4.3.5 Marine Protected Area Management

The term "protected area" can be defined as an area which is officially designated as such in order to conserve and preserve exclusively against destructive human exploitation from the viewpoint of protection and maintenance of biodiversity, flora/fauna and scenery. Management of a protected area falls under the responsibility of a council to be formed especially for this purpose. Each protected area therefore has its own management council.

The designation of protected areas in Indonesia is based on Forestry Ministerial Decree No. 687/kpts/11/1989, which provides four categories of protected area as follows:

- Tourism / Natural Forest (*Hutan Wisata*);
- National Park (*Taman Nasional*);
- Grand Forest Park (*Taman Hutang Raya*); and
- Marine Tourism Park (*Taman Wisata Laut*).

The above-mentioned decree recognized the need for sustainable development toward a far-reaching goal of conservation of ecosystem and natural resources in order to maximize use of Indonesia's rich natural resources, which have a great potential for tourism development. However, the regulatory system on protected area management is highly complicated, because although there are a number of regulations regarding protected areas and restricted areas, none exists outlining the basic protected area management law in Indonesia. It is required that regulations related to protected area management should be compiled and reviewed to incorporate this essential aspect to the regulations.

In the study area, there are two National Parks, Bunaken Marine National Park and Bogani Nani Waterborne National Park. The Bunaken National Park is categorized as a Marine National Park. Legal basis of Bunaken National Park is as follows:

Year 1986	Forestry Ministerial Decree (No. 328/Kps-11/86) regarding the designation of a Marine Natural Reserve
Year 1989	Forestry Ministerial Notification (No. 444/Menhut-11/89) regarding the designation of Bunaken-Manado Tua Marine National Park
Year 1991	Forestry Ministerial Decree (No. 730/Kpts-11/91) regarding the change of functions and renaming of Bunaken Manado Tua - Arakan Wowontulap Marine Natural Reserve to Bunaken National Park

Bunaken National Park Authority (*Balai Taman Nasional Bunaken*) was established by the Ministry of Forestry in 1997. The functions of the Authority are:

- To protect and preserve rare and unique organisms in the land and marine ecosystem;

- To ensure the welfare of local communities through a sustainable resource utilization; and
- To increase regional income through development and management of diving tourism.

The Authority has a head office in Malas, three sub-section offices in Bunaken, Siladen and Wowontulap, and three workstations in Mantehage, Bunaken and Raprap (21 rangers and 9 patrols). Its functions are based on the 25-Year Park Management Plan of Bunaken National Park formulated in 1994 by BAPPENAS and USAID. This Plan was approved in 1997. The Authority implements park management by engaging in the following activities:

- Protecting the park from violations;
- Conducting an awareness program;
- Monitoring visitor activities; and
- Surveying the general conditions of habitats and biota in the park.

The Authority has also submitted a revised zonation system to the PKA in Jakarta in 1998 (although there has not been any sign of follow-up regarding the proposed revision).

The Bunaken National Park management zoning has a long history. First, a zoning plan was prepared by NRM-1 (Natural Resources Management Program) in 1996. This was followed by another zoning plan prepared by then Ministry of Forest based on 10 categories of management zone in 1997. At about the same time, a new zonation based on a zoning system for a national park was being prepared by NRM-2. Finally, after 44 community meetings, the zoning system for Bunaken Island was completed. Other areas including the coastal area of North Sulawesi Peninsula will be finished in 2001. The new categories of management zoning of Bunaken National Park are shown in Table 4.13 and Figure 4.3.

Table 4.13 Bunaken National Park Zoning System

Zones	Definition or Prohibited Activities
Core Zone (*Zona Inti*)	*Core zone* refers to a part of national park area that has to be absolutely protected; no human activities are allowed. (Article 32)
Buffer Zone (*Zona Pendukung Umum*)	*Buffer zone* refers to areas outside the core zone and titled lands. It serves to watch over the wholeness of the core zone. Management of these areas, however, lies in the proper authority and its management must still follow government regulation.
Tourism Utilization Zone (*Zona Pemanfaatan Pariwisata*) Community Utilization Zone (*Zona Pemanfaatan Masyarakat*)	*Utility Zone* refers to a part of national park area that is intended for recreation center and tourism visits
Other Zone (*Zona Lain*)	*Other Zone* refers to a zone outside utility zone and buffer zone and designated as forest zone, traditional utility zone, rehabilitation zone, etc.

Source: Natural Resources Management Program-1

Table 4.14 Classification and Area of Zones

Categories of Zone	Area (ha)
Core Zone	1,391.05
Utilization Zone	1,153.34
Rehabilitation Zone	191.98
Water Support Zone	11,680.31
Land Support Zone	2,342.29
Public Support Zone	72,279.77
Recovery Zone	26.27
Total	89,065.01

Source: Peta Petunjuk Lokasi, Taman Nasional Bunaken

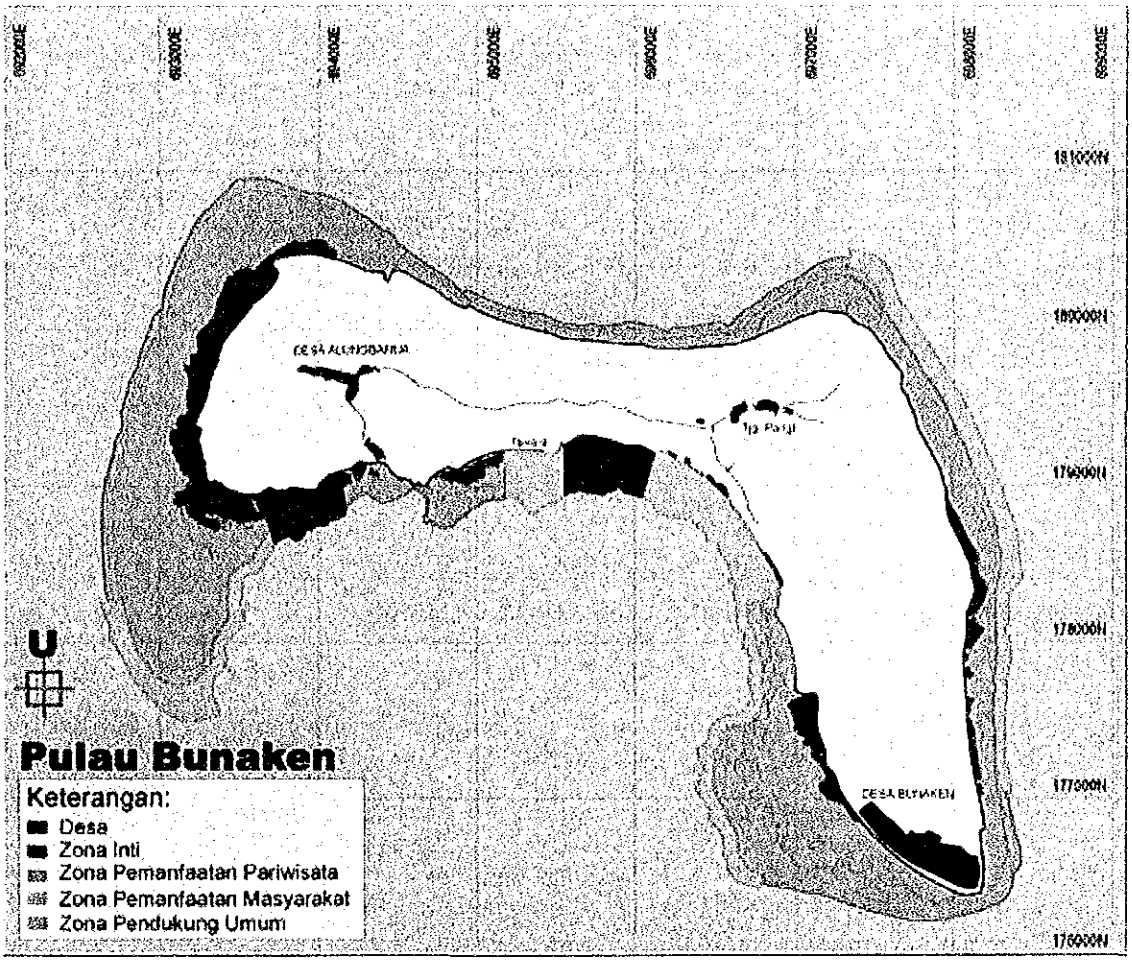


Figure 4.3 Management Zoning Plan of Bunaken National Park

Source : USAID

The national government allocates a budget for the management of Bunaken National Park whose budget has been relatively small between 1994/1995 – 1998/1999 amounting to US$ 3.75/ha/year (*NRM/EPIQ*). In 1999/2000, the budget of Bunaken National Park was Rp. 885,458,000 and it went down drastically to Rp. 265,000,000 in the year 2000, or around US$ 0.39/ha/year. With this limited funds, Bunaken National Park Authority has to operate on a tight budget considering that it has a personnel complement of 45 persons including 25 persons working as Forest Police (*Jagawana*) responsible for patrolling an area of 3,562.6 ha. Their breakdown according to educational background is as follows: 12 of *Sarjana* (S1) level, 1 of *Sarjana Muda*/Diploma level, 31 of high school level and 1 of elementary school level.

The Bunaken National Park Working Team (*Tim Kerja Taman Nasional Bunaken*) was established in May 2000 under North Sulawesi Governor Decree No. 826/03/54. The Working Team comprising 20 members undertook the following tasks in a span of one month:

- Establishment of a coordination body (Bunaken National Park Council: *Dewan Pengelolaan Taman Nasional Bunaken*);
- Establishment of an independent financial supporting unit such as a foundation (*yayasan*);
- Preparation of draft local regulations (Governor Decree) regarding collection of entrance fee for nature and tourism;
- Conduct a study on charge system of tourism activities for nature;
- Conduct a study on guidelines of tourism activities for nature and ecology, social, cultural and economic conditions; and
- Investigation of financial sources for natural resources conservation in coastal waters of North Sulawesi.

The Working Team recommended the establishment of Bunaken National Park Management Council (*Dewan Pengelolaan Taman Nasional Bunaken*) based on the first task mentioned above. Objectives of the council establishment are as follows:

- To support development and conservation of the park;
- To establish a responsible body for sustainable social welfare for the next generation through coordination and communication; and
- To advise the Authority.

The Council coordinates and communicates with stakeholders and formulates a management plan in cooperation with the Authority to rally support for the maintenance and conservation of the Park. Moreover, a management unit, which may be categorized as a foundation (*yayasan*) or a cooperative, shall be established by the Council. On top of the

things this management unit has to do is to look for new sources of revenue for park management. Local governments, the Authority and tourism operators have already discussed and agreed on the collection of park entrance fees and the collected money will be used to finance the implementation of park management. The schedule of fees by the Council is shown in Table 4.15.

Law No. 22/1999 deals with Regional Governance and Law No. 25/2000 concerns keeping a balance between Central and Regional Governance, but still, the management body of national parks has to be regulated by the central government. Furthermore, the decision on and implementation of entrance fee for the park do not fall under local regulations, but rather are based on Government Regulation No. 59 (1988), Law No. 20 (1997), Government Regulation No. 73 (1998), Law No. 22 (1999), and Government Regulation No. 25 (2000). Tourism Development Tax and the entrance fee from the Park shall be categorized as Non-Tax National Income (PNBP) such as revenue of central government, so that the collected entrance fee shall go to the National Treasury. Therefore, these regulations would have to be revised if the local government were to decide and collect the entrance fees.

Table 4.15 Schehdule of Entrance Fees of Bunaken National Park by Bunaken National Park Management Council

a.	**Visitor**			
	1.	Foreigners	Rp.	75.000/person
	2.	Local people	Rp.	2,500/person
b.	**Researcher**			
	1.	Foreigners		
		a. 1 to 7 days	Rp.	100,000/person
		b. 8 to 30 days	Rp.	200,000/person
		c. 1 to 6 months	Rp.	400,000/person
		d. 0.5 to 1 year	Rp.	600,000/person
		e. Up of 1 year	Rp.	800,000/person
	2.	Local people		
		a. 1 to 7 days	Rp.	45,000/person
		b. 8 to 30 days	Rp.	75,000/person
		c. 1 to 6 months	Rp.	125,000/person
		d. 0.5 to 1 year	Rp.	200,000/person
		e. Up of 1 year	Rp.	250,000/person
c.	**Water transportation**			
	a. Ship with engine of up to 40 hp		Rp.	50,000/ship/year
	b. Ship with engine of 41 to 80 hp		Rp.	75,000/ship/year
	c. Ship with engine upwards of 80 hp		Rp.	100,000/ship/year
d.	**Taking photo and video**			
	Foreigners			
	a. Commercial film		Rp.	3,000,000/min.
	b. Commercial video		Rp.	1,000,000/min.
	Local people			
	a. Commercial film		Rp.	2,000,000/min.
	b. Commercial video		Rp.	500,000/min.

Source: Bunaken National Park Council, 2000

4.4 Coastal Development Plans in the Study Area

4.4.1 Provincial Coastal Management Plan

There is a coastal management plan at the provincial level called "Coastal Management Strategic Plan," which is supported by MREP of USAID. This strategic plan was authorized by BAPPEDA North Sulawesi Province in 1998. It aims to manage marine resources in an integrated manner for their sustainable utilization and optimal environmental, economic and social benefits. In this strategic plan, management strategies had been formulated based on four goals including social development, ecological conservation, economic and administrative goals excluding action plans. It seems to suppose that local governments are

trying to achieve these goals. However, it cannot be said if the local governments are implementing coastal management appropriately, because responsible agencies for coastal management did not exist at that time, with the exception of the Directorate General of Fishery, Ministry of Agriculture.

4.4.2 Regional Spatial Development Plan

Local governments at the provincial and municipal/regency level have to prepare the Spatial Development Plan (RTRW: *Rencana Tata Ruang Wilayah*) of the region, based on guidelines issued by Ministry of Home Affairs and Regional Development. Contents of those guidelines of provincial and municipality/regency are almost the same. Guidelines of RTRW show planning directions as follows:

- Management direction of conservation area and development area;
- Management direction of urban area, rural area and certain area in the region;
- Development direction of urban and rural center system;
- Direction of infrastructure development system;
- Direction of priority development area; and
- Direction of land use, water use, air use and use of other natural resources.

The RTRW is prepared by BAPPEDA. Regarding the spatial development directions of coastal areas, the strategies shall be defined based on the above collaboration in the RTRW. In the study area, there is a Provincial RTRW and four municipal and regency RTRWs. However, the RTRW Bolaang Mongondow is still in progress up to this time. Each RTRW is summarized below:

Table 4.16 List of the Regional Spatial Development Plans (RTRW) in the Study Area

RTRW	Planning Period	Area (km^2)	Population In 1999	Future Population Year
North Sulawesi Province	1999/2000 - 2015 (15 years)	13,108.582	2,736,600	3,124,720 (2020)
Minahasa Regency	1999/2000 - 2010 (10 years)	4,270.866	770,820	833,813 (2005)
Manado Municipality	1999/2000 - 2010 (10 years)	176.189	388,008	831,707 (2018) *
Bitung Municipality	1999/2000 - 2010 (10 years)	302.927	121,070	130,355 (2010)
Bolaang Mongondow regency	1993 - 2002 (10 years)	8,358.6	428,332	466,243 (2002)

Source: BAPPEDA Office of each jurisdiction.
Notes: *The review of the RTRW Bolaang Mongondow is in progress at present.*
The figures in parentheses show the year.
* According to PDAM forecast. Other forecasts are according to each RTRW report.

(1) RTRW North Sulawesi Province

North Sulawesi Province has designated eight (8) strategic areas, two (2) critical areas and one (1) special area, based on the development potentials and spatial balance of the areas as well as development policies of the municipalities and regencies of the province.

Eight (8) strategic areas

Four (4) out of eight (8) strategic areas are for establishment of centers of agricultural production in the four districts in Gorontalo and Bolaang Mingondow regencies, aimed at increasing agricultural production of the province. Two (2) out of the remaining 4 are located in the coastal area, and they are:

- Coastal tourism area in Manado (Tanjung Pisok, Bunaken, Tasik Ria); and
- KABIMA (Kauditan-Bitung-Kema) industrial area.

From tourism development aspect, Manado is located close to Bunaken National Park, which is the core tourism destination of the province. There are beautiful and varied coral reefs and fishes in Bunaken National Park, so that the preservation of those resources is the most important issue. The RTRW stated what position tourism development would be given in the next priority sectors. At the same time, for the increase of markets, diversification of tourism attractions is also an important issue. The land reclamation project along the Boulevard of Manado will prepare the land for establishment of new tourist attractions in Manado.

For the promotion of the industrial development of the region, the provincial government selected the strategic area for building industrial areas in KABIMA (Kauditan-Bitung-Kema). KABIMA is located in the strategic area between Manado and Bitung and close to the international port in Bitung and airport in Manado. The dominant types of industries will be agro-industry and food-processing.

RTRW has selected the above two areas as strategic development areas, while the remaining vast rural areas including a great number of fishery villages in the coastal area are left out..

Two (2) critical areas

One of the critical areas is Tondano watershed in Minahasa regency in the study area and another is the watershed area of Limboto Lake and Bolango-Bone Rivers in Gorontalo regency, which is outside the study area. Soil erosion from agricultural land and others is one of the problems in Tondano watershed, because the eroded soils

may flow into the sea directly or through rivers and affect the coral reefs and associated marine lives.

One (1) special area

The provincial government has designated one special area in the border and isolated islands, Sangihe Talaud regency, which is outside the study area.

a) Development priority sectors

The provincial government has identified five (5) priority sectors, which are expected to be advantageous sectors for economic development of North Sulawesi province in the RTRW. For coastal management, fishery and tourism sectors are listed up. The RTRW mentioned the following:

Fishery sector: 1) For management of the sea fish resources, arrangement of the coastal area management plan, application of beach buffer zone, and protection of mangrove forest are important; and 2) For management of the inland fish resources, arrangement of lake management plan for open water and net-pond culture, supply and control of water to pond, and planning and arrangement of the river fishery.

Tourism sector: for management of the tourism industry, supply of potable water, restaurants, golf course and other tourist facilities, as well as pollution control and protection of natural tourist attractions, is important.

Mining and energy sector: 1) Mining activity has impact to water resource, in the form of trouble at the river basin (increase of run-off and sedimentation) and pollution (waste into river, soil and sea), and 2) Mining activity also uses water. The role and responsibility of the Committee of Implementation Order for Water Management cover control of river basin, water quality and water supply.

b) Framework for the future development of the province

The population of North Sulawesi province increased almost twofold in 24 years, from 1.4 million in 1961 to 2.6 million in 1995. The annual growth ratio was 1.84% in this period. According to the population forecast by RTRW North Sulawesi, which was studied by the Institute of Demography, University of Indonesia in 1991, the annual growth rate from 1990 to 2020 will constantly decrease from 1.12% for 1990 - 1995 to 0.43 for 2015 – 2020, then the population will be around 3,125,000 persons in 2020.

The following spatial balance matrix was identified based on the evaluation of

development potentials by sub-area in the province. The matrix indicates basic development direction of each sub-area and an expected functional network of the province. Figure 4.4 shows the spatial balance of productive activities based on the analysis of development potentials of the province.

Regency/municipality	Foods Cultivation	Plantation	Trade & Commerce	Marine Transportation	Manufacturing	Land Transportation	Service Level
Minahasa Regency		■					Provincial
Manado Municipality			■			■	Provincial, National, International
Bitung Municipality				■	■		National, International
Bolmong Regency	■						Provincial
Sanghe-Talaus Regency		■					Provincial
Gorontalo Regency	■						Provincial
Gorontalo Municipality			■				Local

Source: Spatial Development Plan, North Sulawesi province

Figure 4.4 Spatial Balance Matrix of Productive Activities based on the Analysis of Development Potentials

Among the sub-areas, the corridor between Manado and Bitung is designated as an integrated economic development area (KAPET), which is expected to become a major economic growth pole and an export base of high quality products in eastern Indonesia. The development priority is given to manufacturing in the corridor: agro-industry and other potential industries. The transportation infrastructure including the airport and the seaport in Bitung is expected to be fully utilized for the development.

The development potentials and socio-economic conditions of sub-areas are synthesized in Table 4.17. It presents the results of analyses on various conditions of each sub-area for the future development and will be utilized to propose and/or recommend appropriate and efficient development programs and land use plans for the sub-areas in the province.

Table 4.17 Synthesis of Development Potentials of Sub-areas

Regency/ Municipality	Priority Sector for the Spatial Balance	Potential Activities	Level of Socio-economic Conditions (grade)
Minahasa regency	*Plantation (and also) * Small scale industry * Industrial raw material	* Corn cultivation * Coconut and clove plantation * Fresh water pond culture * Gold mining * Geothermal energy	*Job opportunity (good) * Health (good) * Human resource (good) * Settlement (medium) * Investment (medium) * GRDP(medium) * Industrial centre(good)
Manado municipality	* Trade and commerce * Land transportation (and also) * Education * Small-scale indutry	* Higher education	* Settlement (medium) * Health (good) * Accessibility(medium) * GRDP(medium) * Human resource (good) *Job opportunity (good) * Investment (medium) *Job opportunity (good)
Bitung municipality	* Marine transportation * Medium and large scale industries	* Fishery	* Health (good) * GRDP (medium) * Investment (medium) * Industrial centre (good) * Accessibility (medium)
Bolaang Mongondow regency	* Food plants cultivation	* Corn and rice cultivation * Gold mining * Granite mining	* Settlement (good) *Job opportunity (good) * Growth of village center (medium) * Human resource (medium)

Source: RTRW North Sulawesi Province

(2) RTRW Manado Municipality

The major issues for the preparation of RTRW of Manado municipality are as follows (background factors have been considered in the plan):

- Internal factors including lowering the rate of urban population increase, changes of various plans and programs and Law No.22/1999;

- External factors including KAPET Manado – Bitung, BIMP – EAGA and the Pacific Region, the center of the eastern Indonesia and AFTA 2003 and APEC 2010; and
- Reference to the Municipal Degree No.54/1996 regarding RENSTRA (Strategic Urban Development Plan 1996 –2001).

The important issues in RENSTRA 1996 - 2001 include the following:

- Development of human resources and institutional capability;
- Promotion of commercial, service, small-scale industry and informal sector as well;
- Promotion of tourism industry;
- Encouragement of private investment;
- Promotion of youth and sports;
- Increase of regional income; and
- Increase of potential fishery resources.

Concerning the development and management of the coastal area, the municipality of Manado has designed the following policies and plans in RTRW, which can be grouped into the management of (1) protection areas, (2) coastal development, (3) industrial development and (4) infrastructure development as follows:

a) Protection areas

The Bunaken National Park must keep its natural conditions as it is with the vegetation (mangrove) to protect against beach erosion by imposing regulations on land use (100 meters from the lowest tide). The sea area in the National Park has a designated zonation system for the maintenance of the park. For the maintenance of the park, the close coordination work should be strengthened among the related organizations, especially the provincial government, the regency of Minahasa and Bunaken National Park Authority and the Municipality of Manado, as well as related private enterprises and communities.

The buffer zones for coastline, rivers, dams and springs are designated as protected areas, based on Law No.32/1999. In addition to the above areas, the municipality also proposes protected forests and mangrove forests and has identified natural disaster areas

The study of the use and management of the above buffer zones was made, and three zones for all the coastal area of the municipality were proposed. The proposed policy of the development and management of the zones is as follows:

Zone A: (Malalayang to Manado Port)

The coastal area of the zone has to be properly managed from the development and land use activities by providing a buffer zone 35 m wide from the shoreline or 15 m wide from the edge of the coastal road. The necessary measures to manage the zone are as follows:

- Obligation of installation of sewaage treatment system for all new building constructions;
- Prohibition of the direct discharge of humanwaste and wastewater from the buildings; and
- Denial of operational permission by the municipality, if the above conditions are not fulfilled.

Zone B: (Maasing – Bitung Karangria – Tumumpa)

The zone has already been occupied by residential developments; however, the environmental improvement of the area is required from the living and coastal environment points of view. The necessary measurements of the area will be housing relocation and employment opportunity for the people.

Zone C: (Molas – Bunaken Island)

The zone has been intensively used for tourism activity. For the management of the coastal environment, the buffer zone of 40 m landward from the high tide should be provided

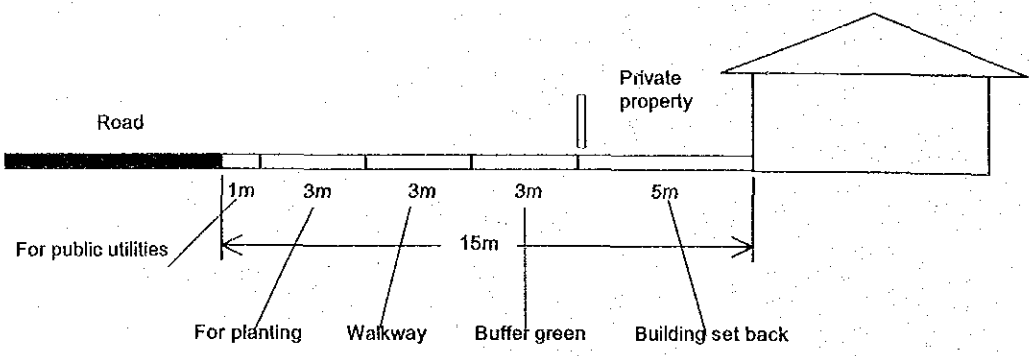
The table below shows the guidelines for development and land use of the coastal buffer zones.

Table 4.18 Management Scheme of the Coastal Buffer Zone

No.	Development and land use	Zone A	Zone B	Zone C
1	Residential development *1)	V	V	X
2	Plantation	V	V	V
3	Nature	V	V	V
4	Commercial development *2)	V	X	X
5	Forestry (w/ permission)	X	V	V
6	Wildlife	X	V	V
7	Research & educational activities	V	V	V
8	Sewage treatment plant	V	V	V
9	Tourism development	V	X	V

Source: RTRW Manado municiaplity 2000 – 2010.
Note: V: allowable activities and X: not allowable activities.

The municipality of Manado has issued the municipal regulation No.115a/1993 regarding the Green Belt and Road Buffer Zone for the Boulevard and Piere Tendean roads. The width of the green belt and road buffer zone is 15 meters, and the zone is sub-divided by purposes of use of land as follows:



Source: RTRW Manado municiaplity 2000 – 2010.

Figure 4.5 Green Belt and Road Buffer Zone

The regulation states that all the necessary costs for the implementation of the buffer zone have to be financed by the municipal budget.

b) Coastal area development

The planned reclamation areas are 60.5 ha in total at present; part of the areas such as Bahu has already been completed with commercial facilities. Efficient use of the sea front area should be implemented, taking environmental care such as quality of discharged water, solid waste and visual harmonization into consideration. The government of the municipality needs to settle Local Acts for the control of use of public beach including reclamation areas. Land use of planned reclamation areas is shown in Table 4.19 below. Figure 4.6 shows the land reclamation scheme in Manado municipality.

Table 4.19 Sea Reclamation in the Manado Municipality

Location (Kelurahan)	Company name	Area (ha)	Land use (proposal)
Wenang Selatan, Titiwungen	PT. Megasurya Nusa Lestari	30	hotel, shopping mall, restaurants, children's park, city park, harbor
Wenang Utara, Sario Tumpaan, Sario Utara	PT. Multicipta Perkasa Utama	21.5	hotel, shopping mall, restaurants, marina, children's park
Bahu	PT. Bahu Cipta Persada	7.5	hotel, shopping mall, convention hall, marina
Wenang Utara	PT. Papetra Perkasa Utama	1.5	jetty, souvenir shops, coffee shop, swimming pool

Source: RTRWK Manado 1999/2000

Note: Property right (HGB) has or will be given to the above company, with 84% of reclamation area; government holds the right for the rest (16%) of the area, which will be used for public purpose, such as city park, parking area, places for informal sector.

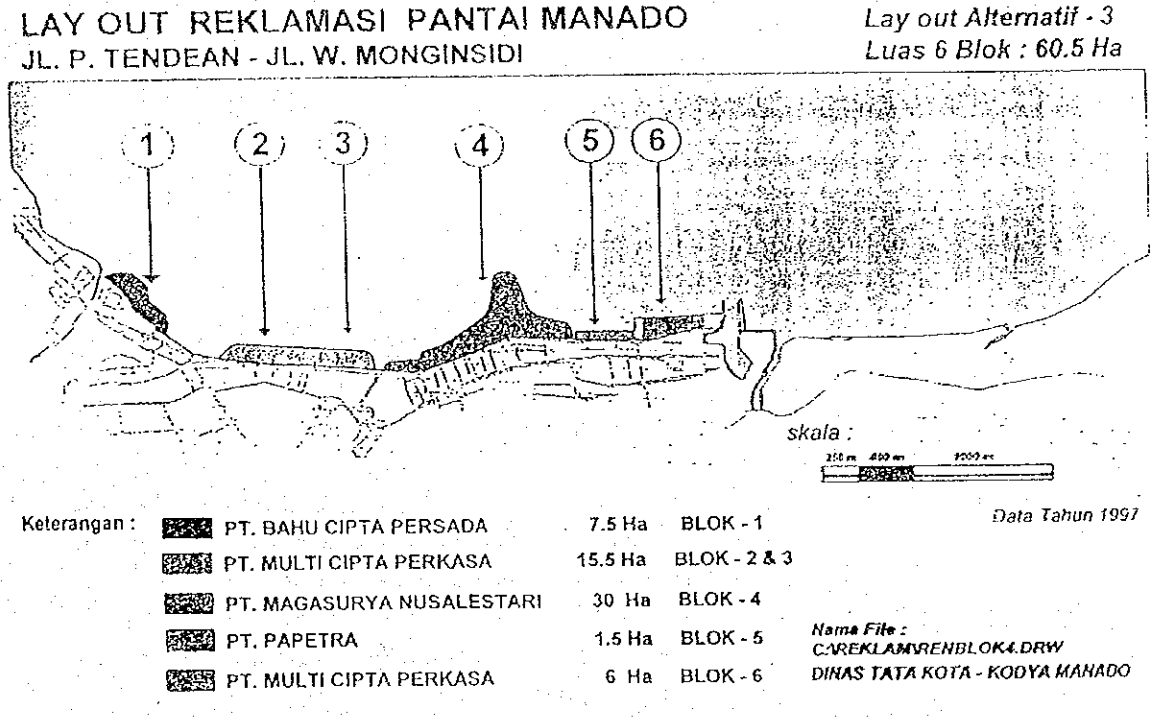


Figure 4.6 Land Reclamation Scheme in Manado Municipality.
Source: Manado Municipality

RTRW does not mention the improvement of the port in Manado. Based on the other sources of information, construction of the new fishing port at the north side of the existing Manado port has been started. There is a proposal to provide fast ship facility for international network with Davao in 18 hours. There is also a proposal to build a new road connecting Boulevard to the above fishing port with a bridge across the existing port of Manado; however, this idea is still in conceptual stage. The environmental conditions of the existing port become worse with poor sanitation and dumping of garbage in the port. The improvement of sanitary conditions is strongly required in this area.

c) Industrial development

Fishery Sector: The brackish water pond is found only in Molas, with an area of 15 ha. According to the Act, 10% is the maximum area of mangrove forest that can be converted to another land use. Aquaculture should pay special attention to this. The major production from the brackish water pond is milkfish, shrimp and crab. Indoor aquaculture of fish and salt water shrimp using seawater will be profitable in the near future. Meanwhile, there is no plan for the development of tourism sector in RTRW.

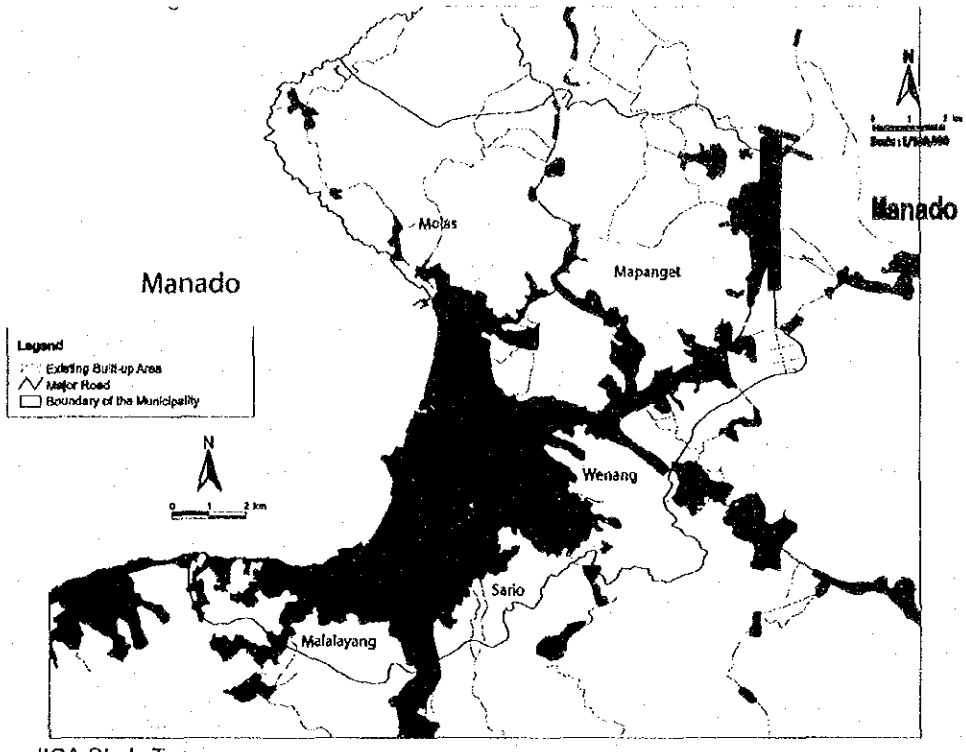
d) Infrastructure development

Manado municipality's plan on human waste and solid waste management is contained in the report "Master Plan for Human Waste and Wastewater Disposal for the City of Manado: IBRD Loan No. 3340 – IND Sulawesi Irian Jaya UDP." The plan states that the following are the necessary measures for the management of human waste of Manado:

- Campaign and environmental education on health and sanitation;
- Building of MCK along the rivers and sea front;
- Provision of soft loan for the installation of appropriate individual septic tank;
- Provision of off-site system in high density area; and
- Increase of vacuum car's service.

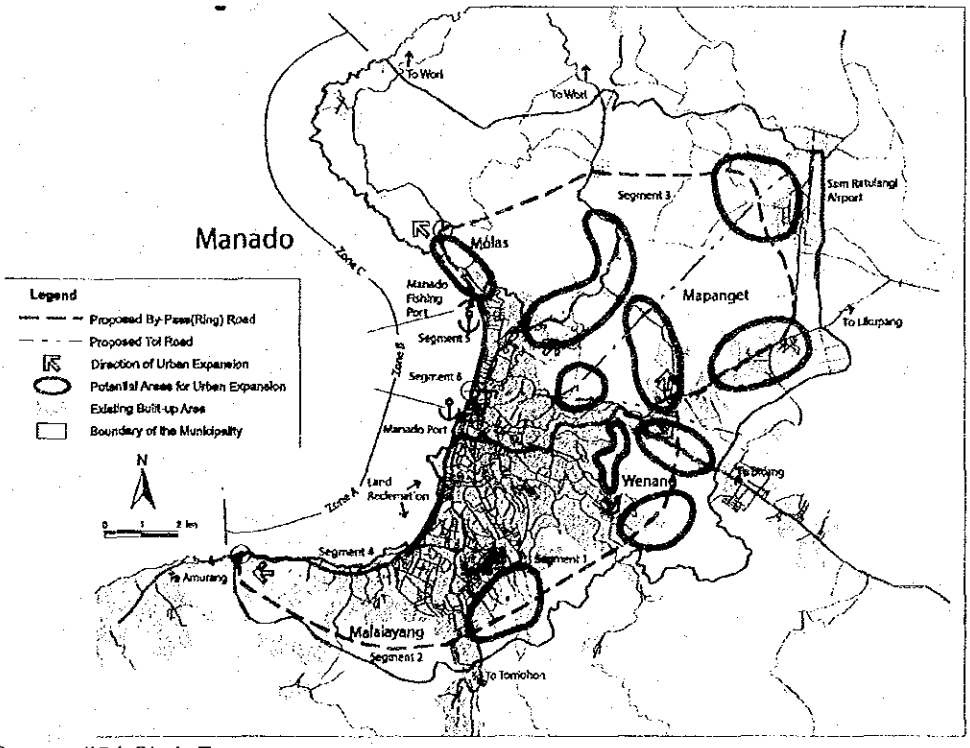
There are no responsible organizations charged with cleaning seawater areas, except harbor water areas, which are to be managed by the port authorities. Garbage is scatterd in port area. Even though the port authority has responsibility for cleaning the port area, there is no mention of improvement of waste collection in coastal area in RTRW.

Figure 4.7 shows the planned development areas proposed in the RTRW and potential development areas of the municipality of Manado.



Source: JICA Study Team
based on RTRW Manado

(EXISTING)



Source: JICA Study Team

(FUTURE)

Figure 4.7 Planned and Future Development Areas of Manado

(3) RTRW Bitung Municipality

Priority sectors/areas for the preparation of RTRW of Bitung are concentrated in the coastal area of the municipality. They include the following:

- Port area;
- Industrial area (KABIMA); and
- Tourism area.

The RTRW Bitung pointed out coastal environmental problems as follows:

Water pollution

Gold mining in Batu Angus, Bitung Utara district, could potentially create a conflict between the tourism area of Lembeh Strait and marine fishery activities, due to dumping of tailings, throwing of garbage into the sea and fuel dumping of ships in Bitung harbor. Landslides and floods result from the large-scale cutting of trees, especially in Batuputih and Dua Saudara Desa, for timber production for shipbuilding and other structures.

Coastal erosion

There are potential coastal erosions along the coastline of Madidir, Wangurer towards the low land of Girian. It is brought about by coastal land structure and severe waves from the Maluku Sea and unnatural factors such as generation of waves by ships. It is estimated that there will be a loss of 2 to 3 meters of coastline every year in the next 10 years.

Environmental degradation of Lembeh Strait

In Lembeh Strait, those irrational actions such as dynamite fishing, cyanide fishing, and setting huge nets could threaten the sustainability of marine ecosystem.

Concerning the development and management of the coastal area, the municipality of Bitung plans the following:

a) Protection areas

There are two nature preservation areas, i.e., Mt. Tangkoko (3,196 ha) and Mt. Duasudara (4,299 ha), and two natural tourism parks of Batu Putih (615 ha) and Batu Angus (635 ha) in the municipality. All these areas are located in the coastal area. There are also proposed protection and conservation areas. In addition, the

municipality also proposes protected forests around the above two nature preservation areas and marine park in the Bitung Selatan district.

b) Coastal area development

The disorderly development of housing, warehouse, industry, etc can be seen especially along the coastal area as a recent development tendency.

There are plans for development of coastal areas such as container port, fishing port, ferry terminal, fishery processing industries and shipping facilities, and other supporting activities. In the urban area, the infrastructure system such as drainage, solid waste management and wastewater treatment facilities are not installed; the environmental qualities of those areas have been degraded. An integrated development and management planning will be required especially for the Lembeh Strait and the coastal area, taking the above environmental issues into consideration.

For the construction of a container port in Bitung Port (Pelabuhan Samudera Bitung; 1st class port), the land reclamation proposal has been approved by the mayor. To support the service of Bitung Seaport, encouragement of the coast guards is needed.

c) Industrial development

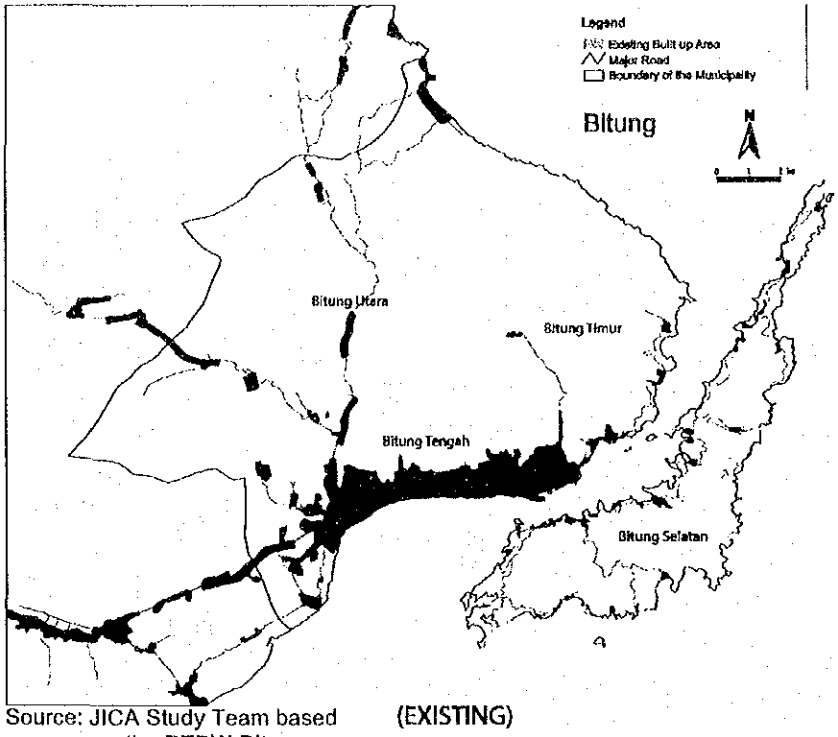
There is no specific plan for the tourism development, however, the following tourism areas will be important:

- Marine and eco-tourism in Batu Putih;
- Eco-tourism in Tangkoko nature reserved area; and
- Protection and presentation of Tarusius and other flora and fauna attractions.

d) Infrastructure development

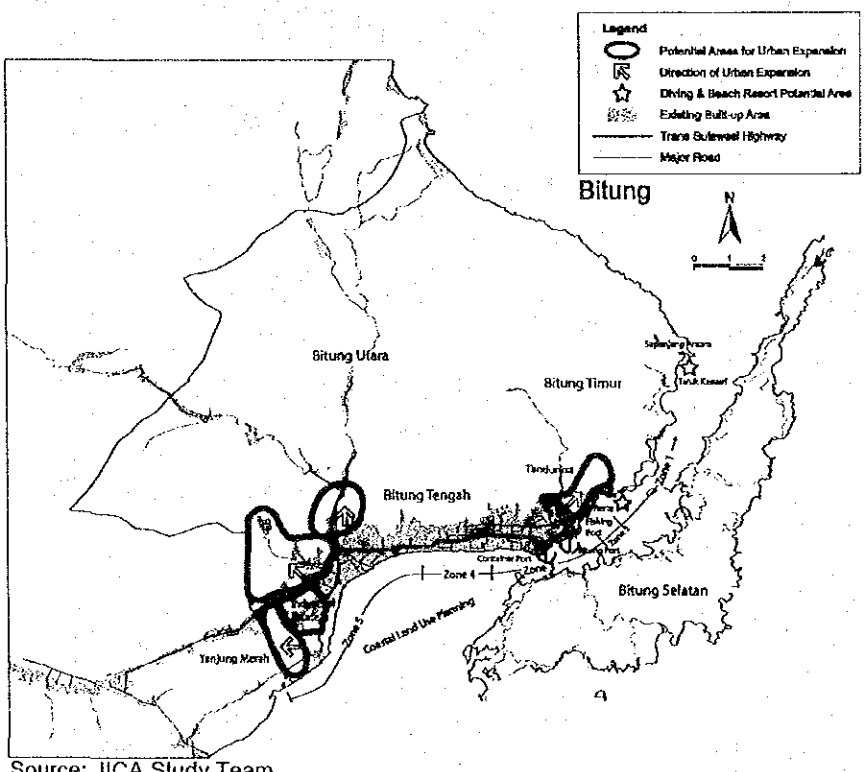
There is no proposal for the improvement of wastewater management including domestic, industry and gold mining in the RTRW. However, the investigation of the environmental pollution by the gold mining activities in Batuangus and large-scale fish/food processing industries in the coastal area must be carried out for the assessment of environmental situations.

Figure 4.8 shows the planned development areas proposed in the RTRW and potential development areas of the municipality of Bitung.



Source: JICA Study Team based on the RTRW Bitung

(EXISTING)



Source: JICA Study Team

(FUTURE)

Figure 4.8 Planned and Future Development Areas of Bitung

(4) RTRW Minahasa regency

Development priority areas in the regency as major issues for the RTRW planning are designated as: 1) KAPET Manado – Bitung area, 2) KABIMA industrial area (establishment of agro-industrial estate), 3) Marine tourism area in the north Minahasa (Likupang and islands), and 4) Amurang – Tumpaan urban development area.

Strategic corridors of improvement of living environment are: 1) Manado – Bitung, 2) Manado – Tomohon, and 3) Tomohon - Tondano

The targets of the development can be itemized as follows:

- Agricultural sector;
- Increase of job opportunity;
- Increase of ecomony and income;
- Promotion of industries other than agriculture;
- Improvement of educational situations; and
- Stabilization of population increase ratio within 1% and increase life expectancy to 70 years old.

Concerning the development and management of the coastal area, the regency of Minahasa plans the following:

a) Coastal area development

The sustainable utilization of the marine resources should be encouraged through the increase in fishermen's capability to catch fish and its processing, the development of maritime industry and marine tourism. At the same time, the recording and evaluation of marine resources should be developed. This is done in collaboration with the university, such as Faculty of Fisheries and Marine Sciences UNSRAT and Faculty of Marine Technology, the Institute of Minahasa Technology Tomohon.

There is no proposal for the improvement of the existing ports in Belang and Likupang, and also other area development in the coastal area.

b) Industrial development

The development strategy of fishery sector includes the following:

- Collecting data on the economic values of commodities and markets of the marine, brackish and fresh water fisheries.

- Marine fishermen need to be equipped with outboard engine in order to expand their fishing ground.
- Marine fish culture, brackish water and freshwater ponds need to be supported by the fish processing industry. Processing of salted fish, presto fish, dried shrimp, and canned fish and shrimp need to be developed in the fishery producing areas.

The direction of fishery development is shown below:

Table 4.20 Direction of Fishery Development in the Regency

	Production center	Development area
Marine fishery	3	1) Tambariri and Tombasian
		2) Likupang
		3) Belang
Seaweed and shell	2	1) Belang (islands)
		2) Likupang and Wori (islands)
Tambak shrimp and milkfish	1	Likupang
Inland fishery	3	1) Kakas, Eris and Tondano (around Tondano Lake)
		2) Modiding (around Moat Lake)
		3) Dimembe with Tatelu

Source: RTRW Minahasa regency

The regency plans to encourage marine tourism development as main tourism, as well as of non-marine tourism development, including resort tourism (hotel, golf, resthouse), and mountain/highland tourism (agro-tourism, hiking, natural park) as a supporting tourism. The priority tourism development areas identified on coastal zone are as follows:

- North coast of Minahasa between Wori-Likupang for development of marine tourism resorts in non-mangrove areas;
- East coast of Belang district and its surroundings for marine and natural tourism facilitated with resort development within natural sustainability;
- Amurang – Tenga and its surroundings which could be developed for marine and natural tourism;
- The development of Kema coast and its surroundings must be restricted so that the coast is not occupied by tourism facilities; and
- The coast of Pineleng district located in the vicinity that is largely affected by the provincial capital of Manado could be developed as tourism area for the citizens.

c) *Infrastructure development*

There is no plan for the improvement of water supply system, wastewater and solid waste management in the area. However, the investigation of environmental pollution

by the gold mining activities in the area must be carried out to understand the environmental situations around the activity areas.

(5) RTRW Bolaang Mongondow Regency

The major issues for the RTRW planning of Mongondow Regency are as follows:

- Economic growth;
- Mitigation of regional disparity;
- Maximum use of natural resources and development of human resources; and
- Protection and management of natural environment.

Concerning the development and management of the coastal area, the regency of Bolaang Mongondow plans the following:

a) Coastal area development

There is no proposal for developing coastal areas including sea port.

b) Industrial development

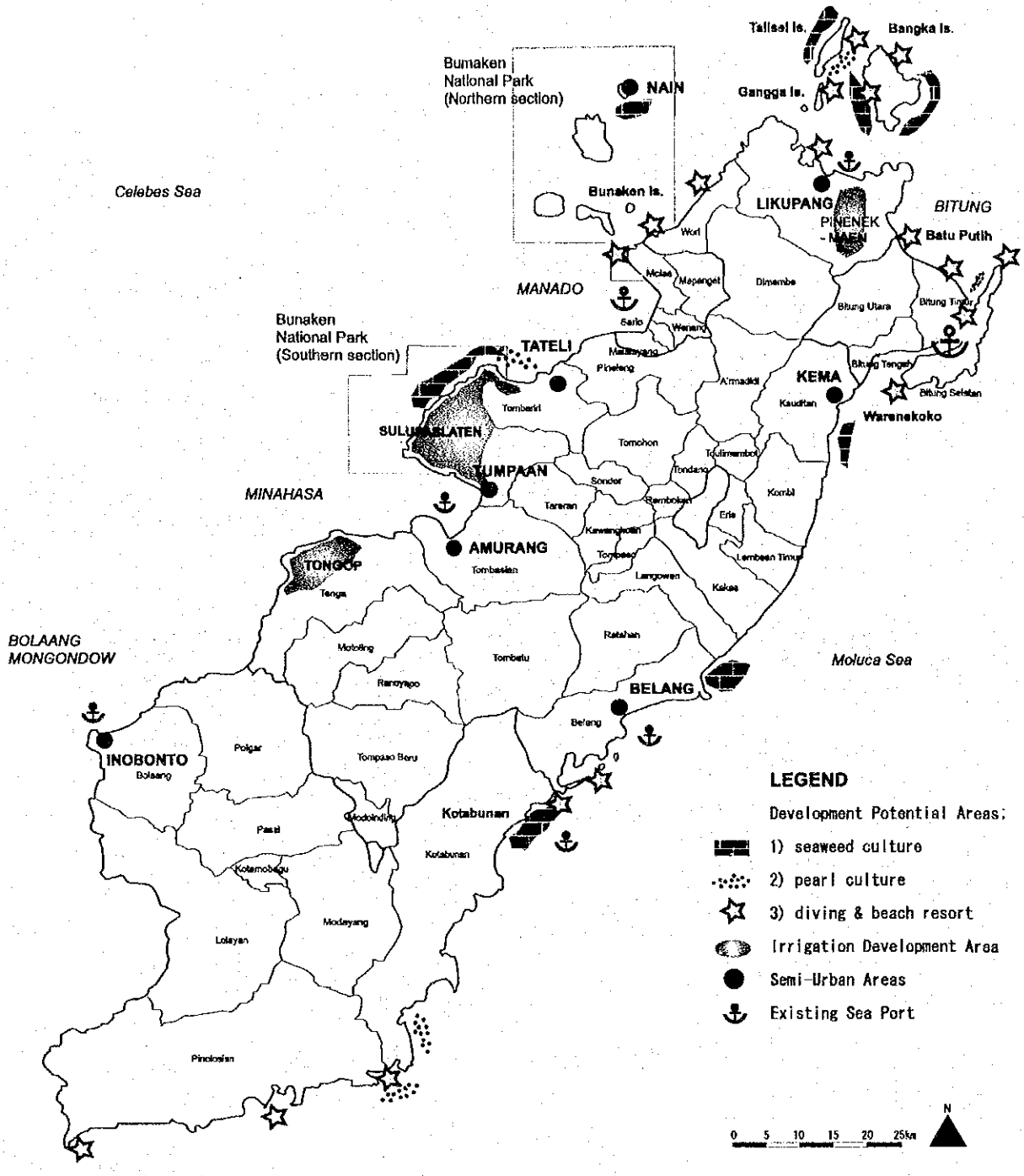
One of new fishery sources which has not been much exploited economically is 'Bandeng fish' and it has apparently found lots of seed along the southern beaches.

The development of the sites of tourist attractions such as beaches and hot springs are required as well as the improvement of roads and other infrastructure system. Because the regency is far from the Manado gateway to tourists, the present tourism activities in the regency is very small. There are 17 hotels and other accommodations and 7 restaurants at present, and the number of tourist arrivals is not available at the moment.

c) Infrastructure development

There is no plan for the improvement of water supply system, wastewater and solid waste management in the area. However, the investigation of environmental pollution by the gold mining activities in the area must be carried out to understand the environmental situations around the activity areas.

Figure 4.9 shows the planned development areas proposed in the RTRW and potential development areas of the rural coastal areas in the Study Area.



Source : JICA Study Team

Figure 4.9 Planned and Future Development Areas in the Rural Coastal Area

4.4.3 National and Provincial Development Plan

The State Policy Guideline, (*Garis-garis Besar Haluan Negara*: GBHN), is usually a 25-year long-term national plan; however, the planning period of the latest GBHN (1999) is only for 1999 – 2004, due to the transition period, including presidential election, decentralization and others. With regard to the former GBHN drawn up in 1993, the section of the marine sector was separated from the agricultural sector for the first time.

The Basic Pattern of North Sulawesi Development Plan (*Pola Dasar Pembangunan Daerah Propinsi Sulawesi Utara*: POLDAS) is originally a long-term plan at the provincial level. However, the planning period of the latest POLDAS is for 2000 – 2005, because of the transition period also. POLDAS indicates the local development policy and framework for North Sulawesi. POLDAS' mission is expressed in terms of globalization, democratization and autonomy. Its mission statement regarding marine resources is listed 9th, that is, "*to optimize use of marine resources, fisheries and other marine products utilization to community prosperity through proper policy.*" It is not clear, however, whether the strategy, priority and implementation mechanism apply not only to marine resources management but also to other sectors.

The Regional Annual Development Plan (*Rencana Penbangunan Tahunan Daerah*: REPETADA) shows the budget for coastal management in North Sulawesi. The budget share of coastal management depends on what is considered as coastal area. According to REPETADA 2000, the provincial development budget for coastal management accounts for Rp. 6,209 million or only 7% of the total development budget (Rp. 88,557 million) as shown in Table 4.21; but this amount covers not only coastal management but also inland aspect, such as inland protected area management, agriculture, and forest management. This means that the budget for coastal management is even less than 7% of the total development budget. Further, it appears from this figure that the provincial government still does not enhance coastal management in North Sulawesi, although efforts are being made to promote optimal use of marine resources through proper policy in POLDAS.

Table 4.21 Annual Provincial Budget for North Sulawesi, 2000

Items	Budget (Rp.)
Fishery Resources Program	**450,000,000**
• Fisheries Development Project of North Sulawesi	450,000,000
Living Environmental Management and Development Program	**5,759,000,000**
• Development and improvement of environmental quality in Manado City	325,000,000
• Maintenance of living environment in North Sulawesi	1,000,000,000
• *Protected area management and reforestation in North Sulawesi* Province	1,880,000,000
• Coastal community development in developing areas	2,554,000,000
Total Budget for Coastal Management	6,209,000,000
Total Development Budget	88,557,000,000
Total Regional Budget	151,101,888,000

Source: BAPPEDA North Sulawesi, Regional Annual Development Plan 2000

4.5 Community-Based Coastal Management

(1) Background

In the last 60 years, the role of village level control on coastal resources through traditional management by communities has diminished in North Sulawesi due to a changing framework from traditional legal basis to modern centralized management regime. North Sulawesi coastal management, however, has suffered more from isolation and ineffective management due to inaccessibility to government administration in the form of centralized government. As a result, what has been happening in North Sulawesi is that the role of community level coastal resources management is undermined and it has been replaced by open access regimes, which is a free for all with uncontrolled entry for resource use and gives the economic incentive to the user, and encourages the user to explore as much of the resource as possible before others do.

Although it should be kept in mind that Community-Based Management (CBM) is not a panacea for resource management, efforts should still be made to encourage village level control on coastal resources in North Sulawesi, and also to institutionalize CBM for coastal area in the form of a decentralized government administration. CBM for coastal area must not be understood as all elements of coastal resources management should be allocated to the local communities, but a more dynamic partnership must evolve between local communities and local government. Moreover, this should be complemented by the ability of the local government to provide enabling legislation and other assistance.

In this section, an analysis is made of existing CBM areas in the study area by comparing

them with the non-CBM villages, also in the study area, in terms of resource use. Then a discussion follows on what would be the elements for establishing a CBM in the study area that would achieve this goal: "To realize sustainable and effective coastal resources use by communities and to empower coastal communities for their area development." A more detailed analysis is made in "Volume IV: Community-Based Coastal Management."

(2) Analysis of Existing CBM in the Study Area

In order to establish a CBM model in the study area, an analysis is first made of the current CBM situation there. Although their numbers are not significant, there are some areas undertaking CBM. Kulu village is used as example for the purpose of this discussion. And for comparison, the Study looked into the coastal resources of Rap-rap village, a non-CBM area, which is facing many coastal management issues right now.

In Kulu village, the community has been planting mangroves since 1992. During that year alone, 200 families, or over 1,000 community members, participated in this tree planting. Each family planted around 10 mangroves, so that all together 2,000 were planted. On the 26th of October 1996, which was the 70th foundation anniversary of the village, community members participated once again in tree planting and, this time, 1,500 mangroves were planted. There was a change in the community's mangrove planting efforts on "Environmental Day," the 5th of June 2000, when it was decided to plant mangroves at the water catchments area in Kulu village instead.

Rap-rap has the widest coral reefs in Minahasa regency and is designated as a part of Bunaken National Park (TNB) since the early 90s; however, the condition of corals greatly varies from category I (0~25% coral cover) to III (50~75% coral cover) with the worst near the village (Coastal Community Survey, August 2000). This condition is associated with human activities, such as coral mining, dynamite fishing, and the use of destructive fishing gears. Dynamite fishing is happening on a daily basis by both fishers from outside and inside of village. Monitoring activities by the Park Authority and the community for dynamite fishing is not happening much due to some political reasons, which make the issues very difficult to solve.

The area has a very wide area of mangrove forest and seagrass bed besides coral reef. Community people use mangroves for their daily living and sometimes catch dugong, whose habitat is in the seagrass bed area, for their sustenance.

(3) Discussions

By comparing the two villages of Kulu and Rap-rap, it is found that they both have very rich

and various coastal resources in their coastal area. Kulu village has decided to conserve the mangrove forest in the area and is utilizing the coastal space effectively, while Rap-rap village destroys their resources and feels that the conservation of their resources is a hopeless situation. There are some points of discussions identified by analyzing these two different types of communities.

a) The aspects of perception and knowledge of coastal resources and affinity to the coastal resources, and the aspect of knowledge of management and sense of initiatives

People's perception and knowledge of coastal resources is important but the knowledge of management and sense of initiatives might be more important factors for CBM. In Kulu village, people have very high perception and knowledge of coastal resources and sense of closeness to their coastal resources, so do Rap-rap village. People in the coastal area know their resources, locations, functions, and conditions very well; however, they lack the capacity to manage their resources and do not believe that they are able to do it. The big difference between Kulu village and Rap-rap village is that Kulu people believe in their ability to conserve their resources and are willing to take action because of their sense of ownership to the coastal resources.

The Study Team could not find any practice of traditional knowledge on coastal resource management in the area, even in Kulu village. It would be important to introduce modern management ideas and skills to communities where coastal management is absent, according to their need. What is essential is how this information would be disseminated and how communities could be organized in order to establish CBM for the coastal area.

b) Sense of ownership based on territorial boundaries

One of the biggest differences between Kulu village and Rap-rap village is whether or not the community has a sense of ownership of their coastal areas. Kulu villagers have a very strong sense of ownership of their coastal area and believe that any resources inside the area belong to them. It is not known exactly where this sense of ownership came from, but the important observation is that this ownership seems to be associated with the boundaries in the sea which they believe divide their area and others. This sense of ownership may lead to the sense of village level management to conserve their coastal area and resources in Kulu village.

In order to establish CBM for the coastal area, it would be a very important element to

consider giving an ownership of the coastal area based on territorial boundaries. Then, there would probably be a need to consider giving coastal communities some form of user rights of the coastal area in order to protect their resources from outsiders, and conserve them by sustainable use.

c) Mobilization of community

In order to practice CBM for the coastal area and its resources, it is very important to have figures or an organization concerned with area development as well as management in their villages. In Kulu, the elders still have strong influence on the community and their traditional knowledge of coastal resources and management can be integrated into the area development without much conflict from village members. In Rap-rap society, the village is consist of immigrants from different places, so that there was a break down of old social structures and system of each cultural group, and any traditional management knowledge were lost rapidly from memory as those knowledgeable about them have passed away. In a society like Rap-rap, which is typical in Minahasa, there is probably a need to establish an organization which considers integrated coastal development and management for coastal resources in order to mobilize and direct the community to the conservation of coastal resources for their sustainable use and for areal development.

4.6 Information System on Coastal Management

There are issues on coastal management regarding administrative information especially accessibility. One such issue pertains to the difficulty to collect necessary information such as regulations for coastal management from government, because government offices do not keep this kind of document nor maintain a library or establish any information flow system. Even in government offices that are not under this type of situation, it is so difficult to access information owing to the government's policy on coastal management. There is a need for local governments to provide the necessary information to people, because coastal management should incorporate feedback from various stakeholders such as fishermen, the business sector and NGOs.

4.6.1 Information Flow for Coastal Management

(1) Existing data related to environmental management and spatial use of coastal areas.

Despite the fact that North Sulawesi Province has 1,987 km of coastline, there has been neither organizations nor specific sections/divisions that are in charge of coastal management. Consequently, there is not enough information regarding coastal management nor any systematic information system existing in the area of coastal management.

In the former regime, however, information was collected and utilized on a sectoral basis and this routine information corresponded only to sectoral needs. In terms of statistical data such as demography, these were collected by statistics offices (Kantor Statistik) in coordination with local governments. These information, however, are not directly related to coastal management and planning.

In North Sulawesi, information related to coastal management has been utilized in regional spatial development plans for the respective needs of each sector. Therefore, only kinds of organization, kinds of information, and the way to collect information can be analyzed by examining existing regional spatial development plans. Five agencies used to prepare those plans, namely, BAPPEDA, BAPEDALDA, *Dinas Perikanan*, *Dinas Pengairam*, *and Dinas Kehutanan*. Since those plans were formulated by provincial level agencies only, therefore, the examination of said plans were also only at the provincial level.

Table 4.22 summarizes plans, related data and activities by relevant organizations.

Table 4.22 Plans, Related Data, and Products by Relevant Organizations

	Role of Sector in Charge	Related Data and Information for Coastal Management	Product/ Report
BAPPEDA	Spatial Use Plan	Coastal Plan in Spatial Plan	Province in Figures (?)
		Environmental Issues	Provincial Spatial Development Plan (RTRWP)
BAPEDALDA	Environmental Impact Assessment		Regional Natural Resources Balance (NSDA)
	Regional Carrying Capacity		Regional Environmental Quality Balance (NKLD)
		Pollution Impact Management (Control and Monitoring)	Environmental Impact Analysis
	Environment Management Unit Environment Monitoring Unit Environment Management Plan/Environment Monitoring Plan		UKL/UPL RKL/RPL
Fishery Office (*Dinas Perikanan*)	Fishery (*Perikanan*)	Marine Resources Data	Area data for permission Quantitative data for marine resources
Water Irrigation Office (*Dinas Pengairan*)	Water Irrigation (*Pengairan*)	Beach Protection	Coastal Protection Program in North Sulawesi Survey Investigation and Design (SID)
Forestry Office (*BRLKT*)	Forestry (*Kehutanan*)	Mangrove Protection and Rehabilitation Program Watershed Conservation and Rehabilitation	Data for Mangrove Data for Watershed (DAS), especially on critical areas for land use

Source : JICA Study Team

(2) Organizations and Kinds of Data

a) BAPPEDA

Regional Spatial Development Plan (RTRWP)

BAPPEDA formulates RTRWP based on planning proposals including budgeting received from related agencies. BAPPEDA, therefore, has information, which relates to planning of RTRWP in coastal management area. However, there is neither plans nor regulations, which directly relate to coastal management in RTRWP.

Routine information for monitoring of on-going projects funded by National Budget (APBN), Foreign Aid (BLN) & Regional Budget (APBD)

Every project funded by APBN, APBD & BLN has to submit a report every three months to BAPPEDA at monitoring / evaluation meetings, which every head of related provincial, regency/municipal, and district government offices has to attend. BAPPENAS is also given a copy of every monitoring report submitted, especially reports of projects funded by APBN & BLN. In these monitoring meetings, if issues related to coastal management come up, BAPPEDA is able to coordinate with related offices to discuss these issues.

BAPPEDA receives information through the reports submitted at every meeting.

b) BAPEDALDA

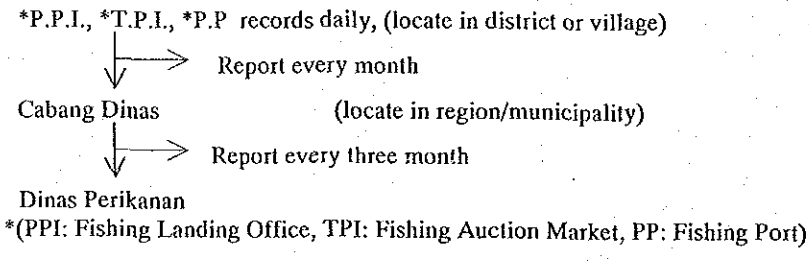
Environmental Statistics of Indonesia

BAPEDALDA gathers environmental information such as those on natural environment, man-made environment, and social environment for the Environmental Statistics of Indonesia.

c) Dinas Perikanan

Quantitative Data on Marine and Aquaculture Production

Dinas Perikanan has reliable and valid field data collected by this organization itself. The flow of information to *Dinas Perikanan* is shown below:



Cabang Dinas located in region/municipality receives reports from 5 P.P.I., 8 T.P.I, and 1 P.P. every month. Then it sends these reports to Dinas Perikanan every three months.

There are three different kinds of data: Fish production (*Bidan Penangkapan*), Aquaculture production (*Bidan Budidaya*), and Processed Food production (*Bidan*

Pengolahan), which are collected by P.P.I., T.P.I., P.P. Cabang Dinas then gathers and compiles each item. Those data are then filed in a formatted report.

Data Regarding Concessions, Spatial Use and Identifying Potential Area

Fishery office has data regarding concessions, spatial use and potential area identification. Concession of fishing and fees were legislated by provincial decree (PP) No.13, 2000 following implementation of decentralization in January 2001.

d) Water Resource Division (*Dinas Pengairan*)

Water Resources Division has four sections. Irrigation and Operation & Maintenance sections, however, are only the very active ones out of the four sections. Although natural disaster control should be one of main missions of the division, the structure of the organization does not respond to this mission. Regarding data for coastal, irrigation, and watershed management, internationally funded on-going projects are the main source of data for the division.

Regarding coastal management, the Division formulated the Master Plan Pengamanan Daerah Pantai Sulawesi Utara based on Survey Investigation and Design (SID) in 1997/98. International donors funded the surveys. The Division accumulated in quantity and quality enough physical and geographical data, which they surveyed.

On the other hand, an area of concern is that there are no proper related regulations to make a proper master plan in the current situation. Also the master plan is not an integrated plan but still a sectoral one, which covers breakwater facilities and other physical facilities.

e) Forestry Division (*Dinas Kehutanan*)
(Office of Land Rehabilitation and Soil Conservation: BRLKT)

In the past, Forestry Division was mainly in charge of permissions and other routine works. BRLKT under the Department of Forestry was actively implementing the following activities:

Guideline for Rehabilitation and Conservation for Critical Land Use Surrounding DAS

This guideline is a plan for mid term (5 year) and long term (15 years). Every five years, the Division revises the plan.

Monitoring Acitivities for Five Priority DAS: Tondano, Dumoga, Ranoyapo, Mahena, and Bone Bolango Rivers

The monitoring is being carried out with physical, social, economic and cultural indicators.

Pilot Project for Rehabilitation of Critical Land Use in DAS and Reservation of Mangroves

The "Minahasa Regency Mangrove Development Program in North Sulawesi" was launched in September 2000. The program covers four villages: Sarawet, Bato, Popareng, and Ranoyapo.

Therefore, BRLKT has data regarding land use of priority DAS and also any information regarding mangroves and their areas.

Before year 2000, BRLKT was reporting to the Land and Land Conservation office under the Forestry Division. Now BRLKT has been reporting to Forestry Divisions in each region and municipality since January 2001. But BRLKT is currently facing a problem of its existence; it will be kept as it is for only until next year. Its status is now under discussion among the following agencies: Dept. of Agriculture, Ministry of Foreign Affairs (Dalam Negeri) and Administration Reform (Aparatur Negara).

Before restructuring of organizations, although each section has its own data, which is necessary to carry out its work and there is a system by which these data are reported to the section they belong to, there is no integrated data which aims to manage coastal areas in total due to lack of a responsible agency or lack of demands to do so. In other words, under the centralized regime, each sector accumulated only their own data for their own purpose in their own organization. Specific data would not be found if no responsible organization or section existed which required such data.

(3) Governmental new initiative for establishment of information system for coastal management

One problem area seen in information for coastal management is that information exist independently according to sectoral needs and are not integrated. Also no information can be found if responsible organizations/sections/divisions do not exist. Moreover, at this moment, because of the transition from the former regime to the new regime, the continued existence of direct branch offices from the central office is under consideration.

Despite these problems, in local governments, there is a movement to establish a kind of

integrated data management office in each province, regency/municipality as shown in the following table, although the names and organizations are not uniform.

Table 4.23 Proposed Data Management Office

Province/Regency /Municipality	Integrated data management office
North Sulawesi	Electronic Data Management Office (*Kantor Pengelolaan Data Elektronik*) :
Bolaang Mongondow	Data Management and Electronic Sub-division (*Sub Baglan Pengelohan dan Elikrtronik*) Agriculture and Forest Enlightenment Information Board (*Badan Informasi Penyuluhan Pertanian dan Kehutanan*)
Bitung	Bitung City Electronic Data Management Office (*Kantor Pengolahan Data Elektronik(PDE) Kota Bitung*)
Minahasa	Electronic Data Management Office (Kantor Pengolahan Data Elektronik)
Manado	Not yet established

Besides the above-mentioned independent organizations, each sectoral service office (*Dinas*) has its own "unit": Local Technical Implementation Unit (*Unit Pelaksana Teknis Daerah: UPTD*) to collect information from the locations concerned.

There are two institutions directly controlled by the central government: 1) Agricultural Enlightenment Information Board (*Balai Informasi Penyuluhan Pertanian*), especially for fishery-related information, and 2) Statistics Office (*Kantor Statistik*).

Agricultural Enlightenment Information Board is still under direct management of the Department of Agriculture, since January 2001. However, under decentralization transition, regency/municipal governments are showing their willingness to manage the board by themselves and are now negotiating with the central government. In the case of Minahasa regency, the government decided to maintain the management of the board as it is, and this decision is going to be re-examined after one year.

The statistics office has main function of collecting basic and nationwide statistical information/data. It standardizes questionnaires and follows the national appointed items to survey. Its data are collected by extension officers at district and village levels.

Qualitative aspect of routine data/information can be improved by directly or indirectly connecting to income generating activities, as Fishery Division's fish production data,

which was endorsed by provincial decree No.13, as mentioned before.

4.6.2 Database System for Coastal Management

(1) Background

Since 1987 the Ministry of Environment in Indonesia has been developing technical personnel for GIS and Remote Sensing tasks as part of its personnel training program. Specifically, an Integrated Regional Environment Development Program was carried out with assistance from the Canadian International Development Agency (CIDA). Four areas of Jakarta and the provinces of East Java, South Sulawesi and Irian Jaya had been selected as model areas for GIS development and the output were utilized for purposes of regional development and environmental management.

Two notable projects relating to database building had been conducted in Indonesia. One was the Marine Resource Evaluation and Planning Project (MREP) from 1994-1998, which was funded by the Asian Development Bank (ADB). A large database on fields such as biophysics, infrastructure, social economy and demography was constructed.

The other project was the Digital Marine Resource Mapping (DMRM) Project from 1996-1999 under the National Survey and Mapping Agency (Badan Koodinasi Survei Dan Pemetaan *Nasional:* BAKOSURTANAL), which was funded by Norway. The project outputs were primarily marine charts and a map of Economic Exclusive Zone (EEZ) at 1:200,000 scale covering the whole territorial boundary of Indonesia's ocean waters generated by digital mapping based on aerial photographs.

(2) Related Agencies

In order to determine the GIS database situation of related agencies, the Study conducted a questionnaire survey and an interview survey in September 2000. The following responded to the survey:

- BAPPEDA (Planning Board, North Sulawesi Province);
- BPN (National Land Use Board, North Sulawesi Province);
- BIPHUT (Forest Inventory and Mapping Agency);
- BRLKT (Land Rehabilitation and Soil Conservation Agency);
- DINAS (Water Resources); and
- UNSRAT (University of Sam Ratulangi).

(3) Main Purposes of Introduction of GIS Database

GIS was introduced into all of the above-listed agencies between 1992 and 1998 as a part of projects by the central government and international aid agencies such as CIDA. The main purposes of GIS introduction were to construct a database from collected information for project use, to grasp existing situations based on the constructed database, to select a priority area for development of a management plan and to determine problem areas.

Each agency utilizes the GIS as a basic tool to manage information (e.g. land use, land ownership, city facilities, river and harbor facilities, forestry, and natural environment protection zone) under their respective jurisdiction. Updating of database is carried out independently as well.

(4) Software and Hardware for GIS Database

a) Software

ArcView, ArcInfo and MapInfo distributed by U.S.-based companies are GIS software used by the agencies surveyed. These software can indicate and refer to database rapidly; the database is built by the user and it can be updated. Furthermore, various outputs can be generated following statistical manipulation and analysis.

Although ArcView and MapInfo are distributed by different companies, they can read each other's data file. Specially, the Shape file form that ArcView adopts has already been circulated as a worldwide standard file in GIS. Therefore, when each agency will exchange data files with each other in the future, such a standard file form will be adopted.

b) Hardware

PC (Personal Computer) is used for the hardware fundamentally and centrally. Most agencies use PCs, connecting more than one computer by local area network (LAN). Generally, the digitizer for the input, the color plotter for A 0 edition, CD-R/RW to do the backup of the data files and so on are used as other equipment in each agency. These pieces of equipment are necessary to do all the work such as input of data, processing, analysis and output map preparation consistently.

DINAS has installed a server (NT server), which manages database intensively. It has also adopted a Client/Server System that provides the database of GIS to more than one client (PC) from the server.

c) Cost of maintenance

A PC unit can now be used to run GIS unlike before when a central hardware or an engineering work station (EWS), which is more expensive, had to be utilized. Many of the agencies acquired their GIS in the latter half of the 1990s when it was cost effective to do so.

Based on the result of the questionnaire survey, the upgrading period of the hardware and the software is thought to be from about 3 to 5 years, and the updating period of the database is mostly from about 1 to 10 years. Moreover, there are personnel expenses to consider as well as maintenance cost of GIS, which is expensive.

d) The network of GIS database

The agencies have no regulation about the provision of information including the GIS database. Nonetheless, it is found that BAKOSURTANAL and BPN do not provide other agencies with any of their data, while BIPHUT, BRLKT, Water Resources, and Sam Ratulangi University require an official letter to release their data.

Adoption of an information network system requires each agency to provide information to one another. Many of the agencies plan to put up a center and network with other areas, too. For example, in Water Resources, although it has been equipped with LAN, the GIS database cannot be used freely by its staff.

(5) Production from GIS Database

In general, the agencies prepare maps ranging in scale from 1:50,000 to 1:250,000. However, most of their maps are based on the topographical map issued by BAKOSURTANAL, which are already outdated. Therefore, each related agency looks forward to the updating of the topographical map to be used as the latest base map.

The following kinds of maps are produced by the agencies:

- BAPPEDA : Land Use (1/250,000), Spatial Development Plan (1:250,000);
- BPN (National Land Use Board North Sulawesi Province): Land Use (1:50,000, · 1:250,000), Land ownership (1:1,000), Soil (1:50,000, · 1:250,000);
- BIPHUT (Forest Inventory and Mapping Agency): Forest Land Use Consensus (1/250,000), Vegetation (1/250,000);
- BRLKT (Land Rehabilitation and Soil Conservation Agency): Forest Land Use (1:250,000) ;

- DINAS (Water Resources): Master Plan (1:50,000), Priority (1:50,000), Port (1:250,000), Land Use (1:250,000); and
- UNSRAT (University of Sam Ratulangi): Gold Mining (1:50,000, · 1:250,000).

(6) Human Resources

Each agency has at least 2 persons assigned exclusively to GIS work. They received their training of about several months from GIS specialists (probably from the GIS software company that sold the software.) in the project that introduced the GIS. Only BPN has a technical training section for GIS in their central office. A GIS staff in BPN is posted to department offices in each district after their training at the central office and acquiring a license. But they prepare only a base map for the database there because GIS is not always used in all department offices.

4.6.3 Problems of Information System

Based on the analysis of the present state of GIS operation in the agencies related to the coastal management of North Sulawesi area, the following three categories of problems are found:

- Problems about the preparation of information and GIS;
- Problems about securing a budget for the production of GIS; and
- Problems about the cooperation of the related agencies.

The above-mentioned problems are described below.

a) Problems about the preparation of information and GIS

Valid and good quality data and information are essential to an effective management, however, the reality in the area is that information is not utilized well and effectively for coastal management. Sectoral management such as fishery, forest and others do not even use data and information for planning and implementation stage for several reasons. First, all necessary information is not identified nor used, thus its value in management cannot be recognized; lack of experience in data utilization is one of the constraints as well. As a result, the necessary information is not accumulated in an agency nor a useful information network is not established, and necessary information for coastal management is unavailable. This is a vicious cycle generated. Problems regarding coastal information system are summarized as follows:

- coastal information is not utilized because the value of good and valid information has not been recognized for coastal management;

- experiences to utilize information for coastal management are lacking;
- a number of necessary information are lacking for coastal management because these necessary data and information are not identified; and
- information system do not exist such as collection, arrangement, analysis and transmission/release in an agency nor among related agencies.

Especially on GIS, problems related to the preparation of the database are the most serious among the three and need to be addressed as soon as possible. GIS information has been developed by various organizations/agencies such as Public Works Office, Forestry Office, BAPPEDA, National Land Use Board (*Badan Pertanahan Nasional: BPN*), and University. However, information are not standardized so that it is very difficult to utilize or share them among agencies. The unification or standardization of GIS should be considered seriously among organizations and efforts should be made to make a GIS networking system for the different planning purposes including coastal management plan. The following fall under this category:

- The agencies do not have a unified specification on the preparation of the GIS database owing to differences in preparation time frame, scale, and technique. And because of these dissimilarities, many database systems cannot be manipulated by other GIS software.
- It is a multiplex investment to prepare the same kind of map by each agency. For example, the same kind of maps on land use, coastal management, and so on are prepared by these agencies independent from one another. This does not only become a factor of the unadjusted state of the agencies' database; it is also a multiplex investment with the result that a budget that is already small to begin with is spent unwisely.

b) Problems concerning securing a budget for the production of GIS

The introduction and the maintenance cost of GIS depended wholly on the domestic or foreign project that introduced them in the first place. Therefore, because the budget within the agencies was not fully settled after the project's completion, the maintenance of GIS became quite difficult for the agencies. For instance, BRLKT's budget for GIS is only in several hundred thousands of Indonesian rupiah a year, an amount which covers only the paper and ink for the output. In addition, the influence of decentralization movement is considerably big. There are enormous gaps in human resources and financing to carry out new policy and plans. The new local government regime has to face these critical issues and find a way to improve the situation.

It is assumed that the agencies do not recognize the importance of GIS, that sufficient

budget for the maintenance and update of GIS cannot be fully secured, and that the effect on the initial investment in GIS cannot be improved.

Therefore, the following are given as specific problems under this category:

- The budget of the agencies are limited precluding the training of human resources for GIS work.
  Because sufficient budget cannot be secured, the agencies cannot train personnel for GIS work to operate their database. For example, the GIS database developed several years ago with MREP project in BAPPEDA is no longer used because no one of the previous staff who used it from two years ago remained.
- There is not enough budget to maintain the GIS
  The GIS cannot output a satisfactory result if the prepared database is not maintained and updated. When this happens, its practical use is lost, and the major part of its role as an information system cannot be played.
  Hardware and software for the GIS introduction were purchased, and the necessary database could be prepared for the project duration. But because a sufficient budget could not be secured, it was impossible to maintain the hardware and the software and to update the existing database, which in turn made it impossible to prepare a new database.

c) Problems about the cooperation of the related agencies

The problem about the cooperation of the related agencies is closely linked with a. and b. above, and solving this problem is an indispensable condition to work out each of the other problems. Under this problem category, there are three aspects that need serious consideration:

- Providing one another with information is hardly practiced by the related agencies. Though the provision of information to the outside is sometimes done in accordance with the judgment of those in high positions, providing the database owned by one agency to another agency is hardly done. On the contrary, these agencies do not really know what kind of information the others have. And the unified regulations and agreement about the provision of information have not been established yet.
- As a consequence of the above-mentioned problem, the preparation of the information network system connecting the related agencies with each other is delayed. The preparation of the information network system in the local administration is indispensable for the efficient access of the latest information

from the outside. Of course, each agency must cooperate and come to an agreement, and a large fund becomes necessary to build such a system.

- The concrete cooperation system to solve the problem of the related agencies has not been prepared yet.

  To realize the preparation of the unified specifications for the database preparation, the enactment of regulations and agreements about the provision of information, the preparation of the information network system and so on, the staffs of all agencies should cooperate with one another. They should hold a meeting to discuss their problems and come up with a plan on how to best address them, similar to the GIS Working Group meeting with the Study Team held last September 2000.

d) Utilization of data at organizations directly managed by central government

Organizations that are under direct management of the central agencies are now facing a problem of their existence, since the implementation of decentralization in January 2001.

A problem arises when a decision is made to abolish agencies that have the most quantitative and valid data/information than any other local agencies. The local governments have to face this problem and strive to keep those agencies and data for their own sake.

4.7 Human Resources Development

It is not an easy task to look into existing human resources in coastal management, since both "Coastal" and "Management" are new concepts to local governments. While local governments are still being reorganized following decentralization and adoption of autonomy policy since January 2001, they also have just conceptualized "Coastal Management" and have just started to formulate office/section/division accordingly.

4.7.1 Existing Human Resources in Coastal Management

Therefore, existing information on human resources in coastal management will only be available by reviewing organizations before the reform. In the old regime, the concentration of human resources of coastal management area was seen at provincial level; therefore, the organizations which dealt with coastal-related and resource-related matters would be useful to review. These organizations are as follows: BAPPEDA, BAPEDALDA, Office of Land

Rehabilitation and Soil Conservation (BRLKT), Water Resource Office (*Dinas Pengairan*), and Fishery Office (*Dinas Perikanan*). There is no designated section in charge of coastal management in any of these organizations. In terms of backgrounds of staff through formal education and training programs, there are almost none related to coastal resources or coastal resources management except one person who has a master's degree in coastal management.

(1) BAPPEDA

The main function of BAPPEDA is to formulate policies and plans in regional development.

In BAPPEDA, educational backgrounds of economy and social/politics of both B.S. and master's degree are the predominant group with 20 staff members. Coastal management related subjects are agriculture, fishery, environment and regional development. The number of staff who graduated from those departments are 10, 7, 2 and 2 respectively. There are 7 other staff members with engineering background.

(2) BAPEDALDA

Human resource in this organization seems to be meeting minimum requirement. There are six master's degree holders and 23 holders of undergraduate degrees (B.S.) and their variety of backgrounds are corresponding to a wide range of environmental problems. However, there is neither designated section for coastal management nor specialists in this area.

Because the organization is fairly young and it is still difficult for them to carry out their tasks by themselves, BAPEDALDA hires outside specialists and forms teams to carry out each task. The most recent movement in this organization is the creation of "Sub-division of Coastal and Beach Environment Recovery (*Sub-Bidan Pemulihan Lingkungan Pesisir and Pantai*)" in order to strengthen coastal area management. The problem being faced seems to be lack of human resource to fill the division. BAPEDALDA needs to increase the amount of human resources in coastal management area and to build the capacity of existing human resources by providing various training for them.

(3) Office of Land Rehabilitation and Soil Conservation (BRLKT)

BRLKT is under direct management of the Department of Forestry and its main mission is to rehabilitate and conserve main watersheds (DAS), particularly those areas at risks. Most of the staff members are high school graduates (around 40); only two members have a master's degree and six of them hold B.S. degrees. The organization orients practical aspects and gives training courses to staff members for their capacity building to carry out their tasks.

One of their projects is to conserve mangroves by replanting mangroves, and the project is contributing coastal resources management directly and indirectly. Therefore, BRLKT has already built and accumulated knowledge and skills for coastal management, although it has been implemented on a sectoral basis.

BRLKT is facing a serious problem of its existence. The organization is assured to exist as it is only until next year, and nobody is sure about its existence. This would be a problem of local governments who have been totally depending on BRLKT in the past.

(4) Fishery Office

Fishery Office seems to have enough quantity and quality of human resources to carry out their tasks. Two staff members have a master's degree in fishery and 25 have B.S. degrees. There are staff who studied fishery-related subjects, therefore, the work of data collection and analysis of fishing production and so on are being carried out smoothly.

Work they have done for coastal management have not been recognized as theirs; however, the nature of their work is overlapping with coastal management area. The organization is expected to respond to the needs of coastal management, and to establish a section specifically for this and staff it with capable human resources. It is probably necessary to organize training courses for existing human resources and, at the same time, to hire appropriate human resources who are graduates of marine science at Sam Ratulangi University (UNSRAT).

UNSRAT can produce approximately 1000 to 1500 graduates every year there would be a number of potential human resources from UNSRAT for coastal management.

(5) Office of Water Resource (*Dinas Pengairan*)

The office has enough quantity and quality of human resources to carry out irrigation and civil engineering related works. Five staff has irrigation background and 31 staff has civil engineering background. Outside of four line sections (*Structure*), the office is also implementing projects funded by international donors such as the CIDA-funded shoreline protection project. Since the internationally funded projects are implemented independently from line sections and organizations for implementation of projects are dispersed after finishing their projects, the same thing happens to accumulated experience and skills.

The problem area of coastal management is the same as other offices; there is neither designated section nor human resource for coastal management.

4.7.2 Potential Sources of Human Resources

Comparing with other organizations, BAPPEDA has the most potential human resource in terms of quantity in coastal management, although those resources are not tapped yet as human resources in coastal management, since there has not been a designated section for coastal management in the organization.

Coastal management requires various experts on natural environment, ecosystem, sociology, tourism, fishery, economy and forestry. Under a decentralization policy, the responsibility of coastal management is being transferred from central government agencies to local governments. Academic institutes have a function of providing human resources for coastal management. In North Sulawesi, there are educational institutions such as Sam Ratulangi State University, Fishery Academy (belonging to DKP) and Institute of Technology Minahasa (Private University). Fishery Faculty of Sam Ratulangi State University provides approximately 100 persons a year of human resources (see Table 4.24). It is expected that academic institutes will provide human resources with knowledge of coastal management.

Table 4.24 Number of Graduated Students from Sam Ratulangi State University

Department	Year 95/96	96/97	97/98	98/99	99/2000
Aquatic Living Resources Management	14	37	24	0	7
Aquaculture	9	19	20	0	15
Socio-economy of Fishery	0	0	0	0	19
Marine Science	25	38	32	0	49
Aquatic Product Technology	7	10	5	0	14
Fishery Resources Utilization	13	8	9	0	9
Total	68	112	90	0	113

Source: Sam Ratulangi State University

4.7.3 Training Programs for Coastal Management

It should be pointed out that the implementation of government projects and programs are mostly done by contract basis and this is a very common mechanism in Indonesia due to the existing bureaucracy. Therefore, capacity building of both government personnel and human resources in private firms is important in order to adopt new technologies. Related law arrangement and its enforcement need to be strengthened as well.

4.7.4 Problems of Human Resources Development

Under the decentralization policy, most governmental functions and roles have been transferred to local governments from central government agencies. Although it is just a

beginning of the new era, local government is not performing very well due to shortage of competent staff and many other reasons as well. Both raising the number of human resources and their capacity are absolutely urgent agenda for local government to be able to carry the roles. Problems regarding human resources are summarized as follows:

- government staff lack competence to provide good service regarding coastal management;
- government staff cannot perform to expectations because their educational backgrounds or experiences are different from their job description;
- government staff's on-the job and in-house training are not enough;
- The establishment of designated section for coastal management has not been done in any organizations; and
- The staff for the new section has not been prepared yet.

4.8 Environmental Education and Dissemination

4.8.1 Environmental Education in Formal Education System

According to Government Regulation No.23/1997 regarding environmental management, and No.2/1989 regarding the national education system, the sustainable development of natural resources plays a key role in the national development process in order to ensure the welfare and quality of life of the present and future generations.

The issue of population has been a serious national concern these past 25 years such that the subject has been taken up in primary and secondary education since 1984. There is increasing population impact on the environment whose ecosystem could be irreparably damaged. Thus, in cooperation with the Ministry of Environment, the Ministry of Education and Culture formulated and developed a subject on environmental education in 1998 for inclusion in school curriculum.

Implementation of environmental education in schools is by three (3) ways as follows:

a.) In General Curriculum (Administered by National Level)

Environmental education is not taught as an independent subject but rather as a part of regular subjects such as Health, Biology, Geography, History, Economics and so on. Presently, environmental education is an integrated subject in elementary schools(grades 3, 4, 5 and 6), and since 1994, it has been taught at all levels in Junior and Senior High Schools.

b) In Local Contents Curriculum (Administered by Provincial Level)

In this case, environmental education is taught as an independent subject. It gives an opportunity to each province to develop at least 20% of whole curriculum of schools within their jurisdiction as Local Contents Curriculum based on needs.

Because seawaters surround North Sulawesi, the focus of environmental education of the area is marine resources. The provincial office of the Ministry of Education and Culture has published an excellent textbook titled *Potensi Kelautan* (Potentiality of the Sea) for this subject. Moreover, the Ministry conducts an environmental education training course for about 40 teachers in the province every year.

c) Extracurricular Program

Owing to its flexibility, extracurricular programs are suitable for teaching the youth about proper utilization of environment and how they could contribute to its preservation. Examples of endeavors and activities that support and develop environmental education include Boy/Girl Scouts organizations, Essay Writing Contest on environmental issues, Tree Planting, Clean & Green Project and so on.

Environmental education should also be supported by the following:

- Education and training of environmental education practitioners;
- Supply of books and other materials;
- Distribution of information posters, brochures, etc.);
- Forming a network of schools with environmental knowledge; and
- *Working together with institutions and NGOs.*

The government has already started environmental education locally in cooperation with experts from some research institutions and universities and international aid agencies such as GTZ and so on (outsourcing or extended resources). And there has been increasing cooperation with governmental institutions and other independent institutions concerning environmental education (networking). Environmental education has been started in some model schools and it has now become widespread throughout the country.

Following the decentralization policy, in North Sulawesi Province, the Provincial Office of the Ministry of Education and Culture has already compiled such a curriculum for local schools. The Office has also published special textbooks suitable for pupils in this area. However, shortage of budget allocation has given rise to the following problems:

- Inadequate supply of textbook (the ratio is currently 1 book for every 3 to 4 pupils in junior high schools); and
- Only a limited number of teachers (40/year) could attend the course on environmental education, considering that there are 2,961 primary and 541 secondary schools in the province.

4.8.2 Education and Dissemination Activities for the Public

a) Governmental Extension Programs/Activities in North Sulawesi

Governmental organizations are carrying out the following extension projects/activities for the public to communicate and disseminate laws and regulations regarding coastal management in North Sulawesi.

- BAPPEDA: Provincial office is disseminating the laws and regulations through coordination meetings with whole organizations on the provincial level. Kabupaten and Kota level offices disseminate them through extensions or related governmental offices in the region.
- BAPEDALDA: Provincial office is using mass media to accomplish the socialization, enlightment and extension of laws and regulations.
- Fishery Office: Provincial office disseminates the laws and regulations to the communities (including fishermen) through extensions, workshop and mass media.
- Forestry Office: Bunaken National Park Agency under the Directorate General of Natural Protection and Conservation, Ministry of Forestry and Plantations, disseminates laws and regulations through extensions, mass media and leaflets.
- Tourism Office: Provincial office disseminates the information through (a) extensions (b) workshop, coordination meeting, meeting with NGOs, mass media and leaflets (c) tourism organizations and tourism industry (PATA Chapter, Hotel and Restaurant Association, Tour/Travel Bureau Association, and so on).
- Water Resources and Public Work Office: Provincial office disseminates the regulations regarding rivers and swamps through a Public Consultation Meeting.

Although there are several governmental information resources regarding coastal management issues in North Sulawesi as shown above, they are not functioning well on a local community level. Rarely do villagers have direct contact with any government expert on coastal or marine resources. Fishery officers from Kecamatan level office may visit each village 3-4 times a year at most. But only a few people recall what their visits were all about because no printed material is handed out to

them. Therefore, for most of the community people, every governmental policy on marine resources they hear about is just rumors. Villagers have never seen any printed matter, e.g. document, leaflet, signboard and so on.

Some fishermen are displeased because they receive no useful information from Fishery officers about how to improve their livelihood; what these officers provide are merely instructions of regulation on fishing methods and gears. Governmental extension activity seems inactive. Number of extension officers and their communication ability (skill, tools, etc.) are insufficient.

The government side also has some problems in carrying out extension activities. One of the main problems is the misuse of budget. The government agencies tend to use up budget allocated to carry out those extension activities for other activities. This indicates that those education and awareness programs/activities are not emphasized by government agencies due possibly to the thought that effects of inappropriate activities are not seen in the immediate future.

b) Projects funded by internaiotnal donors and NGO activities in North Sulawesi

In the projects funded by international donors and local and national NGOs, environmental awareness activities for community people are one of the most important components. The Indonesian Coastal Resources Management Project (CRMP), locally known as *Proyek Pesisir*, is part of the USAID-BAPPEDAS Natural Resources Management II program. Proyek Pesisir dispatches "extension officers" to project sites in order to educate and activate community people, coordinate activities and activate coastal management in the area.

Since 2000, Proyek Pesisir has also been providing support to develop and test school curriculum based on local conditions. Also Proyek Pesisir was launched in partnership with the Provincial Office in North Sulawesi, Ministry of Education and Culture. They are planning to hold a workshop, meetings of teachers and officers from the Ministry to discuss and analyze what are really needed in terms of environmental education.

Proyek Pesisir has cooperated with TVRI in the production of Lutku Cintaku, sharing Pp 12 million of the total cost of production of 5 million per program. After broadcasting, they utilize VCD copies of programs in communities. Posters are also well utilized because some fishermen are still illiterate.

There are more than 20 non-profitable, non-political, non-governmental organizations in the study area whose missions are to empower communities to manage their coastal

resources for sustainable economic development. These NGOs are supplementing government public awareness activities. For example, *Yayasan Kelola* is actively raising public environmental awareness by utilizing traditional puppet shows and posters; also *Kelola* is disseminating newsletters to communities regularly. They involve school kids to monitor the ecosystem of mangroves and replant these natural resources.

Although NGOs play a very important role in community-based environmental awareness activities, the small NGOs are facing a problem of funding; bigger organizations can get funding domestically and also internationally. As media strategy, still those written information are suitable in most rural areas and often leaflets and newsletters for public awareness are the only information source for community people.

Overall view of environmental education to public is that such community-based environmental awareness activity is nowhere to be done except for communities which are involved with international cooperation projects or NGO programs. Even in such project sites, public education activity is limited by deficiency of resources either in their quantity or geographical coverage.

4.8.3 Problems of Environmental Education in the Study Area

First problem seen in the area of education/enlighten is that there has been very little efforts made in the area up to date. Especially the efforts to raise awareness of coastal management problems for community people are almost non-existent except in areas covered by project/programs funded by external assistance funds. Another problem is that government efforts to disseminate law and regulations against exploitation of coastal resources and area do not exist. People hear rumors of what they should not do but not about the reasons why they should not do those things. Therefore, it is difficult for people to follow the government laws and regulations

School education is in better situation but needs to emphasize more on the coastal subject. The curriculum needs to be oriented more to local coastal situation.

Because these efforts to give right information and knowledge to the public and schoolchildren is weak, knowledge on coastal areas is not enough. Better quality and frequent education/enlightenment is needed not only to have good knowledge but also to change people's perception and behavior/attitude.

4.9 Related Coastal Management Projects and Programs in the Study Area

In the study area, many projects and programs related to coastal management have been implemented in the last 10 years and some are still currently on going. These projects and programs are funded by the national budget, the World Bank, Asian Development Bank and USAID, and currently by the Japanese Government. Following are descriptions of programs/projects by agency.

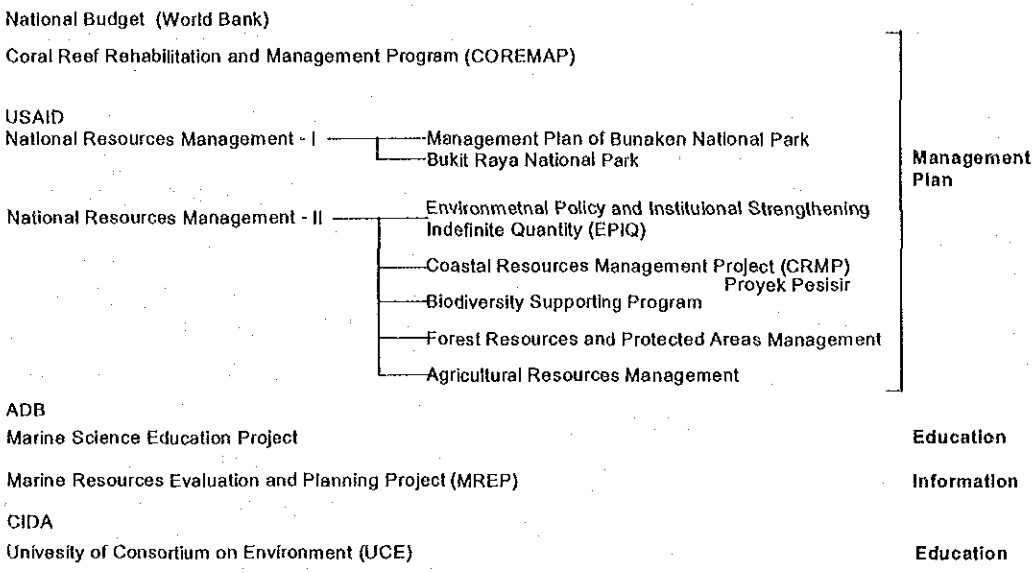


Figure 4.10 Related Projects and Programs in the Study Area

(1) World Bank (WB)

Coral Reef Rehabilitation and Management Project (COREMAP) is an Indonesian Government initiated project, which aims to make use of marine resources sustainable for community prosperity. This project is funded by the World Bank (WB), Asian Development Bank (ADB) and AusAID. WB is funding three components: 1) Policy/Strategy, 2) Public Awareness, and 3)Monitoring, Control and Surveillance (MCS). AusAID is supporting "Institutional Strengthening," and ADB is funding other components in the plan. This is a nationwide project and in North Sulawesi province, BAPPEDA Manado and Yayasan Abda for Bunaken National Park are implementing CBM projects in Bunaken area. Also, BAPPEDA Sangihe Talaud is implementing a CBM project in Sawang village that commenced in 1997 and is ongoing until the present time.

(2) USAID

USAID has been implementing Natural Resources Management Programs in the last 10 years throughout the country. National Resources Management Program I (NRMP-I) was implemented for 5 years from 1991 in North Sulawesi and in East and West Kalimantan area for forest management. The project in North Sulawesi aimed to establish an efficient management plan and an integrated and multisectoral management system of Bunaken National Park. However, the management plan has not been implemented properly by the private sector as well as the community people due to lack of involvement of these stakeholders in the planning process.

Natural Resources Management Program II has five components, namely: Environmental Policy and Institutional Strengthening Indefinite Quantity (EPIQ), Coastal Resources Mangment Project (CRMP: *Proyek Pesisir* as local name), Biodiversity Supporting Project, Forest Resources Management Project, and Agricultural Resources Management Project. These projects started from 1997 and will finish this year. In North Sulawesi province, EPIQ and CRMP are currently ongoing. Objective of EPIQ is to support planning process and policy development related to natural resources management as transparent, open, and responsible process based on strongly quantitative analysis.

CRMP, which is called locally as *Proyek Pesisir*, has been implemented in Minahasa regency since 1997 and will end in 2003. The project focuses on research and development of community-government partnerships in the village of Bentenan-Tumbak, Talise and Blongko. Technical assistance is being given by the Coastal Resources Center of the University of Rhode Island, which was sub-contracted from USAID. Over the past years, the project has been demonstrating good practical examples for community-based coastal resources management in resource-dependent coastal villages in Minahasa Regency.

(3) Asian Development Bank (ADB)

Asian Development Bank funded the Marine Science Education Project (MSEP) from 1989 to 1994, which aims to educate professional human resources on marine sciences in the whole of Indonesia. In North Sulawesi area, Sam Ratulangi University in Manado had fellowships and training for academic and supporting staff. Also civil works to develop the existing facilities were given. Training procurements including boats and research vessels, teaching aid and software were provided in the project. ADB also funded Marine Resources Evaluation and Planning Project (MREP) from 1993 to 1998. The objectives of MREP are to strengthen marine and coastal information system and to strengthen marine and coastal planning and management. In North Sulawesi province, the project was implemented with BAPPEDA as a coordination agency to strengthen the capacity of other local agencies for

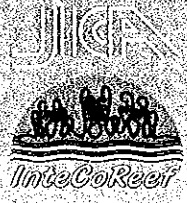
establishment of an integrated marine and coastal information system. However, marine and coastal information system, which is a main objective of the project, was not clearly established.

(4) CIDA

University Consortium on the Environment (UCE)

From 1989 until 1996, the faculties of environmental studies at Waterloo (UW) and York (YU) worked collaboratively with three Environmental Studies Centres in Indonesian universities, namely, University of Jakarta (UI), Institute of Technology at Bandung (ITB), and Gadjah Mada University (UGM), to enhance human resource and institutional capacity for environmental management. This project was known as the University Consortium on the Environment, or simply UCE. In January 1997, after Canora Inc., a consortium of 28 private companies in Canada, signed the CEPI contract with the Canadian International Development Agency, YU signed a contract with Canora which allowed the Education Training program, or UCE, of CEPI to begin. The goal of CEPI is "to strengthen capacity at national and sub-national levels to ensure the effective implementation and promotion of environmental policies and programs."

With regard to UCE, the objective is to strengthen Studies Centers (ESCs) in Java and Sulawesi to train environmental specialists and to conduct quality research and analysis targeted to specific issues in BAPEDAL and the state Ministry of the Environment. In the context of this statement, UCE has as its primary targets for capacity building the ESCs in Sulawesi. The three ESCs in Java primarily work as resource partners with YU and UW to assist the ESCs in Sulawesi.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