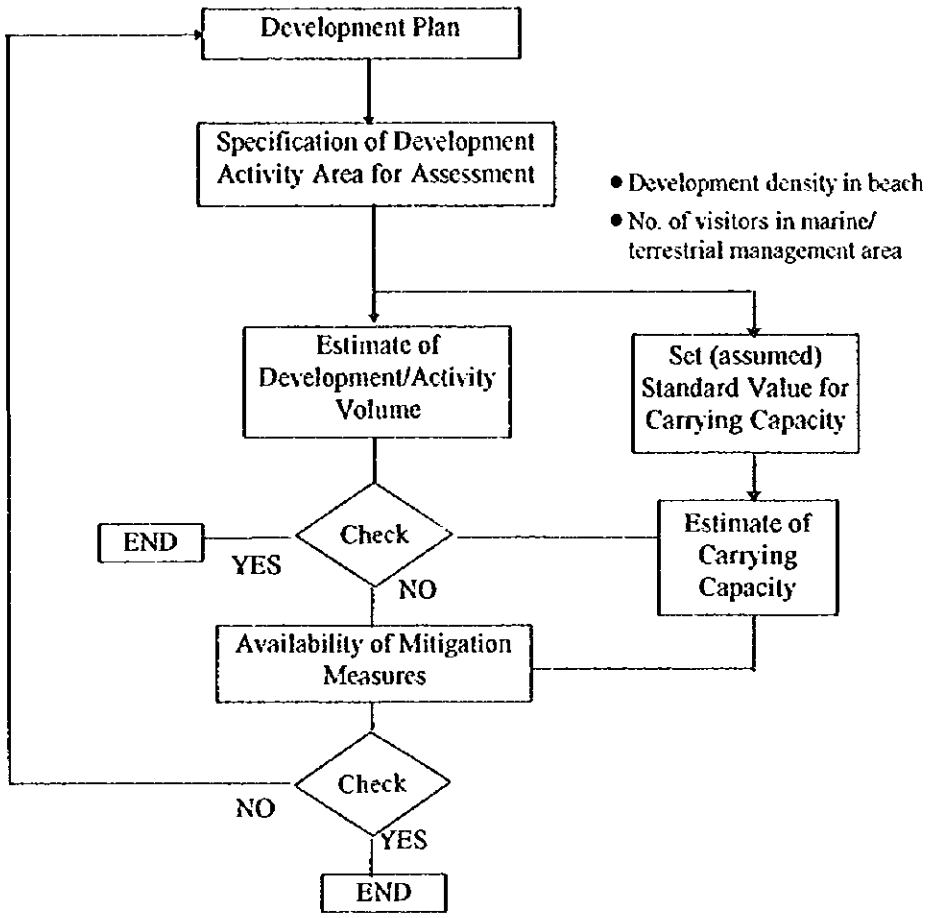
Figure 4-17 Flow Chart for Carrying Capacity Assessment



1) Critical Aspects and Criteria for Carrying Capacity

Criteria for carrying capacity are examined and defined in accordance with the environmental management plan. Outside of marine and terrestrial conservation and preservation areas, the major tourism development areas, the south coast resort and west coast resort areas, are proposed. In the terrestrial conservation areas, educational and research-oriented activities are proposed, and in the marine conservation areas, diving and mangrove cruises are proposed. For each area, criteria for carrying capacity is set (refer to Table 4-19) and explained as follows:

(a) Hotel and Resort Development within the Landscape Conservation Area: Strict regulation and enforcement is needed on the level of sewage discharge to the South China Sea where there are still good-quality corals and dugong. The landscapes of small islands in Gutob Bay need to be preserved. At the same time, within landscape conservation areas along the coast and in the hinterland, density of development shall be as low as 5 rooms/ha to secure an adequate buffer to enhance the visual and physical continuity of forest and beaches. Within the tourism development areas,

the net density is set at 15 rooms/ha to provide high-quality resort environments.

(b) Hotel and Resort Development Outside Landscape Conservation Area: Since the area is positioned as a background to the small islands in Gutob Bay, the 10 rooms/ha maximum capacity development standards is so as not to degrade the visual amenities of the area.

(c) Activities in the Forest Preservation and Conservation Area: Activities in the forest preservation and conservation areas shall be limited to environmental education and research. The frequency of entry to the areas shall not exceed more than one party (8 persons) per hour. Since local vegetation and endangered species still exist in the old growth forests of the central portion of the island, entrance to the forest preservation and conservation areas shall be minimized.

(d) Diving Activities in the Coral Reef Conservation Area: Diving in one spot shall not exceed two groups (less than 10 people per group) in the morning and three groups in the afternoon in the coral reef conservation areas.

(e) Cruising in the Mangrove Preservation Area: Only non-motorized boats with a maximum of six passengers shall be allowed in the Mangrove Preservation Areas. The frequency of cruising shall not exceed 3 boats per hour.

Table 4-19 Criteria for Carrying Capacity

Environmental Management Area Classification	Maximum Capacity	Remarks
1. Landscape Conservation Area	5 rooms/ha (gross), 15 rooms/ha	Hotel, resort
2. Outside of Landscape Conservation Area	10 rooms/ha (gross), 20 rooms/ha	
3. Forest Preservation/Conservation Area	1 party/hour/trail (8 persons/party)	Tourist Activities
4. Coral Reef Conservation Area	5 parties/day/spot (10 persons/party)	
5. Mangrove Preservation Area	3 boats/hour (6 persons/boat)	

Source: Study Team

2) Estimated Carrying Capacity and Proposed Control Method

(1) Carrying Capacity and Control Method for Hotel and Resort Development

Two major tourism accommodation development areas in the structure plan are along the coasts of Buluang and Old Busuanga. In Buluang, 200 rooms of high-class resorts are planned, and in Old Busuanga, mid-high class accommodation facilities are planned. In both areas, the scale of development is about half their carrying capacity.

An area development method by the public sector to guide private investment with an appropriate density requirement will be employed to

control the carrying capacity. Also, development guidelines shall be used to control development to appropriate location and density.

Marine resources such as coral and seagrass are sensitive to resort development especially in the West Coast Resort Area (Buluang). Hotel and resort development shall incorporate marine conservation elements and recycling of treated sewage for watering plants or irrigation purposes shall be considered.

(2) Carrying Capacity and Control Method for Tourism Activities

A centralized environmental management body of Busuanga West shall issue permits for the use of the inland nature trail and mangrove cruise area. Qualified and licensed rangers and/or nature tour guides, who are appropriately educated shall accompany tourists to offer educational opportunities and to prevent negative impacts to the environment.

The environmental management body of Busuanga West shall install mooring buoys at appropriate locations to control boat numbers. Diving operations shall only be managed by divers and boat operators certified by PCSD to prevent negative environmental impacts.

Table 4-20 Estimated Carrying Capacity for Major Development Areas

Identified Area For Assessment	Critical Aspect	Estimated Carrying Capacity		Total	Control Method for Dev'ts/ Activities
		Planned Dev't/Activity Volume/Pattern	Unit Quality		
South Coast Resort	Env. of high quality tourism'resort area Water quality-Gutob Bay	Resort dev't (gross-200ha'net-100ha) (up-to-2010: resort-1000roomsand others)	• gross density: 10rooms ha • net density: 20 rooms ha	2000 rooms	• Area dev't by Public • Dev't guidelines • Sewage treatment/ recycling (for irrigation)
West Coast Resort	Landscape Cnsv. A Env. of high-quality tourism'resort area Water quality for coral reef'seagrass Cnsv. A	Resort Dev't (gross-140ha'net-40ha (up-to-2010: only de luxe class 250rooms and others	• gross density: 5 rooms ha • net density: 15rooms ha	gross-700 rooms net-600 rooms	• Areas dev't by Public • Dev't guideline • Sewage treatment
Inland Nature Trail	Forest Prsv./ Cnsv. A (disturb the ecosystem of endangered'indigenous species)	One trail for environmental'ecological research'education	• 1 or less party/h/trail • less than 8 pax'party	80 pax'day	• Guided by ranger or licensed Guide (application'admis-sion fee w/ guide map'certification
Diving Spot in West Coast of Peninsula	Coral reef Cnsv. A Seagrass Cnsv. A	Mooring buoy for 3 diving spots	• less than 5 parties'day'spot • less than 10pax'party	150 pax'day	• Organized by certified diver/boat operator (certified by PCSD)
Mangrove Cruise in Illultok Bay	Mangrove Prsv. A	Mangrove river (Ditipac River) cruise by small boat	• less than 3boats h • less than 6pax'boat	150 pax'day	• Guided by ranger or licensed guide(application'admissi on fee w/ guide map'certification)

Source: Study Team
Cnsv. A.: Conservation Area
Prsv. A.: Preservation Area

4.4.5 Tourism Development Structure Plan

1) Outline of Structure Plan

The tourism development structure plan for the Busuanga West case study area has been prepared (refer to Figure4-18) and outlined as follows:

The upgraded Busuanga International Airport and Salvacion, the municipal capital, shall be linked by newly constructed roads to improve accessibility to the tourism development area at international, regional, and local levels.

The existing road, which extends from Salvacion to Old Busuanga, San Rafael, New Busuanga Buluang and the northwest end of Busuanga island, shall be improved which will function as the arterial road in proposed tourism development. In old Busuanga, the South Coast Resort will be developed. The Inland Nature Park and Agro-Industry Park are proposed in New Busuanga, and de luxe accommodation facilities will be developed in the West Coast Resort Area. The area will be developed along the arterial road to form a tourism corridor.

In the southern part of the peninsula, extending from the poblacion of New Busuanga, a new road will link the tourism corridor, a planned port and marine tourism activity areas. The linkage to the islands in Gutob Bay will be strengthened through a marina and port.

2) Selection of Development and Utilization Areas for Major Tourism Facilities and Activities

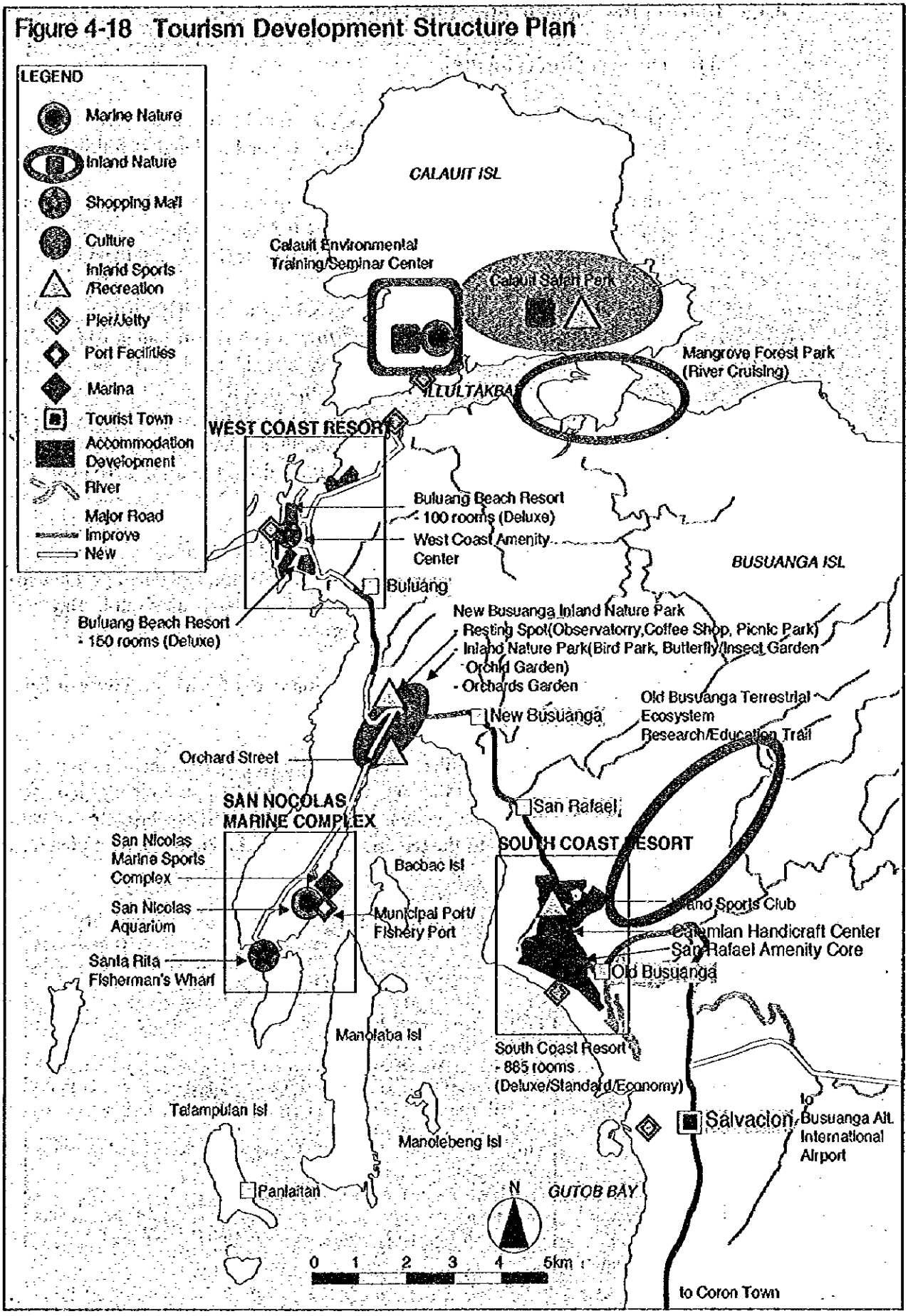
The development and utilization areas for major tourism facilities and activities were selected based on the land suitability analysis, preliminary land use plan, and environmental management plan. The activity areas were selected with due consideration given to the terrestrial environmental management plan (refer to Table 4.21).

Table 4-21 Evaluation Criteria of Tourism Development Suitability

Area/Aspect	Criteria Considered
1. Beaches	White/Wide/Gentle Slope Sandy Beach
2. Hinterland	**Geomorphology**: Flat or slope with less then 18% of incline.
	Existing land use: Existing community, irrigated rice paddies, and mangrove forests are excluded.
	Land Ownership and DAR covered area: Most of the coastal areas are privately owned and an agricultural lot over 5 hectares is subject to the Comprehensive Agrarian Reform Program; therefore, they are not an inhibiting factors of site selection.
	Visual Components: The area needs to have good visual quality such as views of small islands and mountains.
3. Environmental Management	Outside of terrestrial environmental management areas
	The sites does not face the coral preservation areas. Turtle nesting sites (narrow beaches with vegetation) are avoided as much as possible.

Source: Study Team

Figure 4-18 Tourism Development Structure Plan



Source: Study Team

3) Major Resort Area Development

Development of major resort areas shall be limited to the South Coast Resort and the West Coast Resort to minimize small and fragmented development which is hard to manage and may have negative environmental effects. The selected areas are to enhance local characteristics of Busuanga West by incorporating natural marine resources including attractive small islands.

(1) South Coast Resort: The south coast of Old Busuanga has a large lot of 200 hectares in the Busuanga West area. The advantageous location will make it possible to include 1,000 rooms of standard-to-de luxe accommodation facilities, tennis courts, inland sports facilities such as a golf course and horse-back riding fields, handicraft center, shopping center, etc. With these tourism oriented facilities, other facilities shall be concentrated to offer a pleasant environment forming the core tourism development area.

(2) West Coast Resort: The 140 hectare of land along the west coast of Buluang was evaluated to have location advantage over others because of the visual values of Kalampisauan and Elet Islands and the good quality of corals. The condition of the beach, landscape, and natural marine resources are highly valued; however, the area's geographical condition of the hinterland and environmental sensitivity must be carefully considered. Therefore, only about 250 rooms of exclusive resort development is proposed. Accommodation facilities cover only 40 ha or 30% of the total area to be developed. The remaining 70% of the land area shall be preserved as a buffer area.

(3) Inland Nature Trail: Only limited routes shall be utilized for environmental and ecological education and research. Entry to the trail shall be limited to permitted parties with licensed guides and rangers. The results of environmental research shall be used for the management of the terrestrial environment.

(4) Inland Nature Park: The inland nature park is located a few kilometers west of the town center of New Busuanga where the tourism arterial road and the road to the peninsula meet to maximize the advantageous location of land accessibility, while avoiding land use conflict with environmental conservation and preservation. The park includes agro-tourism which aims to develop a nature-oriented day-time tourist attraction.

In the central section of the Busuanga Island, a large scale ranch is in operation under the Department of Agriculture for cattle breeding. The existing facilities are to be incorporated with tourism activities, such as horse-back riding or tourism farming.

Tourism facility development based on local natural resources shall have the function of local enterprise development and promotion which

includes local agricultural product and souvenir development. As tourism development progresses, demand for fresh vegetables, fruits, and cut-flowers will increase. High-quality agricultural development as well as value-added agricultural products demanded from tourism development shall be promoted. The route from the Inland Nature Park to the San Nicolas Marine Complex is expected to attract agro-tourism initiated by local community members.

(5) Facility Development for Beach Activity: Facilities required for marine and beach recreational activities will be developed in the two major resort areas, as water and power supply, telecommunication, sewage treatment facilities are developed. Solid waste collection shall be planned and operated concurrently with the development. Strict sewer discharge and solid waste management conditions will be enforced for structures and for beaches and small islands in Gutob Bay.

(6) St. Nicolas Marine Sports Complex: The area between Bac Bac Island and Capare Island and the south part of the peninsula of New Busuanga are known as a good anchorage places. The locations are suitable for commercial port development with functions to satisfy marine and beach sports activities. The St. Nicolas Marine Sports Complex shall be a marine activity core area with facilities such as a marina and aquarium.

The existing port facility is in Talampulan Island in Panlaitan; however, because of land availability and lack of accessibility, expansion of the facility is difficult. Therefore, the existing port functions will be transferred to the proposed new port in St. Nicolas. The new port, forming a fisherman's wharf, shall be developed to function as the core area for processed fishery products which will be demanded from tourism development. The main features of the proposed port are:

Item	Condition
Marine Condition	Calm without monsoon effects
Depth	Deeper than 5 meters
Environmental Management	Area outside of environmental conservation and preservation areas

Source: Study Team

(7) Area for Marine Sports and Recreational Activities: Marine resources are utilized in accordance with the Environmental Management Area requirements. The acceptable activities are as follows:

Activity	Area	Allowed Activity Level
Marine activities	Preservation Area	Limited to cruising by glass-bottom boats in the peninsula west area.
	Conservation Area	Allowed in SCUBA diving area in the peninsula west areas and island areas.
	Other coral reef areas	Diving and bathing areas
Fishing		Areas except Preservation Areas

Source: Study Team

(8) Required Infrastructure: Development of the key infrastructure shall be prioritized. Airport, roads, power, water, telecommunication, solid waste disposal and other infrastructure shall be developed in conjunction with local community development to facilitate both tourism and socioeconomic development concurrently.

(9) Other Areas to be Linked: In order for the area to be established as an international destination with varied nature tourism attractions, other areas such as Gutob Bay, Calauit Island, etc., should be properly linked.

4.4.6 Typical Tourism Activity Pattern

Tourism potentials may not be effectively tapped unless attractive products are developed. An exercise was made on typical activity patterns expected in the case study areas (refer to Figure 4-19 and 4-20).

In the main island of Busuanga, development of tourism facilities is required in accordance with the tour programs on the basis of the resort lodgings located in the south and west coasts. The tour programs include nature-oriented activities based on inland and marine nature, and ecology education.

1) Activities Based on Inland Resources

(a) Inland Nature Tour: 2 hrs - Target Tourist Arrival (TTA): 38,000/year: A bird park collecting the Philippine Cockatoo and other exotic birds native to the mountainous areas, a butterfly park collecting rare butterflies and beetles and an indigenous orchid garden will be developed.

(b) Agro Tour: 2 hours - TTA: 11,000/year: This seeks to develop a tourist spot focusing on local fruits. It will also contribute to the development of orchards in the area.

(c) Calamian Handicrafts Tour: 2 hours - TTA: 43,000/year: A tourist spot can be enhanced by developing a base of handicraft production which uses local materials such as rattan, bamboo, sea shells, orchids and varied insects. This facility aims to manufacture, display and sell handicrafts, furniture, etc.

Figure 4-19 Typical Activity Pattern: Busuanga West

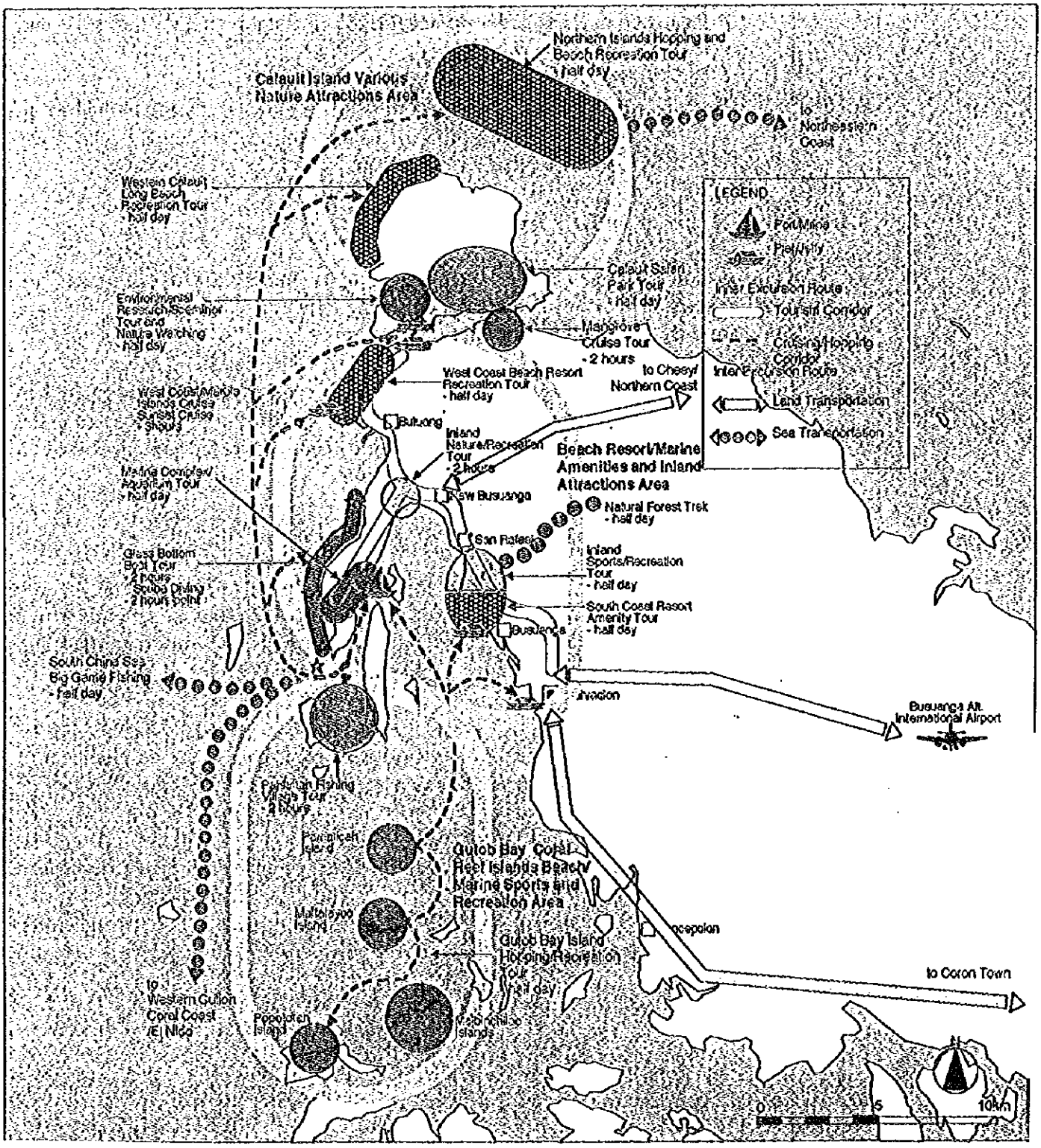
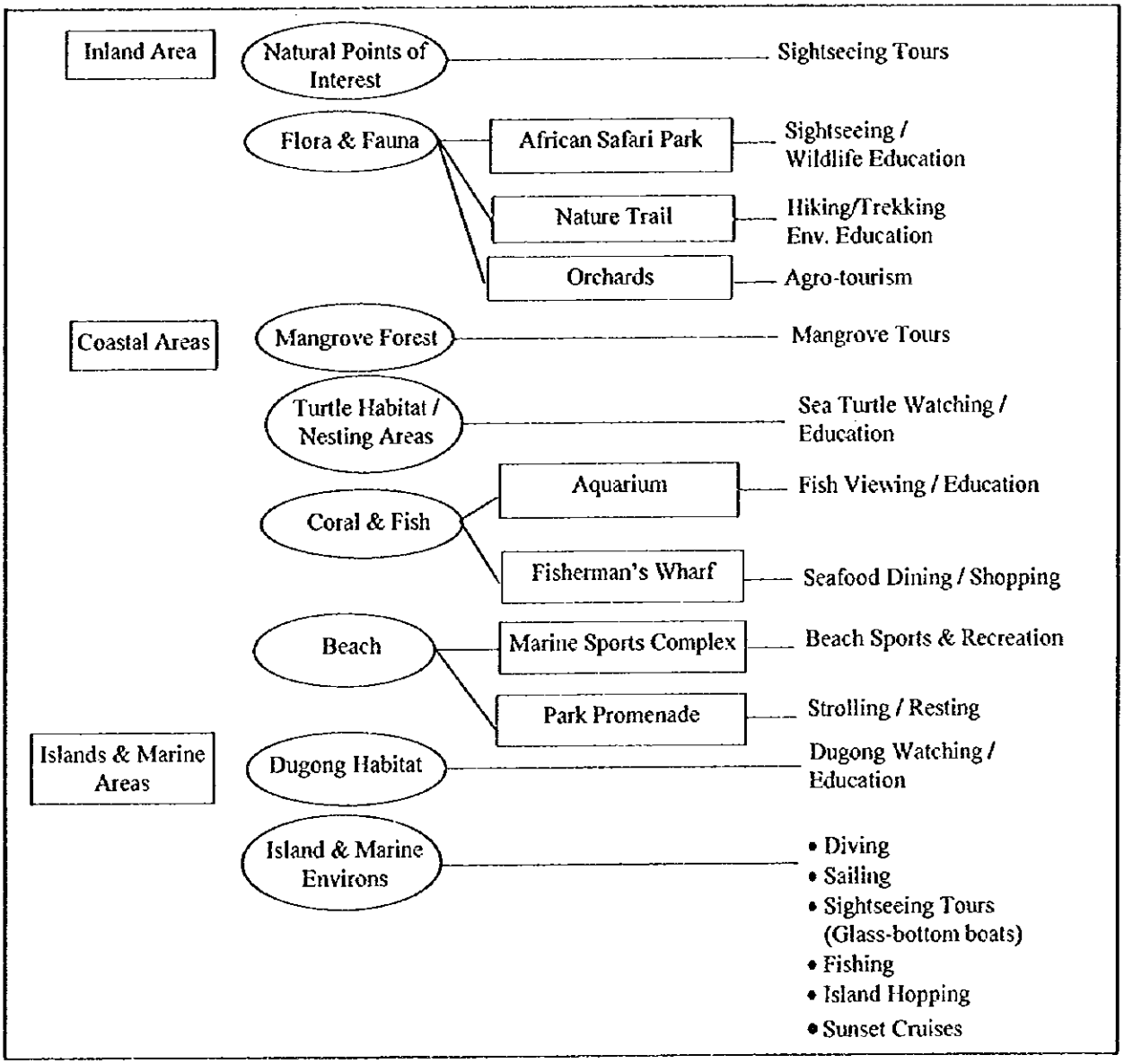


Figure 4-20 Typical Activity Pattern: Busuanga West



Source: Study Team

(d) Sightseeing: Half-day - TTA: 15,000/year: Along the east-west tourism corridor, there are impressive and powerful scenes, such as the jungle extending from the pasture area near the airport to Salvacion through a steep gorge, the emerald-green sea overlooking the mountain pass of New Busuanga and the coastal scenery of a number of small islands in Gutob Bay. These views not only serve as tourist movement lines but can attract a lot of tourists by themselves. In addition, the Chinabayan Waterfall located in the North East of New Busuanga can be added for variation.

2) Inland Resort Activity

(a) Inland Sports: 2 hours to half-day - TTA: 12,000/year: Pasture is one of the major components of the inland scenery. It is important to enhance the selection of daytime sports and recreational activities by developing facilities for horseback riding, tennis, golf, etc. in the area where development is compatible with environmental conservation.

(b) Shopping and other Amenities: 2 hours - TTA: 43,000/year: Various shopping and eating facilities are needed to meet demands (of about 2 hours).

3) Nature- Oriented Environment - Educational Activity

(a) Nature Forest Trail: 2 hours - TTA: 3,000/year: By developing a trail, in a well-controlled manner, from the South Coast Resort to the Lagoon of Nagugagot River along the ridge line, an ecology-oriented tour should be promoted in order to show the tourists not only rare animals and plants but also how to conserve the ecosystem of the area. Manpower training is important for this purpose.

This tour should be subject to the permission of local authorities in charge of environmental conservation in order to protect nature from destruction and to conduct ecological education. This tour should also be guided by a ranger or a guide with permission from PCSD.

(b) Mangrove Cruise: 2 hours - TTA: 3,000/year: Also an education tour, the cruise will show tourists the diverse roles of mangrove forests while contributing to the protection of the Mangrove Preservation Area located at the base of Calauit Island. The development needs to be guided by authorized personnel, and operated with three small boats.

(c) Sea Turtle Watching Tour: 2 hours - TTA: 3,000/year: Hawksbills are frequently seen in this area, and have nesting sites on the narrow steep beaches where coastal forests remain. Their distribution is mainly on the northern coast of Calauit Island, but they are also observed on the main island of Busuanga. It is important to protect the nesting sites in coordination with local authorities, NGOs and local residents (including transfer of eggs to hatcheries in a short time if the site is improper). Observation of the behavior of baby turtles after they hatch, with certain restraints, can be an attractive program for tourists.

4) Activities based on Beach Resources: Half-day - TTA: 70,000/year

(a) Marine Sports/Recreation Complex: Major activity of this area includes hopping among the small islands scattered in the Gutob and Calauit areas, coral reef observation by glass-bottom boats, fishing, cruising, etc. In order to support these activities, it is necessary to develop port facilities,

restaurants and shopping centers to formulate an activity base functioning as a transportation node as well as a tourist spot.

(b) Aquarium: An aquarium can retain a large area of coral reef in good condition. It allows public viewing of the marine ecosystem, such as hard and soft corals, fishes and other creatures, as well as educates visitors.

5) Beach Resort Activity

(a) Beach Sports/Recreation: Half-day - TTA: 43,000/year: In the beaches of the resort area, a pier and a management facility, where necessary equipment is sold or rented and instructors/guides gather, should be developed to support varied sports and beach and coastal recreational activities.

(b) Park and Promenade: In the south and west coast resort areas, it is required to develop a comfortable and safe promenade for the convenience of tourists. The path should be shaded by planted trees and should be provided with amenities such as street furniture.

(c) Seafood Restaurant/Fisherman's Wharf 2 hours - TTA: 58,000/year: Development of seafood restaurants should be pursued to offer an opportunity to taste the rich seafood which Busuanga West produces and, at the same time, enjoy a view of the sunset. Local fishery and food processing industries should be invited to participate in this project. Particularly in the west coast of the Peninsula, high-standard restaurants and shopping facilities are needed. They also should match the surrounding scenery.

6) Major Tour Program in Gutob Bay Coral Reef Islands

Taking advantage of the coral reef bed, clean waters, and various forms of marine life of Gutob Bay, facilities need to be developed for daytime activities. Particularly for some islands where environmental countermeasures can be taken, a de luxe level resort should be developed to diversify the possible activities and accommodation.

(a) Beach and Marine Activity Spots: The four small islands including Pamalican and Maltatayoc located to the south of Capare Island have calm waters except during the southwest monsoon, and are suitable for beach activities and north and diving planned for the south coast resort area. Also, the Malbinchilao Islands have similar characteristics and calm waters throughout the year. Thus, the small island-oriented tourism activity becomes possible throughout the year if a combination of these islands is properly taken into account.

(b) Fishing Villages and Pearl Cultivation Sites: Panlaitan of Talampulan Island is growing as the largest fishing village dealing in fresh and processed marine products. It is suitable to develop as a tourist spot for its

traditional fishery and culture. Also in Talampetan of Capare Island, where the headquarters of a pearl cultivation company are located, display of pearl cultivation, sale of pearls and pearl products, is expected.

(c) Formulation of Island Hopping Network: In order to link individual tourism activities and tourist spots scattered among islands, an island hopping network should be developed in conjunction with the development of related port facilities.

(d) Control and Regulation in Island Resort Development: Island resort development should be restricted within a limited number of islands such as Dicilingan and Popototan where there is ample land (more than 5 hectares). The appropriateness of development should be strictly assessed and regulated based on environmental standards and tourism development guidelines. Island resort development should be of high standard so that the cost burden of infrastructure development and environmental countermeasures can be absorbed.

7) Major Tour Program in Calauit Island and Its Vicinity

Since 1994, nature conservation activities to protect indigenous and endangered species on Calauit Island have been undertaken together with the cultivation of African wild animals.

(a) Safari Park: The role of the existing Safari Park should be defined more clearly towards tourism use. This requires facility development and presumably privatization will contribute to the improvement of the efficiency and attractiveness of the area.

(b) Calauit Environmental Training and Seminar Center: This facility intends to expand its existing to undertake the central roles for the environment management of the area. Training of necessary staff and public relations and education of local residents and tourists, with regard to environmental conservation, are also the functions of this facility. This will enhance the popularity of this area as a tourism area compatible with environmental conservation.

(c) Use of Beaches and Small Islands in Calauit Islands: The use of these areas should be limited for the time being. Future use should be carefully studied to ensure a balance of tourism demand and environmental management as well as the return of people relocated in the past, the nesting sites of sea turtles, and accessibility from the gateway.

8) Other Optional Tours in Calamian Tourism Cluster

In Calamian Tourism Cluster, attractive and rare tourism resources other than those mentioned above are distributed in a great number. It is imperative that integrated and well-coordinated tourism development is carried out in the form

of networks linking tourist spots to tourism facilities in Calamian Tourism Cluster as well as the entire Northern Palawan area.

(a) Coron Town: Coron Town has led the region in development not only as a port town but also as the industrial, cultural, and administrative center of the region. This town could be used more effectively in tourism development aside from its economic and social roles.

(b) Aerial Sightseeing of Coron Island: Coron Island has inland limestone forests and the salt water lakes. Before ecological surveys were completed, the operation of aerial sightseeing tours or observation cruises had been recommended with the condition that these operations not damage nature.

(c) Beach West of Culion and Sunken Ship between Culion and Busuanga: Historic and cultural tours in Culion town, diving around the sunken ship between Culion and Busuanga and the beach located on the west coast of Culion Island should be considered as optional tourist destinations in order to strengthen and diversify the planned tourism activities.

4.5 Tourism Infrastructure/Facility Development Plan

4.5.1 Transportation

Transportation infrastructure is the backbone of regional development. Quality of life depends in large part on basic infrastructure and transportation. Road facilities and ports are critical to the creation of employment opportunities and efficient social services. Current transport development by the central and local governments lack integration of the overall transport development.

The Provincial Medium Term development Plan emphasizes the necessity of transport infrastructure improvement within the next decade. The target is to connect mainland municipalities to the provincial capital with all-weather primary roads and to connect all barangays to their municipal centers with feeder roads.

In order to strengthen the transport network in the entire municipality, improvement of current road conditions in the main island and construction of a deep sea port for bulky cargo movement and the construction of a pier for passenger and cargo movement in the island barangay shall be executed.

1) Road Development

A road expansion project is now being carried out on the national road between Coron and Salvacion. Road developments for the study area will be as follows:

(a) Arterial Road in Busuanga West: In order to improve current road conditions, all barangays of Buluang, New Busuanga, San Rafael and Old Busuanga shall be connected to Salvacion with paved roads 9 meters in width by 2000.

For the purpose of accelerating the recovery of the economy in the municipality, access roads to Busuanga airport shall be constructed in accordance with the airport expansion project. These roads will be concrete paved roads of 12 meters in width and completed by 2000.

Road access to the multi-purpose new deep-sea port, which includes a marina and is proposed by the Study Team for San Nicolas, shall be developed to accommodate both regional and tourism demands.

(b) Feeder Roads: The existing proposed road project connecting New Busuanga to Cheey shall be implemented as an all-weather road of 9 meters in width. Currently the Calauit Safari Park is only accessible by sea transport. To attract visitors, road access will be strengthened. A new road is proposed between Buluang and the transshipment point (pier) to the park in the northern-most part of Buluang.

(c) Other Roads: Access roads in Old Busuanga to farm lands, communal forests, and water sources are to have gravel surfaces and to be 6 meters wide. When all proposed developments are completed, accumulated road length will be as follows:

km

Road Type	1995	2000	2010
National Road	-	19	19
Other Road	14	30	35
Total	14	49	54

Source: Study Team

2) Port Development

The existing municipal port in Salvacion has no function for cargo movement due to its shallowness. The proposed port for San Nicolas will accommodate commercial, fishing and tourism demands. It will be 200 meters in length, 2 meters wide and 10 meters deep.

3) Airport Development

An improvement project, involving the concrete paving of the runway for Busuanga Airport, is on-going. Expansion of the airport into an international airport is proposed with a runway of 2000 meters. As the future northern gateway to Palawan, the airport terminal must also be upgraded to handle projected tourism demands.

4.5.2 Utility Infrastructure

1) Water Supply

Water problems in Palawan Island are mainly due to the lack of a comprehensive planned system to provide water for the whole island. Because of this, water shortages often take place during the dry season in several areas.

(1) Water Resources Availability and Development

There are two typical methods of procuring water. One is surface water from reservoir dams. The other is through deep wells located at the side of rivers. Both methods have merits and demerits. Although reservoirs maintain enough volume throughout the year, they involve high construction costs, and require both large land area and purification plants. On the other hand, it is possible to obtain good quality water through deep wells and construction costs are lower than those of dams; however, volume cannot be guaranteed, especially during the dry season.

Based on the "GROUNDWATER INVESTIGATION REPORT' by NWRC (National Water Resources Council) / UNDP, 1981, Northern Palawan, including the Calamian Island Group, has a the total estimated safe and mining yield of 4,102 litters/sec. and 20,013 litters/sec., respectively. The withdrawal density is 19.3 litters/sec./sq. km and the estimated amount of groundwater is sufficient to meet the requirements.

A program for well drilling should give particular consideration and priority to areas with high potential for groundwater development as indicated in the water availability map prepared by the said study. In low yielding areas, conjunctive use of groundwater and surface water sources may ensure favorable water supply. Springs, if available, could be developed, and wells of large diameter are advisable in dense formations where water can be drawn by means of the water-lift method.

Furthermore, according to the recent study of "RURAL WATER SUPPLY COMPONENT" by DPWH/PMO/SPIADP,1995, Busuanga Island exhibits good groundwater potential. The anticline and syncline beds are favorable reservoirs from the infiltrated rain water. Numerous springs occur as seepage from the joints of these sedimentary formations.

In the future, if there is a shortage, reservoir dams may be constructed to meet the increased demand caused by the development and upgrading of standards of living, but for now, wells are recommended.

(2) Water Demand and Supply Network

Provision of new water supply facilities will be required to cope with the demands of future tourism facilities together with regional use.

Unit water demand for the tourism and local community have been estimated based on available planning standards (refer to Table 4-22 and Table 4-23).

Table 4-22 Unit Water Demand for Accommodation Facilities[1/]

Hotel Type	cu. meter/day/room
De Luxe Hotel	1.5
Standard Hotel	1.3
Economy Hotel	1.1

Source: Planning Standards
[1/] inclusive of all types of water uses

Table 4-23 Unit Water Demand for Urban and Rural Areas

(liter/day/capita)

Year	Urban Water	Rural Water
2000	1631	1101
2005	1751	1201
2010	1961	1321

Source: Improvement of the Puerto Princesa Water Supply, Dec. 1995

As to the supply system, Level II and III [1]systems will be applied to meet future upgrading of living standards. From a geological and engineering point of view, it is proposed that the area will be divided into Buluang Water Area and Salvacion Water Area of which the water demand in 2010 will be 254 cu. meter/day and 712 cu. meter/day, respectively (refer to Table 4.24).

[1] The Government through various agencies involved in water supply defines three levels of water service as follows. Level 1 consists of a point source usually a protected spring or well without distribution system, often provided in areas where houses are few and scattered thinly. It essentially covers 100 persons. Level 2 is a communal faucet system intended for rural areas where houses are clustered enough to justify a simple distribution system with a public standpipe. It delivers water to an average of 100 households per system. Level 3 water supply service refers to a piped system with individual house connections, generally suited for dense urban areas.

Table 4-24 Estimated Water Demand for Busuanga West

Water Area	Use		Total cum./day (liter/sec.)	2000	2001-2005	2006-2010
Buluang Water Area	Tourism	Accomodation[1/]	375 (4.3)	38	150	189
		Other Facilities	51 (0.6)	0	16	35
		Sub Total	426 (4.9)	38	166	222
	Local Community	Urban[2/]	47 (0.5)	0	21	26
		Rural[2/]	48 (0.5)	39	3	6
	Total		521 (6.0)	77	190	254
Salvacion Water Area	Tourism	Accomodation[1/]	1,187 (13.7)	70	683	434
		Other Facilities	35 (0.4)	0	30	5
		Sub Total	1,222 (14.1)	70	713	439
	Local Community	Urban[2/]	823 (9.5)	432	151	240
		Rural[2/]	333 (3.9)	292	8	33
		Sub Total	1,156 (13.4)	724	159	273
	Total		2,378 (27.5)	794	872	712

Source: Study Team

[1/] no. of hotel rooms assumed to be constructed are as follows:

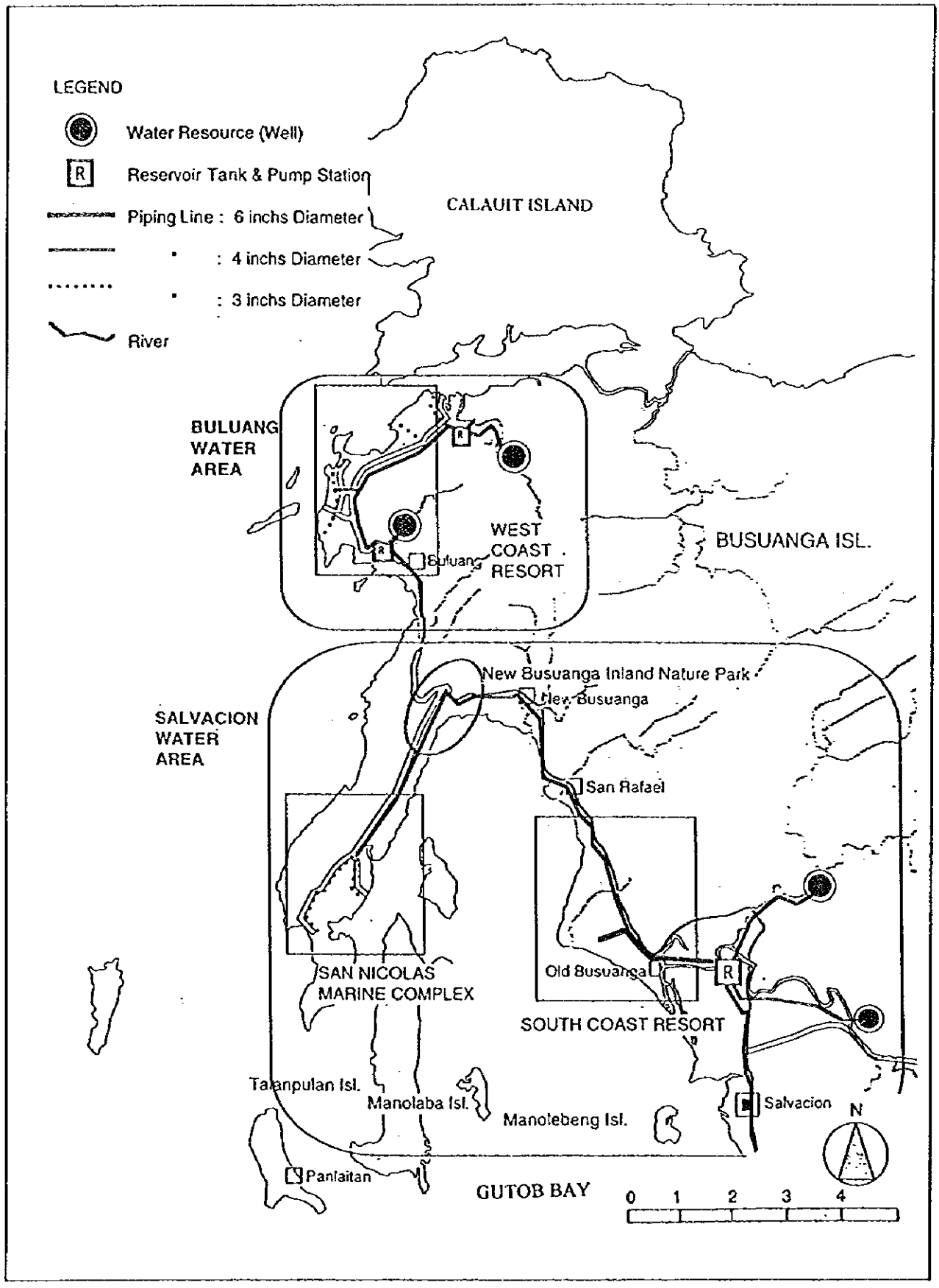
Water Area	Type	- 2000	2001-2005	2006-2010	Total
Buluang	De luxe	25	100	125	250
Salvacion	De luxe	-	320	80	400
	Standard	45	135	220	400
	Economy	10	25	25	60

[2/] Population in respective water areas will be as follows:

Water Area	Type	2000	2005	2010
Buluang	Urban	0	118	240
	Rural	350	350	350
Salvacion	Urban	0	830	1,680
	Rural	2,650	2,500	2,500

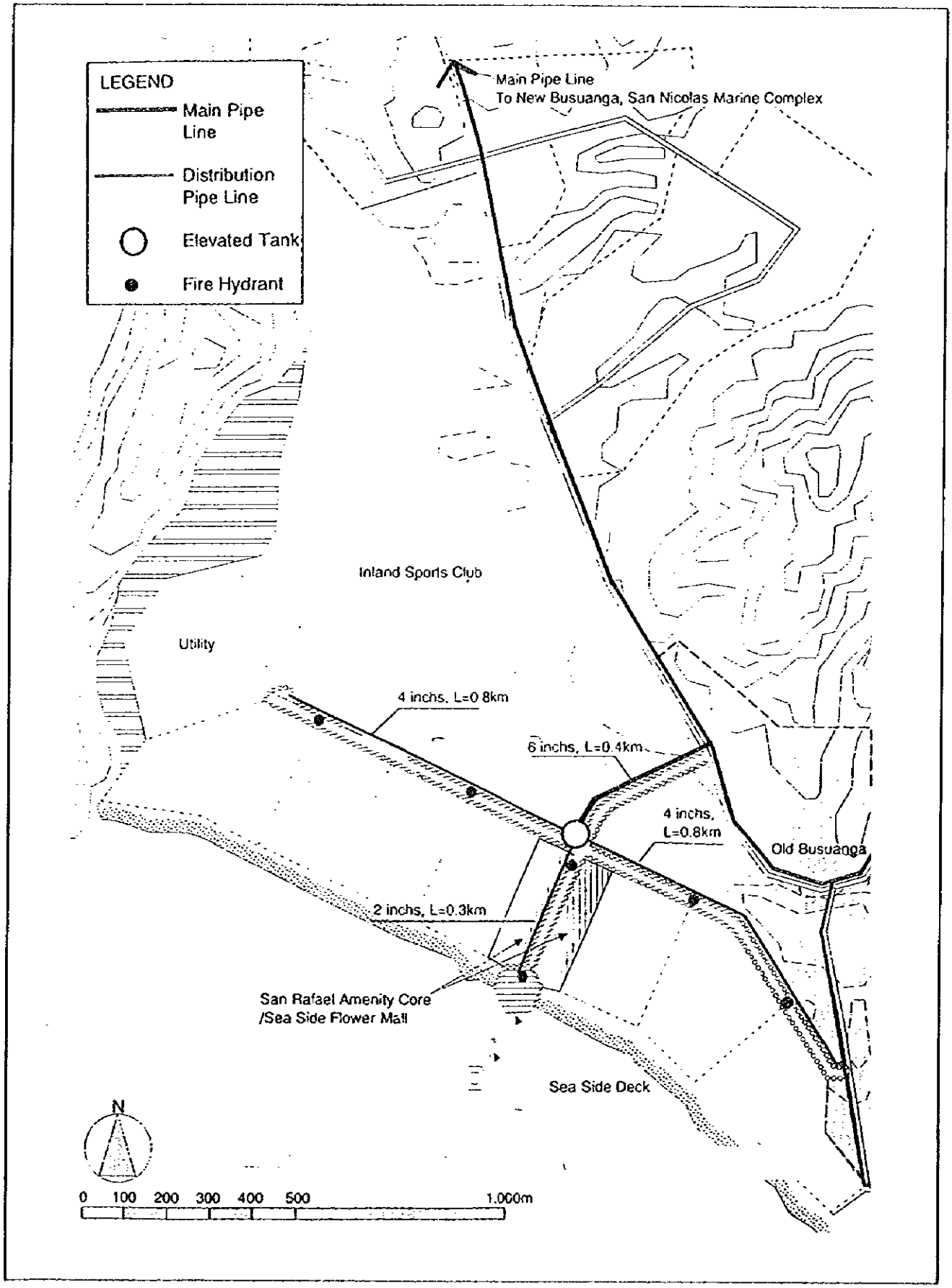
On the basis of the above, a preliminary water supply system plan has been prepared (refer to Figure 4-19 and Figure 4-20).

Figure 4-21 Water Supply System in Busuanga West Tourism Area



Source: Study Team

Figure 4-22 Water Supply System for South Coast Resort



Source: Study Team

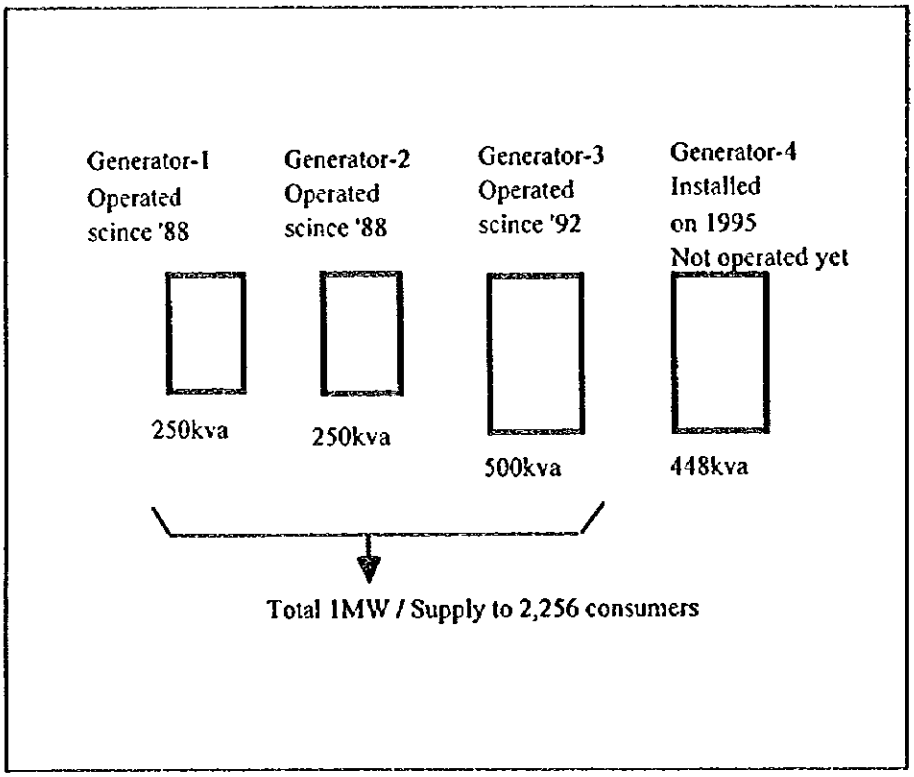
2) Power Supply

The power supply will be on a grid system to provide 24-hour service to the main activity areas and major settlements with adequate rates.

(1) Extension of Existing Power Source

Electricity will be supplied by the existing power plant of NAPOCOR in Coron/Busuanga by expanding the existing system, which currently serves 2,256 consumers (refer to Figure 4-23), to meet future demands.

Figure 4-23 National Power Corporation (NAPOCOR) / Coron [1/ 2/ 3/]



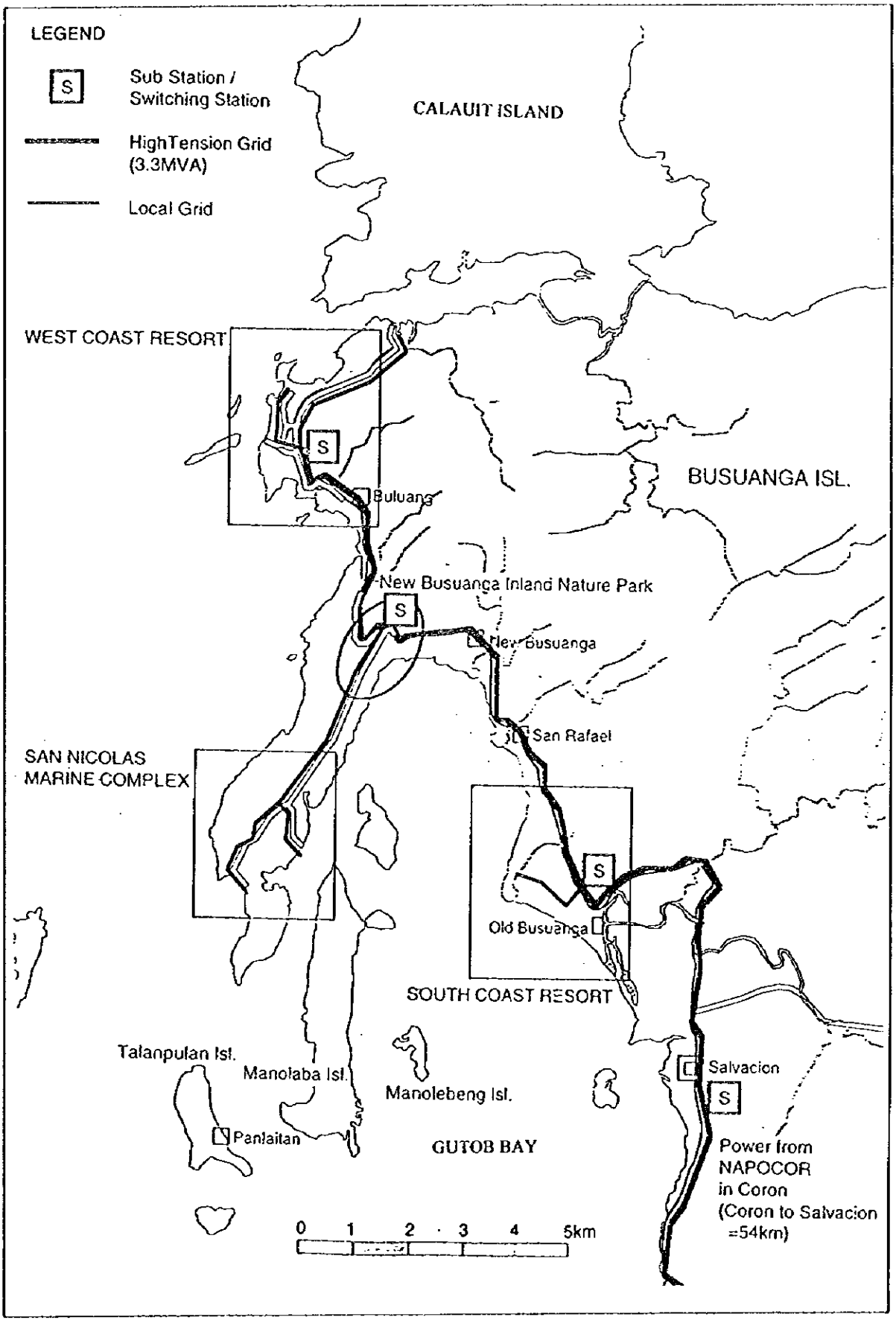
Source: Study Team

[1/] power supply for 24 hours

[2/] number of consumers, including public and commercial users, is 2,256 in total: Coron & others (2,002), Salvacion (158), Old Busuanga (31), New Busuanga (53), Buluang (12)

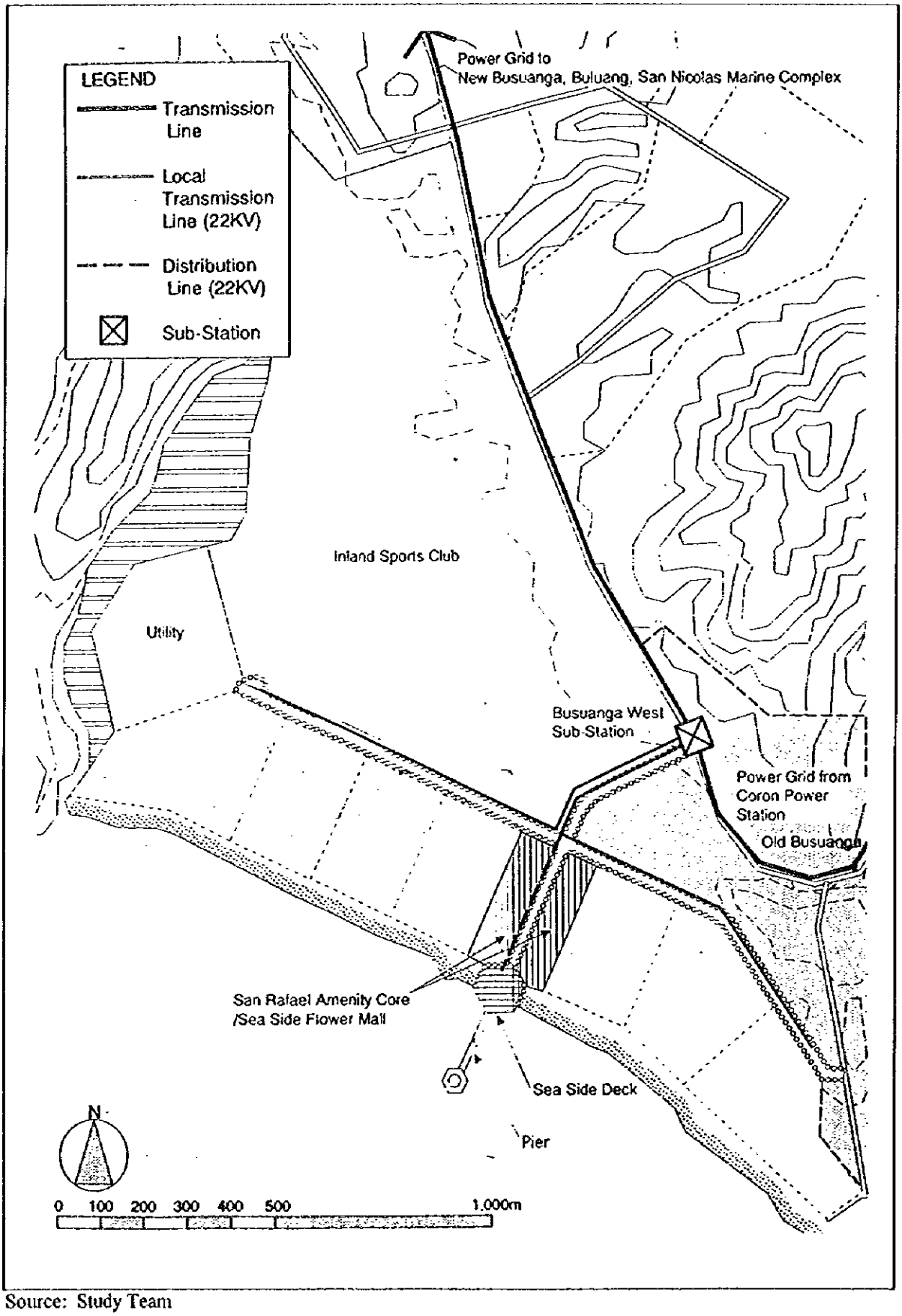
[3/] trunk line is connected from Coron up to Buluang through San Nicolas, Concepcion, Salvacion, Old Busuanga and New Busuanga

Figure 4-24 Power Supply System for Busuanga West Tourism Area



Source: Study Team

Figure 4-25 Power Supply System Plan for South Coast Resort



Source: Study Team

(3) Estimated Power Demand

Power demand of the area was estimated for Tourism and local community use (refer to Table 4-25).

Table 4-25 Estimated Power Demand in Busuanga West

(KVA)

Use		Total	- 2000	2001 - 2005	2006 - 2010
Tourism	Accommodation [1/]	2,997	216	1,566	1,215
	Other Facilities [2/]	3,192	0	1,657	1,535
	Sub Total	6,189	216	3,223	2,750
Local Community [3/]		1,139	814	103	222
Total		7,328	1,030	3,326	2,972
Required Capacity = Total KVA / 0.85 & rounded		8,600	1,200	3,900	3,500

Source: Study Team

[1/] unit demand of 2.7 KVA/room is assumed

[2/] assumed unit demand for various tourism facilities are as follows: aquarium (0.16 KVA/sq. m.), museum (0.14), turtle hatchery (0.07), nido center (0.07), fisherman's wharf (0.12), restaurant (0.10), bar/coffee shop (0.05), marina (0.10), country club house (0.08), spa house (0.10), shopping center (0.09), airport terminal (0.12), amusement/exhibition (0.13), office/shop/institution (0.07), and park/garden (0.1~0.05).

[3/] power demand by the local community has been estimated as follows: No. of households x % of grid coverage x unit demand = demand Assumed % of grid coverage is 65%, 80% and 90% for 2000, 2005 and 2010, respectively. Unit demands by local community are assumed to be 0.505 KVA/consumer household, 0.644 and 0.822 for 2000, 2005 and 2010, respectively, considering that the demand grows as living standards improve.

4) Telecommunication

(1) Proposed Network System

A microwave network system is preferable for inter-islands transmission, international links. It is also easy to construct (refer to Figure 4-26).

(2) Estimated Demand

The number of main lines is estimated for both tourism and local community uses by taking into consideration, area characteristics, function and number of accommodation rooms, etc., providing telephone (cellular phone), telex and facsimile (refer to Table 4-26).

Table 4-26 Estimated Number of Telecommunication Lines

Use		Total	- 2000	2001 - 2005	2006- 2010
Tourism	Accommodation [1/]	83	8	45	30
	Other Facilities	101	0	47	54
	Sub Total	184	8	92	84
Local Community		692	78	182	432
Total		876	86	274	516

Source: Study Team

[1/] unit demand is assumed to be 10-15 rooms/line depending on hotel size

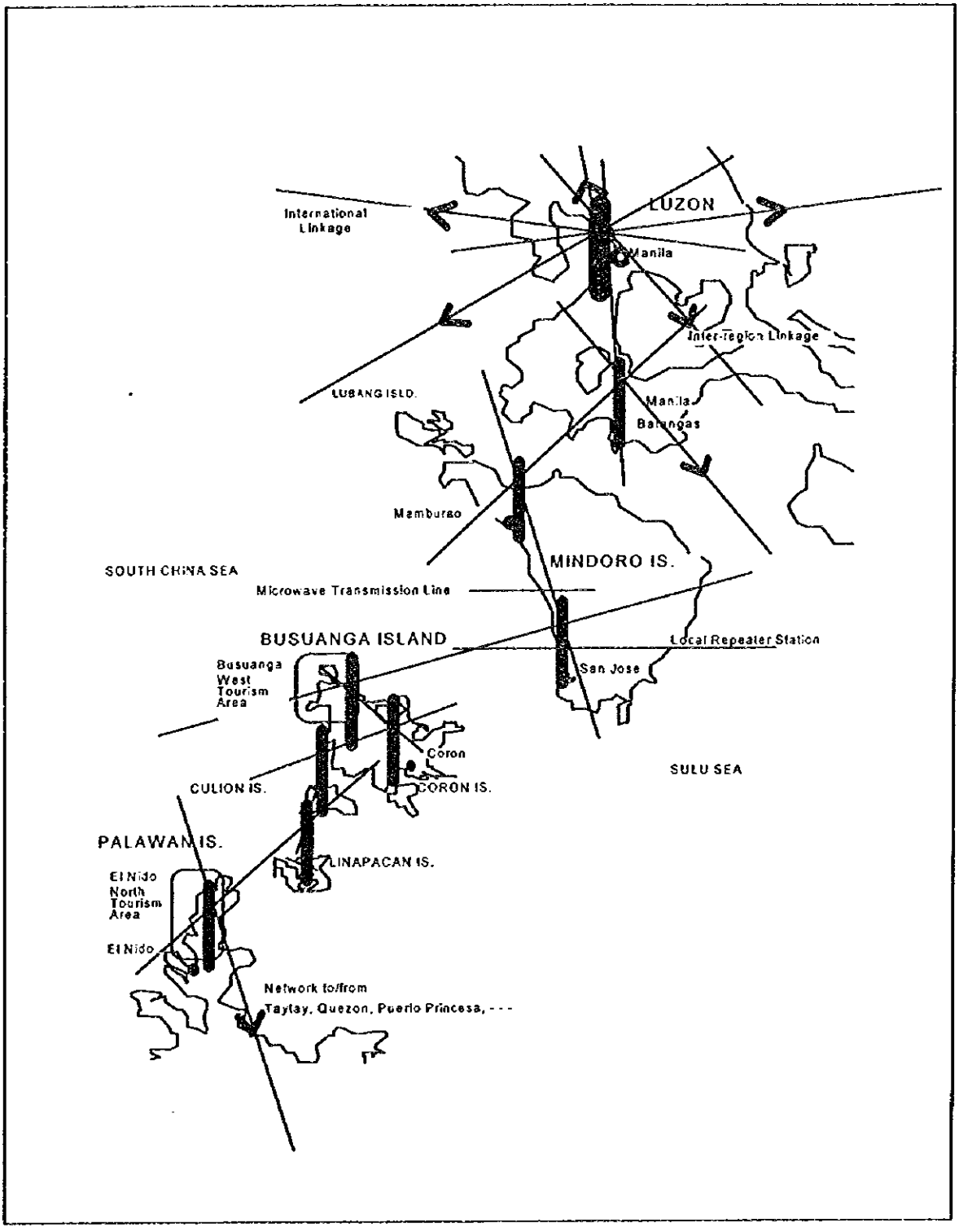
[2/] demand was estimated assuming % of subscription (20,30 and 50% for 2000, 2005, and 2010, respectively) for number households of 390, 608, and 864 for 2000, 2005, and 2010, respectively

5) Sewage Disposal

(1) Necessity of Sewerage System

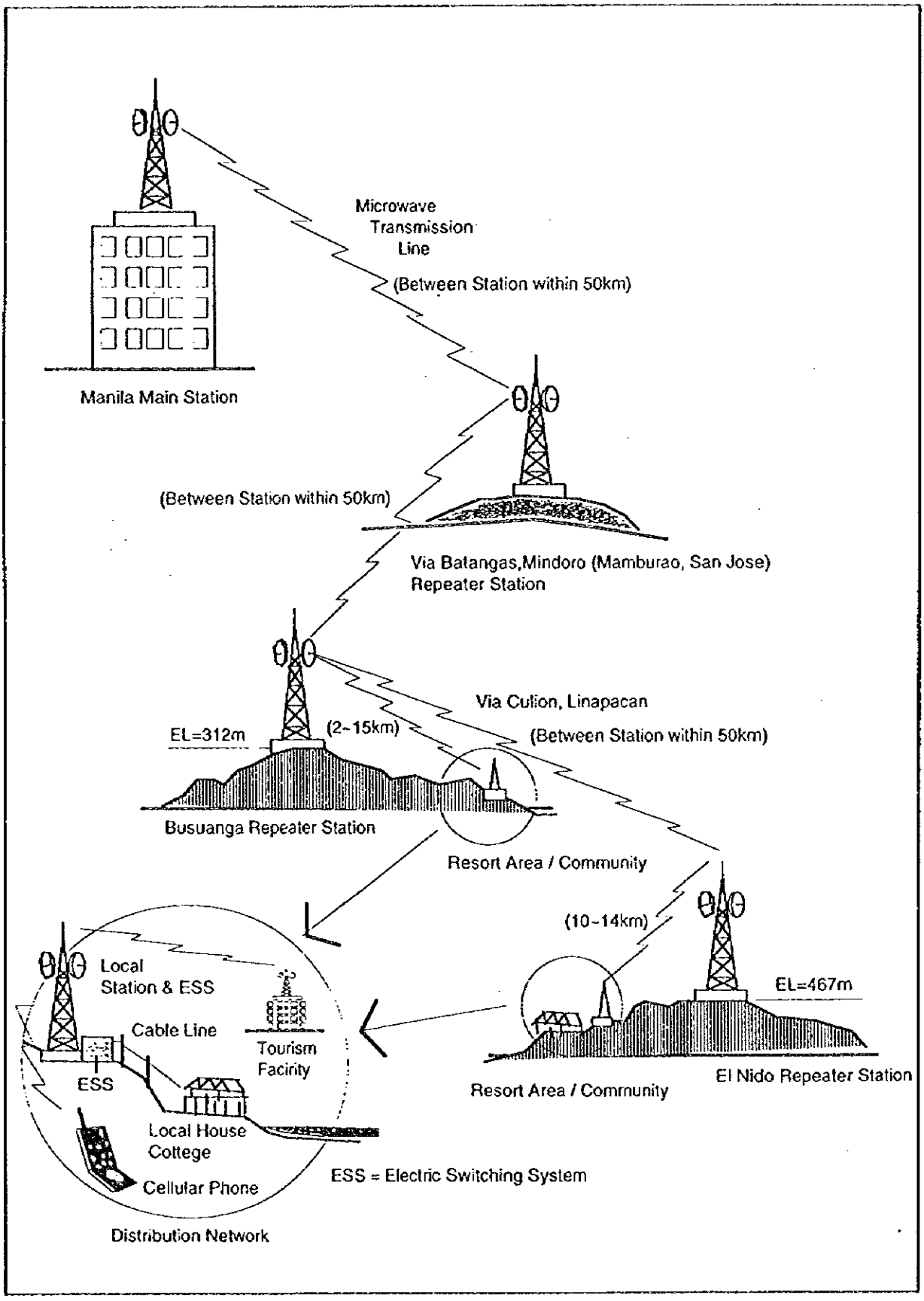
Provision of adequate sewage treatment systems is an important prerequisite to the tourism development in the area. At present, only a few hotels treat sewage on their own, and no centralized sewage treatment facilities are available. For large scale development, a central treatment plant for sewage would be advantageous in terms of efficiency and environmental effects.

Figure 4-26 Microwave Network System



Source: Prepared by Study Team based on interviews with private companies

Figure 4-27 Schematic Diagram for Microwave System for Busuanga and El Nido



Source: Prepared by Study Team based on interviews with private companies

(2) Estimated Sewage Demand

The area may be divided into three sanitary districts: San Nicolas Sanitary District-1 comprising Marine Sports Complex, Aquarium and Fishing Complex with sewage demand of 58 cu. meter/day; San Nicolas Sanitary District-2 comprising Fisherman's Wharf with 24 cu. meter/day and; San Rafael Sanitary District-3 comprising 7 lots, Inland Sports Club, Amenity Center, Seaside Flower Mall, etc., with 1,191 cu. meter/day. The total sewage demand therefore is 1,273 cu. meter/day.

(3) Proposed System

The stabilization/aerated pond treatment process is considered adequate. Sewage and rain water drainage systems, are to be provided concurrently with road construction. The quality of treated water is to be regulated to 60 to 120 ppm of COD. Water treated at the stabilization pond, can be utilized for irrigation water of landscaping, especially for golf course. For small-scale or isolated development areas under the geological conditions, individual septic tanks will be able to treat both night soil and gray water are proposed.

For local communities, improvements of sewage disposal using treatment plants is required in the future. For the time being, a septic-tank system is considered more practical. Based on the above, a preliminary sewage system plan was prepared (refer to Figure 4-28).

6) Solid Waste Disposal

(1) Demand

Solid waste volume was estimated both for tourism and local communities (refer to Table 4-27).

Table 4-27 Estimated volume of Solid Waste

Generator		Total	- 2000	2001 - 2005	2006 - 2010
Tourism	Accomodation[1/]	12.3	0.9	6.4	5.0
	Other Facilities[2/]	20.5	0	12.5	8.0
	Sub Total	32.8	0.9	18.9	13.0
Local Communities[3/]		17.4	4.5	5.7	7.2
Total		50.2	5.4	24.6	20.2

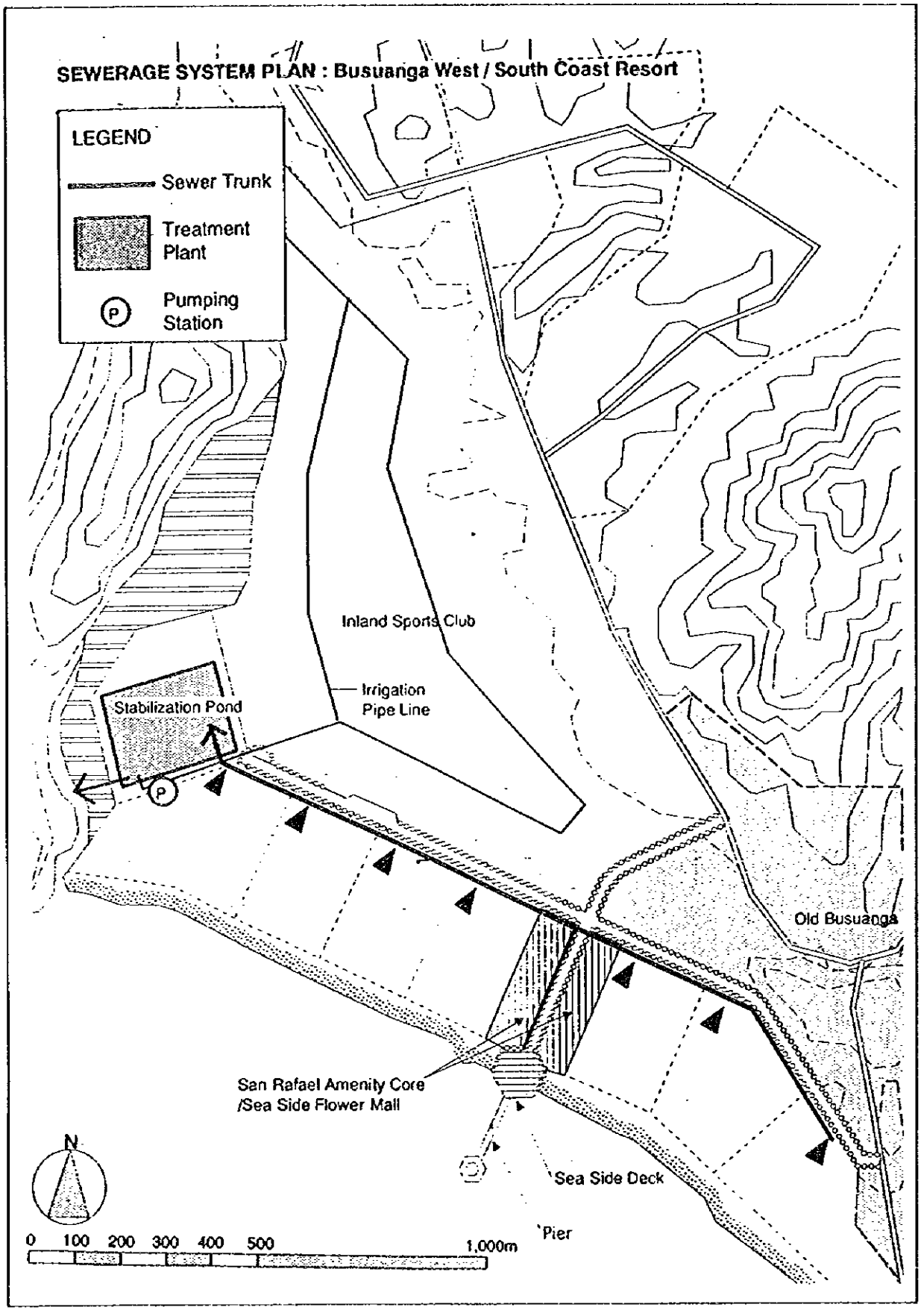
Source: Study Area

[1/] assumed unit volume is 5.0 kg/room/day, while average weight is 450 kg/cu. meter

[2/] varied unit volume is assumed for different types of facilities based on available planing standards

[3/] assumed unit volume and average weight are 0.45 kg/capita/day and 300 kg/cu. meter, respectively. In 1994, Metro Manila experienced 0.45 kg/capita/day and 330 kg/cu. meter

Figure 4-28 Sewerage System Plan for South Coast Resort, Busuanga West



Source: Study Team

(2) Solid Waste Disposal System

Development of an incineration plant is not recommended here, because collected solid waste would be too wet. A conventional sanitary landfill system with adequate protection measures against environmental pollution is considered appropriate.

To meet the solid waste disposal demand, the required size of landfill site is calculated as follows;

- Busuanga Dumping Site:
  50.5 cu.m./day x 365 days = 18,400 cu.m./year

- 10 years capacity:
  18,400 x 10 years = 184,000 cu.m.

- Size of Landfill Site:
  184,000 / 10meter = 1.84 ha

The site has been selected in such a way so as not to disturb the scenery nor the view of residents and tourists. Furthermore, general agreement has been obtained from the related agencies on the selection of this area as a dumping site. Sanitary landfill sites shall be prepared with regard to daily soil covering, fencing, weighing and recording, lining and leaching treatment facility (if necessary). Recycling shall be promoted as much as possible. Also, a system and market for recycling are required.

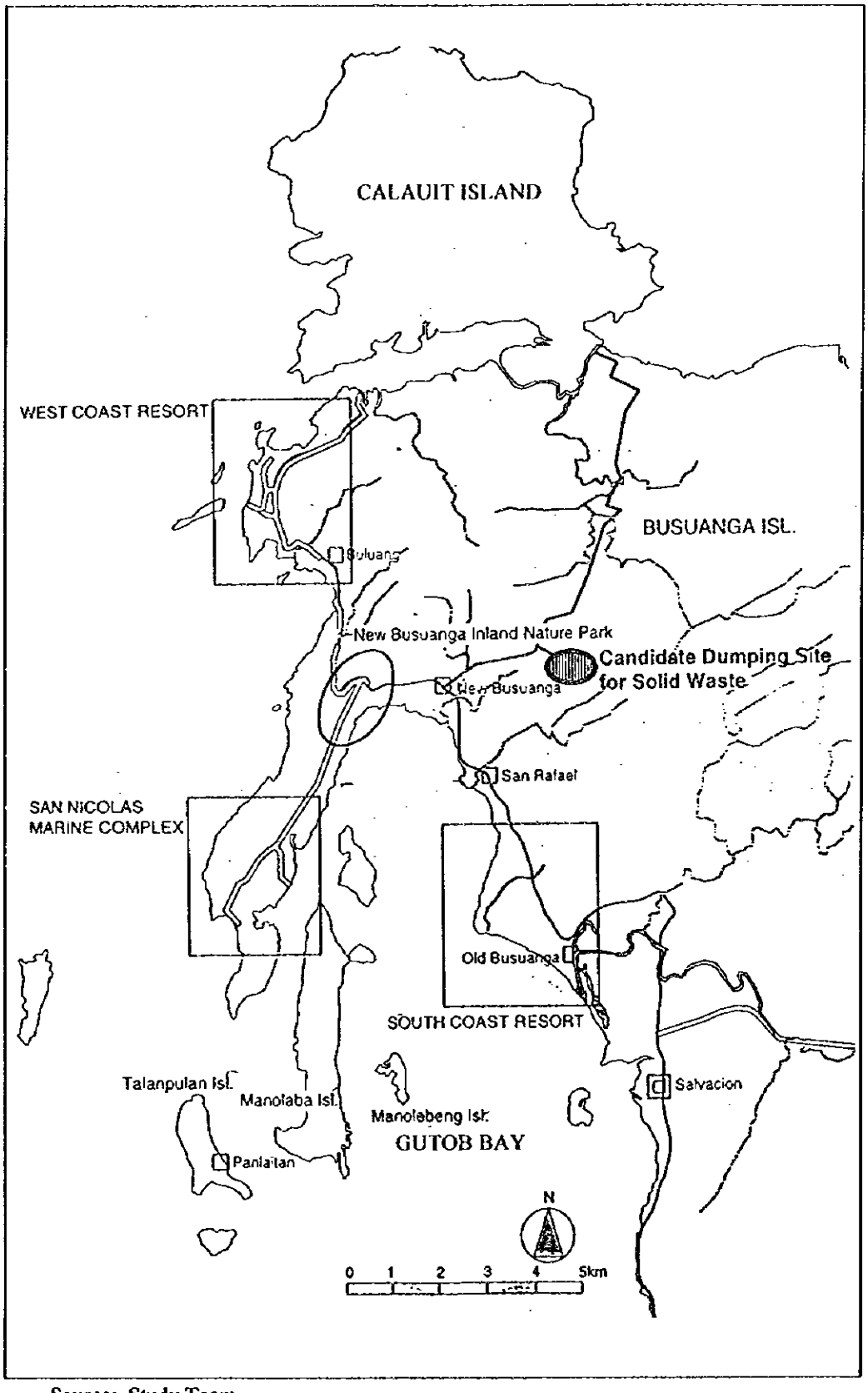
The components of solid waste will include the following:

(a) Sanitary landfill site, access road, excavation, drainage, heavy equipment, weigh-bridge, house, fence and gate, computer, monitoring device, lining and leach treatment facility (if necessary) on site;

(b) Collection vehicle

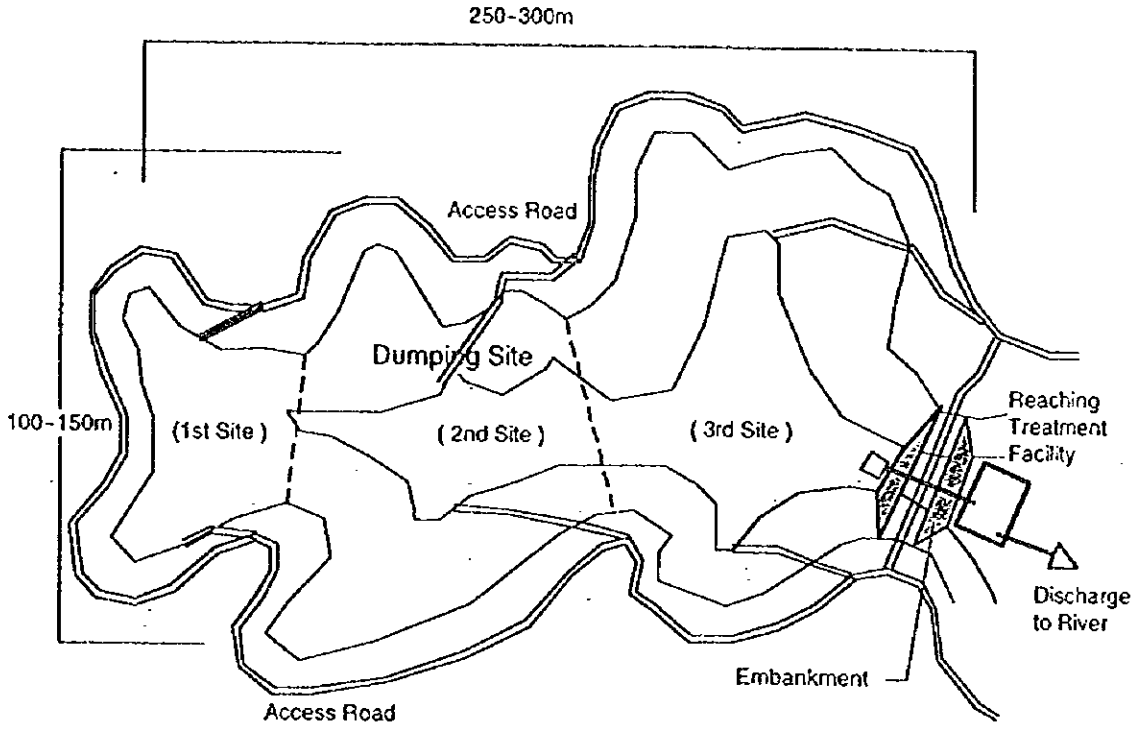
(c) Garage or workshop

Figure 4-29 Candidate Dumping Site for Solid Waste in Busuanga

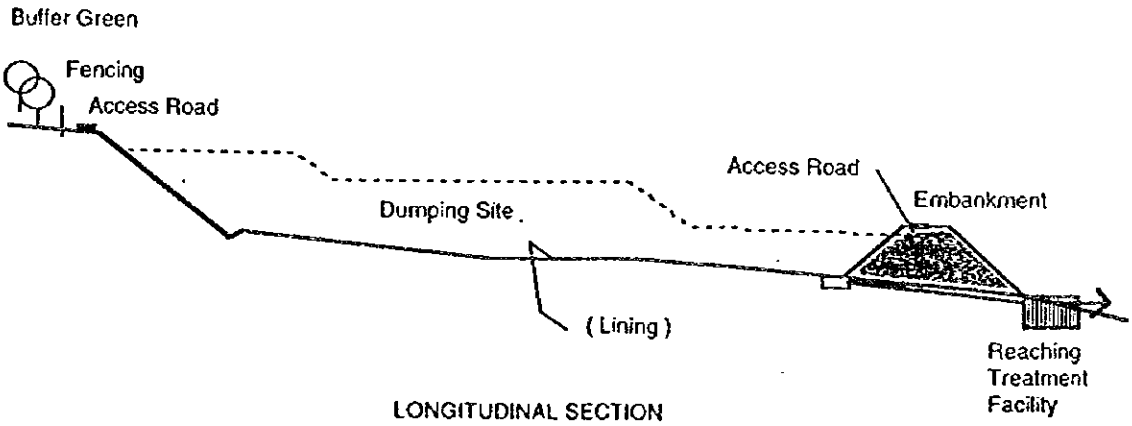


Source: Study Team

Figure 4-30 Conceptual Plan for Solid Waste Dumping Site



SCHEMATIC PLAN



LONGITUDINAL SECTION

Source: Study Area

4.5.3 Tourism Facilities

1) West Coast Resort Area

(1) Hotel and Accommodation Facilities

The resort development area is composed of a beach with a plane hinterland (200 m depth) on the Calauit Island side; a 500 m long beach with a hilly hinterland (500 m depth) on the west; and two 200m-long beaches with a deep hinterland (500 m depth) on the south.

These beaches are surrounded by mountains and hills, and Buluang, the closest Barangay Center, is also located beyond the hills.

The development area has easy access to natural tourism resources such as Calauit Island, and the west coast of San Nicolas which preserves coral reef communities in good condition. 500 m offshore of the west coast, are two characteristic rock islands; Elet Island and Kalampsauan Island.

Considering such natural geographic features, the site shall be developed into exclusive de luxe beach resort facilities. Therefore, accommodation facilities shall have low density (15 rooms/ha net), mid-scale development, and cottage type building design, each structure of one or two floors.

(2) Site Preparation of Resort Development Areas

The resort development shall be designed to blend with the natural landscape. It will start with a 50 room de luxe resort on the west side of the beach which provides more exclusive space. Development of a pier amenity center, a promenade along the beach, and of facilities for marine activities, will follow.

Following this process, other De luxe class resort development of 200 rooms is proposed on the beach area facing Illultuk Bay.

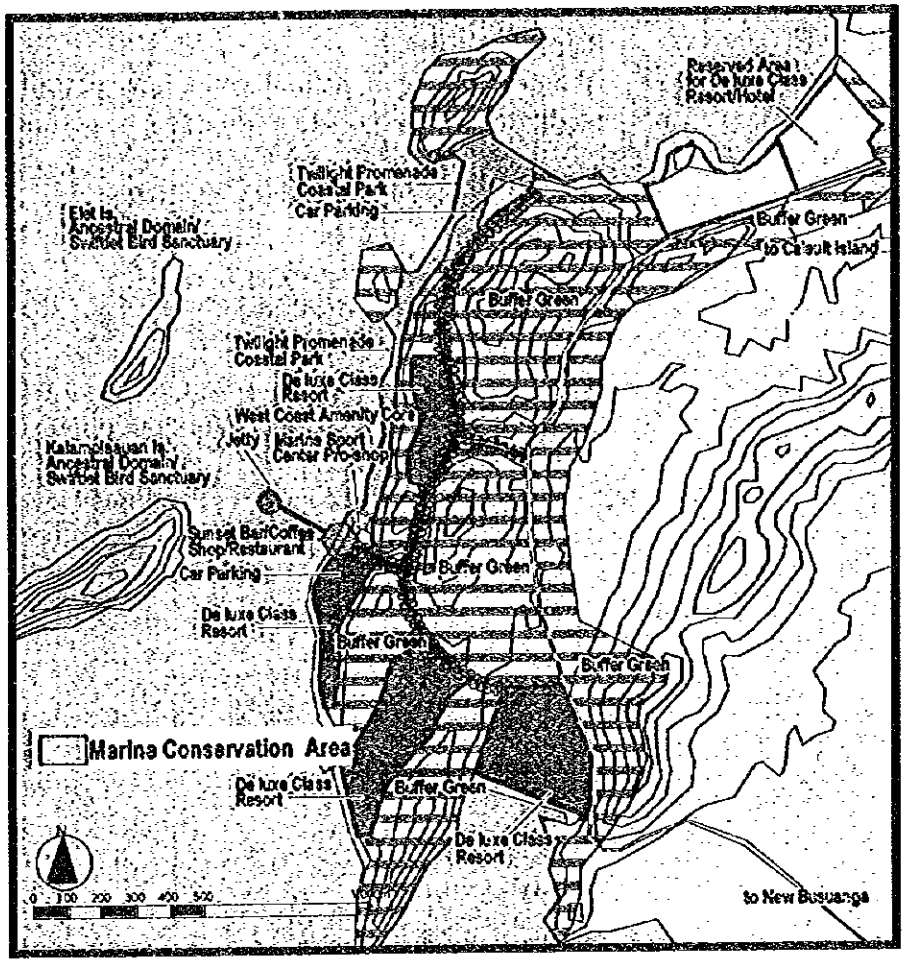
(3) Tourism Facilities

West Coast Amenity Center

(a) Shopping Area

Shopping Mall
The shopping mall will be developed not only for tourists staying at the resort but also for others, such as those on their way to Calauit Island.

Figure 4-31 West Coast Resort Site Layout



Source: Study Area

(Design Concept): Each shop shall be placed independently, with consideration to the natural scenery, such as the two off-shore rock reef islands (Elet Island and Kalampsauan Island) and the setting sun on the western sea area.

Sunset Bar/Coffee Shop/ Restaurant

The western part of the development site commands a sunset view. Therefore, a Sunset bar, coffee shop, and restaurant as well as other facilities shall be provided.

(Design Concept): A part of the Sunset bar and coffee shop will be designed as an open terrace. The bar in particular, shall be located closer to the beach.

Twilight Promenade/ Coastal Park

The Twilight Promenade shall be created in order to provide spaces for people to enjoy the sunset. It will also utilize land toward the northeastern part of the beach, which is otherwise unsuitable for development.

(b) Marine Area

Pier
A pier, floating if natural conditions permit, shall be created to facilitate direct access to marine sports. permit, may be erected.

Marine Sports Center and Pro-shop
At the foot of the pier, the pro-shop which sells equipment of marine sports and provides services of rental equipment and instruction will be constructed.

(Design Concept): The shop will be set enough distance back from the beach, and shall be a one-story building.

Table 4-28 West Coast Resort Tourism Facilities Development

Area	Facilities	Type Dev't	Dev't Components	Size Floor	Size Area	Dev't Period 2000	2005	2010
WEST COAST RESORT					44 ha			
	Buluang Beach Resort				41 ha			
		New	- Inner Road Network and Roadside Landscape (W:12 m)	2 km	24,000 sq.m			
			- Site Preparation of Resort Area:Phase-2		25,000			
			- Site Preparation of Resort Area:Phase-3		100,000			
			- Buffer Green and Forest Reserve		53,600			
	West Coast Amenity Center				2 ha			
		New	- Twilight Promenade/Coastal Park	sq.m	5,000 sq.m			
			- Pier (2m X 200m)	400				
			- Marine Sports Center and Pro-shop	200	500			
			- Sun Set Bar/Coffee Shop/Restaurant	500	2,500			
			- Car Parking (3 buses/11 cars)		600			
	Sewage Treatment				2 ha			
		New	- Sewage Network and Treatment Plant					

Source: Study Team

2) South Coast Resort Area

(1) Hotel and Accommodation Facilities

Since the development site includes a two-kilometer long beach and two off-shore islands, waves are rather mild. A range of mountains, 200m above sea-level which are comprised of primary forests, is situated to the north of the beach while Busuanga River flows to the west and Fabrica River flows to the east where there is also a range of hills 50 to 90 meters above sea-level. Since the hinterland of the beach is a plane which enjoys fine views, it is used as an airstrip at the present. The western-most narrow part of the hinterland is 500m wide and the widest part is about 1,500m wide.

In addition to such geographical features, the site is located 24km from the proposed YKR Airport. Since in the future, travel time by car from the airport is expected to be reduced from approximately 1 ½ hours to around 30minutes, the development is considered to have enough potential to attract large numbers of tourists. Therefore, the site shall be

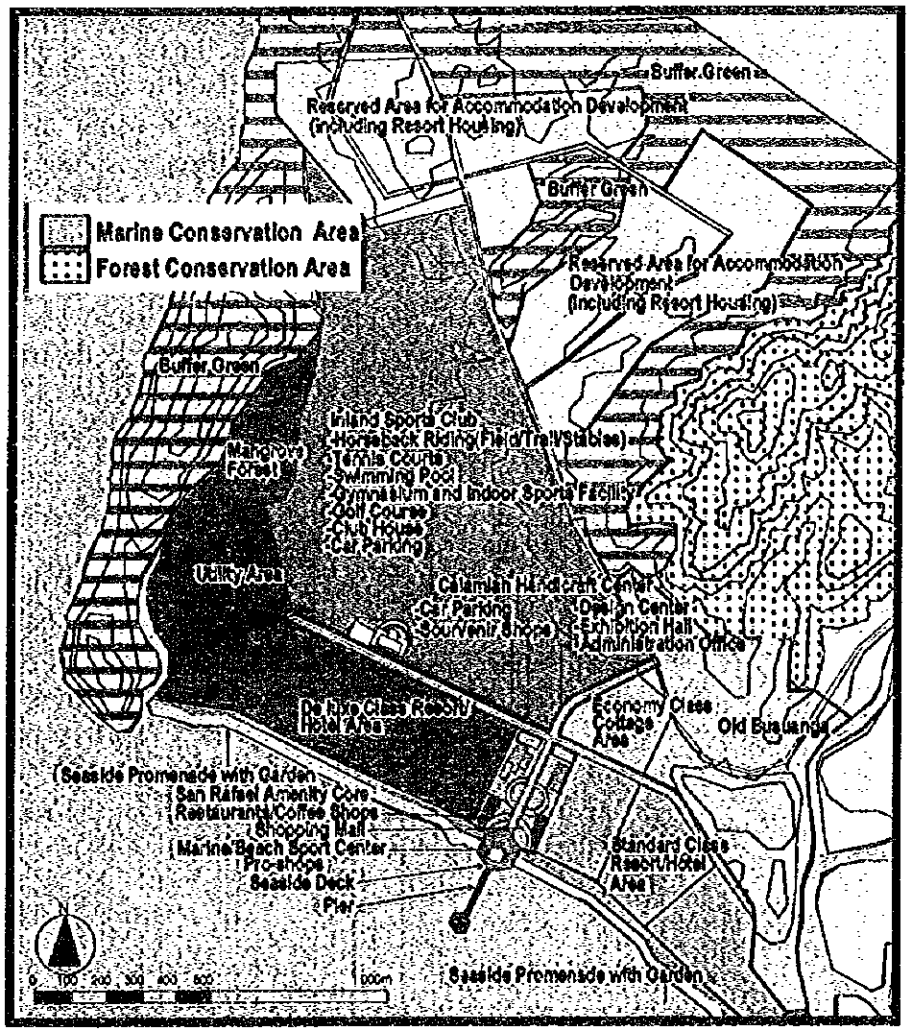
developed as a large-scale beach resort targeting the high to low-end comprehensive mass market.

In terms of possible accommodation facilities, low-level and low-density (30 rooms/ha) buildings are considered for high-class and middle-class developments, and cottage-type accommodation facilities (15 rooms/ha) are considered for low-class projects which are expected to be operated with the participation of local enterprises. The proposed numbers of rooms are as follows: 500 for De luxe class, 370 for standard class, and 15 for economy class.

(2) Site Preparation of Resort Development Areas

The resort site is divided into two areas; eastern and western parts of the beach. Due to the existence of settlement in Old Busuanga, it is difficult to extend the eastern site, but on the other hand, the western site has a large hinterland with mild waves because of the two offshore islands. Therefore, development shall take place in the western part.

Figure 4-32 South Coast Resort Site Layout



Source: Study Team

(3) Tourism Facilities

a) Inland Sports Club

On the huge plain hinterland of the beach, a sports complex, taking advantage of its location next to a large-scale resort, will be developed.

The sports complex will provide various kinds of sports facilities, such as an 18-hole golf course, tennis courts, a swimming pool, and a gymnasium.

b) Horse Back Riding Field/Trail/Stables

In contrast to the facilities in the Safari Park, enhanced horse riding facilities will be provided with instructors for novice riders.

c) San Rafael Amenity Core and Seaside Flower Mall

Shopping Mall/Restaurants/Coffee Shops
In order to create a pleasant beach scene, and to attract people from outside as well as tourists who stay at the resort, the shopping mall shall be designed appropriately. The facility shall be located in the center of the resort with a distinct gate using monuments and tropical plant landscaping to enhance the atmosphere.

A pleasant promenade along the beach and a large flower garden, taking advantage of the unique native flora species should be created. The shops should be designed as low-level structures facing onto the beach, and connected by pedestrian walkways winding through the on-site flower garden. Restaurants and coffee shops, shall have terraces opening onto the flower garden to enhance the dining experience.

Coastal Promenade with Gardens
Attractive landscaping along a promenade from the gate of the resort shall be provided to serve as a guide to the beach. A pocket park shall be created as a place for recreation and relaxation, and street furniture, such as information boards, benches and cascades, shall also be provided.

To create a pleasant nighttime atmosphere for the resort, space for an open theater should be created.

d) Marine Area

Pier
The pier should be constructed to create easier access from the resort to more diversified marine activities.

Marine and Beach Sports Center and Pro-shops

A pro-shop, selling and lending equipment for marine sports and providing instructors, will be created. The shop, also a low-level building, shall be set back from the beach.

e) Calamian Handicraft Center

Design Center for Products Unique to the Area

A Handicraft Center shall be constructed in order to develop new crafts which utilize the rich natural resources available, such as Bear Cat, Calamian Deer, Philippine Cockatoo, and the many kinds of insects. The center should also serve as a training forum for design skills of local handicrafts.

Handicraft Demonstration Room/Souvenir Shop

As an important attraction, the process of making local handicraft products shall be demonstrated. The souvenir shop shall also accept special orders from tourists.

Similar to the other shopping areas, the souvenir shop should also be an independent, low-level building. The display of local products in the shop should be well designed by utilizing the images connected with the Inland Nature Park.

Table 4-29 South Coast Resort Tourism Facility Developments

Area	Facilities	Type Dev't	Dev't Components	Size		Dev't Period
				Floor	Area	2000 | 2005 | 2010
SOUTH COAST RESORT					274 ha	
	Resort and Accommodation				130 ha	
		New	- Inner Road Network with Roadside Landscape	2.5 km	62,500 sq.m	
			- Site Preparation of Resort Area:Phase-1		28,400	
			- Site Preparation of Resort Area:Phase-2		213,400	
			- Site Preparation of Resort Area:Phase-3		223,400	
			- Site Preparation for Resort Housing:Phase-2		133,400	
			- Site Preparation for Resort Housing:Phase-3		133,400	
			- Park and Landscaping Area		313,800	
	Inland Sports Club				100 ha	
		New	- Horse Back Riding Field/Trail/Stables	sq.m	90,000 sq.m	
			- Golf Course(18 Hole)		900,000	
			- Tennis Courts		2,400	
			- Swimming Pool		900	
			- Gymnasium and other Indoor Sport Facility	200	500	
			- Club House	3,000	5,000	
			- Car Parking (2 buses/18 cars)		800	
	San Rafael Amenity Core and Sea Side Flower Mall				3 ha	
		New	- Shopping Mall	1,100 sq.m	3,700 sq.m	
			- Restaurants/Coffee Shops	900	3,000	
			- Coastal Promenade with Gardens		20,000	
			- Pier (3m X 200m)	600		
			- Marine and Beach Sports Center and Pro-shops	300	800	
			- Car Parking (4 buses/21 cars)		1,000	
	Buffer Area/Other Facilities				40 ha	
		New	Sewage Network/Treatment Plant/Irrigation Water Main		5 ha	
		New	Buffer Green and Forest Reserve		35 ha	

Source: Study Team

3) San Nicolas Marine Complex

(1) Tourism Facilities

a) San Nicolas Marine Sports Complex

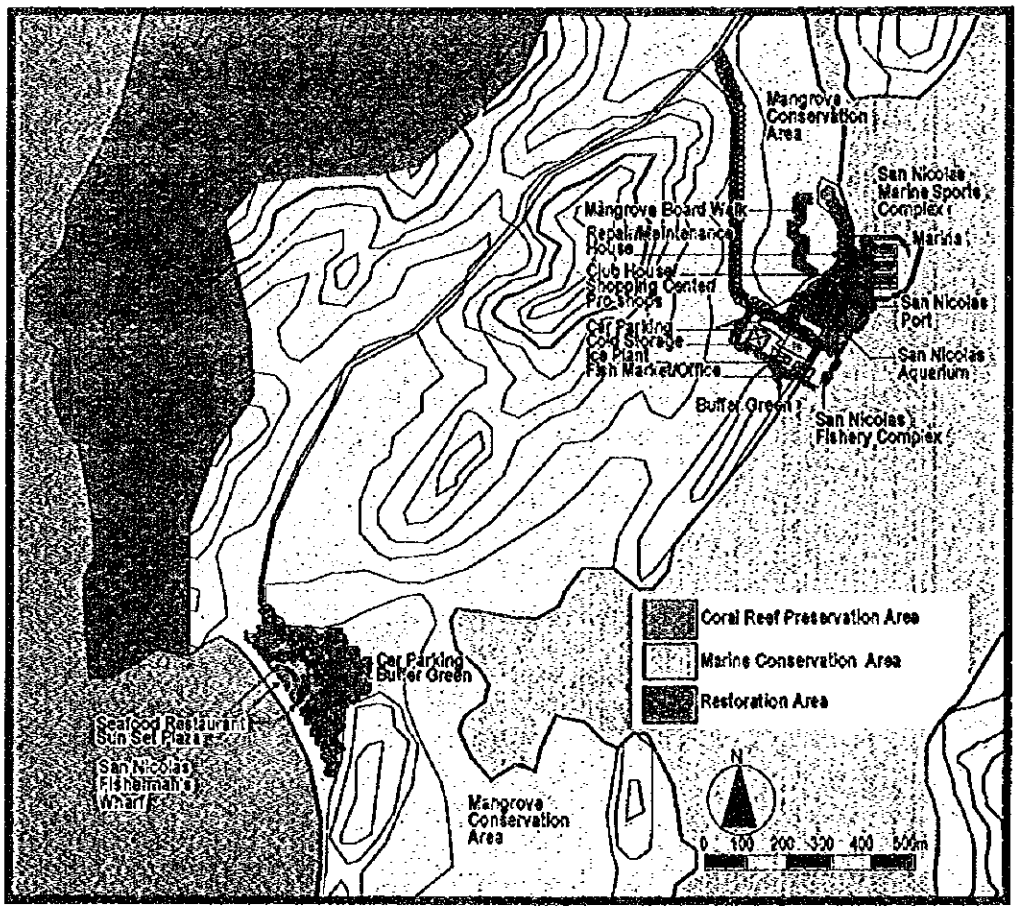
A base for marine activities, including glass-bottom boat tours, diving/snorkeling, cruising, sailing, fishing and island hopping, shall be created. This base will also include a mooring facility for pleasure boats.

Breakwater/Floating Pier

The mooring facility for boats shall be located in Gutob Anchorage where there is little influence of natural wind and waves. However, the new facility shall be equipped to prevent waves from harming other vessels.

(Design Concept): Although a more detailed survey for calmness is necessary, a floating pier, which has less influence on the sea than that of the comprehensive breakwater, is considered to be appropriate.

Figure 4-33 San Nicolas Site Layout



Source: Study Team

Clubhouse/ Pro-shop and Shopping Center: The facility entitles tourists who come back from the beach, as well as club members who moor their own pleasure boats on the pier, to take a shower. The complex shall also be developed into a clubhouse to provide varied facilities, including sales and rental shops for marine sports equipment, a pro-shop providing marine sports instruction, and souvenir shops.

Privacy for club members shall be kept by providing a separated entrance and parking spaces only for members.

(Design Concept): The complex, open to the view of the marina, shall be one-story (there is a section for two-story), and covered with plenty of vegetation.

Seaside Restaurants/ Coffee Shops: On the way to/from the beach, seaside restaurants/ coffee shops shall be provided.

(Design Concept): Including open terraces to the sea, a part of the second-floor of the club house shall be designed for these spaces.

Mangrove Park and Board-walk: A board-walk promenade shall be provided through the mangrove forest of the hinterland.

(Design Concept): Considering the influence on the surrounding flora and the harmony with the surrounding scenery, the promenade shall be a board-walk supported by piers.

b) San Nicolas Aquarium

Aquarium/ Kiosk and Resting Area

Since precious coral reef communities are preserved around the proposed site, the west coast of San Nicolas peninsula, a section for coral reef communities as well as that of tropical fish shall be created in order to conduct research for the preservation of the reef.

Although dugongs and sea turtles are observed along the shore, their detailed ecology has not been fully discovered yet. Therefore, these species shall be kept in the aquarium in order to undertake further research as well as to utilize them as the main attractions of the aquarium.

The surrounding area is hilly and therefore, low level buildings are prescribed as is appropriate landscaping.

Seaside Park/ Promenade

In the front space of the aquarium, to the side of Gutob Bay, a seaside park/ promenade shall be created. It shall also serve as an event space.

(Design Concept): A staircase will be provided from the seaside park to the inside of the pier. This staircase shall serve as a resting place and as the stands for the event space as well as the original function of passage.

c) Santa Rita Fisherman's Wharf

Fisherman's Wharf (Souvenir Shop/ Restaurant)

On the west coast of the tip of San Nicolas peninsula, there are beaches with large hinterlands, where coral reef communities are preserved in good condition. 4km offshore from the coast, Malajon Island, with its rocky mountains, creates characteristic scenery, particularly during sunset. Surrounded by such rich natural resources, a fisherman's wharf including, a restaurant utilizing seafood from the neighboring areas, shall be constructed in this area.

In addition to shops for processed seafood, the Fisherman's Wharf shall be the center of research for future fishing industry possibilities by, for instance, developing healthy seafood products.

(Design Concept): This two-story building shall have an open deck towards the sea which is provided for a rest place and a corridor.

Table 4-30 San Nicolas Marine Complex Tourism Facility Developments

Area	Facilities	Type Dev't	Dev't Components	Size		Dev't Period		
				Floor	Area	2000	2005	2010
SAN NICOLAS MARINE COMPLEX					8.8 ha			
	San Nicolas Marine Sports Complex				3 ha			
		New	- Breakwater (Floating)	100 m				
			- Mooring Facilities (Floating Pier for 50 Boats)	800 sq.m				
			- Mooring Space		8,000			
			- Pleasure Boat Rack Area (50 Boats)		5,000 sq.m			
			- Boat Lifter	2 Units				
			- Landscape Areas and Seaside Park/Promenade		5,000			
			- Mangrove Park and Board-walk (W:1.5 m, L:300 m)	450 sq.m	450			
			- Clubhouse/Pro-shop and Shopping Center	1,000	2,300			
			- Seaside Restaurants/Coffee Shops	800	1,800			
			- Repair / Maintenance House	150	300			
			- Car Parking (12 buses/59 cars)		2,900			
	San Nicolas Aquarium				2 ha			
		New	- Aquarium (Fish Tank/Maintenance/Administration)	2,000 sq.m	5,000 sq.m			
			- Kiosk and Resting Area	400	800			
			- Seaside Park/Promenade		5,000			
			- Car Parking (14 buses/68 cars)		3,300			
	Santa Rita Fisherman's Wharf				2 ha			
		New	- Fisherman Wharf (Souvenir Shop/Restaurant)	1,400 sq.m	1,800 sq.m			
			- Entrance Plaza	500 sq.m	1,300 sq.m			
			- Sunset Plaza		10,000 sq.m			
			- Car Parking (11 buses/55 cars)		2,700 sq.m			
	Sewage Treatment				2 ha			
		New	- Sewage Treatment Plant		1 ha			
		New	- Sewage Treatment Plant		1 ha			

Source: Study Area

Entrance Plaza/ Sunset Plaza
A plaza will be provided at the entrance of the facility, and a sunset plaza will take up the entire side of the beach as a promenade.

The sunset plaza shall serve a variety of purposes: a terrace for coffee shops, outside shops, a resting place and space for events.

(Design Concept): From the entrance plaza to the sunset plaza, openings will be provided to secure a fine view of the beach, the sea and Malajon Island.

4) New Busuanga Inland Nature Park

(1) Tourism Facilities

a) Inland Nature Park

Since an intersection of the road from New Busuanga to Buluang and the road to the marine complex becomes the significant node for tourist movement, an inland nature park serving as a recreational facility will be take advantage of this good location.

Calamian Bird (Cockatoo) Park
Since primary forest is preserved in good condition in the north-west of New Busuanga, the preservation and recovery of it is considered to be necessary. If appropriate action is taken, the condition of this natural habitat can be expected to improve in the near future. Not only a tourist attraction, the bird park shall serve as a center of preservation and research.

Butterfly and Indigenous Insect Farm
For similar reasons to those stated above, a butterfly and indigenous insect farm shall also be developed.

(Design Concept): One section shall display indigenous insects, and birds with tropical flowers and plants, and the other section will be a set of exhibition rooms for introducing specie ecology through the use of photos, videos, and actual specimens.

Orchid Garden
To achieve a balance of preservation an commercialization of varied indigenous orchid species in Palawan, an orchid garden will be built for tourists. The orchids will also be used in community landscaping.

Orchards
Orchards will be cultivated to supply the fruit industry located near Orchard Street. Dishes using the various fruits, such as mango, shall be developed and promoted.

(Design Concept): The development will be located on plain land along the road of New Busuanga for which agriculture is suitable.

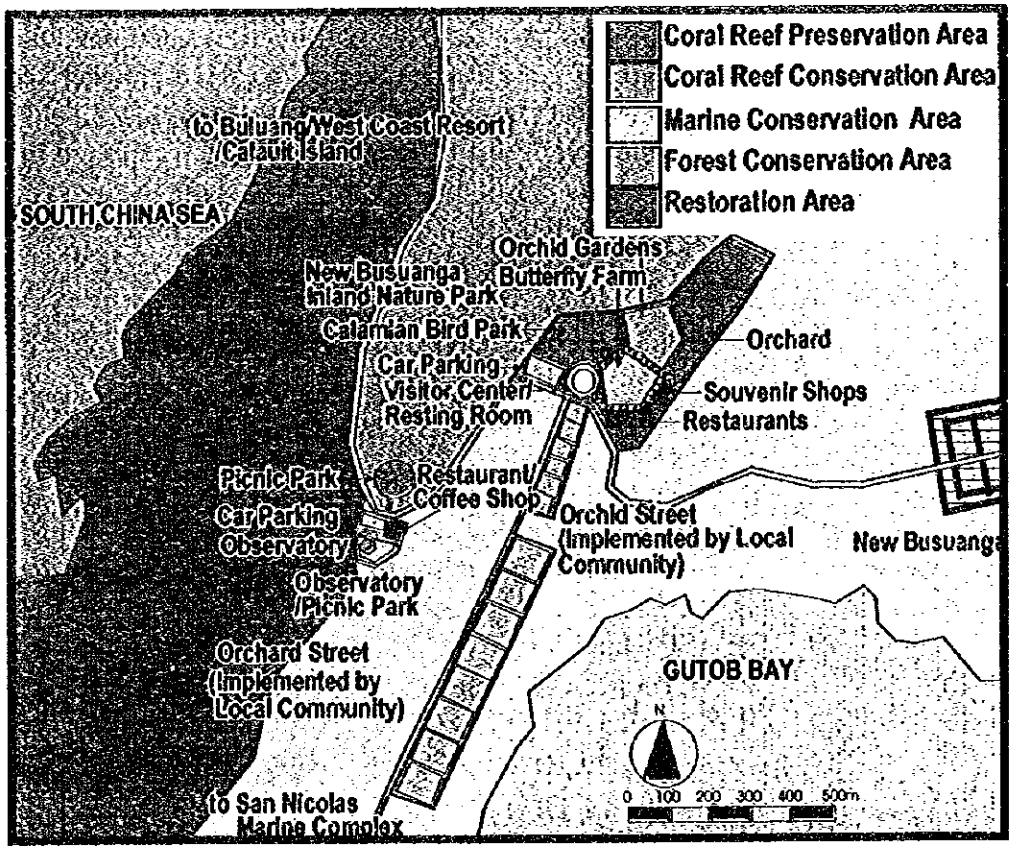
Visitor Center and Souvenir Shop/ Restaurant/ Coffee Shop
A souvenir shop which sells original products and a restaurant/ coffee shop which serves dishes invented by the center shall be provided.

(Design Concept): The number of tourist frequenting these shops is expected to be high. Therefore, entrance to the facility will be located on the road for easy access. The shops will be housed in a single-story structure, while the restaurant will be in a two-storied building, in order to command a view of the bird park.

(b) Orchard Street

Orchard Farm
The orchard farm will function as a center devoted to research and cultivation in an attempt to improve agricultural technology. It will be located on a gradual slope along the coast.

Figure 4-34 New Busuanga Inland Nature Park



Source: Study Team

(c) Observatory/ Resting/ Place/ Picnic Park

Restaurants/ Barbecue Terrace

On the peak of the road between New Busuanga and Buluang, the view of Gutob Bay and China Sea is fantastic. A restaurant and a barbecue terrace will be provided to take advantage of this view.

Kiosk/ Rest House/ Souvenir Shops

Since the peak is situated near a diverging point, a rest house and souvenir shop shall be provided.

Observatory

An observatory will be created to enjoy the view towards the sea.

(Design Concept): In case of the need for extension over the slope, the observatory shall be constructed in a deck-like structure in order to reduce its influence on the surrounding environment. Also, the height shall not exceed that of surrounding trees.

Table 4-31 New Busuanga Inland Nature Park Tourism Facility Developments

Area	Facilities	Type Dev't	Dev't Components	Size		Dev't Period
				Floor	Area	2000 | 2005 | 2010
NEW BUSANGA INLAND NATURE PARK					18 ha	
	New Busuanga Inland Nature Park				16 ha	
		New	- Calamian Bird (Parrot) Park	2,000 sq m	100,000 sq m	
			- Butterfly (/with Indigenous Insect) Farm	(same area of bird firm)		
			- Orchid Garden		10,000	
			- Orchards Garden		10,000	
			- Visitor Center (Information/Resting Room)	300	800	
			- Restaurants/Souvenir Shops	500	1,300	
			- Car Parking (4 buses/19 cars)		1,000	
	Observatory / Resting Place/ Picnic Park				1 ha	
		New	- Kiosk/Rest House/Souvenir Shops	200 sq m	500 sq m	
			- Restaurants/Barbecue Terrace	300	1,000	
			- Observatory		500	
			- Car Parking (2 buses/10 cars)		500	
	Sewage Treatment				1 ha	
		New	- Sewage Network and Treatment Plant			

Source: Study Team

5) Calauit Island

(1) Calauit Safari Park

In addition to the normal extension and improvement works for the existing facilities of Calauit Safari Park, the following new facilities shall be added to increase tourism.

a) Gate Area

Pier on Illultuk Bay

Since it is impossible to get to Calauit Island by land transportation, access largely depends on water transportation. However, most boats presently available are banca boats, and mooring facilities are less developed. Therefore, a pier needs to be created to facilitate the transferring of materials to the Safari Park as well as for access for tourists to the area. The Study Team recommends a road to Calauit Island be built.

Information and Resting Room

At the foot of the pier, the facility which controls the entrance for the Safari, provides information services. A resting place shall also be constructed.

(Design Concept): Located at the gateway to Calauit Island the area necessitates more dramatic effects. Therefore, design of the buildings shall employ animal shapes, and effective landscape by local plants shall be created.

b) Safari Center

Park Headquarters

Park headquarters shall be established and will be given the responsibility of the overall management of the park.

Veterinary Center

A veterinary center in charge of animal health shall be established.

Maintenance Shop

A facility for maintenance and repair of buildings, cars and varied equipment shall be created.

Restaurant/ Coffee Shop/ Souvenir Shops

In connection with an inside restaurant and Handicraft Center, a shop which sells the original goods of the Safari will be built.

Cottage Type Accommodation Facilities

To allow further enjoyment of the beautiful natural resources of Calauit Island, accommodation facilities will be created. They will be dormitory-style so as to meet the comprehensive demands of individual travelers, school excursions, and training seminars.

Staff Housing

In the Safari Park, the staff is usually required to perform extensive duties including caring for the health of the animals as well as servicing visitors. To accommodate the long hours and tedious work of the staff, housing will be provided.

(Design Concept): The accommodation facilities will be built rather close to the animals in the Safari, in the form of multi-floored cottage-type wooden buildings. Landscaping will surround the buildings to form a screen.

c) Safari Area

Touring Path for Horseback Riding/ Resting and Observation Spot/ Stable for Horse Riding

In the Safari Park, a touring path connecting all spots, where various kinds of animals appear, and resting spots shall be created. A stable shall also be built for horse-riding in.

The resting spots and the stable will be built next to each other so that horses can be clearly seen by visitors traveling by car.

(Design Concept): Movement within the Safari will basically be by car or and horseback. Tours by horseback will be conducted by trained guides with the policy of keeping safe distances from park animals.

Mangrove Park and Board-walk
A promenade shall be provided for observation of tropical plants in the mangrove forest.

(Design Concept): The promenade shall be designed as a board walk supported by so as to minimize any harmful impacts to the surrounding ecosystems and to harmonize with the surrounding scenery.

Water Place for Animals
By providing watering holes, animals which gather to drink water will be able to be observed.

(Design Concept): Pipelines and fountain shall be either laid underground or covered by landscape.

Ostrich Park and Feeding Ground
As a new business as well as a new attraction, ostriches shall be bred in the Safari.

d) Other Facilities

Calauit Environmental Research Center
Aiming at preservation of Primary forest, Calamian Deer and Calamian Cockatoo in the area, the center shall be created to undertake research and surveys of inland natural resources.

Marine Monitoring Center and Turtle Hatcheries

The sea area from the north coast of Calauit Island to the west coast of Busuanga contains rich natural marine resources, including a sea turtle egg-lying site, sea grass beds which is food for dugongs, and coral reef communities. Therefore, the center shall be created for research and surveys.

The results of research and survey obtained by these centers shall also be developed and contributed to the protection of natural marine resources in other areas.

Marine and Terrestrial Patrol Station (Bantay Busuanga)

A patrol station for the protection of natural inland and marine resources shall be established .

Indigenous Species Orphanage (stables/ breeding Field)

In cooperation with the Safari Park, this facility shall accommodate orphaned animals, and provide rehabilitation for returning them to their natural habitats.

Training Center for Park Ranger and Guide (environment)

In the Safari park, primary forest, mangrove cruises, and diving in coral reef communities, guides with comprehensive knowledge and experience are required. Therefore, a facility providing appropriate training courses for guides shall be established. At the same time, the training of rangers who control illegal acts against nature and protect the animals, will be conducted.

(Design Concept): Because both the orphanage and the training center are intended for the care and rehabilitation of animals within the Safari Park, the facility shall be located to the west of Safari Center.

e) Tourist Service Area

Seminar House for Environmental Education

The potential users of the facility are summer school and nature school groups. Utilizing the rich natural resources in Calauit Island, the facility shall provide a comprehensive seminar for natural environmental education.

Playground

A grass playground shall be provided for events, campfires and exercising.

Visitors Center/ kiosk/ Resting Room/ Restaurant and Coffee Shop
To provide services to visitors as well as summer school groups, an information center, shops, resting room and a restaurant shall be created.

Headquarters
Headquarters which control all activities in the Safari Park will be established.

Dormitory and Staff Housing
To cope with group tourists for summer school and nature school, dormitory-type accommodation shall be developed. Each building shall be independent and single-storied, and shall be located around the playground. The accommodation facilities shall be wooden, multi-floored, collective cottages.

6) Sporting Facilities

(1) Tourist Center

As the main tourist information center covering accommodation and tourism activity information in the Busuanga West region, a tourist center run by the municipality will be established in Salvacion.

7) Tourism Support Facilities

At YKR Airport, the potential international gateway to Northern Palawan, an information center, which provides information on Coron, the Calamian Islands, El Nido, Puerto Princesa as well as the surrounding areas, will be established.

Similarly, at the South Coast Resort and San Nicolas Marine Complex where many tourists are expected to gather, information centers run by DOT shall be established.

In each information center, a Tourism Security Office shall be established in order to maintain security, and to cope with any troubles tourists may have or any accidents caused by marine activities.

Table 4-32 Tourism Support Facilities Development

Area	Facilities	Type Dev't	Dev't Components	Size Floor	Size Area	Dev't Period 2000	2005	2010
TOURISM SUPPORTING FACILITIES					0.4 ha			
	Tourist Center				0.1 ha			
		New	- Salvacion Town Tourist Office	100 sq m	200 sq.m			
			- Car Parking (3 cars)		100			
	Information Center				0.3 ha			
		New	- Busuanga Airport Tourist Information Center	100 sq m	200 sq.m			
			- Tourist Security Office	100	200			
			- Car Parking (12 cars)		100 sq.m			
		New	- SouthCoast Resort Tourist Information Center	100 sq m	200 sq.m			
			- Tourist Security Office	100	200			
			- Car Parking (7 cars)		100 sq.m			
		New	- San Nicolas Marine Complex Tourist Information Center	100 sq m	200 sq.m			
			- Tourist Security Office	100	200			
			- Car Parking (7 cars)		100 sq.m			

Source: Study Area

8) Beautification

Beautification, such as paving roads and sidewalks, installing street lights, planting gardens in the front of houses, is necessary in this case study area, namely Salvacion, Old Busuanga, San Rafael, New Busuanga and Buluang.

Table 4-33 Beautification Projects

Area	Facilities	Type Dev't	Dev't Components	Size Floor	Size Area	Dev't Period 2000	2005	2010
	Beautification of Tourist Town and Settlements				3 ha			
		Imp.	- Concreting Road (W:10 m, salvacion 1 km, 500 m each)	3 km	30,000 sq m			
		Imp.	- Sidewalk (salvacion 1 km)	1 km	2,000 sq m			
		Imp.	- Street Lighting	1,200 lamps				
		Imp.	- Flower Trees Plantation (Street Tree)	2,400 spots				
		Imp.	- Flower Tree Planting on front gardens of house	3 km				

Source: Study Area

4.5.4 List of Project Component and Estimated Development Cost

The development of Busuanga West as a comprehensive international tourism destination, all relevant components of the entire project have been identified and listed, and their development costs have been estimated (refer to Table 4-37).

The total development cost is estimated at ₱ 6.8 billion of which ₱ 3.6 billion and ₱ 3.2 billion is to be shouldered by the public sector and private investors, respectively. Of the public investment, ₱ 2.6 billion is for regional infrastructure development including roads (₱ 1.2 billion), airport (₱ 0.7 billion), port (₱ 0.1 billion), power (₱ 0.3 billion) and other utilities (₱ 0.3 billion). The remaining public investment of ₱ 1.0 billion is assumed to be spent for site preparation, basic local infrastructure, landscaping, etc., which can eventually be charged to the investors who actually use the development sites.

Table 4-34 Estimated Development Cost

Area	Facilities	Location	Type Devt	Devt Components	Devt Period 2000	2005	2010	Investment/Implementation COST(P million) Public	Private	BODY	Operation/Maintenance COST(P million/y) Public	Private	Body	No. of Employees
1. CALAUIT SAFARI PARK / ENVIRONMENT TRAINING CENTER								143.1	146.0		4.0	10.1		311
	Calauit Safari Park							23.0	131.7			10.1		171
		Calauit Is	Imp.	- Touring Path for Horseback Riding (W 5 m, L 5km)				4.0		CSPC			CSPC	10
			New	- Mangrove Park and Board-walk (W 1.5 m, L 1km)				2.2		Calauit			(Calauit	3
			New	- Resting and Observation Spot(200sq m X 5 spots)				1.0		Safari Park			Safari Park	1
			New	- Ostrich Park and Feeding Ground					1.7	Corp			Corp.)	10
			Exp	- Stable for Horseback Riding					3.3	(PCSD/BTDA/			BTDC/	5
			Imp	- Pier on Ilihituk Bay (5mX50m+500sq m)				2.4		Investor)				1
			Imp	- Information and Resting Room (beside Pier with parking)					7.6					2
			New	- Restaurant/Coffee shop/Souvenir Shops					16.8					15
			Imp	- Cottage Type Accommodation Facilities(50rooms)					24.5					75
			Imp	- Park Headquarter					20.2					35
			Imp	- Veterinary Center					4.6					5
			Imp	- Maintenance Shop					4.6					5
			Imp	- Water Supply Network and Water Place for Animal				13.4						2
			Imp	- Staff Housing					48.5					2
	Calauit Environmental Training/Seminar Center							88.3	14.3		3.0			139
		Calauit Is	New	- Terrestrial Environment Research Center				12.4		PCSD/			PCSD/	30
			Imp.	- Indigenous Species Orphanage(stables/breeding Field)				1.4		Municipality			Municipality	5
			New	- Marine Monitoring Center and Turtle Hatcheries				3.7		/DENR/			/DENR	5
			New	- Marine and Terrestrial Patrol Station (Bantal Busanga)				8.4		Private				30
			New	- Training Center for Park Ranger and Guide(environment)				3.7						10
			New	- Seminar House for Environment Education				9.4						5
			New	- Visitor Center/Kiosk/Resting Room				5.6						5
			New	- Restaurant and Coffee Shop					14.3					10
			Imp	- Headquarter				9.4						20
			Exp	- Dormitory and Staff Housing				32.2						15
			Imp	- Playground				2.1						1
	Sewage Treatment							31.8	0.0		1.0			4
		Calauit Is	New	- Sewage Network				16.8		BTDA			BTDC/	
			New	- Treatment Plant				15.0						4
2. WEST COAST RESORT								134.3	614.0		28.1	102.9		545
	Bufuang Beach Resort							62.2	600.0		11.3	97.9		507
		Bufuang	New	- Inner Road Network and Roadside Landscape (W 12 m)				46.4		BTDA			3rd Sector	5
				- Site Preparation of Resort Area Phase-2				2.5	120.0	Private			BTDC/	100
				- Site Preparation of Resort Area Phase-3				10.0	480.0	Investor			(BTDA+	400
				- Buffer Green and Forest Reserve				3.3					Investors)	2
	West Coast Amenity Center							14.4	14.0		2.2	5.0		40
			New	- Twilight Promenade/Coastal Park				6.0		BTDA			BTDC/	5
				- Pier (2m X 200m)				7.3					Private Investor	
				- Marine Sports Center and Pro-shop				0.1	4.0					10
				- Sun Set Bar/Coffee Shop/Restaurant				0.4	10.0					25
				- Car Parking (3 buses/11 cars)				0.6						
	Sewage Treatment							57.7	0.0		14.6	0.0		2
			New	- Sewage Network and Treatment Plant				57.7		BTDA			BTDC/	2
3. NEW BUSANGA INLAND NATURE PARK								12.8	61.5		12.8	11.7		119
	New Busuanga Inland Nature Park *							7.9	51.5		1.3	9.7		96
		New Busanga	New	- Calamian Bird (Parrot) Park				2.0	6.4	BTDA			3rd Sector	30
				- Butterfly(with Indigenous Insect)Farm				0.4	14.9	(Lease to			BTDC/	15
				- Orchid Garden				2.4	9.0	Private			(BTDA+	10
				- Orchards Garden				2.4	4.8	Sector)			Investors)	10
				- Visitor Center (Information/Resting Room)				0.2	5.4				and Investors	5
				- Restaurants/Souvenir Shops				0.3	10.0					25
				- Car Parking (4 buses/19 cars)				0.2	0.9					1
	Observatory / Resting Place / Picnic Park							1.1	10.0		1.0	2.0		21
		New Busuanga	New	- Kiosk/Rest House/Souvenir Shops				0.1	3.7	BTDA			3rd Sector	5
				- Restaurants/Barbecue Terrace				0.2	6.2	(Lease to			BTDC/	15
				- Observatory				0.1		Private			investors	1
				- Car Parking (2 buses/10 cars)				0.6		Sector)				
	Sewage Treatment							3.8	0.0		2.0			2
		New Busanga	New	- Sewage Network and Treatment Plant				3.8		BTDA			BTDC/	2
4. SAN NICOLAS MARINE COMPLEX								64.7	180.3		10.1	37.9		363
	San Nicolas Marine Sports Complex							26.3	44.1		3.2	14.8		156
		San Nicolas	New	- Breakwater (Floating)				0.3		BTDA			3rd Sector	
				- Mooring Facilities (Floating Pier for 50 Boats)				8.0		(Lease to			BTDC/	3
				- Mooring Space				0.0		Private			(BTDA+	
				- Pleasure Boat Rack Area (50 Boats)				11.0		Sector)			Investors)	
				- Boat Lifter					5.0	Private			and Investors	5
				- Landscape Areas and Seaside Park/Promenade				3.2						5
				- Mangrove Park and Board-walk (W 1.5 m, L 300 m)				0.7						3
				- Clubhouse,Pro-shop and Shopping Center					20.4	Private				45
				- Seaside Restaurants/Coffee Shops					15.3	Investor				35
				- Repair / Maintenance House					2.3					10
				- Car Parking (12 buses/59 cars)				3.1						
	San Nicolas Aquarium							8.9	108.3		2.3	13.7		75
		San Nicolas	New	- Aquarium (Fish Tank/Maintanance/Administration)					100.9	Private/			BTDC/Private	50
				- Kiosk and Resting Area					7.4	BTDA				20
				- Seaside Park/Promenade				5.2						5
				- Car Parking (14 buses/68 cars)				3.6						
	Santa Rita Fisherman's Wharf							16.7	28.0		0.6	9.4		110
		Santa Rita	New	- Fisherman Wharf (Souvenir Shop-Restaurant)				0.3	28.0	BTDA/			BTDC/	100
				- Entrance Plaza				10.2		Municipality			Private	5
				- Sunset Plaza				3.2		Private				5
				- Car Parking (11 buses/55 cars)				2.9						
	Sewage Treatment							12.9	0.0		4.0			2
		San Nicolas	New	- Sewage Treatment Plant				6.5		BTDA			BTDC/	2
		Santa Rita	New	- Sewage Treatment Plant				6.5						

Table 4-34 cont.

Area	Facilities	Location	Type Dev't	Dev't Components	Dev't Period 2000	2005	2010	Investment/Implementation COST(P million) Public	Private	BODY	Operation/Maintenance COST(P million/y) Public	Private	Body	No of Employees
5 SOUTH COAST RESORT								454 8	2,184 1		101 7	293 3		2,563
	Resort and Accommodation							297 4	1,889 6		85 6	276 4		2,015
		Old	New	- Inner Road Network with Roadside Landscape				107 5		BTDA/			BTDC/	5
		Busuanga		- Site Preparation of Resort Area Phase-1				7 1	126 0	Private			(BTDA/	80
				- Site Preparation of Resort Area Phase-2				53 4	758 4	Investment			Investor)	745
				- Site Preparation of Resort Area Phase-3				55 8	955 2					775
				- Site Preparation for Resort Housing Phase-2				33 4						200
				- Site Preparation for Resort Housing Phase-3				33 4						200
				- Park and Landscaping Area				6 9						10
	Inland Sports Club							24 3	243 5		6 0	12 0		365
		Old Busuanga	New	- Horse Back Riding Field/Trail Stables				24 3	25 3	BTDA/			Private	15
				- Golf Course(18 Hole)					126 0	Private			Investor	300
				- Tennis Courts					8 8	Investment			BTDC/	5
				- Swimming Pool					10 0					5
				- Gymnasium and other Indoor Sport Facility					4 1					5
				- Club House					73 4					35
				- Car Parking (2 buses/18 cars)					0 9					
	San Rafael Amenity Core and Sea Side Flower Mall							23 8	46 0		1 1	4 9		125
		Old Busuanga	New	- Shopping Mall				0 4	22 0	BTDA/			Private/	50
				- Restaurants Coffee Shops				0 3	18 0	Private			Investor	50
				- Coastal Promenade with Gardens				15 0		Investment			BTDC/	5
				- Pier (3m X 200m)				7 0						
				- Marine and Beach Sports Center and Pro-shops				0 1	6 0					
				- Car Parking (4 buses/21 cars)				1 0						20
	Buffer Area/Other Facilities							109 3	0 0		9 0			13
		Old	New	- Sewage Network/Treatment Plant/Irrigation Water Main				106 0		BTDA			BTDC/	3
		Busuanga	New	- Buffer Green and Forest Reserve				3 3		BTDA				10
6 TOURISM SUPPORTING FACILITIES								13 0	0 0		2 3	0 0		52
	Tourist Center							1 9	0 0		0 3			6
		Salvacion	New	- Salvacion Town Tourist Office				1 8		Municipality			Municipal	5
				- Car Parking (3 cars)				0 1					Tourist Office	
	Information Center							11 1	0 0		2 0			52
		Airport	New	- Busuanga Airport Tourist Information Center				1 8		DOT			DOT Region-4	4
				- Tourist Security Office				1 8					BTDC/	
				- Car Parking (12 cars)				0 1					Agent/Operator	20
		Old Busuanga	New	- South Coast Resort Tourist Information Center				1 8		DOT			DOT	2
				- Tourist Security Office				1 8		BTDA			BTDC/	2
				- Car Parking (7 cars)				0 1					T. Operator	10
		San Nicolas	New	- San Nicolas Marina Complex Tourist Information Center				1 8		DOT			DOT	2
				- Tourist Security Office				1 8		BTDA			BTDC/	2
				- Car Parking (7 cars)				0 1					T. Operator	10
7 IMPROVEMENT AND UPGRADING OF LOCAL COMMUNITIES								133 3	0 0		19 5	0 0		66
	Tourism Related Industry Development													
		Orchard Street along Port Road						0 0	10 0			1 0		100
			New	- Orchards Farms					10 0	Private			Private	100
		Calamian Handicraft Center in South Coast Resort						24 8	0 0		1 5	19 5		45
			New	- Design Center for a Product Featuring a Character				13 1		BTDA/			Private	10
		Old Busuanga		- Handicraft Demonstration Room				6 1		Municipality			Investor	5
				- Souvenir Shop				6 1		/Private			BTDC/	20
				- Administration Office				1 5		Investment				10
				- Car Parking (4 buses/21 cars)				1 0						
	Human Resource Development													
		Salvacion	New	- Vocational School				20 0		DOE/DOT	4 0		DOE/Municipality	50
	Beautification of Tourist Town and Settlements							86 3	0 0		10 0	0 0		0
		Sutuang	Imp	- Concreting Road (W 10 m, salvacion 1 km, 500 m each)				60 0		Province/			Municipality/	
		Salvacion	Imp	- Sidewalk (salvacion 1 km)				6 8		DPWH			Barangay	
		San Rafael	Imp	- Street Lighting				18 0		Municipality				
		Old Busuanga	Imp	- Flower Trees Plantation (Street Tree)				0 5		/Barangay				
		New Busuanga	Imp	- Flower Tree Planting on front gardens of house				1 0						
	Medical Care and Health Services							52 0	0 0		9 5	0 0		64
		all Barangay	Imp/N	- Barangay Health Station				2 0		DOH	0 5		DOH	4
		Salvacion	New	- Municipal Hospital/Health Unit(Preventive Care Malaria)				30 0		DOH/Mucipal	5 0		DOH	10

Table 4-34 cont.

Area	Facilities	Location	Type Devt	Devt Components	Devt Period 2000	2005	2010	Investment/Implementation COST(P.million) Public	Private	BODY	Operation/Maintenance COST(P.million/y) Public	Private	Body	No. of Employees
REGIONAL INFRASTRUCTURE								2,601.0	20.4		118.0	12.0		118
	Road Construction							1,230.5	0.0		28.0	0.0		0
		Western Busuanga	New	- Concreting Road from Airport to Salvacion (W 12 m)				356.0		DPWH/BTDA			Province	
			Imp	- Imp./Concreting Road from Salvacion to Buluang (W 12 m)				378.0					Province	
			New	- New Road from New Busuanga to Chevy (9m)				157.5					Province	
			New	- New Road from Buluang to Bulusk Bay (W 12 m)				139.0					Municipality	
			New	- New Road from New Busuanga to Santa Rita (W 12 m)				161.0					Province	
	Port and Related Facilities							81	20		13	2		
		Municipal Port						36.2	0.0		6.0	2.0		20
		San Nicolas	New	- Passenger/Goods Vessel Wharf (Quay 100m)				26.0		DOTC/			Municipality	5
				- Terminal Build. (Ticket Office/Waiting Room)				10.2		Municipality				15
		Fishery Complex						44.4	20.4		7.0			50
		San Nicolas	New	- Mooring Facilities (Quay 100m)				26.0		DOTC/			BTDC/Municipality	5
				- Disposal Ground				0.9		Municipality			Fisherman	5
				- Fish Market				15.4		/Province/			Cooperative	5
				- Ice Plant					10.2	Fisherman				10
				- Cold Storage					10.2	Cooperative				20
				- Parking Space				0.5						
				- Landscape and Buffer Areas				1.6						5
	Upgrading/Expansion of Busuanga Alt. International Airport							651.8	0.0		43.0			100
		Coron (NKR Airport)	New	- Expanding Runway				446.0		DOTC			DOTC	100
			New	- Apron				47.0						
			New	- Terminal Building				129.6						
			New	- Hangar (for Private Airplane)				20.2						
			New	- Car Parking				9.0						
	Water Resource Dev't/Water Supply Main Pipeline							75.4	0.0		3.0			4
		Pasadena	New	- WRD on the Lagoon of Nagugangot River				75.4		DPWH			BTDC/Municipality	2
			New	- M. Pipeline to Salvacion				0.0		Province/				
		Old Busanga	New	- M. Pipeline to Old Busanga/San Rafeal				0.0		BTDA				
		New Busanga	New	- WRD on the Waterfall of Chinabayan River				0.0						2
		New Busanga	New	- M. Pipeline to New Busanga				0.0						
		New Busanga	New	- M. Pipeline to Inland Nature Park/Marine Complex Area				0.0						
		Buluang	New	- M. pipeline from WRD to Buluang/West Coast Resort				0.0						
	Power Supply Network							321.0	0.0		49.0			0
		Coron/Buluang	Imp.	- Upgrading of main power supply network				217.0		NAPOCOR			NAPOCOR	
		Buluang	New	- Expansion of Power Line from Buluang to Bulusk Bay				91.0						
		Coron	Exp.	- (Expansion of power generation plant)				13.0						
	Telecommunication Network							150.0	0.0			19.0		4
		Sagrada	New	- Relay Tower(station)-1 Microwave Tower of Trunk Line				150.0		Private			Private	4
	Waste Disposal							91.6	0.0		12.0			8
		New Busuanga	New	- New Sanitary Landfill Area				86.6		DPWH/BTDA			BTDC/Municipality	2
		Salvacion	New	- Waste Disposal Station(Car Parking/Washing/Office)				5.0		Province/BTDA				6
	Total's - Western Busuanga							3,561.8	3,206.2		319.5	467.9		4,137

Source: Study Team

4.6 Feasibility of the Proposed Development

1) Economic Aspect

The proposed development has been evaluated similarly to the Master Plan, and a significant EIRR of 23% from the national economic viewpoint is expected. However, as to the economic impact on the local economy at the provincial/municipal level, this depends on how the local economic system will be integrated with the proposed development.

It is indicated from the analysis that government should start working to help the regional/local supply of human resources, materials and services match the demand adequately.

2) Financial Aspect

The proposed development, which will produce a total of 92 ha of building sites with complete infrastructure, includes the costs for regional infrastructure, tourism facilities, environmental management, and tourism area development, excluding hotel/accommodations and other commercial facilities. When all the development costs are charged to the building sites, it will cost P7,200 per sq. m. On the other hand, when a half of the regional infrastructure is shared with industry outside of the tourism sector, it will cost P6,000 per sq.m.

With the level of infrastructure provided in the development, it is likely that resort operators will be able to absorb the level of costs.

An important financial aspect is that environmental fees/contributions to be collected from the tourists in this case study area should be brought to the area where environmental restoration/conservation needs are significant, because the Busuanga area with relatively superior environment requiring less restoration cost should cross-subsidize other unfavorable areas.

3) Social Aspect

In the proposed development plan, tourism developments are not isolated from existing settlements but rather are integrated to expect mutual benefits such as shared infrastructure/services and exchange of needed resources. Workers can commute easily without developing separate settlements. Various tourism facilities based on local environmental/cultural resources may provide opportunities for local communities as well as ICCs to participate in the developments.

4) Environmental Aspect

Proposed developments have been assessed by area/facility from environmental viewpoints (refer to Table 4-35). The results indicate that positive impacts are expected. Negative impacts, if any, are negligible. However, a number of project components such as roads, port and marine sports complex at San Nicolas, waste disposal facility, etc. should be carefully assessed with particular regard to the ecology in the area.

In order to ensure that the proposed developments do not adversely affect the environment, a number of mitigation measures for relevant areas and aspects will be implemented (refer to Table4-36).

5) Development and Management Aspects

In order to assure the sustainability of the development, a number of conditions will have to be met. First, the benefits that are received should arise from the development and not from land transactions. Second, the benefits should be equitably distributed among stakeholders according to their contributions or

their contributions or responsibilities, and at the same time, equally shoulder the costs as well. If this process is maintained over the years, the development areas will be adequately managed.

The conventional way that private developers construct resorts of different sizes and quality even with development permission, including EIA from the government, may not work effectively in a way that a sustainable tourism concept is assured. Developments may not take place as planned even with an effective ECAN zoning. More concrete measures are necessary with particular regard to effective control over lands and developments both on physical and management aspects.

In order to ensure the physical quality not only of the direct project site but also to have the development shoulder an adequate share of the external infrastructure and environmental conservation costs from which the development will be benefited, at the least, the following measures are needed: statutory land use plan (e.g. effective ECAN Zoning), strict development permit system including EIA based on workable guidelines, and enforcement charges.

Even after individual resorts have been constructed initially according to the set standards, the collective resorts may not function as an integrated resort complex nor sustain the quality as a whole. Therefore, it is considered that a single development organization to manage the development needs to be established.

The development organization acts as the implementing body of the developments to undertake activities such as acquiring/consolidating lands, developing common infrastructures, preparing development sites which then will be sold or leased to private developers, approving development and management plans of the private sector, managing common space and infrastructures based on collection of association dues and so on. A critical area is how to control lands wherein if acquisition is difficult, the concept of land readjustment may be applied.

Table 4-35 Assessment of Possible Environmental Impacts of Proposed Development

Environmental Element / Project Component	Physical & Chemical Effects					Ecological Effects			Aesthetic Effects					Socioeconomic Effects						
	Water	Groundwater	Air Characteristics	Wind	Inversion	Vegetation	Terrestrial Wildlife	Aquatic Species & Habitats	Land	Atmosphere	Water	Flora & Fauna	Man-Made Objects	Demography	Manpower	Transportation	Housing and Community Infrastructure	Education, Health & Social Services	Lifestyle of Communities	Indigenous Cultural Communities
1. CALAUIT SAFARI PARK/ ENVIRONMENT TRAINING CENTER																				
1) Calauit Safari Park	C-	C-	-	-	-	B-	-	C-	-	-	-	-	-	-	B+	B+	-	-	-	-
2) Calauit Environmental Training / Seminar Center	C-	-	-	-	-	C-	-	A+	-	-	-	-	-	-	B+	-	-	A+	-	-
3) Sewage Treatment	B+	-	C-	-	-	C-	-	B-	-	-	C-	-	-	-	-	-	-	-	-	-
2. WEST COAST RESORT																				
1) Bulwang Beach Resort	C-	-	-	-	-	C-	-	C-	C-	-	-	-	-	B+	B+	-	-	-	B+	-
2) West Coast Amenity Center	C-	-	-	-	-	-	-	B-	-	-	B-	-	-	-	C+	-	-	-	B-	-
3) Sewage Treatment	B+	-	C-	-	-	-	-	C+	-	-	-	-	-	-	-	-	-	C+	-	-
3. NEW BUSUANGA INLAND NATURE PARK																				
1) New Busuanga Inland Nature Park	C-	-	-	-	-	-	-	-	-	-	-	-	-	B+	B+	-	-	-	-	-
2) Orchard Street	C-	-	-	-	-	-	-	-	-	-	-	-	-	-	C+	-	-	-	-	-
3) Observatory/Resting Place/ Picnic Park	-	-	-	-	-	-	-	-	-	-	-	-	-	C+	C+	-	-	-	-	-
4) Sewage Treatment	B+	-	C-	-	-	-	-	C+	-	-	-	-	-	-	-	-	-	-	-	-
4. SAN NICOLAS MARINE COMPLEX																				
1) San Nicolas Marine Sports Complex	C-	-	-	-	-	C-	C-	B-	C-	-	B-	B-	-	-	A+	B+	-	-	-	-
2) San Nicolas Port	C-	-	-	-	-	C-	-	B-	-	-	B-	B-	-	-	C+	A+	A+	-	-	-
3) San Nicolas Aquarium	C-	-	-	-	-	C-	-	C-	-	-	-	-	-	-	C+	-	-	B+	-	-
4) San Nicolas Fishery Complex	C-	-	-	-	-	-	-	C-	C-	-	-	-	-	-	B+	B+	A+	-	-	-
5) Santa Rita Fisherman's Wharf	B-	-	-	-	-	C-	-	C-	-	-	-	-	-	-	-	-	-	-	-	-
5) Sewage Treatment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C+	-	-
5. SOUTH COAST RESORT																				
1) Resort and Accommodation	B-	-	-	-	-	-	-	-	C-	-	-	C-	-	-	B+	-	-	-	B+	-
2) Inland Sports Club	C-	-	-	-	-	C-	-	-	B-	-	-	C-	-	-	B+	-	-	-	-	-
3) San Rafael Amenity Core and Seaside Flower Mall	B-	-	-	-	-	-	-	C-	C-	-	B-	-	-	-	B+	-	-	-	-	-
4) Calamian Handicraft Center	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B+	B+
5) Buffer Area/Other Facilities	A+	-	-	-	-	A+	B+	B+	B+	-	C-	B+	-	-	-	-	B+	C+	-	-
6. TOURISM SUPPORTING FACILITIES																				
1) Tourist Center	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2) Information Center	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. IMPROVEMENT AND UPGRADING OF LOCAL COMMUNITIES																				
1) Beautification of Tourist Town and Settlements	-	-	-	-	-	-	-	-	-	-	-	A+	A+	-	B+	B+	A+	-	B+	-
2) Medical Care/Health Facility	-	-	-	-	-	-	-	-	-	-	-	-	-	C+	-	-	-	A+	A+	-
8. TOURISM INFRASTRUCTURE																				
1) Road Construction	-	-	-	-	-	B-	B-	-	B-	-	B+	B-	-	-	A+	A+	-	-	B+	-
2) Upgrading/Expansion of Busuanga Alt. International Airport	-	-	-	-	-	C-	-	-	C-	-	-	-	-	C+	C+	B+	-	-	-	-
3) Water Resource Dev't/Water Supply Main Pipeline	B+	-	-	-	-	-	-	B-	C-	-	B-	C-	-	-	B+	-	A+	A+	A+	-
4) Power Supply Network	-	-	C-	-	-	-	-	-	B-	-	-		-	-	C+	C+	A+	A+	A+	-
5) Telecommunication Network	-	-	-	-	-	-	-	-	B-	-	-	C-	-	-	C+	C+	A+	A+	A+	-
6) Waste Disposal	B+	C+	-	-	-	B-	B-	-	B-	-	-	B-	-	-	-	-	A+	A+	-	-

Source: Study Team

A+: Significant Positive Impact
B+: Moderately Positive Impact
C+: Negligible Positive Impact
A-: Significant Negative Impact
B-: Moderately Negative Impact
C-: Negligible Negative Impact

Table 4-36 Environmental Mitigation Measures in Busuanga West Case Study Area

Parameter	Baseline Conditions	Probable Negative Impact without Mitigation Measures	Mitigation Measures
Water quality	- Water quality is relatively conserved. - There are coral reefs, seagrass. - There are habitats of Dugong, sea turtles - Water pollution sources are limited.	- Generating waste water, such as sewage will cause water pollution. - Discharged soil into the sea will cause water pollution	- Closed sewage treatment system is required (waste water will be treated, and treated waste water is used as irrigation water.)
Water demand	- Water consumption will increase.	- water supply for communities will be lacked.	- Water resources development is required. - Water is recycled after use for saving.
Odor	- Population density is relatively low	- Generating odor from sewage treatment facility will cause deterioration of living environment.	- Sewage treatment facility is constructed far from communities and accommodation facility. - Sewage treatment facility is surrounded with wall and plant.
Vegetation and Terrestrial Wildlife	- Forest area has been decreased.	- Decreasing forest cause decreasing habitat for terrestrial wildlife.	- Arrangement of facilities are considered for minimizing lose of forest. - Alternative forest is established as substitute for lost forest. - Reforestation is promoted.
Aquatic habitat	- Coral reefs are distributed. There are relatively conserved coral reefs. - Coral reefs has been deteriorated by siltation. - There are Dugong habitats and sea turtle nesting sites.	- Discharged soil into the sea will cause extinction of coral and other aquatic habitats. - Generating waste water, such as sewage will cause deterioration of coral reefs, seagrass beds and wildlife habitats.	- Measurement of soil erosion is presented in "Soil Erosion" - Closed sewage treatment system is required (waste water will be treated, and treated waste water is used as irrigation water.)
Soil erosion	- In appropriate infrastructure causes soil erosion in Northern Palawan. - There are bare lands by slash-and-burn and cutting trees.	- Soil erosion causes deterioration of terrestrial environment such as forest, wildlife habitats and landscape. - Soil erosion causes deterioration of marine environment especially coral reef.	- Steep slope area is not developed. - Construction methods are adopted for minimizing soil erosion. - Slope protection is carried out. - In rainy season, slope area is not constructed, or measurement of soil erosion is done.
Beach erosion and Sedimentation	- Potential shoreline of beach erosion and sedimentation has never found in around project sites. However, occurrence of them is unknown.	- Beach erosion causes decreasing sandy beach, and collapsed structures. - Sedimentation causes river-mouth clogging.	- Structure design is considered for currents and drift sand.

Source: Study Team