

Appendix - A

Case Study of the Spatial Use Planning

Appendix 1

Case Study of the Spatial Use Planning

A.1.1 Purpose of the Study

The JICA's management plan aims to provide policy to regulate the uses of the coastal resources and spaces especially from the natural environmental conservation point of view, and does aims to define "How to use the coastal areas", form the coastal development point of view. The coastal development and use policy planning should be based on more comprehensive studies including development policies and demands of various socio-economic and infrastructure sectors and also detail studies of technical and economic and financial aspects.

However, during the course of the discussions with the members of the Local Steering Committee and the Sub-steering Committees in the North Sulawesi, they realized that the coastal use plan is really important and urgent tool for the development and control of the coastal areas and they requested to the JICA Study Team to prepare an example of "How to formulate a coastal use plan". The JICA Study Team agreed to prepare some reference materials for the formulation of the coastal use plans, which are going to prepare by the government agencies concerned at the Provincial and Municipality/Regency.

The materials consist of the general planning process and criteria, and for the easy understanding of the users of the materials, we prepare a preliminary study for the formulation of spatial use plan in a selected area as an example to apply the planning process and criteria. Although the information, required for the formulation of the spatial use plan is lacking, we hope that the results of the case study will help the planners for the formulation of the spatial use plans.

A.1.2 What is the Spatial Use Plan for the Coastal Areas?

(1) Background

According to the Degree of Home Affair Minister No. 19 in 1996, the Local Governments have to clearly specify the policy of use and development of the areas not only of the terrestrial but also water areas and to show the spatial use patterns in their RTRW. However, the policy on the use of the water area and even the coastal land area do not provide in the RTRW of the North Sulawesi Province and also RTRWs of Manado, Bitung, Minahasa and Bolaang Mongondow. This fact creates a serious problem on the management of the coastal areas. Because if they have no spatial use plan on the coastal area, they have no basis for the evaluation of the applications of the building and business permissions on the coastal area. In reality, the evaluations are made not based on the spatial planning and as a consequence, unfavorable coastal development and use can be seen in some areas, such as seafood restaurants in Kalasey and tourist piers in Pineleng. The Spatial Use Plan is really important and necessary tool

(2) Objectives of the Spatial Plan

Based upon the forecast of the future goals of the coastal areas, to promote the socio-economic activities effectively and functionally and to create favorable coastal environment for the human and natural environment, rational spatial use and development patterns should be realized by defining of land and water areas into type of protection and utilization.

For this purpose, the Spatial Use Plan should be formulated to show the areas or zones divided by type of protection and utilization, and to regulate and promote the spatial use and development of the coastal areas both land and water areas, through implementation of the approvals on building and business permissions, in addition to the implementation of AMDAL

The coastal spatial use plan covers the areas of;

- a) Terrestrial area 200 meter from the high-high water shoreline, which covers the area for coastal buffer zone and adjacent hinterlands.
- b) Sea water area 12 miles from the high-high water shoreline in general and 4 miles in specific, because the spatial use and human activities, such as mariculture, tourism, sea transportation are concentrate and also coral and other sensitive marine lives are habitat in the inshore.

Needless to say that the terrestrial area is also subject to the existing RTRW, so that the coordination and integration of the spatial use policy between RTRW and the coastal spatial use plan must be made.

(3) Coastal Spatial Use Items

The coastal spatial use plan has to show the protection and utilization policies on the areas, same as the land use plan in RTRW. The basic items of the spatial use plan are composed by the following categories;

- a) Category-1: Protection categories including natural preservation, cultural preservation and natural disaster risk areas, which are the items of the National Protection Area system, provided by the Presidential Degree No. 32, 199 regarding the Protection Areas. The protection areas on the sea water are not defined yet due to the lack of information and attentions, The management zoning maps prepared by the JICA Study Team provides the important basis for the determination of the protection areas in the sea waters.
- c) Category-2: Utilization categories including port and other coastal development areas, settlement, fishery, tourism, agriculture, plantation, forestry, etc. The items in this category are almost same as the items of the land use plan in RTRW, but the coastal spatial use plan covers not only the terrestrial, but also water areas, such as seawater areas for mariculture and tourism uses.

Table A.1 shows the basic items for the spatial use plan.

The spatial use plan is also required to describe the supplementary information which are supporting or effecting to the spatial use including;

- a) Major roads and transportation facilities, such as transportation terminal and depot, airport, seaport, railway, etc.
- b) Public and community facilities such as community assembly hall, university, hospital, markets, parks, religious facilities, final deposit site, etc.
- c) Planned development sites such as land reclamation. ports, roads, resettlement, etc.

Table A.1 Coastal Spatial Use Items

Categories	Sub-categories	Spatial Use Items	Detail Items	Zone
Protection	Natural Preservation (JICA's management zoning map provides important information	National and Regional Parks		Coastal
		Marine Protection Areas incl. Marine Sanctuary	coral reefs fish reserve	Water Water

Categories	Sub-categories	Spatial Use Items	Detail Items	Zone	
	on natural preservation in the coastal areas)	(spatial and/or seasonal)	wildlife	Coastal	
			others	Coastal	
		Protection Forest		Land	
		Protection Mangrove		Coastal	
	Cultural Preservation	Historical or Archeological Sites		Coastal	
		Indigenous or Traditional Areas		Coastal	
	Natural Disaster Risk Area (Master Plan of Coastal Area Protection in North Sulawesi, PU map provides important information on natural disaster risk in the coastal areas)	Shoreline and river mouse Protection		Coastal	
Utilization	Port and Related Facilities	National, Provincial and Local Ports, Markets, Storage, Yards, etc.	Including landing beaches, anchorage areas	Coastal	
	Coastal Development Promotion Area	Industry, Commercial, Residential, Services, etc.		Coastal	
	Coastal Development Control Area			Coastal	
	Village Settlement Areas			Land	
	Fishery	Mariculture		fixed net, pearl farming, seaweed culture and fish pond	Mainly in Water
			Floating Devices	<i>Bagan, Lumpung</i>	Water
			Zoning by type of fishing boat and gear	Based on Fishery Law No.9, 1985	Water
	Tourism	Tourism and Recreational Centers	hotels, restaurants, beach resorts, seaside and water sports, relaxation, etc.	Coastal	
	Agriculture	Intensive Agricultural Area			Land
		Extensive Agricultural Area		Limited Use	Land
	Plantation	Plantation Area			Land
	Forestry	Forestry Area			Land
		Mangrove Forestry		For production	Coastal

Source : JICA Study Team

A.1.3 Planning Process for the Formulation of Spatial Use Plan of the Coastal Areas

(1) General Planning Flow

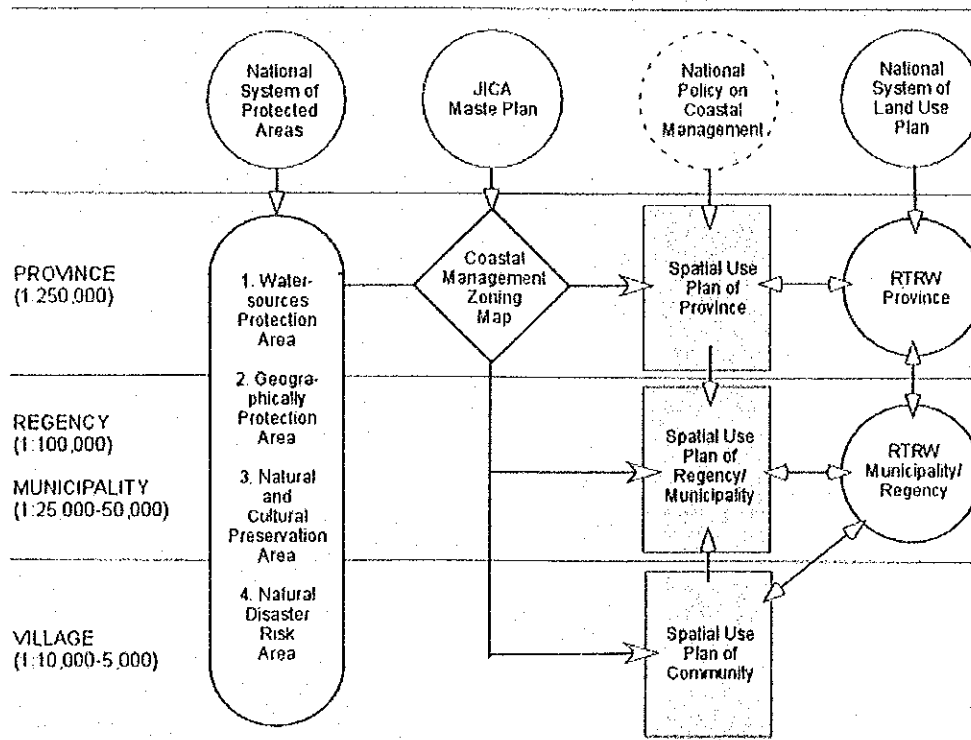
The local governments have responsibility to prepare the spatial use plans of the coastal areas in their jurisdictions. The target years and the scales of the map for the spatial use plans of the coastal areas at the different levels are as follows similar to RTRW, shown in Table A.2;

Table A.2 Target Year and Scale of the Map of RTRW

	Target Year	Scale of the Map
Province	15 years	1 : 50,000
Regency	10 years	1 : 100,000
Municipality	10 years	1 : 25,000 – 50,000
Village	10 years	1 : 5,000 – 10,000

Source : JICA Study Team

Figure A.1 shows the general planning flow for the formulation of spatial use plan of the coastal areas at the three government levels, provincial, Kota/Kabupaten and Desa levels..



Source : JICA Study Team

Figure A.1 General Planning Flow

The major points to be discussed and required coordination among the three levels of the spatial plans are the followings;

a) Between the Provincial and the Regency/Municipality

The major points, requiring discussions and close coordination between the Provincial and Regency/Municipality are 1) the development project sites and spatial use of the particular areas, which are important for the region and national wide, such as large-scale coastal urban development, regional ports, industrial estate, housing projects, etc., 2) the location and boundary of the Provincial Marine Protected Areas, which might be interests for both government levels, and 3) Marine Protection Areas such as protection areas for coral reefs, mangrove and other marine lives.

- Development and spatial use of national and regional importance
- Establishment of Regional Marine Protected Areas
- Establishment of the Other Marine Protection Areas

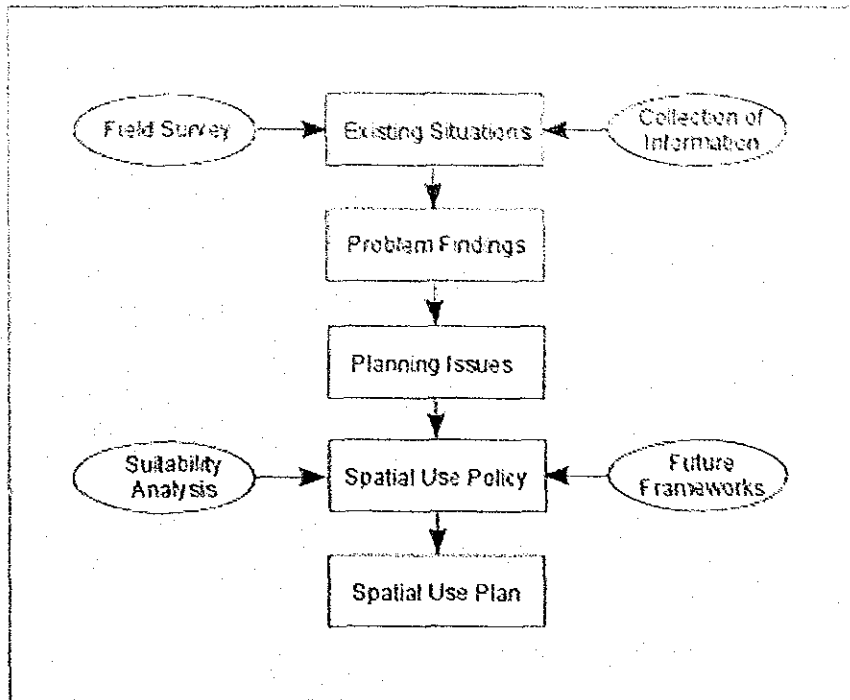
b) Between the Regency/Municipality and the Village

The major points, requiring discussions and close coordination between the Regency/Municipality and Village are 1) the development project sites and spatial use of the particular areas, which are important for the area and district wide, such as middle or small-scale coastal urban development, ports, industrial estate, housing projects, etc., 2) the boundary of the Community Seas, which might be required fair assessment and judgement in the decision making process, and 3) Marine Protection Areas such as protection areas for coral reefs, mangrove and other marine lives.

- Development and spatial use of district and area importance
- Establishment of Community Seas
- Designation of Marine Protection Areas

(2) Study Flow of the Planning

Figure A.2 shows the study flow for the formulation of spatial use plan of the coastal areas.



Source : JICA Study Team

Figure A.2 Study Flowchart

A.1.4 Descriptions of the Study Components

(1) Existing Situations

Table A.3 shows the basic data and information required for the formulation of spatial use plan at the Provincial, Municipal/Regent and Village levels. The major categories of the data and information are as follows;

a) Socio-economy

The present situations of the population, households, age/sex structure, religious, socio-culture, original places, languages in the demographic area and employment structure, work places, number of establishments, areas of agriculture, irrigation and plantation areas along the shorelines, household income and expenditure, financial situations of the relevant government agencies, etc. in the economic sector are basically required information. In addition to the above, more specific and detail data and information will be required in the following economic sectors;

- Fishery
- Tourism

b) Natural environment

The situations of shoreline forms, seabed, coral reefs, coastal plants, estuaries, wildlife, general and marine climate, topography, soil, environmental pollution, soil and beach erosions, etc. are basically required information.

c) Spatial use of land and sea water areas

The situations of the land use, including detail land use in town/village, agricultural and forestry land use and land tenure in the terrestrial areas, and fishery, mariculture, tourism, recreation, sea transportation, etc in the water areas are basically required information. The information of the protection areas, such as protected forests, mangroves, National Parks, marine preservation areas, etc., and planned development areas also important.

d) Buildings and infrastructures

The situations of the houses and other buildings, water supply, sanitary, garbage, electricity, energy, communication, transportation, roads, ports, markets, facilities of education, medical, recreation, etc. are basically required information.

Table A.3(1) Basic Data Necessary for the Formulation of the Coastal Spatial Plan:
Socio-economy

1. Socio-economy				
Category	Information	Detail	JICA	Sources
Demography	Total population		●	BPS, Kantor
	Increase rate	Census '80, '90, 2000	●	
	Natural and social increases			
	Distribution			
	Households		○	
	Age / sex		○	
	Religious		○	
Economy	Employment by sectors			BPS, Kantor, Residents
	Work places by sectors			
	Establishments by sectors			
	Agricultural areas	By crops, products, yields		
	Irrigation areas	By type of irrigation		
	Products by sectors/enterprises			
	Income and expenditure			
Fishery	Fishermen by type of employment		○	Fishery Office, Bappeda, Kantor, Residents, Site check
	Production of fishes by types			
	Boats by types			
	Fishing gears by types			
	Fishing grounds		○	
	Existing aquaculture			

1. Socio-economy				
Category	Information	Detail	JICA	Sources
	Any constraints and potentials on coastal use and development for fishery			
	Submissions of the development proposals on fishery			
	Seasonal activities			
	Activities on the reef flat areas			
	Activities on the beaches and shorelines			
	Any regulations on coastal use (including traditional customs)			
	Dynamite and toxic fishing			
	Illegal activities of cutting mangrove			
	Illegal activities of coral mining			
	Fishermen's organization			
	Market facilities and flow			
	Processing industry			
	Any charge on products			
	Additional works instead of fishery			
Daily life and lifestyle of fishermen				
Tourism	Tourist service facilities by type of operations	Hotel, Melati, Dive shop, Restaurants, Travel agents, etc.	○	Tourist Office, Bappeda, Kantor, Tourism operators, Boatmen, Residents, Site check
	Survey on operations	No. of guests, size of facilities, occupancy rate, seasonability, etc.	○	
	Tourist areas and attractions	Dive site, beach, scenic beauty, mangrove, etc.	○	
	Tourist boats by sizes			
	No. of tourists / divers			
	Tourism associations			
	Any regulations on coastal use			
Finance	Revenues and expenditures			Financial Office
	Budget for development projects			
	Taxes and charges			

Notes: *1) Master Plan of Coastal Area Protection in North Sulawesi 1997/98, Ministry of Public Works, SECON.

● Available, and ○ Partially available at JICA Information System.

Kantor means the Governmental Offices of the Village.

Table A.3(2) Basic Data Necessary for the Formulation of the Coastal Spatial Plan: Natural Environment

2. Natural Environment				
Category	Information	Detail	JICA	Sources
Natural	Climate	Temperature, wind	○	Meteorological Office, Residents

2. Natural Environment				
Category	Information	Detail	JICA	Sources
	Topography		○	Bakosurtanal, BPN
	Geology		○	
	Soil		○	Center for Soil and Agro-Climate Research
	Vegetation		○	Forestry and Estate Crop Office
	Hydrology		○	Bangda
Marine Climate	Tide		○	Meteorological Office
	Waves		○	
	Current		○	
	Drifling sand			
Shoreline	Shoreline forms	Rocky, White/Black Sand, Mud, Artificial structure	●	Site check
	Beach erosion		●	Water Master Plan *1), Residents, Site check
	Abrasion	on the rocks, beach walls/protectors		Bangda, Residents, Site check
	Shoreline protection works	T-groin, Seawall		Bangda
Seabed	Contour	Depth of water		Bakosurtanal
	Texture		●	Site check
Coral Reefs	By conditions	Excellent, good, fair, poor	●	Aerial photo, Site check
	JICA Management Zoning	Preservation, conservation, rehabilitation	●	JICA
Coastal Plants	Mangrove/Nippa		●	Aerial photo, Site check
	JICA Management Zoning	Preservation, conservation, rehabilitation	●	JICA
	Seagrass		●	JICA
	Algae		●	JICA
	Other plants such as swamp, marsh, etc.		○	
Wildlife	Habitats		○	
	Other activities areas		○	
River and Estuary	Current			Bangda, Bapedalda, Kantor, Residents, Aerial photos, Site check
	Velocity			
	Flow rate			
	Sedimentation			
	Flood			
	Solid waste and contamination			
	Water quality			
	River improvement works			
Soil Erosion of the Hinterland	Land use conditions of the areas along the rivers			Forestry and Estate Crop Office, Kantor, Residents, Site check
	Eroded areas			
	JICA Watershed Management Zoning	Preservation, conservation, rehabilitation	●	
	Soil protection works and programs			
Environmental	Water quality	Seawater		

2. Natural Environment				
Category	Information	Detail	JICA	Sources
Pollution and Disasters	Subsidence			Bapedalda, Kantor and Residents
	Bad smell			
	Fire			
	Landslide and landslip			
	Dangerous			
	Emergency			

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Table A.3(3) Basic Data Necessary for the Formulation of the Coastal Spatial Plan: Spatial Use of Land and Seawater Areas

3. Spatial Use of Land and Seawater Areas				
Category	Information	Detail	JICA	Sources
Land Use	Existing land use pattern	Residential, commercial, industrial, public facilities, religious facilities, open space, agricultural dry and wet lands, natural forest, Alang alang, etc.	●	BPN, Aerial Photo, Residents, Site check
	Evolution of urban / village areas			Kantor, Bappeda
	Recent and on-going development areas		○	Bappeda
	Suitable and possible sites for future development			Bappeda, Kapet, Kantor, Residents
Land Tenure	Land ownership			Kantor, BPN, Residents
	Land price			
Water Use	Fishery and aquaculture	Existing, potential, plan of fishing grounds, pearl and seaweed cultures and fish & shrimp ponds	○	Fishery Office, Fishermen
	Tourism and recreation	Existing, potential, plan	○	Tourism Office, Private Tourism Sectors
	Navigation routes	Existing, plan		Sea Transportation Office, Boatmen
	Security	Existing, plan		Defense Office
Situations of Stakeholders	Port users, Shipping agents, Maritime agents, Port workers, Fishermen, Fish farmers, Communities, Tourism operators, Related governmental offices, etc.			Agents, persons concerned
Protection Areas	Water-sources protection area	(may not exist in the coastal areas)		Presidential Degree No. 32/1990
	Geographical buffer zone	Coastal Buffer Zone		
		River Buffer Zone		
		Lake and Dam Buffer Zone		

3. Spatial Use of Land and Seawater Areas				
Category	Information	Detail	JICA	Sources
	Natural and cultural preservation areas	Water Spring Buffer Zone		
		Natural Preservation Area	○	
		Marine and Other Water Preservation Areas including coral reefs, wetland, lagoon and other important marine ecology	○	
		Mangrove Area	●	
		National Park, Forest Park, Natural Recreational Park	●	
		Cultural Preservation Area		
	Natural disaster protection areas	Shoreline Protection	○	
		Landslide Protection		
		Flood Protection		
		Earthquake		
Other Spatial Uses and Development Regulations	Agriculture			Agriculture Office, Kantor, Farmers
	Fishery			Fishery Office, Kantor, Farmers
	Forestry			Forestry and Estate Crop, Kantor, Private forestry sector
	Adat system on spatial use			Kantor, Residents
	Other special sites			Kantor, Residents
Future Indicators	Population			Bappeda, BPS
	Economy by sectors			
	Water balance			
	Land use			
	Traffic volume			
	Pollution loads			
	Environmental standards			
	Development targets			

Notes: *1) Master Plan of Coastal Area Protection in North Sulawesi 1997/98, Ministry of Public Works, SECON.

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Table A.3(4) Basic Data Necessary for the Formulation of the Coastal Spatial Plan: Buildings and Infrastructure

4. Buildings and Infrastructure				
Category	Information	Detail	JICA	Sources
Buildings and Utilities	Total number of houses and other buildings	Commercial, services, industrial, public facilities, etc.		BPS, Kantor, Residents
	By structures	Permanent, semi-permanent, temporary		BPS, Kantor, Residents
	Illegal or dangerous buildings	Especially in the coastal buffer zone		Kantor, Residents

4. Buildings and Infrastructure				
Category	Information	Detail	JICA	Sources
	Disqualified or inappropriate buildings	Especially in the coastal buffer zone		Kantor, Residents
	Water supply system	Quantity and quality		Water supply company, Kantor, Residents
	Sanitary system	Septic tank with coral rocks, discharge into sea water		Kantor, Residents
	Garbage	Especially in the coastal zone both land and water areas		Kantor, Residents
	Electricity			Electricity company, Kantor, Residents
	Energy	Use of mangrove		Kantor, Residents
	Communication			Communication company, Kantor, Residents
	Transportation	Vehicles, boats and other means, and public transport, traffic volumes, traffic accidents, etc.		Transportation operators, Residents
Public Facilities and Infrastructures	Roads	Type and conditions		Bangda, Residents
	Railways			Railway Office
	Parking area			Kantor, Residents
	Ports	Type and size, management body, cleaning of the port area		Port Administration Office
	Parks and gardens			Kantor, Residents
	Markets			
	Slaughterhouse			
	Education and culture			
	Medical and welfare			
Sports and recreation				

Notes: *1) Master Plan of Coastal Area Protection in North Sulawesi 1997/98, Ministry of Public Works, SECON.

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(2) Problem Findings

The followings will be useful for the general checklists of the problem findings

- a) Are there buildings (houses, factories, markets, etc.) or human activities areas (agricultural farm, plantation, etc.) in the coastal land areas within 100 meter from the shorelines? Do those buildings and activities make any conflict with other important activities? Do they cause any environmental pollution to the adjacent coastal areas? Do they expose to the risks of natural disaster? Do they take any preventive or counter measures on these problems?

- d) Are there sites of mariculture, such as pearl culture farming, fish, shrimp, seaweed farming, etc. in the water areas? Do they make (and possibly) any conflicts with the other activities, such as transportation, tourism, etc.? Do they cause (and possibly) any environmental pollution to the adjacent areas? Do they expose to the risks of natural disaster? Do they take any preventive or counter measures on these problems?
- e) Are they use *bagan* and/or *Impung* in the water areas? Do they make (and possibly) any conflicts with the other activities, such as transportation, tourism, etc.? Do they cause (and possibly) any environmental pollution to the adjacent areas? Do they expose to the risks of natural disaster? Do they take any preventive or counter measures on these problems?
- f) Are there the protection areas, which have been delineated, according to the Presidential Degree No. 32, 1999, such as mangrove forests, marine preservation areas, etc.? Do the areas protect appropriately? Do they know the means and boundaries of protection areas? Do they still cut and sell mangrove trees? Do they take any preventive or counter measures on these problems?
- g) Are the corals and coral fishes decreases in qualitative and quantitative? What will be the reasons to decrease? Do they still mine and sell live and dead corals? Do they take any preventive or counter measures on these problems?
- h) Is there problem on over-fishing in particular grounds? Is there problem on conflicting of fishing activities? Do they take any preventive or counter measures on these problems?
- i) Are there any activities other than fishing, transportation and tourism, such as mining of sands, rocks, silver, oils, gas, etc. in the seawater areas? Do they make (and possibly) any conflicts with the other activities, such as fishing, transportation, tourism, etc.? Do they cause (and possibly) any environmental pollution to the adjacent areas? Do they take any preventive or counter measures on these problems?
- j) Are there seawater pollution by the sewage water from households, markets, factories, etc.? Where are the places of sources? Do they take any preventive or counter measures on this problem?

- k) Are there garbage scattered in the shoreline areas and in the seawaters? Are there plastic bags or other garbage covering up the coral reefs? Where are the places of source? Do they take any preventive or counter measures on this problem?
- l) Do you consider the seascape becomes worse? What are the reasons? Do they take any preventive or counter measures on this problem?
- m) Are there sedimentation of soil on the reef flats? Where are the places of soil erosion? Do they take any preventive or counter measures on this problem?
- n) Are there agricultural farms, livestock raising, slaughterhouse and plantations along the shorelines? Do they use chemicals such as pesticide and/or fertilizers? Do they cause (and possibly) any environmental pollution to the sea water quality? Do they take any preventive or counter measures on these problems?
- o) Are there gold and other mining activities in the watershed? Do they cause (and possibly) any environmental pollution to the sea water quality? Do they take any preventive or counter measures on this problem?
- p) Are there soil sedimentation in the reef flats by the roads and other buildings along the shorelines? Do they take any preventive or counter measures on this problem?
- q) Are there wildlife habitats in the coastal areas? Do they have any changes in the recent years, such as decrease in number of jugon jugon or shifting the places of the laying eggs of seaturtle? What are the major reasons of those changes? Do they take any preventive or counter measures on these problems?

3) Planning Issues

The followings will be useful for the general checklists for the identification of the planning issues

- a) Institutional and organizational review and arrangement will be necessary to clarify the responsibilities of the government agencies concerned for the coastal management

- b) Zoning and regulations on spatial use and development will be necessary to avoid the spatial conflicts and control the coastal activities and development
- c) The development potentiality analysis will be required for the spatial use planning
- d) Enlightenment and education for the people to stop destructive fishing and coral mining will be encouraged
- e) Introduction of spatial and time limits for fishing activities will be necessary
- f) Strict regulations on the discharge of sewage water and garbage in the coastal areas will be necessary
- g) Special measurements to minimize soil erosion and inflow of soil on the reef flats will be necessary in some areas
- h) Special measurements to minimize the environmental deterioration by the inflow of chemicals from agricultural and mining activities will be necessary.
- i) Strict regulations on the human interventions to the habitats of marine wildlife and ecosystem will be necessary.

(4) Suitability Analysis

The following studies are required for the suitability analysis;

- a) Are there potential areas or not-used areas where are suitable for new settlement, public facilities, fishing port, tourism facilities, etc. along the shorelines? The suitability analysis map for settlement and by type of facilities is recommend to prepare for the analysis. The topographic conditions, structure of town and village area, accessibility to the roads and town/village centers and land tenure will be key factors in this analysis.
- b) Are there potential areas suitable for agriculture and forestry by type of products and cultivation? Preparing the suitability analysis maps for agriculture and forestry is recommend for the analysis. The topographic, soil and water conditions will be key factors in this analysis.

- c) Are there potential areas where are suitable for mariculture, such as pearl culture farming, fish, shrimp, seaweed farming, etc. in the water areas? The suitability analysis map for mariculture is recommended for the analysis. The topography and micro-marine climate conditions will be key factors in this analysis.
- d) Are there areas where are required for protection, such as coral reefs, mangrove forests, wildlife habitats, etc.? The Protection Areas prescribed in the Presidential Degree No.32, 1990 should be applied in the areas. The areas required protection especially in the coastal and seawater areas could be based on the JICA's management zoning map.

The areas defined in the above study must be prioritization, i.e. which areas are most important for each purpose of spatial use and protection.

(5) Future Frameworks

The following studies are required for the future socio-economic frameworks;

a) Population forecast

This is the basis for the assumption of the area demand for settlement and other facilities in the terrestrial area. This study will be a key for the determination of the area demand in the target years especially in the areas with large population, such as Manado and Bitung, and also in the medium and small towns, such as Amurang, Likupang, Belang, etc. The area required for the houses, public facilities and infrastructures in the future could be estimated based on the forecasted number of population.

Although the population of the most of the small villages have not much changes in the past, some villages

b) Socio-economic development framework

The leading and potential economic sectors in the coastal areas are fishing and tourism. The rough estimation for the tourism development was made for the case study as follows;

The numbers of visitors is the key indicator of the development framework of the tourism sector. The data of the number of visitors and other data is available at the BPS or Tourism Office in the Provincial Government. The estimation of the number

of visitors will be made in the provincial level first, and then assumptions of the allocation of those visitors into the specific areas will be made. The required areas for the tourism development will be estimated by the number of accommodation rooms and size of other tourist facilities. The Figure A.3 shows the study flow of the estimation of the size of the hotel accommodation and other tourist facilities by the destinations or tourist areas. The spatial use plan in the tourism development areas shall be based on this kind of estimation.

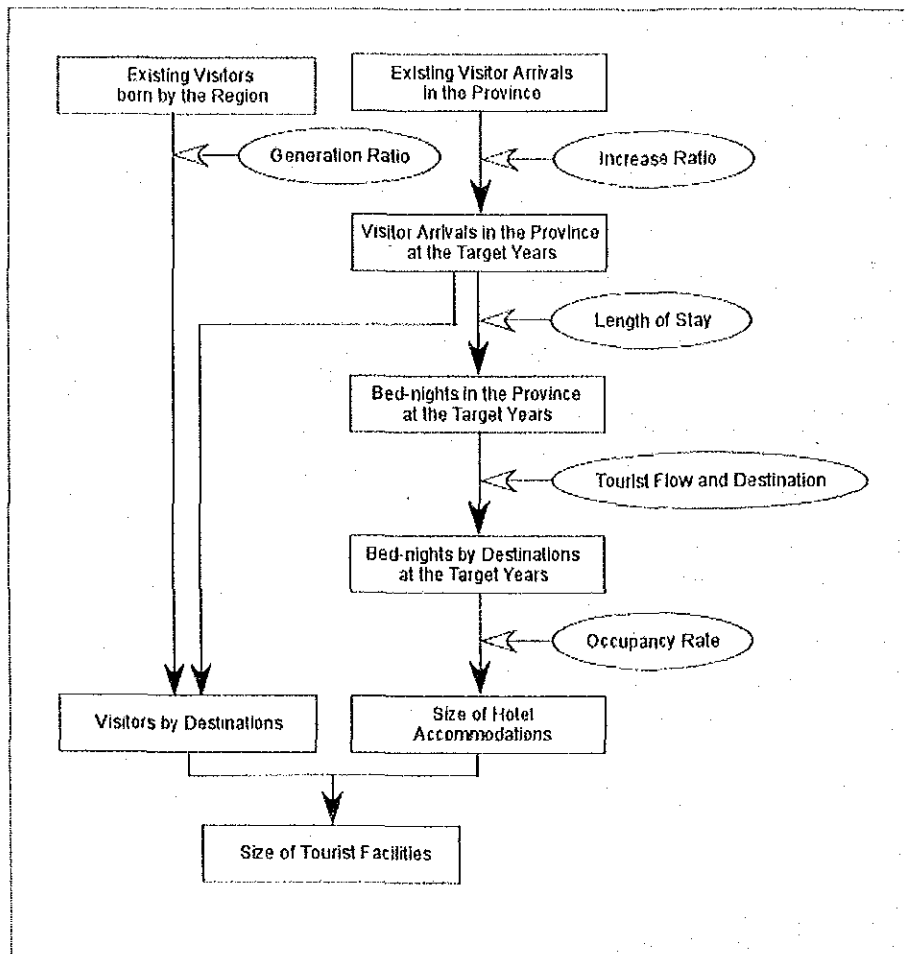


Figure A.3 Estimation of the size of hotel and other tourist facilities

(6) Policy Making for Spatial Use

The followings are the general requirements for the spatial use of the coastal areas;

The coastal and shoreline areas are very important spaces for the socio-economic activities of the coastal fishery, tourism, sea transportation, coastal urban development, commercial, industrial and settlements, but also important for the following functions;

a) Protection of Coastal Natural Environment and Ecology

The areas along the shorelines both landward and seaward are composed of beaches, rocks, mangroves, seagrasses, estuaries, lagoons, coral reefs, etc. and generally rich in natural and biological resources, and provide special habitats of reef fishes, shrimps, crabs, mollusks, and seabirds, jugs, seaturtles and other marine lives. Those areas where are rich in biodiversity should be kept from such the human interventions such as coastal urban development and fish farming activities.

b) Shoreline Protection

The high waves and tides strike the beaches sometimes during the monsoon periods, and the beaches and houses, agricultural farms in the hinterland are eroded and demolished by the high waves and tides. The areas where have been eroded and destroyed and the areas where have potential risk of beach erosion and demolition should be protected from those natural disasters. The provision of the buffer zone on the beaches and other shorelines will be one of the effective measures to prevent or mitigate the damages and shore protection works such as seawalls, groins, bulkheads and gabions are other measures to protect the shorelines from the natural disasters.

c) Provision of the Public Spaces

The public demands to use of and access to the coastal areas are very high. The areas along the shorelines are important spaces not only for the buffer zone and shore protection work, but also seaside roads, ports, city parks and other public infrastructure structures. The coastal areas, especially white-sand beaches are providing good spaces for recreation and relaxing for the visitors and general public. In these areas, the open access to those beaches should be provided to the public and individual occupation and private use should be avoided.

d) Maintenance and Improvement of Seascape

The maintenance and improvement of the seascape of the coastal areas are very important not only for the tourists, but also residents of the region. The beautiful scenarios along the coastal areas, including Boulevard in Manado municipality and fantastic panoramic sequences along the coastal roads in the rural areas are the tourist attractions themselves and also maintenance of those values will be a proud of

the residents of the region. The areas along the shorelines are important to maintain and improvement of seascape.

Those requirements should be taken into account in the process of the policy making of the spatial use planning.

(7) Realization of the Coastal Buffer Zone

The Presidential Degree No. 32 1990, regarding Protection Areas, prescribed the Coastal Buffer Zone as “a limited area along the shoreline, where is important to conserve the function of shoreline” and defined “ the area shall be minimum 100 m from the shoreline at high water level”. However, there are no further detailed regulations, this Zone has not yet implemented except the municipality of Manado at present. The municipality of Manado has been applied this Zone on;

- The area with 35 m from the shoreline in general,
- The area 15 m from shoreline in the zone of Boulevard (See Figure A.4), and
- The area with 40 m from the shoreline in the zone of Molas and Bunaken areas.

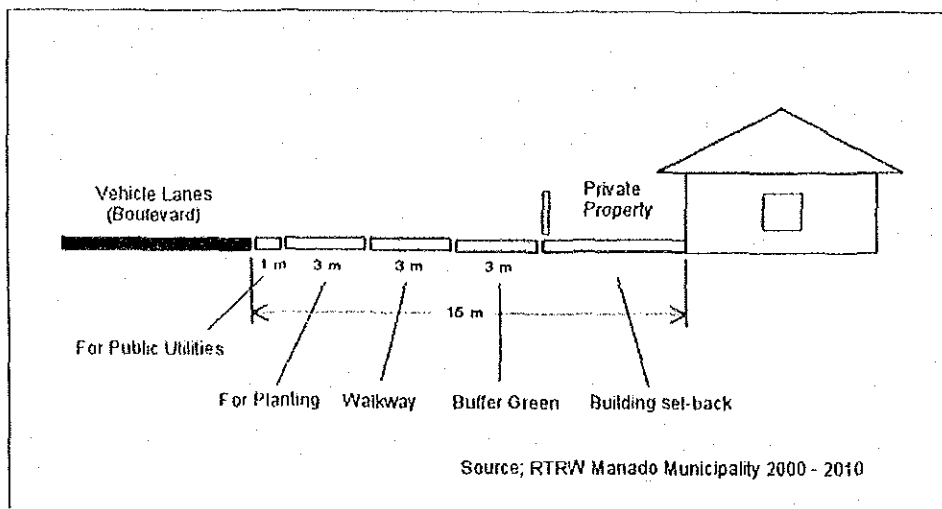


Figure A.4 Green Belt and Road Buffer Zone (Coastal Buffer Zone along the Boulevard)

These zones have been indicated in the RTRW Manado, however, the detail regulations are not stated in the plan and the management of spatial development and use seems not working at present.

There is another regulation of permission system on business and building. This regulation also works as checking of the development and spatial use activities by legal procedure.

The Coastal Buffer Zone system is essential for the spatial use management in the coastal areas together with this permission system.

The “Coastal Buffer Zone” can be defined generally as follows;

- Area for public use and/or facilities
- Area for safety avoiding disaster arise from the sea side
- Area for minimizing the human intervention to the marine ecosystems

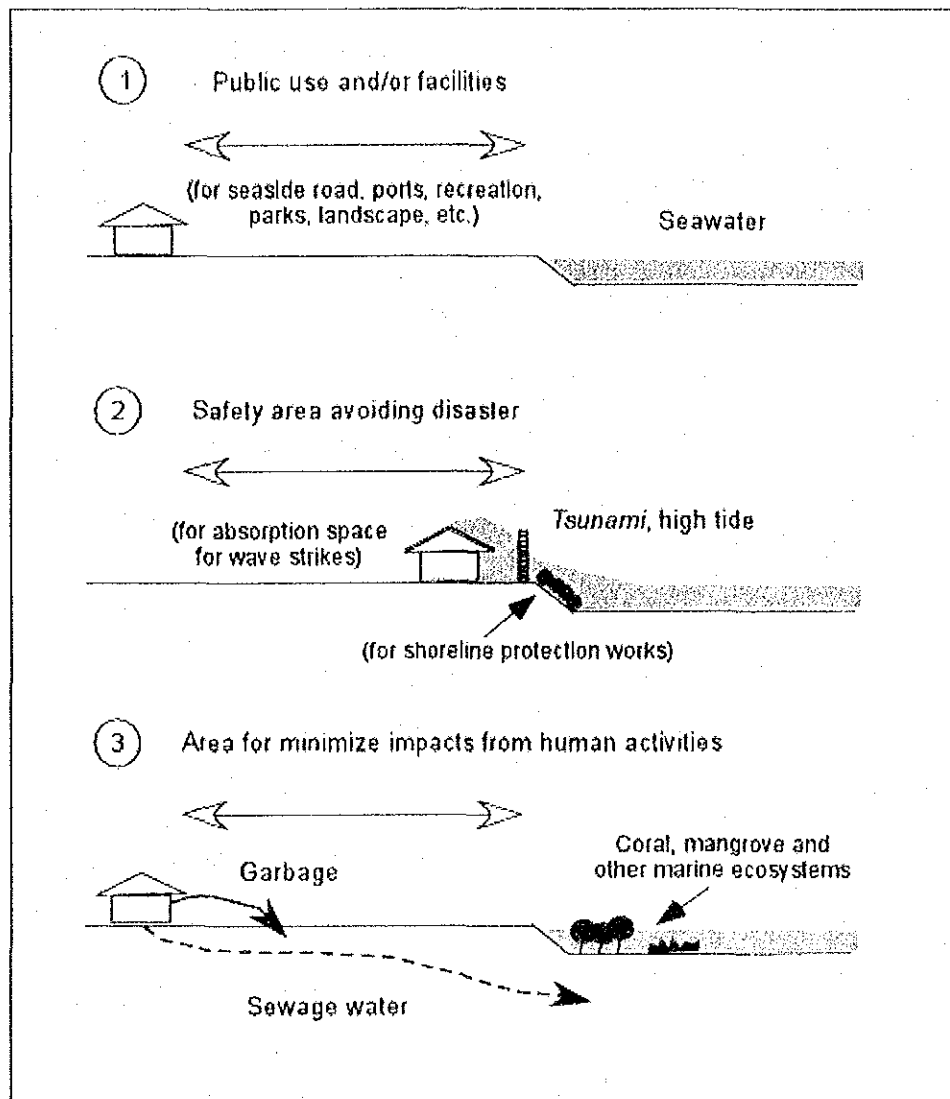


Figure A. 5 Function of Coastal Buffer Zone

The JICA Study Team proposed to apply the Coastal Buffer Zone in the Study Area as follows;

- The area with at least 100 m from the high-high seawater level in the rural areas and 30 – 100 m in the urban areas shall be delineated as the Coastal

Buffer Zone in general, except the mangrove forests which are specified as wide as $130 \times P$, where P = tidal range in the area.

- Within the zone, permanent buildings, such as housing, commercial, industry facilities are not allowed to build in general.
- The utilization of the Coastal Buffer Zone permits plants, land use which do not change the land function as shoreline protection, i.e. ordinal agricultural and plantation uses, and public facilities and use, which also do not change the land function, i.e. shore protection works, roads, parking, public recreation area, etc.
- In the rural zone, the demands to keep the buffer zone are not high in general, because there are no high demand on the public use and facilities and the economic values on the areas are less important, if comparing with that in the areas in the urban areas. The important thing is to protect the area adjacent to the sea from soil erosion and chemicals directly to the seawaters.
- The serious problems are found in the urban zone and semi-urban areas. The most of the seafront areas are already occupied by the housing and other buildings and private landowners, and it is very difficult to acquire or allocate those lands for the above spatial demands, and the seafront areas are very important for socio-economic activities, such as commercial, industry, sea transportation, fishery, tourism, etc., especially in the urban centers, such as Manado and Bitung.
- The specific criteria on the area of the Coastal Buffer Zone within the already built-up zones in the urban and semi-urban areas will be required, taking above situations into considerations. The special attentions should be paid for the realization of the Coastal Buffer Zone in the urban and semi-urban areas to the following areas;
 - The areas with high risks for the attacks of high wave and *tsunami* should be made shoreline protection works or provided enough space for absorption of the wave attacks.
 - The areas with high demands for public use or public facilities should be examined development or re-development plans, considering the strengthening of the shoreline functions and space demands.
 - The areas with high potentiality for redevelopment, such as slum clearance for commercial and tourism development, etc. also required examinations of the redevelopment plans of the areas.
 - The area in front of the vulnerable corals and other marine ecosystems, such as the preservation, conservation and rehabilitation areas for coral reefs and mangrove forests, designated by the JICA Study Team, should be strictly control the human interventions and coastal development.

A.1.5 Conceptual Layout of the Spatial Use Plan

Figure A.6 shows the conceptual layout for the spatial plan in the urban and rural areas. There are 3 categories on the spatial use item, i.e. 1) protection, 2) utilization and 3)

control and limited use. The spatial use items in the land area are mainly composed by 1) utilization and 2) control and limited use, and in the water area, 1) protection and 2) utilization.

In the urban area, the delineation of the coastal development promotion area(s) is the essential step in the spatial use planning process, and the following points should be considered;

- a) The area and location required for future coastal urban development
- b) The area in front of the seawater area, where the rich in natural environment or vulnerable eco-system are existing, should be avoided for the development promotion area. (Those areas should be identified based on the management zoning maps, prepared by the JICA Study Team)

In the rural area, the designation of the marine protection area(s) is the important step of the spatial use planning study, considering the following points;

- a) The designation of the marine protection areas should be examined based on the management zoning map, prepared by the JICA Study Team, and clarify the responsible organizations, i.e. Provincial, Municipal/Regent, Village, to designate and maintain the marine protection areas
- a) The area in front of the seawater areas, designated in the above study, should be considered as control and limited use area. For instance, the agricultural areas in front of the important seawater areas, should be limited the activities to generate soil erosion and discharge of chemicals used in the farm lands.
- b) The delineation of the boundary of the Community Sea is also important work in the rural area.

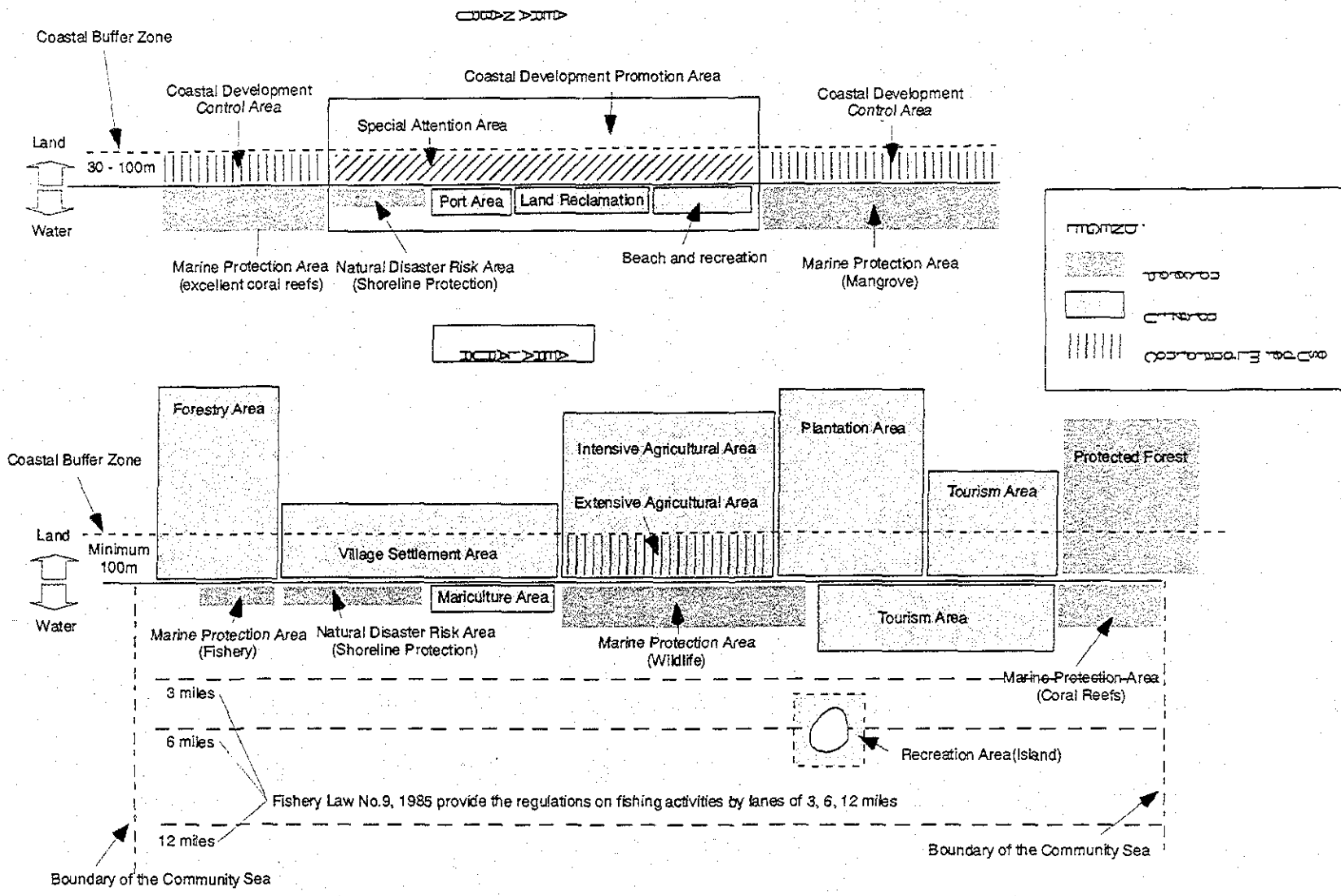


Figure A.6 Conceptual layout for the spatial plan in urban area and rural area

A.1.6 Selection of the Case Study Area

The criteria for the selection of the case study area are the followings.

- (1) The area where has excellent natural resources such as coral reefs and fishes, mangroves and natural environment, and need protection or conservation of those resources.
- (2) The area where has excellent tourism resources such as white-sand beaches, beautiful coral reefs and underwater scenery and panoramic views to the islands and seascape and other tourism attractions.
- (3) The area where has a possibility to overlap and create spatial conflicts among the users of the natural resources, such as among the fishermen, fish farmers, tourists, communities, etc.
- (4) Ones of the villages of the Rapid Rural Survey, done by the JICA Study Team, so that the some detail information are available at hand at present for the Study Team.

Based on the above criteria, the following villages in the Belang District of the Minahasa Regency have been selected for the Case Study area

- Basaan
- Basaan Satu
- Ratatotok Timur
- Ratatotok Satu

A.1.7 Existing Situations

(1) Spatial Use of the Area

Basaan, Basaan Satu, Ratatotok Timur and Ratatotok Satu are all located in Belang District in Minahasa Regency, on the southern coastal areas in Molucca Sea side. It takes around 3 hours from Manado (100 km) and 30 minutes form the town of Belang (20 km), the nearest center of economic activities and the capital in the district.

Topography is plain at the settlement areas and becomes hilly after several hundreds meters from the shorelines. The soil structure composed of sand along the coast, and mixed with clay and rocky soil in the hilly area in Basaan. The dominant land use of the area is coconuts palm or mixed with other tree crops and extensive agricultural

farmlands are spread behind the settlement area in Basaan. The soil near the Ratatotok seems not suitable for agriculture, and only small areas are cultivated behind the village. The typical section of the shoreline is that the sea bottom is covered by mud or black sand about 50 to 100 meters seaward, then sea grass continues up to reaching coral reefs. Seawater looks turbid up to 200 meters toward offshore and gradually becomes clear on the reef flat.

Lots of garbage is found along the coast and some other areas such as under the elevated houses that built on the seawater surface. It is known that those people live in the elevated house discharge the sewage water and solid waste into the seawaters directly. There is a worry among the local communities about the seawater pollution by the gold mining sites that are located in the upper hill of the Ratatotok.

In the seawater, there are 314 ha of coral reefs, of which 15 ha are excellent, 13 ha are good conditions, and the rests are fair and poor conditions in front of the 4 villages. Some 225 ha of the mangrove forests spread along the shoreline. The most of the fishermen catch the pelagic fishes, such as skipjack, tuna, smooth tail travelly, scads, etc. using lift-nets, hand lines, drift gill-nets, shark hand lines, small purse-sein, etc. in the inshore and the coral fishes such as rabbitfish, grouper, snapper, etc. also captured on the reef flats, using set grill-net, drift gill-net, etc. The fishing activities on the reef flats in front of the Ratatotok Timur is scanty, because they afraid that the fishes are contaminated by the mercury from the gold mining sites. The small-scale seaweed culture are scanty operated. Formerly, sea turtles lying their eggs on the beaches near the settlement, but now it was moved out to the islands off the village.

Table A.4: Number of households, type of fishing gears, fishes and boats in Basaan Satu

Type of boats	No. of households	Type of fishing gears	Type of fishes
Small boat with puddle (<i>londe/pelang panggayung</i>)	100	Line	
Small boat with small engine (<i>pelang katinting</i>)	3	Coral reef net (<i>pukat nyare</i>)	Coral reef fishes
Small boat with engine - 40 HP (<i>pelang motor</i>)	5	(<i>bagan</i>)	Bait fishes, Anchovy (<i>no nae, ikan putih</i>)
Big boat (<i>funae</i>)	1	(<i>tagoho net</i>)	Others and Tuna (<i>gas, cackling</i>)

The fishermen in Ratatotok Timur divided in two types; line fishermen (*nelayan pancing*) and raft fishermen (*nelayan bagan*) or bait fishermen (*nelayan umpan*). Line fishermen use small boats with puddle (working in the morning 4:00-12:00, and

in the night at 16:00 – 7:00). Raft fishermen work in the afternoon catching ikan putih, conveying to fish ship boat (*kapal ikan funae*). Fish ship boat is catching skipjack and tuna. The high season is May to July, middle in March to April, the second in August to September and very small in November to December and no activity in January to February.

(2) Population and Socio-economy

There are 4 hamlets (*dusun*) in Basaan Satu. The population of the village was 1,115 and 323 households in 2000 Census. There are 566 houses, of which 3 are permanent, 15 are semi-permanent and 525 are made of wood, and the remaining 23 are made of bamboo in 1999, according to the data of the Village Office.

There are 5 hamlets (*dusun*) in Ratatotok Timur. The population of the village was 1,067 and 291 households in 2000 Census. There are 303 houses, of which 3 are permanent, 100 are semi-permanent and 150 are made of wood, and the remaining 50 are made of bamboo in 1999, according to the data of the Village Office.

There are at least 5 ethnic groups in the village; Minahasa, Sangerian, Gorontalo, Bugis, Bajo, Ternate, Java, etc. There is no clear separation among the settlement of the five groups, but most of the fishermen live in the beach areas in Basaan Satu and Ratatotok Timur. The Christian is dominant religion with 1 church in Basaan Satu and the Islamic is dominant religion with 2 mosques in Ratatotok Timur.

The livelihood of the village members is mainly farming (200 farmers), and fishing (115 fishermen), followed by government officers (9 persons), trading (8 persons), and others in Basaan Satu and mainly fishing (350 fishermen), followed by carpenter (10 persons), government officers (3 persons), trading (5 traders) and others in Ratatotok Timur.

There are 3 units of economic cooperatives and 12 groups of money rotation union (*arisan*), however the cooperatives are not working well. There are no other socio-cultural organizations, except one musical group. The informal organizations under the church and mosque are active.

(3) Infrastructure

The present conditions of the infrastructure systems in Basaan Satu are as follows;

The clean water supply is good derived from some springs to distribute each house by water pipe lines, and the electricity is provided by the Electricity Company. The

roads in the village are built by stones without asphalt pavement. There is one elementary school, one junior high school, one health care center (*puskesmas*) and 6 health service centers (*posyandu*). The public transportation from the village to the nearest town of Belang is available using microbus or small size cargo trucks (3 units), motorcycles (5 units), and boats (7 units). Various type of boats are found in the village, but mainly for fishing and not for passengers or cargo transportation. The communication facilities consist of 45 units of radios and 21 units of televisions, no telephones.

There is no information on the infrastructure systems in the other villages at hand.

Table A.5 Population and Households of the Case Study Area

	Population (by Census year)			Households in 2000	Area (ha)
	1980	1990	2000		
Basaan	2,405	2,495	1,662	415	824.4
Basaan Satu	-	-	1,115	323	1,255.1
Ratatotok Satu	1,892	2,505	1,834	522	432.4
Ratatotok Timur	-	-	1,067	291	670.8
Total	4,297	5,000	5,678	1,551	3,182.7

Source : JICA Study Team

Table A.6 Present Land Use of the Case Study Area

	Area (ha)	Share (%)
Dense forest	42.2	1.3
Mangrove	225.1	7.1
Plantations	2,006.0	63.0
Plantations with agricultural farmlands	772.2	24.3
Settlements	120.8	3.8
Others	16.4	0.5
Total	3,182.7	100.0

Source : JICA Study Team

Table A.7 Live Corals and Mangrove

	Live Corals					Mangrove
	Excellent	Good	Fair	Poor	Total	
Basaan	0.0	7.8	22.8	39.7	70.3	8.1
Basaan Satu	0.0	0.0	29.4	65.2	94.6	20.1
Ratatotok Satu	15.2	5.5	43.2	44.3	108.2	161.1
Ratatotok Timur	0.0	0.0	0.0	40.9	40.9	35.9
Total	15.2	13.3	95.4	190.1	314.0	225.1
Share (%)	4.8	4.2	30.4	60.6	100.0	-
Share in the Total Study Area (%)	0.2	1.8	9.7	88.3	100.0	-

Source : JICA Study Team

A.1.8 Scenario of the Development Policy of the Area

Of course the comprehensive studies are required for the formulation of the policy making on the spatial use, including frameworks of future population and economic goals, development and space demands of various sectors, constraints and potentiality of the land and water areas, etc. Because of the lack of information for those studies, the examination of the scenario writing is attempted to make general directions of the development of the area. Considering the existing situations and development potentials of the area, the following three directions are assumed as the alternative development scenarios of the area.

Scenario-1: Protection of coral reefs and other natural environment

Scenario-2: Protection of coral reefs and other natural environment and promotion of the mariculture development

Scenario-3: Protection of coral reefs and other natural environment and promotion of the coastal tourism development

JICA Study Team selected the scenario (3) from the above, for the case study.

A.1.9 Projections for Development Framework

The projections of the population and tourist arrivals in the case study area were made as follows;

(1) Population Projection

Table A.8 shows the population of the 4 villages in the case study area in 1980, 1990 and 2000 Census year, and also shows the estimated future population in 2005, 2010 and 2015. The projection of the population, here was made based on the assumed annual increase ratio of 1.3%, which is the average increase ratio between 1990 and 2000 in the total population of the 4 villages.

Table A.8 Population of the 4 villages in the case study area

	1980	1990	2000	2005	2010	2015
Ratatotok Satu and Timur (1)	1,892	2,505	2,901	3,091	3,294	3,511
Basaan and Basaan Satu (2)	2,405	2,495	2,777	2,959	3,154	3,361
Total	4,297	5,000	5,678	6,051	6,448	6,871
Annual increase ratio (1)	-	2.8%	1.5%	1.3%	1.3%	1.3%
Annual increase ratio (2)	-	0.4%	1.1%	1.3%	1.3%	1.3%
Annual increase ratio (Total)	-	1.5%	1.3%	1.3%	1.3%	1.3%

The population of the village in the target year is the essential figure to determine the areas of the settlement for the respective village. The area for the expansion of the settlement in the target year shall be allocated in the spatial use plan.

(2) Tourist Projection

Table A.9 shows the result of the estimation of the visitor arrivals and hotel demand in the case study area, based on the study flow, as mentioned in Figure A.3.

Table A.9 Estimation of the No. of Visitors and Hotel Demands in the Case Study Area

		2005	2010	2015
Hotel guest arrivals *1) (persons)	Foreign	879	2,466	5,958
	Domestic	10,902	30,582	49,253
	Total	11,781	33,048	55,211
Demand for hotel rooms *1) (rooms)	Foreign	18	45	109
	Domestic	75	224	376
	Total	93	269	485
Site area required for hotel *2) (ha)		2.3	6.7	12.1
No. of visitors in the tourist area *3) (persons)	on peak day	269	574	1,036
	on average day	99	259	509

Source: Compiled by JICA Study Team

Notes:

*1) Refer to the Tables A.1.9 for detail information,

*2) Based on the criteria of 40 rooms/ha (low density type resort hotel), and

*3) Including foreign, domestic and local visitors.

Table A.10(a) PROJECTION OF THE VISITOR ARRIVALS

Number of Visitor Arrivals in the North Sulawesi Province 1995-2000

	1995	1996	1997	1998	1999	2000
Foreigner	23,762	32,525	42,821	34,502	44,087	27,557
Domestic	643,283	992,997	1,114,454	467,502	477,702	341,694
Total	667,045	1,025,522	1,157,275	502,004	521,789	369,251

Source: Dinas Pariwisata Propinsi Sulut

Projection of the Number of Visitor Arrivals in the Province 2005-2015

		Estimated no. of visitor arrivals			Assumed annual increase ratio		
		2005	2010	2015	2000-2005	2005-2010	2010-2015
Foreigner	(high)	35,170	49,328	79,444	5%	7%	10%
Domestic	(high)	436,098	611,650	985,068	5%	7%	10%
Total	(high)	471,268	660,978	1,064,512	-	-	-
Foreigner	(low)	35,170	44,887	57,289	5%	5%	5%
Domestic	(low)	436,098	556,584	710,357	5%	5%	5%
Total	(low)	471,268	601,471	767,646	-	-	-

Source: Compiled by JICA Study Team

Notes: The annual increase ratio of the visitor arrivals in the recent years are as follows;

- World; 4% (1990-'98) - Asia & Pacific; 7% (1990-'97) - Indonesia; 13% (1990-'97)

Projection of the Bed-nights in the Province 2005-2015

		Estimated no. of bed-nights			Assumed length of stay		
		2005	2010	2015	2000-2005	2005-2010	2010-2015
Foreigner	(high)	158,267	246,642	476,664	4.5	5.0	6.0
Domestic	(high)	654,147	1,223,299	2,462,670	1.5	2.0	2.5
Total	(high)	812,414	1,469,941	2,939,333	-	-	-
Foreigner	(low)	158,267	224,437	343,734	4.5	5.0	6.0
Domestic	(low)	654,147	1,113,167	1,775,893	1.5	2.0	2.5
Total	(low)	812,414	1,337,604	2,119,627	-	-	-

Source: Compiled by JICA Study Team

Projection of the Local Visitors by the Destinations 2005-2015

Destinations	Estimated no. of local visitors/year			Estimated no. of local visitors/peak day		
	2005	2010	2015	2000-2005	2005-2010	2010-2015
Manado city *1)	209,539	327,091	494,887	2,296	3,585	5,423
Bunaken area	115,067	178,554	266,035	1,261	1,957	2,915
Gunung Tampah	16,990	26,521	40,126	186	291	440
Malalayang beach	113,264	176,806	267,507	1,241	1,938	2,932
Bitung city *1)	80,723	134,019	206,092	885	1,469	2,259
Lembeh	4,249	7,054	10,847	47	77	119
Belang - Kotabunan	18,065	28,945	43,875	198	317	481
Other coastal areas	54,196	86,836	131,626	594	952	1,442
Inland and others	120,443	201,360	317,153	1,320	2,207	3,476
Total	732,536	1,167,185	1,778,148	8,028	12,791	19,487

Source: Compiled by JICA Study Team

Note; *1) Prime purpose is visiting the city, then some of visitors visiting Bunaken, Gunung Tampa, Malalayang will visit Manado city and visitors in Lembeh will also visit Bitung city, because those destinations are located nearby.

Table A.10(b) : MANADO-BUNAKEN TOURIST AREA

Projection of the Bed-nights in Manado-Bunaken Area 2005-2015

		Estimated no. of bed-nights			Assumed share of the area		
		2005	2010	2015	2000-2005	2005-2010	2010-2015
Foreigner	(high)	106,830	160,317	297,915	67.5%	65.0%	62.5%
Domestic	(high)	376,134	672,815	1,292,902	57.5%	55.0%	52.5%
Total	(high)	482,965	833,132	1,590,816	-	-	-
Foreigner	(low)	106,830	145,884	214,834	67.5%	65.0%	62.5%
Domestic	(low)	376,134	612,242	932,344	57.5%	55.0%	52.5%
Total	(low)	482,965	758,126	1,147,178	-	-	-

Source: Compiled by JICA Study Team

Projection of the Demand of the Hotel Rooms in Manado-Bunaken Area 2005-2015

		Estimated no. of rooms			Assumed occupancy rate		
		2005	2010	2015	2000-2005	2005-2010	2010-2015
Foreigner	(high)	489	587	909	40.0%	50.0%	60.0%
Domestic	(high)	1,722	2,465	3,947	40.0%	50.0%	60.0%
Total	(high)	2,211	3,052	4,856	-	-	-
Foreigner	(low)	489	534	656	40.0%	50.0%	60.0%
Domestic	(low)	1,722	2,243	2,846	40.0%	50.0%	60.0%
Total	(low)	2,211	2,777	3,502	-	-	-

Projection of the Total Visitors in the Year and Peak Day in Manado-Bunaken Area 2005-2015

		Estimated no. of total visitors/year			Estimated no. of visitors/peak day		
		2005	2010	2015	2005	2010	2015
Hotel visitors	(midium)	885,955	1,419,151	2,290,524	2,427	3,888	6,275
Local visitors	(midium)	454,860	708,972	1,068,555	4,985	7,770	11,710
Total visitor	(midium)	1,340,814	2,128,123	3,359,079	7,412	11,658	17,986

Source: Compiled by JICA Study Team

Table A.10 (c) : LEMBEH TOURIST AREA

Projection of the Bed-nights in Lembeh Area 2005-2015

		Estimated no. of bed-nights			Assumed share of the area		
		2005	2010	2015	2000-2005	2005-2010	2010-2015
Foreigner	(high)	7,913	18,498	47,666	5.0%	7.5%	10.0%
Domestic	(high)	16,354	61,165	123,133	2.5%	5.0%	5.0%
Total	(high)	24,267	79,663	170,800	-	-	-
Foreigner	(low)	7,913	16,833	34,373	5.0%	7.5%	10.0%
Domestic	(low)	16,354	55,658	88,795	2.5%	5.0%	5.0%
Total	(low)	24,267	72,491	123,168	-	-	-

Source: Compiled by JICA Study Team

Projection of the Demand of the Hotel Rooms in Lembeh Area 2005-2015

		Estimated no. of rooms			Assumed occupancy rate		
		2005	2010	2015	2000-2005	2005-2010	2010-2015
Foreigner	(high)	36	68	146	40.0%	50.0%	60.0%
Domestic	(high)	75	224	376	40.0%	50.0%	60.0%
Total	(high)	111	292	521	-	-	-
Foreigner	(low)	36	62	105	40.0%	50.0%	60.0%
Domestic	(low)	75	204	271	40.0%	50.0%	60.0%
Total	(low)	111	266	376	-	-	-

Source: Compiled by JICA Study Team

Projection of the Total Visitors in the Year and Peak Day in Lembeh Area 2005-2015

		Estimated no. of total visitors/year			Estimated no. of visitors/peak day		
		2005	2010	2015	2005	2010	2015
Hotel visitors	(midium)	25,909	74,960	142,045	71	205	389
Local visitors	(midium)	4,249	7,054	10,847	47	77	119
Total visitor	(midium)	30,158	82,014	152,892	118	283	508

Source: Compiled by JICA Study Team

Table A.10 (d) : BELANG - KOTABUNAN TOURIST AREA

Projection of the Bed-nights in Belang - Kotabunan Area 2005-2015

		Estimated no. of bed-nights			Assumed share of the area		
		2005	2010	2015	2000-2005	2005-2010	2010-2015
Foreigner	(high)	3,957	12,332	35,750	2.5%	5.0%	7.5%

Domestic	(high)	16,354	61,165	123,133	2.5%	5.0%	5.0%
Total	(high)	20,310	73,497	158,883	-	-	-
Foreigner	(low)	3,957	11,222	25,780	2.5%	5.0%	7.5%
Domestic	(low)	16,354	55,658	88,795	2.5%	5.0%	5.0%
Total	(low)	20,310	66,880	114,575	-	-	-

Source: Compiled by JICA Study Team

Projection of the Demand of the Hotel Rooms in Belang - Kotabunan Area 2005-2015

		Estimated no. of rooms			Assumed occupancy rate		
		2005	2010	2015	2000-2005	2005-2010	2010-2015
Foreigner	(high)	18	45	109	40.0%	50.0%	60.0%
Domestic	(high)	75	224	376	40.0%	50.0%	60.0%
Total	(high)	93	269	485	-	-	-
Foreigner	(low)	18	41	79	40.0%	50.0%	60.0%
Domestic	(low)	75	204	271	40.0%	50.0%	60.0%
Total	(low)	93	245	350	-	-	-

Source: Compiled by JICA Study Team

Projection of the Total Visitors in the Year and Peak Day in Belang - Kotabunan Area 2005-2015

		Estimated no. of total visitors/year			Estimated no. of visitors/peak day		
		2005	2010	2015	2005	2010	2015
Hotel visitors	(midium)	36,194	91,596	165,920	99	251	455
Local visitors	(midium)	18,065	28,945	43,875	198	317	481
Total visitor	(midium)	54,260	120,541	209,795	297	568	935

Source: Compiled by JICA Study Team

A.1.10 Spatial Use Plan

Figure A.10 shows the proposed spatial use plan of the Basaan-Ratatotok area. The Study Team proposes this area as the part of the Provincial Marine Park. The sea water areas of 3 miles from the shoreline is designated as Lane 1:Category 1, according to the Fishery Law No.9, 1985, and the water area up to 4 miles as the territorial water of the Regency of Minahasa. The major points of considerations for the planning of the spatial use of the areas are as follows;

- (1) Use of the land
 - a) The existing mangrove forests along the shoreline should be protected as mangrove protection zone according to the Presidential Degree No.32, 1990, regarding Protected Areas. Some of those forests will be utilized for tourism purposes such areas in Ratatotok Satu, Ratatotok Timur and Basaan Satu.

- c) The shoreline in front of the Ratatotok Satu village settlement area should be designated for shoreline protection zone as defined in the Master Plan of Coastal Area Protection in North Sulawesi, PU, and provide protection measure against the wave attack.
- d) The agricultural areas along the shoreline should be delineated as extensive agricultural area to avoid soil erosion and inflow of chemical discharge from the farmlands.
- e) The houses and other facilities of the village should be designated as village settlement area, considering the future expansion of the village area.
- f) The beach and hinterland of the Bay of Buyat should be allocated for tourism use, because the tourism development potentials of location and attraction of the area are high.

(2) Use of the water

- a) The coral reefs along the little cape of Dokokayu and Putusputus islands are evaluated as excellent in the study. The water area around the islands should be designated as strictly protected zone for coral reefs.
- b) The Bay of Bohungon and water areas around Babi Island should be designated as water zone for tourism use, because the tourism development potentials of location and attraction of the area are high. In this zone, the tourists will enjoy the swimming, boating, diving, fishing and other activities exclusively, to avoid the spatial conflict with fishing and other activities.
- c) The Bay of Buyat should be designated as water zone for tourism use, because the tourism development potentials of location and attraction of the area are high. In this zone, the tourists will enjoy the swimming, boating, diving, fishing and other activities exclusively, to avoid the spatial conflict with fishing and other activities. This area also has potential for seaweed culture, because of the calm wave. The further study of spatial use plan of this area is required.

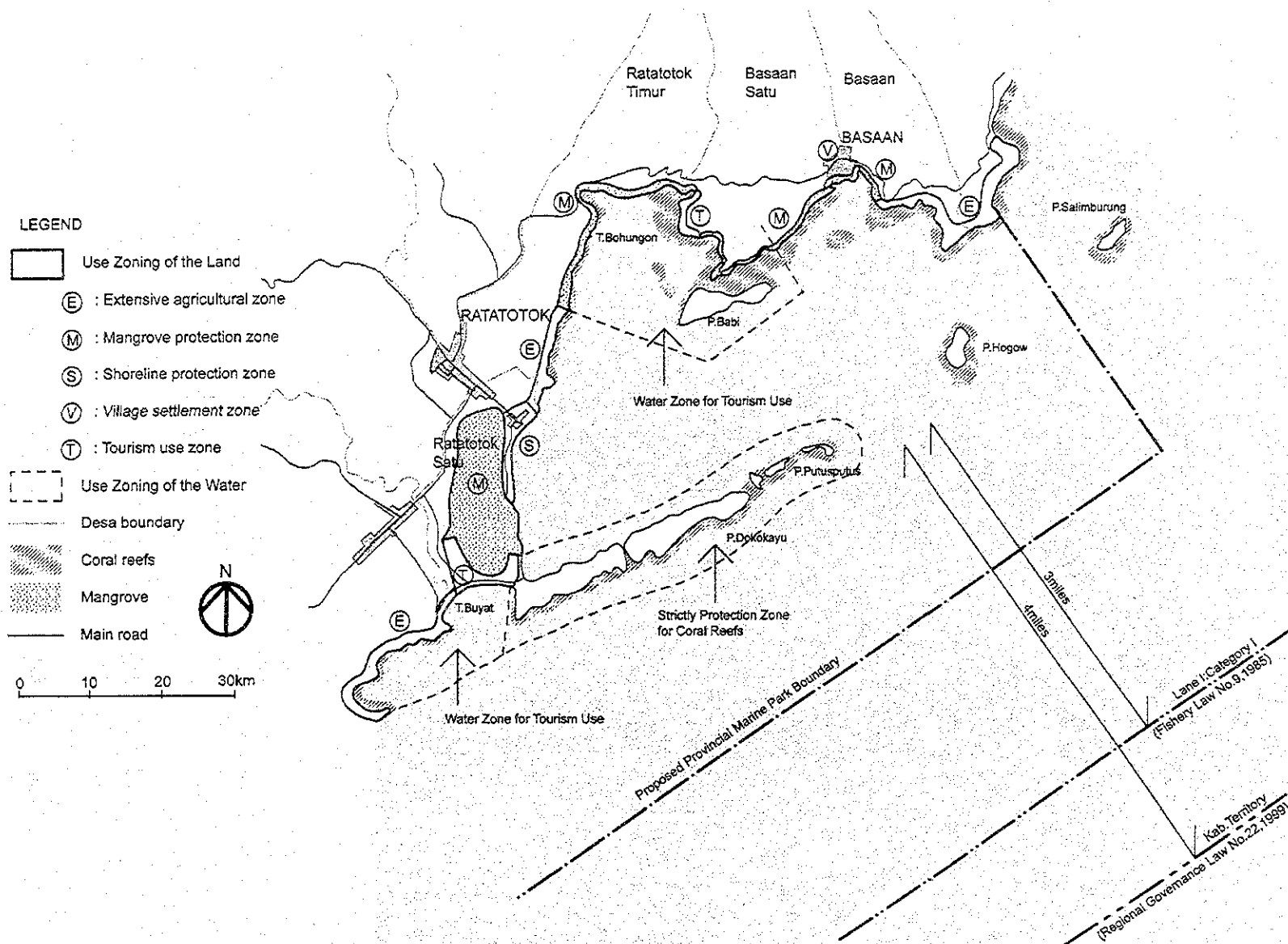


Figure A.10 Coastal Spatial Use Plan of Basaan - Ratatotok Area (Case Study)

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