanum	Palawan Peacock	absent	absent	absent
4) Gracula religiosa	Talking Myna	common even in lowlands	common even in lowlands	uncommon
5) Ducula sp.	Gray Imperial Pigeon	common even in lowlands	common	common
6) Anthracoceros marchei	Palawan Hornbill	common even in lowlands	common except in cultivated areas	common
7) Tanygnathus lucionensis	Blue-napped Parrot	common especially during cashew fruiting season	common	uncommon
8) Prioniturus	Palawan Racket-Tailed Parrot	common in lowlands	common especially when rice is maturing	common
13) Caloenus nicobarica	Nicobar Pigeon	common even in lowlands	common even near cultivated areas	common even in lowlands
<b>Mammals</b>				
1) Manis javanica	Palawan Scaly Anteater	common	common	uncommon and limited to forest
2) Sundasciurus sp.	Snad Squirrel	common	common	common
3) Hystrix pumila	Porcupine	common	common	common in forest
4) Felis bengalensis	Little Leopard Cat	uncommon	common even in cultivated areas	rare
5) Paradoxurus hemaphroditus	Palm Civet	common even in lowlands	common	
6) Viverra zangalunga	Malay Civet	common even in lowlands	common	uncommon
7) Macaca fascicularis	Philippine Long Tail Monkey	very common	very common	common but limited to forest
8) Sus barbatus	Wild Boar	common even in lowlands	very common	common but limited to forested areas
9) Tupaia palawanensis		common even in lowlands	common	common
10) Cervus porcinus		absent, limited to New Busuanga, Buluang to Datay Plain	very rare; limited to forest and kaingin areas adjacent to forest	absent; last recorded in the area in 1986

Source: Study Team

<sup>1/</sup> refer to Figure 4-4 for site locations

Figure 4-4  
Estimated Distribution Range of Calamian Deer  
Based on Interviews



## 2) Marine Environment

### (1) Current Condition

#### (a) Coral Reef:

Excellent coral reef can be observed only along the open sea coast of Busuanga Peninsula, which shows live coral coverage of more than 75 %. Live coral reef is very poorly distributed in Gutob Bay and does not exist along parts of the Calait coastline (refer to Figure 4-5).

#### (b) Seagrass Bed:

Seagrass beds were found widely in the coastal areas around the mouth of the Busuanga River which pours into Gutob Bay (refer to Figure 4-6.)

#### (c) Mangrove Forest:

Though a detailed field survey was not conducted on mangrove, the mangrove forest south of Calait Island was confirmed to be of large-scale and high quality. Other mangrove forests were evaluated and found already degraded (refer to Figure 4-7).

#### (d) Marine Wildlife:

Interviews with local people evidenced that this area is abundant with Dugongs and sea turtles. The seagrass beds in the area may attract these endangered animals as they feed on such vegetation.

#### (e) Others:

Indication of destructive activities on coral reef was found. These activities include dynamite fishing, anchoring of boats and pearl farming being practiced in Gutob Bay. Though the quality of sea water does not show signs of eutrophication, disorderly expansion of these activities will hamper environmental conditions and the recreational use of this area.

### (2) Issues of Environmental Degradation

Current conditions of marine environment in the case study area are not as critical as in other parts of Northern Palawan. However, the following areas need to be addressed immediately:

- Soil discharge should be stopped through civil engineering countermeasures and plantation in the upstream area.
- Illegal fishing practices should be stopped through law enforcement.
- Attention should be paid to anchoring of all boats.
- Wastes including driftwood should be removed from the sand beaches.

Figure 4-5  
Distribution of Coral Reef in  
Busuanga West

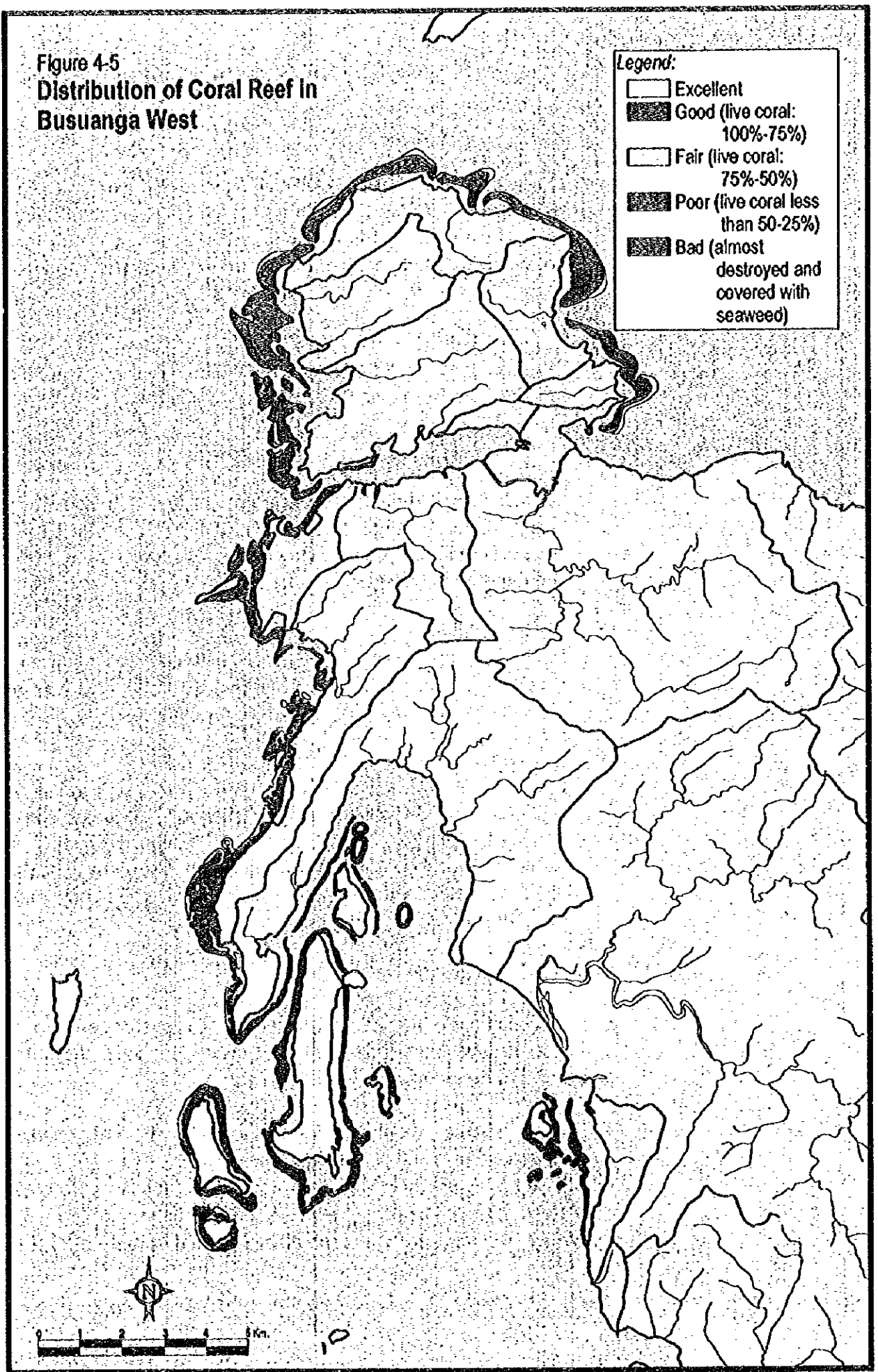




Figure 4-6  
Distribution of Seagrass Bed  
and Seaweed in Busuanga West

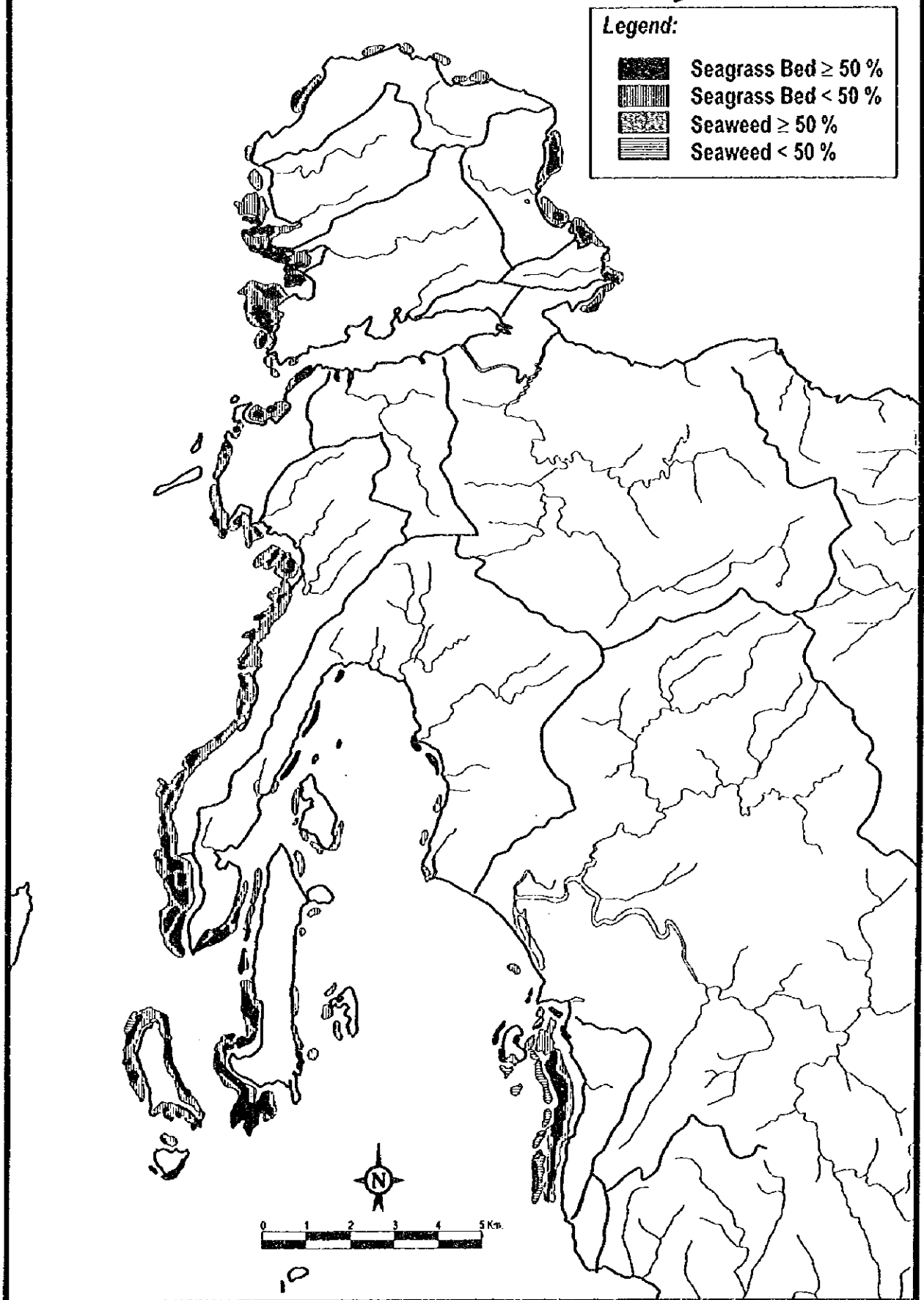
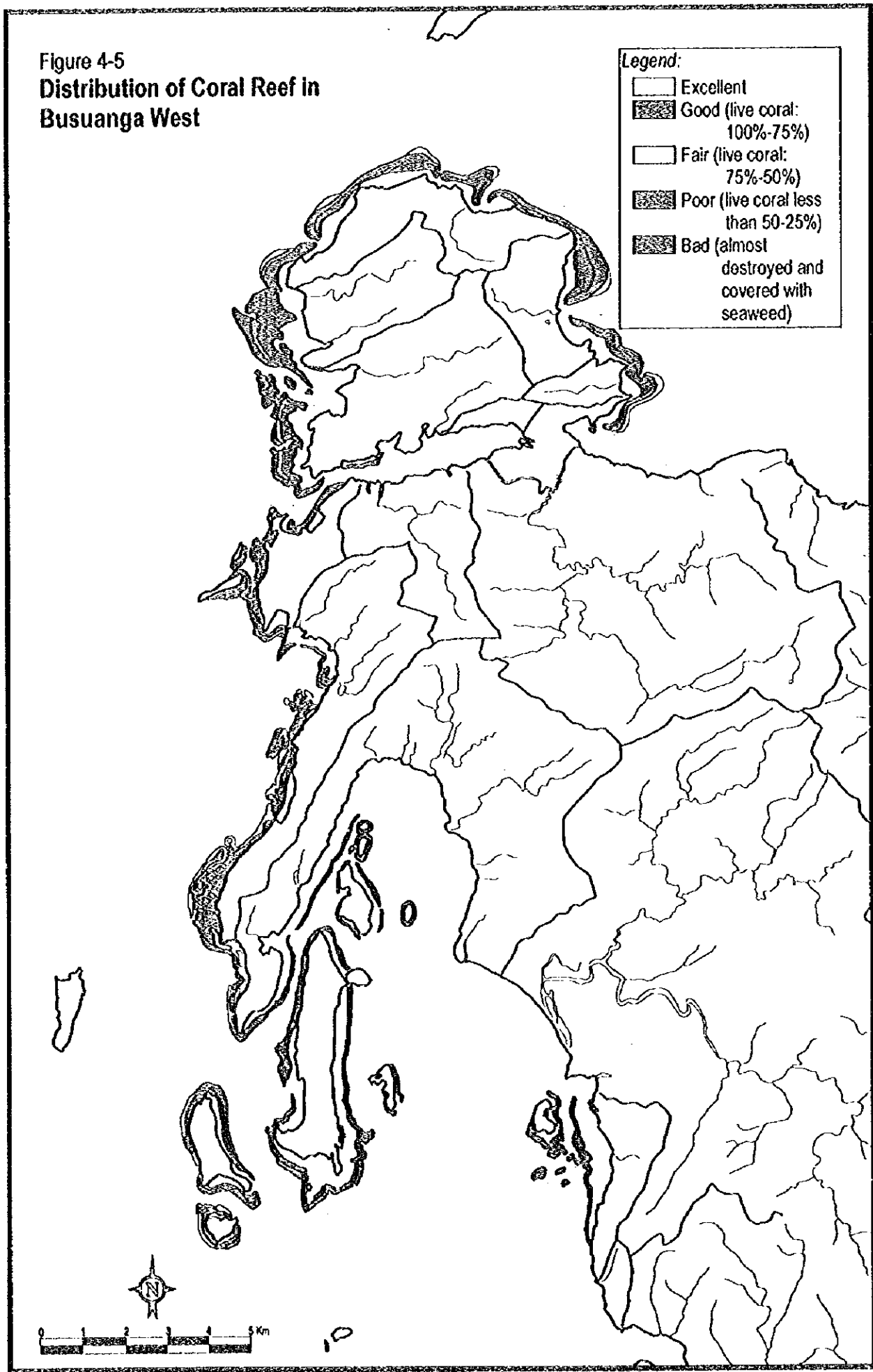


Figure 4-5  
**Distribution of Coral Reef in  
 Busuanga West**



Source: Study Team

Figure 4-6  
Distribution of Seagrass Bed  
and Seaweed in Busuanga West

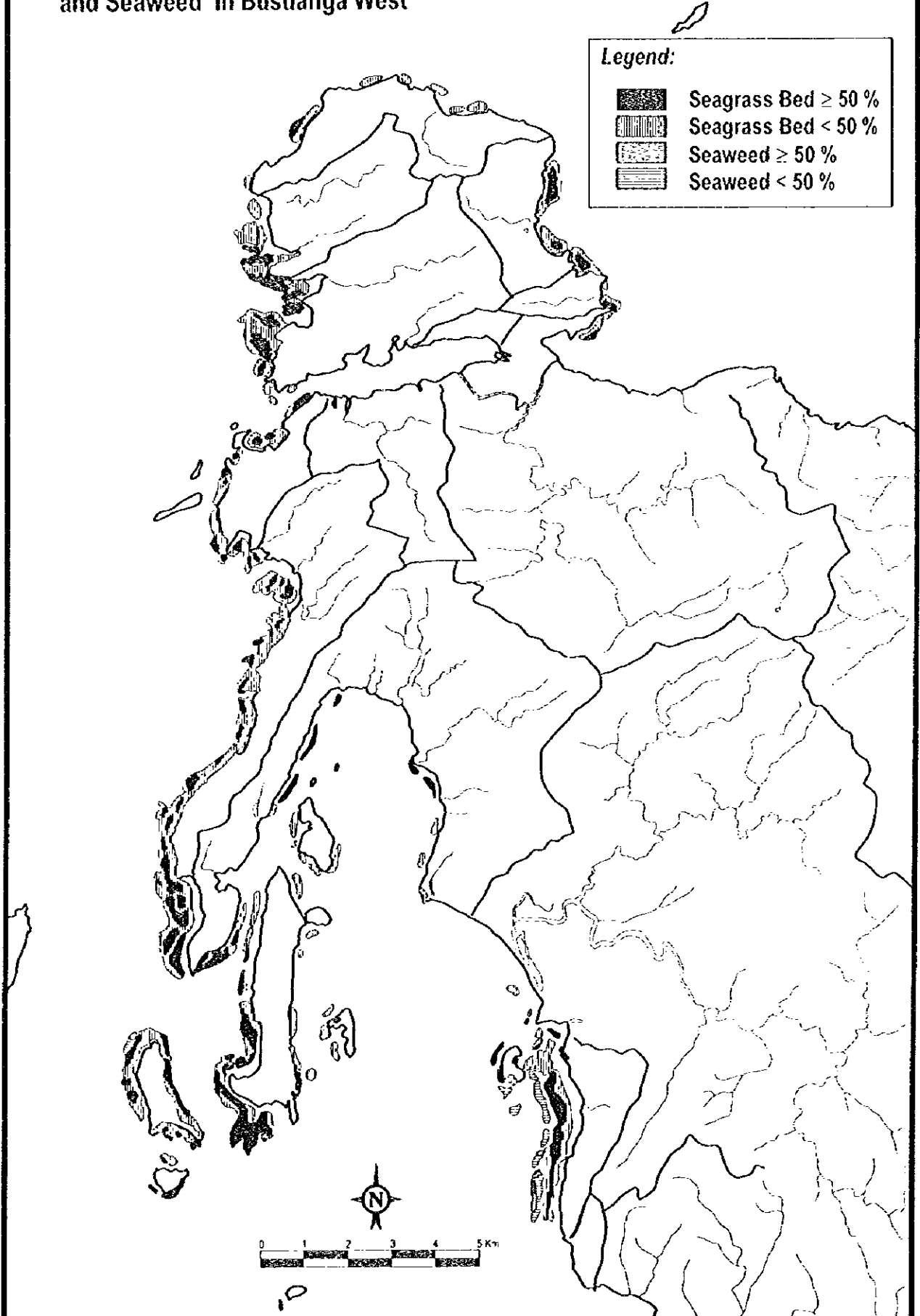
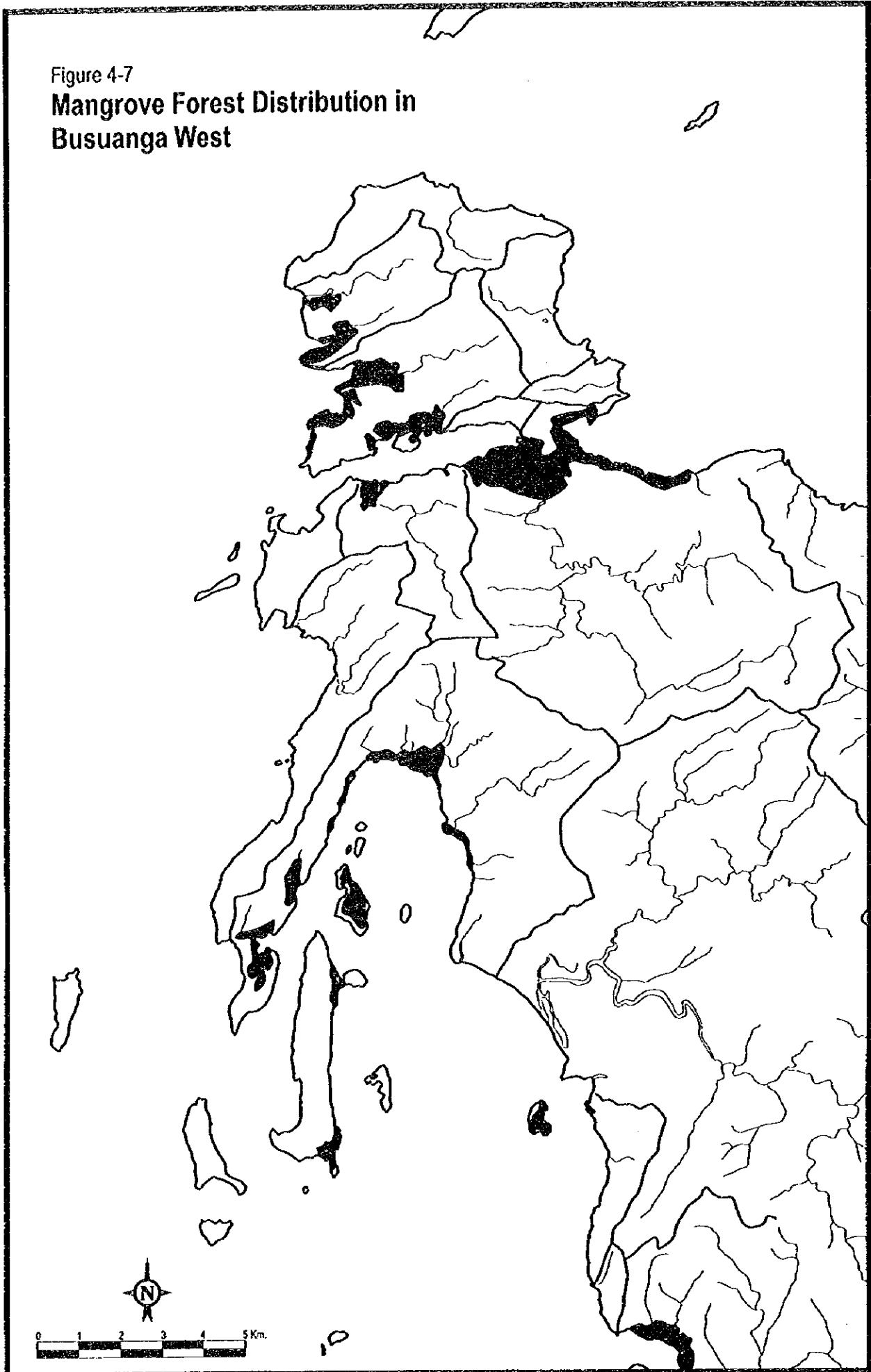


Figure 4-7  
**Mangrove Forest Distribution in  
Busuanga West**



Source: Study Team

### 3) Social Environment

Out of 15 barangays in the municipality of Busuanga, the following 10 have indigenous communities.

Barangay	Location of Indigenous Communities
Buluang	Mainland but especially Sitio Maulad
Cheey	Sitio Minuit
Concepcion	Mainland and Sitios Alaya and Maulad
Magalambay	Sitios Papachelon, Galoc, Depunglungad, Laho
Panlaitan	(96 Members)
Sagrada	Seaside areas
Salvacion	
San Isidro	(55) Members
New Busuanga	
New Quezon	Sitio Pinalaypayan

Source: OSCC and Municipal Profiles

The majority of the indigenous people are found in the islands. They belong to Tagbanua/Calamianen or the so called "Sea Tagbanuas" and are dependent on fishing and the gathering of nido (edible bird's nests) for their livelihoods. According to the supplemental survey conducted by the Study Team, the approximate average annual income of households is P21,000 which is basically earned between February and June (as shown in the following schedule).

January	:	Cleaning of nests
Feb. to May	:	Harvesting of edible nests
June	:	Fishing for squid and octopus
July to Nov.	:	Typhoon season

Limited work opportunities leave the people dependent on these earnings for the other 7 months of the year. Therefore, alternative means of cash income must be considered, especially during the period between July and January.

Land inhabited by indigenous people has been designated as an "Edible Birds' Nest Sanctuary and Ancestral Lands Exclusively for the Cultural Minorities" (Resolution No. 391, 1996). This area covers Malajon Island (Black Island) and the neighboring islands of Colocotoc, Elet, Kalampisauan and Eli. These islands are only inhabited by indigenous people during the harvesting period.

At the time of the supplemental survey, a land dispute involving Malajon Island (Black Island), between a Chinese trader and the indigenous people there, had been resolved by Resolution No. 39, s. 1996 of the Municipality of Busuanga. This declared Malajon Island and its neighboring islands "Edible Birds Sanctuary and Ancestral Lands Exclusively for the Cultural Minorities." The Resolution states, "No private person, group, or any entity

shall be allowed to occupy, utilize, or otherwise own the said islands, or any portions thereof, for any purpose whatsoever except as otherwise intended for the cultural minorities to harvest and conserve the edible birds species inhabiting the said islands as their habitat."

## 4.2 Environmental Management Plan

### 4.2.1 Environmental Management Area Classification

#### 1) Criteria and Area Classifications

In order to provide a basis for environmental management plan formulation, the study area has been classified based on the assessment of existing environmental condition and levels of needed actions. Conservation and Preservation Areas were delineated based on the criteria shown in Table 4-7.

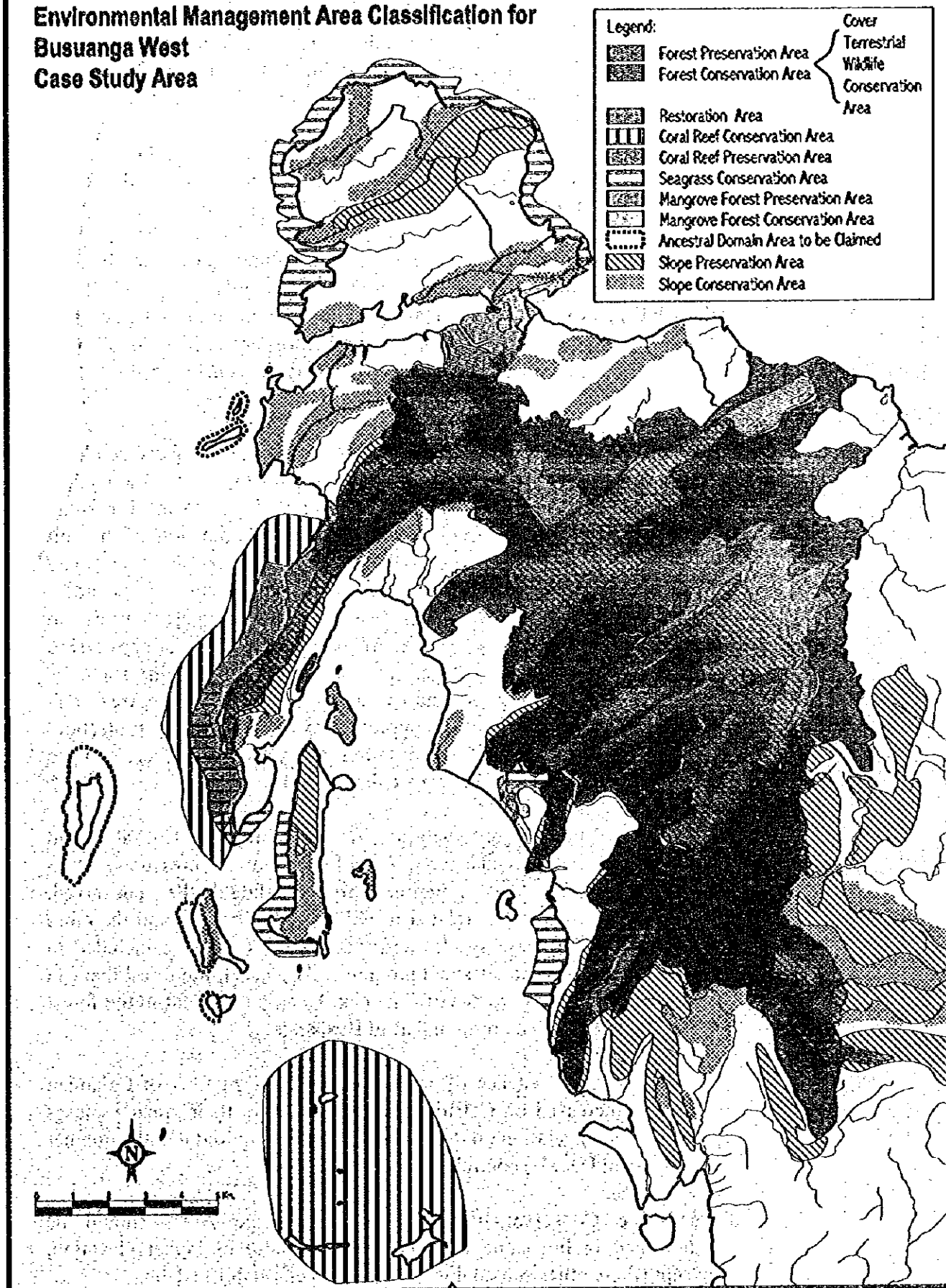
The results of the work are shown in Figure 4-8 and explained in the following sections.

Table 4-7 Criteria for Environmental Management Area Classification

Environment		Criteria for	
		Preservation Area	Conservation Area
T e r r e s t r i a l	Forest	<ul style="list-style-type: none"> <li>- intact, unique, and biologically significant ecosystem</li> <li>- mossy forest and old growth forest</li> </ul>	<ul style="list-style-type: none"> <li>- large-scale secondary forest.</li> <li>Forest Quasi - Conservation Area</li> <li>- residual forest</li> </ul>
	Slope	<ul style="list-style-type: none"> <li>- area with slope of above 50%</li> </ul> <p>Slope Conservation Area</p>	<ul style="list-style-type: none"> <li>- area with slope range of 18% - 50%</li> </ul>
	Terrestrial Wildlife		<ul style="list-style-type: none"> <li>- habitat of endangered and endemic species</li> </ul>
M a r i n e	Coral Reef	<ul style="list-style-type: none"> <li>- more than 75% live coral cover</li> </ul>	<ul style="list-style-type: none"> <li>- 50% to 70% live coral cover</li> <li>- conservation areas surround preservation areas</li> </ul>
	Seagrass		<ul style="list-style-type: none"> <li>- seagrass beds with at least 50% cover of macrophytes</li> </ul>
	Mangrove Forest	<ul style="list-style-type: none"> <li>- slightly disturbed mangrove forest with an area of more than 500 ha.</li> <li>- moderately disturbed mangrove forest with an area of more than 1000 ha.</li> </ul>	<ul style="list-style-type: none"> <li>- slightly disturbed mangrove forest with area of less than 500 ha.</li> <li>- moderately disturbed mangrove forest with an area of 500-1000 ha.</li> <li>- severely disturbed mangrove forest with an area of more than 1000 ha.</li> </ul>
	Dugong		<ul style="list-style-type: none"> <li>- frequent dugong sighting</li> </ul>
	Sea turtle		<ul style="list-style-type: none"> <li>- dominant nesting beach of sea turtles</li> </ul>

Source: Study Team

**Figure 4-8**  
**Environmental Management Area Classification for**  
**Busuanga West**  
**Case Study Area**



## 2) Terrestrial Environment

- (a) Forest Management: Areas with old growth forest, well-developed secondary forest, possible Calamian Deer migration routes and Philippine Cockatoo habitats shall be designated as Preservation Areas. Construction of permanent structures in these areas is prohibited.

Forest area within the Preservation Area is fragmented. In order to connect these fragments, and thereby ensure the continuity of the forest ecosystem, trees of diversified species should be planted.

Reproduction brush and some extensive agricultural areas which include estimated migration routes of surviving Calamian Deer, shall be designated as Conservation Areas for buffering human impacts. Forestry activities using vegetation indigenous to the area and which do not pose an extensive threat to the ecosystem, may be encouraged for the economic benefit of local communities.

- (b) Slope Protection: The mountains of Busuanga are relatively gentle in slope. Steep slope, mainly found in the upper portions of the mountains, is mostly not covered with forest. This may be due to the limestone formation in substrata, which causes quartz contamination in the soil thus impeding tree growth. In the Preservation Area, construction of any kind should not be allowed in areas with greater than 50% slope. Construction of structures in the Conservation Area requires permission for areas with slope of 18 - 50 %. Areas that have slope of above 18% and no vegetation coverage, require slope protection such as reforestation. Existing structures in the Preservation Area and Conservation Area should be improved to facilitate slope protection. Possible measures include reforestation, spray of grass seeds, and the construction of fences and adequate drainage channels.

- (c) Terrestrial Wildlife Conservation: As the Philippine Cockatoo and Calamian Deer are endangered (mainly by human pressures), their possible habitats and migration routes should be conserved. Conservation of forest is related to wildlife conservation and therefore the protection of these species and their habitats must be included in forest management policies and programs. At present, the forest that can be used for migration routes of Calamian Deer is sufficient in the forest restoration area in the northern part of Busuanga.

Due to the non-existence of natural enemies, the number of Calamian Deer has increased on Calauit Island. As a result, their grazing causes decreases in vegetation on the island. It may be required that the number of Calamian Deer be controlled.

- (d) Landscape Conservation: Protected Landscape Areas should be established in limestone forests, especially those of higher elevation, except where other sub-zoning areas have been established



### 3) Marine Environment

- (a) **Coral Reef:** The Busuanga peninsula has well-conserved coral reef and seagrass beds. Therefore the east side of the peninsula should be preserved. Conservation area should be established in the north and the south of the Coral Reef Preservation Area.

The western watershed of the Busuanga peninsula is categorized as agriculture and reproduction brush but scattered pockets of primary and secondary forest exist. It is expected that soil erosion will give rise to sedimentation on the coral reef; therefore, preventive measures to protect the slope, such as reforestation, should be carried out immediately for coral reef conservation. Establishment of protected areas under NIPAS can be proposed on the west coast of the Busuanga peninsula for effective management.

The island group to the south of the Busuanga peninsula, Pamalican Island, Pagtenga Island, Dicingan Island, Maltatayoc Island and others as well as the submerged reef, have been damaged by dynamite fishing. However, live coral and associated fish remain in the reef. There is rehabilitation potential and so restoration of the area should be considered.

Activities in the area within 300 m from the reef edge and linked-reef edge are prohibited for 5 years and environment destructive activities and collection and gathering of fish, shell and other marine life are prohibited. However, boating, swimming and snorkeling, operated by certified guides and operators, are allowed with careful consideration to the environment. With proper monitoring of coral conditions, shifting use of coral reef for commercial fishing may be considered (refer to Table 4-8).

Table 4-8 Concept of Shifting Coral Reef Use for Fishing

Year	Area-A	Area-B	Area-C
1st Year	fishing	closed	closed
2nd Year	closed	fishing	closed
3rd Year	closed	closed	fishing
4th Year	fishing	closed	closed

Source: Study Team

- (b) **Seagrass:** The coast of Calauit island, on the west side of the Busuanga peninsula and on the south of Capare island should be conserved for seagrass beds. In principle, construction of any structures that disturb currents should not be allowed, excluding pier-type structures. Moreover, coral nets should not be allowed in areas where dugong are found.

- (c) **Mangrove Forest**: Conserved mangrove forest that is located between Calauit island and Busuanga island can be established as a Mangrove Forest Preservation Area. In this area, cutting of trees, reclamation of land, and other activities that disturb current conditions are not to be allowed. However, boat cruises can be allowed if conducted by certified guides and boat operators and if the size and number of boats are restricted.
- (d) **Marine Wildlife Conservation**: Scavengers prey on lizard eggs and newly-hatched sea turtles. With the increase in tourists, it is expected that the population of scavengers will also increase. Therefore, food shall not be allowed into sea turtle nesting areas. Dugong are found along the coast of Calauit and the mainland, but dugong habitat requiring conservation has yet to be identified.

#### 4) Social Environment

Although there are no ancestral domains and lands under DENR Administrative Order No. 2, 1993 at the present, Busuanga municipality established ancestral domains and lands in Malajon island and the islands of Colocotoc, Elet, Kalampisauan and Eli under regulation of Busuanga Municipality No. 39, 1996.

Indigenous cultural communities should prepare management plans for each area in cooperation with supporting agencies and groups such as PCSDS, municipal governments and NGOs. Management plans should include plans for sustainable use of natural resources.

### 4.2.2 Required Environmental Management Measures

#### 1) Identified Management Measures

In order to protect and conserve the environment in the study area on the basis of the proposed Environmental Management Area Classification, a number of management measures need to be undertaken. They are:

- (a) restoration of degraded areas
- (b) constant monitoring of terrestrial and marine environments
- (c) establishment of Busuanga Peninsula Protected Area under NIPAS
- (d) water pollution control
- (e) solid waste management

#### 2) Restoration of Environmentally Degraded Areas

This work involves reforestation and rehabilitation of eroded areas. Natural recovery aims to rehabilitate forest gaps and corridors for wildlife. Reforestation, including that of mangrove forest, consists of nursery operation, plantation establishment, maintenance and protection, administration, and supervision. In the case study area, there are 360 ha (300

ha of forest and 60 ha of mangrove forest) that require natural recovery. There are approximately 250 ha of eroded area in Buluang Barangay which require rehabilitation.

3) **Monitoring of Terrestrial and Marine Environment**

Terrestrial environment monitoring covers flora and fauna, and especially forest. Periodic monitoring (twice a year) will be conducted and satellite images will be analyzed every year. Monitoring of marine environment covers coral reef and seagrass and will be conducted twice a year.

4) **Establishment of West Coast Busuanga Peninsula Protected Area**

Compared with other Northern Palawan areas, the west coast of the Busuanga Peninsula is rich in coral reef and seagrass, which can be classified as a core zone of ECAN zoning, and has value at national and international levels.

The establishment of a protected area is possible under NIPAS. The proposed area has approximately 1,800has. The following benefits are expected from the establishment of this region as a protected area:

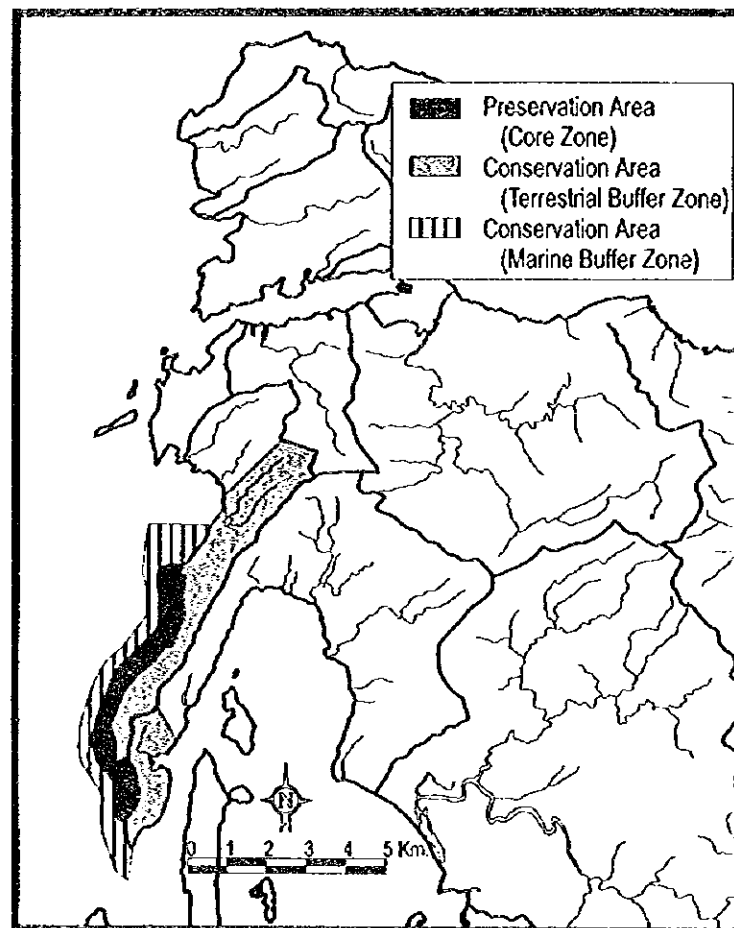
- Land and coastal use can be regulated.
- Responsible agency can be made clear.
- Funds can be provided from DENR.
- Establishment of funds, such as Integrated Protected Area Fund (IPAF)
- Entrance fees can be collected from visitors.

Protection areas can be delineated to cover coral reef that has high rates of live coral and are surrounded by conservation areas. Coral reef is very sensitive to sedimentation and therefore should be protected from erosion and landslide. Watershed that is located in the west coast of the Busuanga Peninsula should be delineated as a buffer zone or restoration zone. Zoning concept is shown in Figure 4-9.

For the successful management of the proposed protected area, the following areas need to be duly considered:

- (a) Terrestrial Environment: Monitoring migration and population of Calamian Deer would be needed to assess modification of ecosystems in Calauit and Busuanga islands. Wildlife harvesting (wild boar, Tabon bird, wild chicken and others which are locally utilized) should be monitored in order to assess human population pressure on the ecosystems. Minimum community-based logging with social forestry should be allowed for the local economy only in intensive use zones.

Figure 4-9 West Coast Busuanga Peninsula Protected Area and Its Zoning Concept



Source: Study Team

(b) Marine Environment: Monitoring the live coral coverage and species composition of the coral community as well as the seagrass community through a diving survey would be needed to assess the modification of the ecosystem. Monitoring surveys should be conducted twice a year, taking the seasonal change of turbid water discharge into account. Monitoring of dugongs and sea turtles should also be done through periodical observations and interviews with local people.

(c) Establishment of Protected Area Management Office: A protected area management office will be established, involving a team of personnel such as a superintendent, marine environment officers, terrestrial officers, rangers, a maintenance officer, an administrative officer, etc., whose activities will be supported with adequate equipment.

#### 5) Water Pollution Control

Classification of surface water standards and proposed water quality classification map are shown in Table 4-9 and Figure 4-10 respectively. According to Table DENR Administrative Order No. 35, 1990, effluent standards must stay within those shown in Table 4-10.

The coastal area of Busuanga can be divided, based on shoreline, coastal use and water quality, into inner and outer Gutob Bay. The inner Gutob Bay area, because, it is used for dugong habitats and fishing grounds, should keep Class-SB surface water quality standards (DENR Administrative Order No. 34, 1990). Outer Gutob Bay should keep Class-SA water quality standards.

There is pearl farming at present on the east side of Capare Island which intends to expand further south. Although only limited environmental information such as hydrology conditions and water quality is available, it is reasonable to assume that high densities of fish and shell culture will give rise to water pollution in areas where there is a low exchange of water because of nets and other equipment obstructing currents. Therefore, coastal use should be restricted in Gutob Bay. And, further study including prediction of water exchange is required.

Figure 4-10 Classification for Required Standards of Water Quality

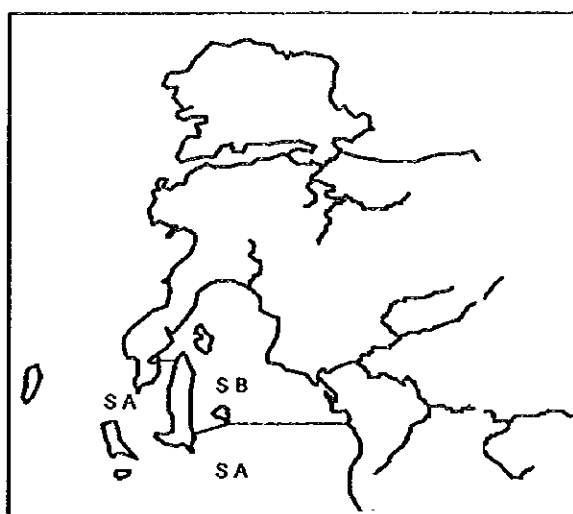


Table 4-9 Criteria for Surface Water Quality Classification

Classification	Beneficial Use
Class SA	<ol style="list-style-type: none"> <li>1) Waters suitable for the propagation, survival and harvesting of shellfish for commercial purposes;</li> <li>2) Tourist zones and national marine parks and reserves established under Presidential Proclamation No. 1801; existing laws and/or declared as such by appropriate government agency.</li> <li>3) Coral reef parks and reserves designated by law and concerned authorities.</li> </ol>
Class SB	<ol style="list-style-type: none"> <li>4) Recreational Water Class I - (Areas regularly used by the public for bathing, swimming, skin diving, etc.);</li> <li>2) Fishery Water Class I (Spawning areas for <i>Chanos chanos</i> or "Bangus" and similar species).</li> </ol>
Class SC	<ol style="list-style-type: none"> <li>1) Recreational Water Class II (e.g. boating, etc.);</li> <li>2) Fishery Water Class II (Commercial and sustenance fishing);</li> <li>3) Marshy and/or mangrove areas declared as fish and wildlife sanctuaries;</li> </ol>
Class SD	<ol style="list-style-type: none"> <li>4) Industrial Water Supply Class II (e.g. cooling, etc.);</li> <li>5) Other coastal and marine waters, by their quality, belong to this classification</li> </ol>

Source: DENR Administrative Order No. 34, 1990

**Table 4-10 Effluent Standards**

PARAMETER	UNIT	Class SA		Class SB		Class SC		Class-SD Water not Classified	
		OEI	NPI	OEI	NPI	OEI	NPI	OEI	NPI
Color	PCU	(a)	(a)	150	100	(b)	(b)	(b)	(b)
Temperature (max. rise in degree C in RBW)	C rise	(a)	(a)	3	3	3		3	3
pH (Range)		(a)	(a)	6.0-9.0	6.0-9.0	6.0-9.0	6.0-9.0	5.0-9.0	5.0-9.0
COD	mg/l	(a)	(a)	100	60	250	200	300	200
Settleable Solids (1 hr.)	ml/L	(a)	(a)	0.3	0.3	-	-	-	-
5-Day 20 C BOD	mg/L	(a)	(a)	5	30	120(c)	100	150(c)	120
Total Suspended Solids	mg/L	(a)	(a)	70	50	200	150	(d)	(e)
Total Dissolved Solids	mg/L	(a)	(a)	1,200	1,000	-	-	-	-
Surfactants (MBAS)	mg/L	(a)	(a)	5.0	2.0	1	10	-	-
Oil/Grease (Petroleum Ether Extract)	mg/L	(a)	(a)	5.0	5.0	15	10	15	15
Phenolic Substances as Phenols	mg/L	(a)	(a)	0.1	0.05	1.0(f)	0.5(f)	5.0	1.0
Total Coliforms	MPN/mL	(a)	(a)	5000	3000	-	-	-	-

Source: DENR Administrative Order No. 35, 1990

OEI: Old or Existing Industry

NPI: New/Proposed Industry or wastewater treatment plants to be constructed

PCU: Plutonium Cobalt Unit

(a): Discharging of sewage and/or trade effluents is prohibited or not allowed

(b): Discharge shall not cause abnormal discoloration in the receiving waters outside of the mixing zone

(c): For wastewater with initial BOD concentration over 1,000 mg/L but less than 3,000 mg/L, the limit may be exceed up to a maximum of 200 mg/L or a treatment reduction of 90% whichever is more strict

(d): Not more than 60 mg/L increase (dry season)

(e): Not more than 30 mg/L increase (dry season)

(f): Not present in concentration to affect fish flavor or taste or tainting

### (6) Solid Waste Management

Household waste is disposed of by local governments and in principle, garbage from the tourism sector is to be managed by the tourism sector. Garbage can be disposed of at the municipal disposal site, with a nominal disposal fee. Solid waste management can be divided into four components as shown in Figure 4-11.

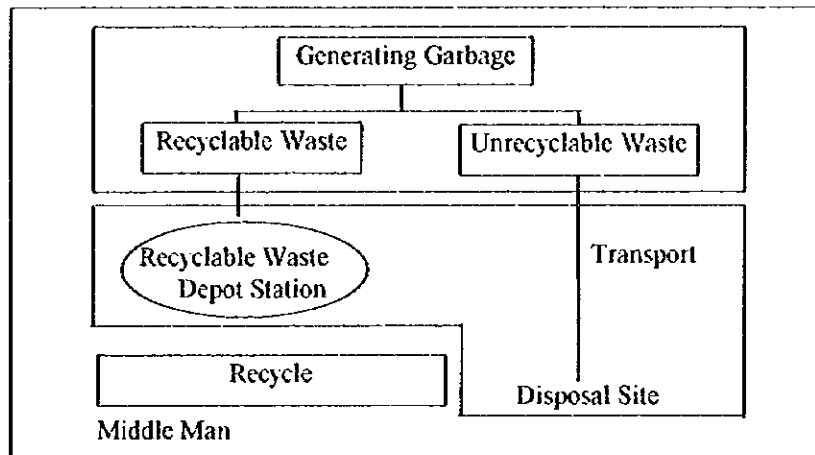
**Collection/Transport:** Resort and other facility operators should separate garbage into recyclable waste and non-recyclable waste. This waste will be collected and conveyed by compactor cars or trucks. Care should be taken to keep garbage and leachate from scattering, which can cause sanitary problems.

**Treatment:** Recyclable waste will be deposited at Recycle Centers which may be located in New Busuanga. Entrusted middle-men may purchase recyclable waste.

**Disposal:** Sanitary landfill should be chosen for the sites with due consideration to the following, from an environmental standpoint:

- It is prohibited in Preservation and Conservation areas.
- Watershed used for water supply should not be selected.
- The area with unstable slope should not be selected.
- Leachate should be treated according to set standards.

Figure 4-11 Solid Waste Management in Busuanga: Flow Chart



Source: Study Team

6) Estimated Costs for Environmental Restoration and Conservation Measures

Major restoration and conservation measures discussed in the previous sections require inputs of finance, qualified manpower, and adequate equipment. Initial and recurrent costs have been roughly estimated (refer to Table 4-11).

Table 4-11 Estimated Costs for Major Environmental Restoration and Conservation Measures

Measures	Initial Cost: P000	O & M Cost: P 000/yr	Total (1997 - 2010): P million
1. Restoration			
1) Reforestation (360 ha) <sup>1/</sup>	7,090	--	7.1
2) Rehabilitation or eroded area <sup>1/</sup>	4,930	--	4.9
2. Monitoring of Key Environment <sup>2/</sup>	--	1,100	15.4
3. Establishment of Busuanga Peninsula Protected Area <sup>3/</sup>	3,280	990	17.1
4. Overall Environmental Area Management and Administration <sup>4/</sup>	1,000	500	8.0
<b>Total</b>	<b>16,300</b>	<b>2,590</b>	<b>52.6</b>

Source: Study Team

1/ including nursery operation, plantation establishment, maintenance, administration etc., estimated unitcost is P19,700/ha

2/ including personnel, equipment, satellite data analysis

3/ including vehicles, boats, communication equipment, computers, diving equipment, etc.

4/ including establishment of a main office, 2 inland and 2 marine stations, operation and management.

### 4.2.3 Environmental Administrative Framework

#### 1) Needs for Establishing an Effective Environmental Management Framework

At present, there is hardly an effective environmental arrangement framework to ensure the implementation of proposed measures or protection of the environment in the case study area. Weak organization and absolute lack of funds, qualified personnel and proper equipment and proper equipment for monitoring patrolling, law enforcement, education/campaigns, restoration and conservation work, etc., are serious constraints. Mechanisms for involving local communities including NGOs for environmental management of specific areas is also lacking. Delays in completing ECAN Zoning also weakens the basis of environmental management.

#### 2) Organizational Structure

A central body for environmental management for the case study area should be the municipal government because of a number of reasons. The environment is a serious concern of local communities and effective conservation necessitates direct involvement of communities in terms of awareness, and monitoring, etc. Preparation and enforcement of ECAN Zoning is the responsibility of the municipal government which also stands in the best position for coordinating higher agencies such as PCSD, DENR, the provincial government etc., with the tourism development body, local communities and any other agencies with interests in the area. Organizational structure for environmental administration for the area is shown in Figure 4-12 and outlined as follows:

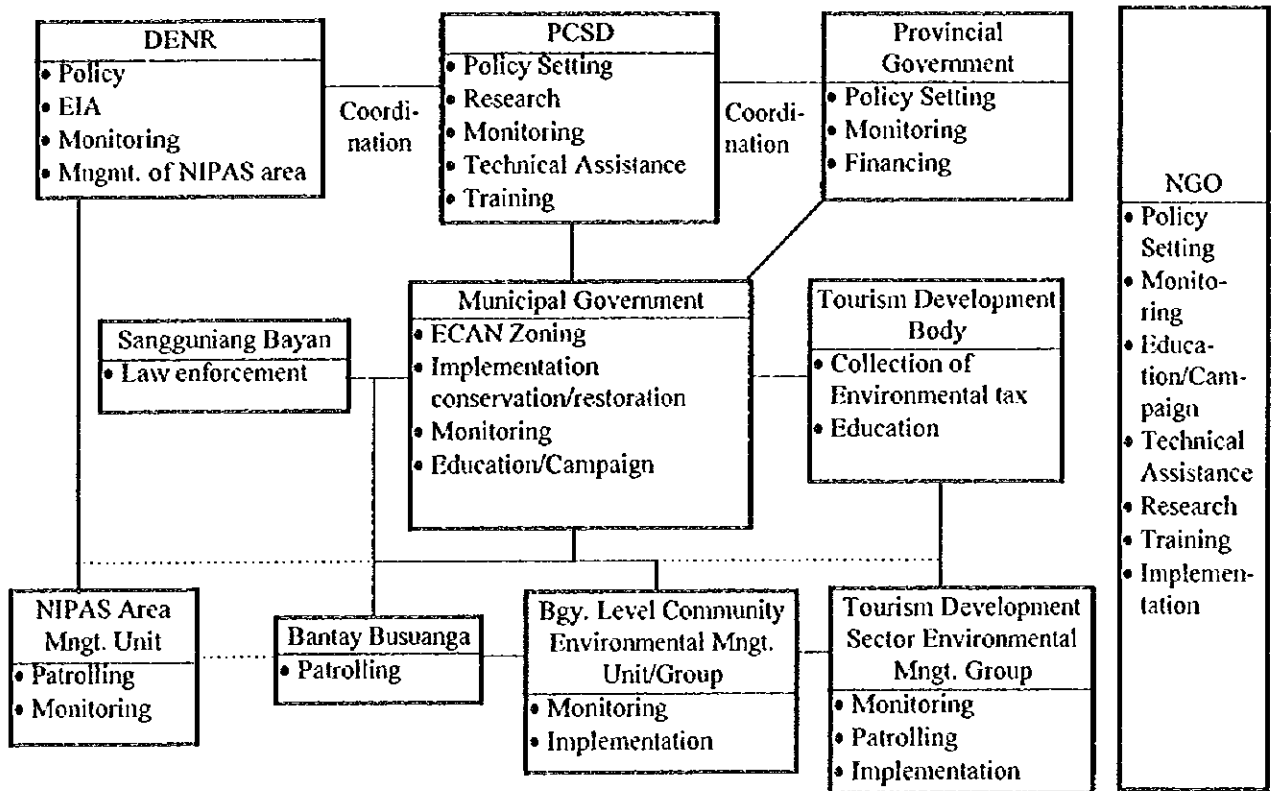
DENR and PCSD: DENR and PCSD formulate environmental policy and planning at the national and provincial levels. However, the main responsibility for the establishment of environmental policy and planning based on the national environment policies by DENR, is given to PCSD. This agency provides technical assistance to Busuanga Municipal Government.

Busuanga Municipal Government: According to the Manual of Operation for Devolved General Management Functions, DENR and local government units endeavor to appoint Environment and Natural Resources Offices, named Municipal ENROs. As of November 1996, however, there are no such offices established. Municipal ENROs are very important to environmental management. The following offices are proposed:

- |                                 |                    |
|---------------------------------|--------------------|
| (1) Municipal ENRO (Salvacion): | Overall management |
| (2) Salvacion Station:          | Inland Environment |
| (3) Talampulan Station:         | Marine Environment |
| (4) Cheey Station:              | Inland Environment |
| (5) Dahat Station:              | Marine Environment |



Figure 4-12 Organizational Structure for Environmental Administration



Source: Study Team

Area management stations mainly patrol for illegal activities, monitor conservation and restoration projects and programs, and provide information to Municipal ENROs and include terrestrial and marine environment management (refer to Table 4-12).

Table 4-12 Staff Requirement for Environmental Management in Busuanga

Office/Station	Type of Staff	No.	Role
A. Main Office	Municipal ENRO	1	- representative of municipal environmental administration
	Environmental Planner	2	- environmental management planing, ECAN Zoning, environmental resources management, institutional and organization arrangement
	Terrestrial Environmental Officer	5	- terrestrial ecosystem conservation, forest management, wildlife conservation, terrestrial environmental restoration
	Marine Environmental Officer	5	- marine ecosystem conservation, fishery resources assessment and management, marine wildlife conservation
	Water pollution Officer	2	- pollution control
	Sanitary Engineer	2	- waste management
	Data analysis officer	2	-update and maintenance of data base
	Administrator	1	- Administrative service for staff
B. Terrestrial Management Station	Station Head	1x2	- overall management
	Ranger	4x2	- patrol for illegal activities, information of environmental conservation and restoration projects
C. Marine Environment Mngt. Station	Station Head	1x2	- overall management station
	Ranger	4x2	- patrol for illegal activities, information of environmental conservation and restoration projects

Source: Study Team

Bantay Busuanga: Bantay Palawan patrols for illegal activities throughout the entire province of Palawan, excluding Puerto Princesa. Since its coverage is wide, it is also effective to establish a municipal-based system. Once established, Bantay Busuanga should effectively coordinate with the neighboring municipalities of Coron and Culion as well as Bantay Palawan.

Sangguniang Bayan: Sangguniang Bayan executes regulations on illegal activities. According to the Manual of Operation for Devolved General Management Functions of DENR, Sangguniang Bayan can impose appropriate penalties for acts which endanger the environment.

Busuanga West Tourism Development Body: The municipal government may entrust to tourism development bodies, certain areas of environmental management such as patrol of municipal waters or designated areas, education of tourists, etc., as conservation of quality environment is a major concern of the tourism sector. Collection of environmental tax may be an important role, if it is institutionalized. Adequate environmental management groups or units can be organized to cover specific areas.

Environmental Management at Barangay/Community Level: For effective management of the environment, involvement of local administration and communities becomes very critical. Therefore, it is proposed that effective units at the barangay or specific community/area level should be established for which proper facilities, equipment, training and financial support be provided. Voluntary participation of residents also needs to be effectively tapped.

NGOs: In environmental management, the roles of NGOs are widely expected at different levels of activities, including policy setting, monitoring, education/campaigns, research, training, implementation of preservation/conservation work, etc. Depending upon the function and capabilities of the NGOs, they should be an integral part of the management system.

### 3) Financing Environmental Management

Preliminary estimates of the financial requirements for environmental management of the case study area indicates that approximately ₱ 16 million of initial cost and about ₱ 2.6 million of recurrent cost would be needed for specified activities. It is expected that in this Study that the tourism sector may be able to contribute to shouldering these costs. One possible way is to directly or indirectly charge environmental costs to tourists who are the main consumers of the rich environment (a willingness-to-pay for environmental conservation interview survey of tourists found that a foreign tourist is willing to pay an average of about US\$ 50 per trip). If it is assumed that US\$ 30 or ₱ 780 per tourist to the Busuanga West resort area, will be contributed for environmental conservation, a total of ₱ 110 million in year 2010 (₱ 780 x 141,500 tourists) will be generated. This not only sufficiently covers the estimated environment management costs of Busuanga, but it also can subsidize other areas where environments have been degraded and

therefore tourism development potentials reduced, such as Taytay, Roxas, San Vicente, etc.

### 4.3 Socioeconomic Framework and Preliminary Land Use Plan

#### 4.3.1 Socioeconomic Framework

##### 1) Population

The population of the case study area and the whole municipality has been projected based on the past trend and the regional medium-term development plan. (Refer to Table 4-13).

Table 4-13 Projected Population

Barangay	Population			Growth Rate (% / yr.)	
	1995	2000	2010	95 - 2000	2000-10
Salvacion	2,376	3,100	4,700	5.5	4.2
Old Busuanga	648	800	1,100	4.3	3.2
New Busuanga	696	900	1,500	5.3	5.2
Buluang	514	700	1,200	6.4	5.5
San Rafael	470	600	1,000	5.0	5.2
Study Area	4,704	6,100	9,500	5.3	4.5
Rest of Busuanga	11,139	13,400	17,800	3.9	2.9
Total	15,843	19,500	27,300	4.2	3.4

Source: Study Team

As roads improve, settlements will be developed along the roads and vicinity of tourism development areas, especially Buluang, New Busuanga and Salvacion.

##### 2) Transport Network:

Although there is no overall regional development structure plan for the case study area, developments of infrastructure would be accelerated. The national road between Coron and Busuanga poblacions shall be paved with concrete, and accessibility to the Busuanga airport shall be improved via existing roads and a new road which will directly connect Salvacion with the airport. Busuanga airport is to be expanded and upgraded to international standard. Moreover major settlement areas including Cheey and transshipment points of port such as the new municipality port of San Nicolas and the access point to Calaut, shall be linked with Salvacion poblacion by paved roads to improve and accelerate local socioeconomic activities.

The existing municipal port has little function in terms of cargo movement because of its shallow depth. A new port shall be constructed with greater depth in San Nicolas.

### 3) Socioeconomic Development

While population is expected to increase further and basic infrastructure and services will be expanded, there are no concrete industry and economic plans. In addition to the expansion of agriculture production and productivity, tourism development potentials should be effectively actualized.

#### 4.3.2 Preliminary Land Use Plan

##### 1) Needs for Effective Land Use Plan

At present, there is no officially recognized land use plan which would provide a physical development framework in an integral manner between conflicting elements related to settlement, industrial development, environment conservation, tourism development, etc. Although it is not a direct objective of this Study, a preliminary land use plan has been prepared in order to verify that the proposed tourism development can be adequately integrated as a part the area's entire physical and socioeconomic system.

##### 2) Current Land Use







An existing land use map has been prepared by the Study Team based on the aerial photo taken by the Study Team and other available materials (refer to Figure 4-13). Current land use characteristics and summarized as follows:

- Predominant land use in the case study area is forest and grassland. It is seen that the forest coverage has been significantly reduced and disintegrated, turned to brushland/grasslands, or has been converted to other uses.
- Agricultural lands are scattered nearby the settlements areas along the coast and rivers.
- Relatively well-preserved medium to large-scale mangrove communities exist in many parts of the study area.

Other sources of information on land use as of 1990 indicate that land use is dominated by pasture land and forest. Agricultural land use share only 5.4 km<sup>2</sup> or only 4% of the total barangay area related to the case study area (refer to Table 4-14).

Figure 4-13  
Existing Land Use Map  
for Busuanga West

*Legend:*

-  Forest
-  Brushland
-  Grassland
-  Agricultural
-  Mangrove
-  Settlement

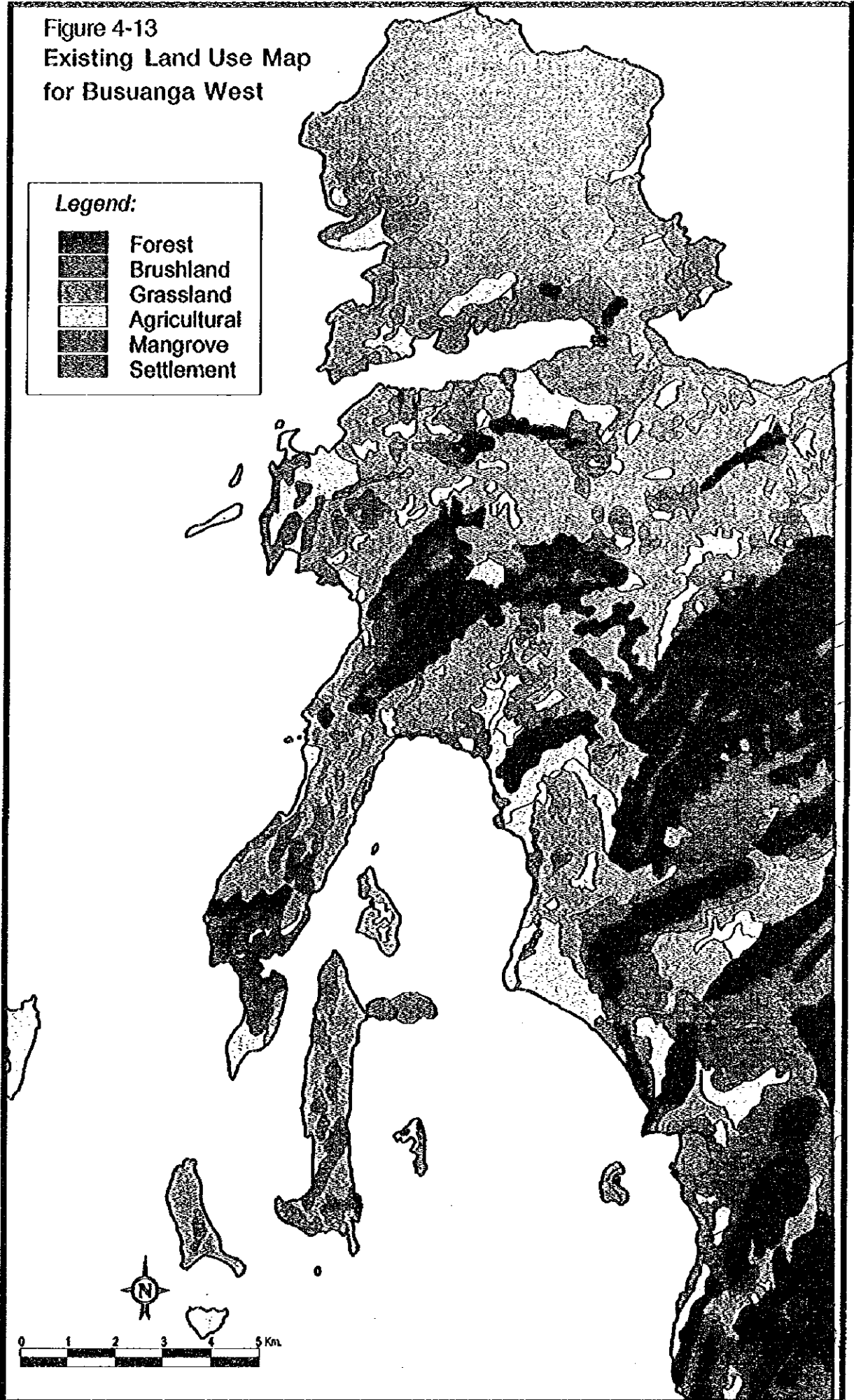


Table 4-14 Existing Land Use in Busuanga, 1990

Barangay	Total Area (km <sup>2</sup> )	Land Use								
		Residen-tial	Commer-cial	Industrial	Coco Farm	Rice/ Corn Farm	Other Agricul-ture	Pasture Land	Fishpond/ Man-grove	Forest
Salvacion	34.3	0.10			0.1	1.2	0.3	27.2	0.4	4.8
Old Busuanga	28.0	0.00			0.1	0.9	0.4	16.9	1.1	8.6
New Busuanga	24.7	0.06			0.2	0.9	0.3	11.3	1.4	10.4
Buluang	28.8	0.06			0.2	0.3	0.1	11.8	0.8	15.6
San Rafael	19.7	0.04			0.1	0.1	0.2	15.2	0.2	3.9
Study Area	135.3	0.25	0	0	0.7	3.4	1.3	82.5	3.9	43.3
Rest of Busuanga	2.6	0.48	0.02	0	0.8	6.0	1.8	153.8	5.8	50.9
Total	392.2	0.73	0.02	0	1.5	9.4	3.1	236.3	9.7	94.2

Source: National Statistical Office, Provincial Office of Palawan, Puerto Princesa

### 3) Estimate of Land Requirement and Development Suitability Analysis

In order to accommodate future demands on lands, land requirements by major land use type have been estimated and development suitability analyzed.

(a) Estimate of Land Requirements: Future land requirements have been estimated on the basis of projected population and number of farmers in 2010. A total required area is approximately 900 ha to accommodate 4,800 population or 960 households in four barangays including Buluang, New Busuanga, Old Busuanga, and San Rafael which will be mainly engaged in agricultural activities. It is clearly seen that the required land size is only about 1/3 of the estimated suitable area for development (refer to Table 4-15).

Table 4-15 Estimated land Requirements and Land Availability, 2010

Barangay	Estimated Population in 2010	Required Land Area in 2010 (ha)				Existing Suitable Area for Dvlpt. (ha)
		Residential Area <sup>1/</sup>	Farm Lot <sup>2/</sup>	Others <sup>3/</sup>	Total	
Old Busuanga	1,100	14	155	16	184	670
New Busuanga	1,500	19	248	18	284	750
Buluang	1,200	15	270	16	301	540
San Rafael	1,000	13	105	15	133	750
Total	4,800	61	778	65	902	2,710

Source: Study Team

<sup>1/</sup> assumed density is 80 persons/ha or 625 m<sup>2</sup>/family including building sites, infrastructure space, etc.

<sup>2/</sup> assumed size of farm lot is 3 ha/farmer

<sup>3/</sup> including commercial, institutional, industrial, and open space

b) Estimate of Development Suitability of Lands: Development suitability of the area has been analyzed on the basis of soil condition and slope, and classified into the following four categories:

- (i) land suitable for paddy and residence
- (ii) land suitable for tree crop
- (ii) land unsuitable for agriculture
- (ii) land unsuitable for agriculture and residences

The estimated suitable area for development is approximately 2,700 ha in the four barangays of Old Busuanga, New Busuanga, Buluang, and San Rafael (refer to Figure 4-14 and Table 4-15).

#### 4) Formulation of Preliminary Land Use Plan

The land use plan for the case study has been preliminarily formulated for the four barangays of Old Busuanga, New Busuanga, San Rafael, and Buluang (refer to Figure 4-15). Characteristics of the plan are briefly as follows:

- future land use can totally comply with development suitability of lands, thus no conflict between environment is foreseen;
- future land use expansion basically takes place along the existing roads and settlements;
- tourism development areas will be fully integrated with regional infrastructure and the socioeconomic system of the area.

### 4.4 Tourism Development Structure Plan

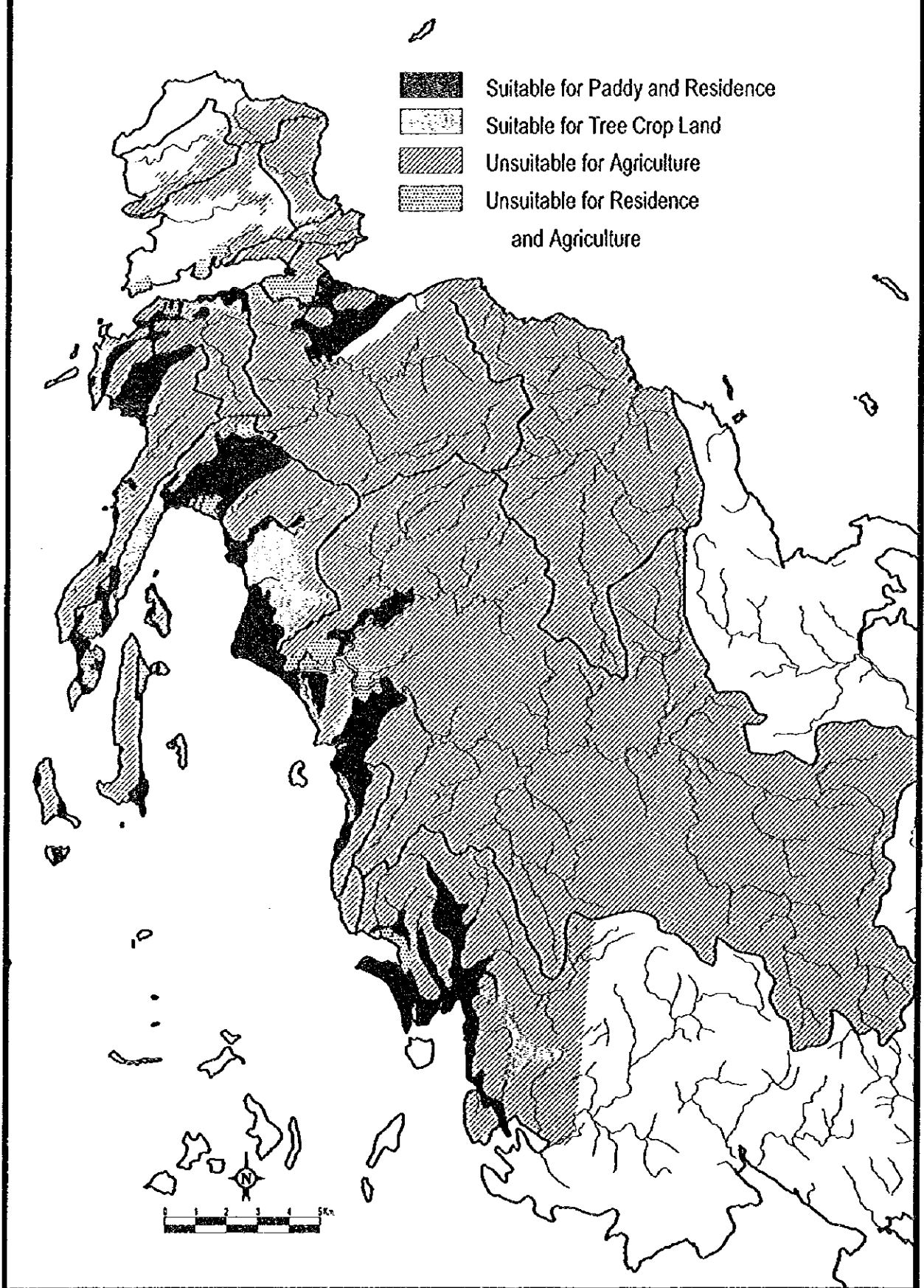
#### 4.4.1 Development Concept and Framework

##### 1) Development Concept

Critical issues in the area such as the improvement of existing inefficient infrastructure and the huge cost for the preservation of natural resources, would be favorably addressed by attracting high-quality tourism development which can shoulder these costs partly or entirely.

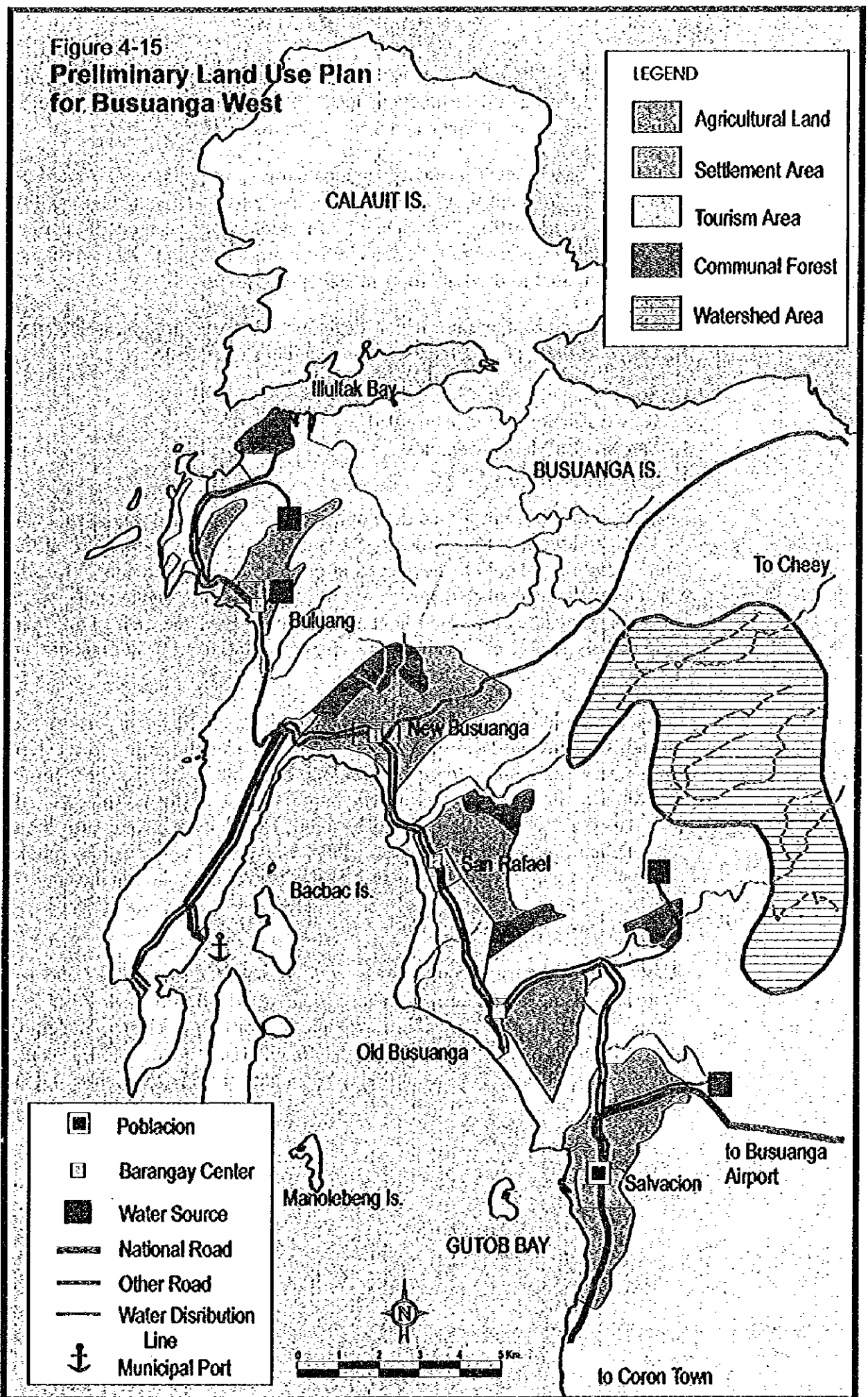
To tap the main target markets of international tourists from East Asia and other ASEAN countries, where there has been high economic growth, as well as European and North American tourists, development upgrading YKR Busuanga feeder airport to international standards is essential. As a main international gate to Palawan, safe and comfortable facilities should be available at the airport to arriving tourists.

Figure 4-14  
Land Suitability Map for  
Busuanga West





**Figure 4-15**  
**Preliminary Land Use Plan**  
**for Busuanga West**



Source: Study Team

Salvacion should be reinforced as the supply center for human resources and should have various urban functions including municipal tourist office, local industry facilities, and training and medical treatment.

White sand beaches which can accommodate tourism development, should be selected. Development should be guided properly to achieve the high-quality befitting an international acceptance. In addition, a center of marine transportation connecting the various tourism attractions in Calamian Islands should be created to diversify tourism activities.

The following are the four major development areas proposed. Detailed discussion of these developments can be found in subsequent sections.

1. South Coast Resort
2. New Busuanga Inland nature Park
3. San Nicolas Marine Complex
4. West Coast Resort Area

Apart from the above proposed developments of concentrated tourist spots on the south and west coast of Busuanga Island, other tourist spots utilizing the natural resources should be developed in order to create international resorts which meet the diversified demands of tourists. Therefore, diving spots, sport recreational facilities for island hopping on Gutob Bay, the Safari Park, and facilities for natural environment preservation on Calauit Island should be developed.

Priorities should be given to the construction of the International Airport and the infrastructure works including, the access road from the airport to Western Busuanga. Not only tourism development, but also socioeconomic development in local areas is a very important aspect to any project. All necessary items of the infrastructure, including electricity and water provision, telecommunication, waste disposal facilities as well as transportation, should be developed with consideration given to the local communities in the area.

#### 1) Tourism Development Framework

About 75% of the total 95,000 foreign tourists expected to visit the Calamian Tourism Cluster would be those with a single destination (6 nights: 30%, 5 nights: 44%), and 20% are those traveling to/from other clusters including Puerto Princesa and El Nido. Of the total 46,500 domestic tourists 1/3 would stay 4 nights and 2/3 would stay 3 nights (refer to Table 4-16).

**Table 4-16 Estimated Number of Tourists by Length of Stay**

Length of Stay	Foreign	Domestic	Total
6 nights	30,000	0	30,000
5 nights	42,000	0	42,000
4 nights	4,000	16,000	20,000
3 nights	0	30,500	30,500
1 night	19,000	0	19,000
<b>Total</b>	<b>95,000</b>	<b>48,500</b>	<b>141,500</b>

Source: Study Team

The demand for tourism activities in the case study area is not only generated by overnight tourists, but also by those who stay outside the area and visit the study area on a day trip. Considering these tourists, the average number of tourists visiting the area is estimated at about 1,800 a day and at 4,350 on a peak day in 2010.

**Table 4-17 Estimated Number of Tourists (Physical Development Framework) for Daytime Tourism Activity Facilities**

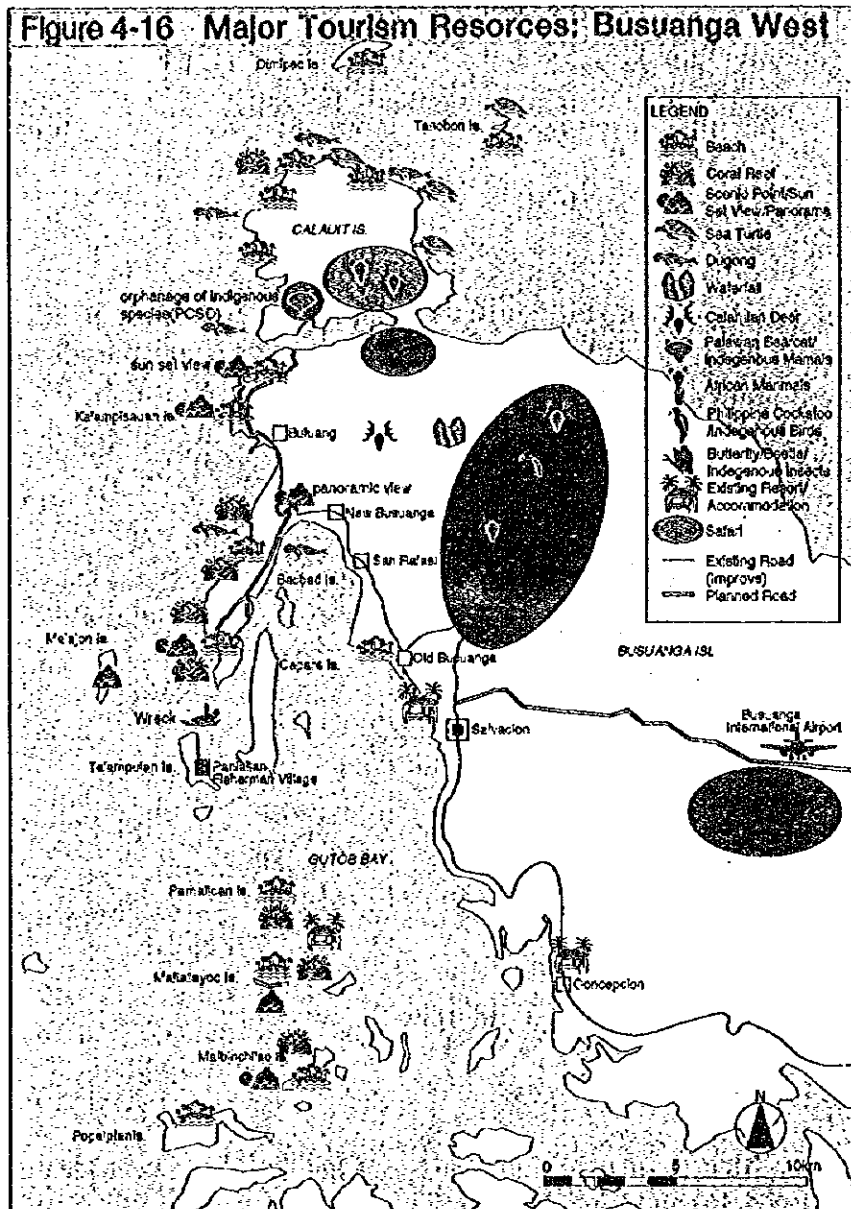
	2000	2005	2010
<b>Average Daily Tourist Inflow</b>	150	950	1800
• Stay in Busuanga West	110	850	1550
• from Outside	40	100	250
<b>Peak Day Tourist Inflow</b>	500	2300	4350
• Stay in Busuanga West	350	2050	3750
• from Outside	150	250	600

Source: Study Team

#### **4.4.2 Tourism Development Potentials**

##### **1) Tourism Resources**

Main tourism resources in Busuanga West have been identified (refer to Figure 4-16) and explained as follows:



Source: Study Team

**(1) Natural Marine Resources**

The natural resources important to marine tourism are as follows: 1) well-distributed and diversified coral reef communities, and colorful coral fish for SCUBA diving and glass-bottom boat tours; 2) existence of rare species of animals, such as dugongs and sea turtles, which increase opportunities to call attention to the importance of protecting the natural environment; 3) existence of big migrating fish resources, such as tuna and sword fish, which can be the main objects of sport and game fishing.

The Busuanga West area possesses all of these important resources:

- Large-scale and diversified good coral communities along the coast and offshore islands of the South China Sea.
- Fish resources in and around the coral reef coasts for diving and 20 to 40 km from Calamian archipelago, for game fishing.
- Dugong breeding sites and sea turtle nesting grounds located in seagrass beds and on sand beaches.
- High water quality on the South China Sea side during north-eastern monsoon winds and prevailing fine weather.

In addition, around Calauit island and the headlands of the west coast of Busuanga island, there are various sizes of white-sand beaches, including a large 2 km-long beach and a small isolated beach. These beaches are considered to have high potentials for future tourism development. However, large-scale tourism developments on narrow and steep beaches surrounded by natural coastal forest should be avoided because these beaches tend to be chosen as nesting places by Hawksbill turtles.

Since most of Busuanga island, on the north part of Gutob bay and the coasts of the smaller islands, is covered by mangrove, tourism developments are considered to be limited to white-sand beaches around Old Busuanga.

The small islands from the middle of Gutob bay to Culion Island have rock reefs, green hills, long growing beaches and small sand beaches. These characteristics, coupled with the white-sand beaches, blue sky, green hills and emerald green sea water, are favorable to tourism in this area. These colors, paired with the sunset hues famous around the west coast of Busuanga Island, are also essential factors for creating internationally acclaimed tourism areas.

## (2) Inland Natural Resources

Inland natural resources in the center of Busuanga Island have well-maintained forests and other terrestrial ecological systems including the endangered Calamian Deer and Philippine Cockatoo. Unique landscape made up of limestone and heavy metal soil is identified as two of many attractive natural resources.

**Geographic Features:** The range of mountains lying 200-300 meters from North to South in Busuanga island create headlands over Gutob Bay. The islands in the Bay are also characterized by mild geographic features. However, rocky mountains made of limestone in Malajon, Kalampsauan, Elet and other small islands on the north of the Calamian Island are known as habitats of swallows similar to El Nido. Therefore, these nido-hunting areas have been allocated as ancestral domain areas by the municipality.

Remaining Natural Forest and Rare Indigenous/Endangered Species and Ecosystem of Flora and Fauna: Since diverse non-timber products, such as rattan for local enterprise development, and orchids are found in this area and because many peculiar and endangered species have been observed, facilities relating to natural education are proposed in this area.

However, care must be taken to protect the natural habitats of endangered species from illegal and/or destructive activities. Policy preparation and implementation for environmental protection measures are essential. For tourism uses, mandating authorized nature tour guides/forest rangers to accompany tourists and controlling the entrance to fragile ecological areas is necessary.

River and Lagoon: The broad Busuanga River, which flows into Old Busuanga does not dry up even during the dry season. Crocodiles used to inhabit the river but are now extinct. The Nagugagot River, flowing to the Busuanga river, through a valley running from North to South, forms a lagoon, which is expected to satisfy local demands. Its potential for being utilized as environmental education and observation routes is high, when surrounding forests and their ecosystems are incorporated.

Waterfall: The Chinabayan Waterfall, situated in the northwest of New Busuanga does not dry up, and is potentially an important sightseeing spot as well as a water supply source.

### (3) Cultural Resources

The social and cultural features as well as historic interests in this area can be attractive tourism resources. Unfortunately, there are few historic artifacts or buildings remaining in this area. However, since some sunken World War II ships are found here, ship-exploration diving can be promoted.

The development of local traditional industry based on rattan, is considered to be beneficial to both tourism and the local economy. The market expansion of local products can be achieved by technical and design improvement, and by the extension of product variety.

The traditional ways of living and cultural activities of the indigenous peoples have almost disappeared. However, nido hunting on small limestone islands which have been appointed as ancestral domains, remains one of the few traditional activities in the area.

### (4) Other Resources

Since 1975, more than half of the unused lands belonging to Busuanga Municipality have been developed into the Calait Wildlife Sanctuary by DENR, and cattle breeding farms by DOA. At Calait Wildlife Sanctuary, the breeding of African-origin herbivorous mammals and of

endangered species, such as Calamian Deer, have been carried out. In the end, the number of Calamian deer has exceeded the limit of 2000 per habitat. The potential for a safari-type natural park is therefore great: It would help the deer; promote PCSD functions of breeding local endangered species and preserving natural resources; as well as be the possible site for a research center which would provide specialized facilities for preservation, research and education.

At present, more than half of the farm lands, over 40,000 ha which are situated between the mountains, still have natural forest and ecosystems. Only a small part of plain land is used for breeding and raising cattle. According to a natural environment management plan, other sports facilities, including farms for horse riding, orchards and orchid farms, are proposed for the use of the idle lands.

## 2) Tourism Development Opportunities

Existing tourism developments are divided into the following three categories; 1) developments by joint capital from both domestic and overseas sources, 2) developments for foreigners living in Philippines; 3) developments by local capital.

Most developments in Busuanga belong to the second category and are relatively small (less than 200 rooms). The developments on the small islands in Gutob Bay are even smaller (the average number of rooms is around three).

Busuanga West benefits from rich natural resources, and enjoys great possibilities of diversified tourism activities including excursion flights over Coron Island, the Safari Park in Calauit Island, a port town in Coron Island, the vast farms inland, and the natural forests home to Calamian Deer and Philippine Cockatoo. Therefore, once the regional infrastructure is improved and the land for development is secured, tourism investment in this area will dramatically increase.

### 4.4.3 Tourism Development Constraints

The existing constraints on tourism development in Northern Palawan are inaccessibility, the lack of infrastructure and of public incentive for private capital investment, as well as the rapid rise of land prices in the area. There is also the fact that developers have already started purchasing beach areas and small islands which they consider suitable for tourism development.

#### 1) Accessibility to the Gateway of Calamian Tourism Cluster and International Tourists Flow

As aforementioned, YKR Busuanga Airport needs to be upgraded immediately in order to attract affluent tourists from ASEAN countries. Based on the idea that Ninoy Aquino International Airport will remain the

main gate for tourists from other parts of the world to Palawan, the function of the NAIA should also be reinforced to compete with other international airports in South East Asia.

Presently, the only access road is the National Highway which takes long diversions along the south coast of Coron City. Although the present construction works for road-width expansion will be completed, the reduction in travel time from the airport to the tourism facility (originally, estimated to take from 50 minutes to one hour) is considered to be difficult to achieve. Therefore, the construction of another alternative route should be assessed for West Busuanga in the future.

## 2) Regional and Tourism Infrastructure Development

Generally, not only tourism but the infrastructure including water/electricity provision, telecommunication, sewage disposal and waste disposal facilities, have not been developed in the area. The high cost of such infrastructure development along with the low-profitability of such projects dissuades and even prevents private investments.

## 3) Institutional Measures to Promote Private Tourism Investment

The dire need for intensive infrastructure development and the induction of investments on environmentally responsible tourism was discussed in the Comprehensive Tourism Master Plan for the Philippines.

However, more concrete measures to encourage private sector investment on tourism development in this area, such as improvements of financial and institutional measures, the introduction of new taxes, promotions for attracting investments and the establishment of new offices for dealing with inquiries, have yet to be announced by any of the governments.

## 4) Land Speculation

The Comprehensive Tourism Master Plan for the Philippines, tourism development plans by the provincial government, and rumors about projects have ended in a land speculation craze, particularly of lands along the coastlines in San Vicente and Taytay. This phenomenon has raised land prices and has made it difficult to purchase the necessary lands for developments. Such land speculation booms happen on small distant islands where the wonderful natural environments are preserved and land ownership is not registered, such as with public land. Developers in Puerto Princesa offer varied services, such as the introduction of properties through excursions, and land lease procurement which includes obtaining certificates from the municipality (40,000 pesos for an island development of less than 50 rooms).



It is almost impossible to carry out the appropriate developments under the current land speculation conditions because additional constraints of land use requiring industrial development have also arisen. This type of land investment boom can sometimes be a big factor in the destruction of the local societies and the economic environments in the areas; therefore, it is necessary to provide policies and measures for restraining land speculation and guiding the appropriate use of lands.

#### 5) Areas Covered by the Comprehensive Agrarian Reform Program

All privately owned agricultural land larger than five hectares, and all public agricultural land, is subject to the Comprehensive Agrarian Reform Program (CARP). Therefore, idle land and large lots that are suitable for tourism development are in conflict with the program. Table 4-18 shows lots covered by CARP. Out of those, four lots overlap with the tourism development plan areas.

Table 4-18 Lots Covered by CARP: Busuanga West

Barangay	Type <sup>1/</sup>	Name	Title No.	Titled Area (tax declaration): ha	Distributable Area: ha	Status
Buluang	CA	Vicente Sandoval	TCT-27-3 <sup>2/</sup>	22.1630	15.1630	for documentation.
New Busuanga	CA	Efren Montilla	TCT-T-9128 <sup>2/</sup>	16.1415	11.1415	for documentation.
Old Busuanga	CA	Hrs. of Luisa Parmelee	OCT-4037	112.2405	10.1755	for survey
	CA	Hrs. of Luisa Parmelee	OCT-4037	96.7386	8.8944	for survey
	CA	Hrs. of Vicente Sandoval	TCT-52 <sup>2/</sup>	68.2047	28.2047	for doc.
	CA	Hrs. of Vicente Sandoval	TCT-52 <sup>2/</sup>	68.2046	38.2047	for doc.
Salvacion	CA	Benjamin Sandoval	E-8120	9.6950	4.6950	for doc.
	CA	Ignacio Yap	TCT-8124	14.3047	9.3097	for doc.
		Development Bank of the Philippines	TCT-9946	11.8870	11.8870	Distributed (11/17/92)

Source: DAR

<sup>1/</sup> CA: Compulsory Acquisition

<sup>2/</sup> lots that overlap with the proposed tourism development

#### 4.4.4 Assessment of Carrying Capacity

As the structure plans are developed, the carrying capacity of the area is estimated. The feedback process of defining the carrying capacity is shown in Figure 4-17.