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## **BUILDING INTEGRATED COASTAL MANAGEMENT CAPACITY IN INDONESIA: THE CONTRIBUTION OF MREP**

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### *Abstract*

Indonesia's marine environment encompasses an area of 5.8 million square kilometres. Since 1994, the Government of Indonesia has emphasized marine and coastal development as an independent sector in the national development strategy; sustainable utilization and development of marine and coastal resources is now a key policy emphasis.

In recognition of the need for improved databases and spatial plans for marine and coastal resources management, the Government has embarked on a series of data collection, planning and capacity-building initiatives. Foremost among these is the Marine Resources Evaluation and Planning (MREP) project supported by the Asian Development Bank. The first proposed phase of the project was undertaken between 1993 and 1998; a second stage extension (MAREMAP) is currently in design.

The MREP project emphasized institutional development in two principal areas: strengthening of marine and coastal planning and management and strengthening of marine and coastal information systems. The project focused on a wide range of agencies at both the national level and in ten participating Provinces. To support the objectives of the project, a substantial training program (2300 person months) was conducted.

This paper outlines the considerable contribution of the MREP project in building coastal management capacity in Indonesia and on lessons learned which may be applicable to other large scale natural resources management and institutional strengthening projects.

## I. INTRODUCTION

Indonesia is the largest archipelagic state in the world with 17,508 islands, a coastline of about 81,000 km, and marine area of about 5.8 sq.km. representing approximately 70% of its total territory. For centuries the biological richness and diversity of coastal and marine resources have been a major food source, particularly animal (fish) protein. More recently, oil and gas, and other minerals in the coastal zone have been tapped for economic development. Furthermore, coastal and marine areas have many other functions including fisheries, aquaculture (mariculture), centres for recreation and tourism, agroindustries, transportation and harbors, industrial sites, settlement and waste sink. With ever increasing population growth and the fact that natural resource and environmental services (living space, fresh air, and other amenities) in terrestrial ecosystems are becoming scarce or difficult to develop, marine and coastal areas will be a primary focus for Indonesia's sustainable economic development. Since the promulgation of the 1993 State Policy Guidelines (GBHN), the Government of Indonesia has emphasized marine and coastal development as an independent sector in national development strategy and planning.

Marine and coastal resources development during the First Long-term Development Plan (1969/1970-1994/1995) has resulted not only in a number of positive achievements (e.g. economic growth, foreign exchange earnings, and provision of employment) but also in environmental degradation, such as pollution, physical degradation of mangroves, coral reefs, beaches and other coastal habitats, and overfishing, at a level that threatens the sustainable capacity of marine and coastal areas to support further economic development. In addition, many coastal communities still live in poverty and, thereby, are forced to exploit coastal and marine resources which are ecologically marginal (fragile) or with destructive methods like dynamite fishing and coral mining, just to fulfill their basic needs (subsistence). In other words, ongoing environmental degradation taking place within Indonesia's coastal and marine areas is not only because of rapid development (industrialization) but also due to poverty.

The challenge for the management of coastal and marine resources development in Indonesia is thus how to manage the utilization (development) of coastal and marine areas including their embodied resources on an optimal and sustainable basis for the utmost benefit of the entire Indonesian nation. There are several obstacles to achieve sustainable development of coastal and marine resources in Indonesia; one of the most important factors is a lack of integrated management approaches to coastal and marine resource development.

The implementation of integrated coastal management (ICM) in Indonesia has also been constrained by a lack of capable personnel to carry out the tasks of ICM, and by insufficient data and information on which to base planning and decision-making. This is especially true at provincial and district (local) levels. It is in this context that the MREP (Marine Resources Evaluation and Planning) project was conducted in Indonesia from 1993 to 1998.

## II. THE NATURE OF COASTAL ZONE MANAGEMENT IN INDONESIA

Despite the vastness of the Indonesia's coastal and marine areas as well as their significant contribution to the national economic development, the attention and efforts of Government of Indonesia to manage coastal and marine development on a sustainable basis are still far from what should have been done by a large maritime country like Indonesia (see, for example, Miles, 1999). This is best illustrated by the fact that the first National Policy on Sustainable Coastal and Marine

Resources Development in Indonesia was only published in 1988 in a three volume report entitled "*Action Plan for Sustainable Development of Indonesia's Marine and Coastal Resources*" (BAPPENAS/CIDA, 1988). Unfortunately, these policies were never officially adopted as national guidelines for coastal and marine resources development in Indonesia's economic development planning and practices. It was not until Repelita VI (the Sixth Five-Year Development Plan) that coastal and marine development activities were considered as a specific (independent) focus sector in the Indonesian economic development system.

The Government of Indonesia conducts its development activities within the framework of long term development periods (PJPs) of 25 years. The first PJP covered the period from 1969/70 through to 1993/94. PJP II began in 1993/94 and will run through to 2018/19. Within these 25 year long-term development phases, the People's Consultative Assembly (Majelis Permusyawaratan Rakyat - MPR) establishes the General Outlines of State Policy (GBHN) for five year periods and these outlines are subsequently interpreted and implemented by the President as concurrent five-year development plans called Repelitas. Repelita I (1969/70-1978/74) focused on the economic stabilization and rehabilitation of the nation's infrastructure, particularly in the agricultural, irrigation and transportation sectors. Repelita II (1973/74-1978/97) targeted social equity, the improvement of the population's living standards and developing the outer islands as a means of building up a strong national economy. Repelita III (1978/79-1983/84) addressed national self-sufficiency in rice, the expansion in the manufacture of (light) machinery and again an improvement in the quality of life. Repelita V (1988/89-1993/94) emphasized further development of the industrial sector in addition to supporting reliable growth in the agricultural domain. The previous five Repelitas all had a strong land-based focus; reasons for this are understandable.

The transition period between the latter years of Repelita V and the beginning of Repelita VI was marked by an increased concern by both government and private sectors for integrated management of coastal and marine resources. Since the late 1980's numerous projects and programs related to the management of coastal and marine resources development have been initiated, which were mostly in cooperation with international donor agencies (Table 1).

In Repelita VI, the multi-sectoral nature of coastal and marine resources development was recognized. Repelita VI established the importance of coastal and marine environments with respect to fulfilling the nation's needs such as a source of food, medicine and cosmetics, raw materials through the extraction of bioactive substances (natural products) from marine organisms, for energy, as communication and industrial areas, and as an area where the nation's defence and security priorities should be established.

Repelita VI anticipated that the coastal and marine environment and its embodied resources can be utilized to support the economic development of the nation in general by providing employment and business opportunities. This was expected to be achieved through further development of the transportation, shipping, fishing, aquaculture, tourism, and other offshore industries such as seabed mining and continued exploration and production of oil and gas.

Table 1. Partial summary of completed and on going marine and coastal environmental projects and programs in Indonesia 1983-98

Cooperating Agencies	Project and Programs
Asian Development Bank	<ul style="list-style-type: none"> <li>• Marine Resources Evaluation Project (MREP)</li> <li>• Marine Sciences and Education Project (MSEP)</li> <li>• Coastal Environmental Management Project (CEMP)</li> <li>• Coral Reef Rehabilitation Management Project (COREMAP TA)</li> <li>• BAPEDAL Regional Network Development Project,</li> <li>• Sulawesi Mangrove Management and Rehabilitation Project,</li> <li>• Segara Anakan Project</li> </ul>
United Nation Environmental Program	<ul style="list-style-type: none"> <li>• Regional Seas Program - Coordinating Body on the Seas of East Asia (COBSEA)</li> <li>• Conference of Parties II on the Convention Biological Diversity (Jakarta - November 1995)</li> </ul>
UN-Food & Agriculture Organization (FAO)	<ul style="list-style-type: none"> <li>• Cendrawasih Bay Coastal Area Development Project</li> </ul>
United Nation Development Program	<ul style="list-style-type: none"> <li>• Marine Pollution, Monitoring and Training Program</li> <li>• Riau Zone Land Use Management Project</li> <li>• Reforestation in Critical Watersheds</li> <li>• Watershed Rehabilitation in Nusa Tenggara Timur Project</li> <li>• Research and Application to Mangrove Ecosystems</li> <li>• GEF/UNDP/IMO Regional Program for the Prevention and Management of Marine Pollution in the East Asian Seas</li> </ul>
World Bank	<ul style="list-style-type: none"> <li>• Environmental Management Technical Assistance Project</li> <li>• BAPEDAL Development Project</li> <li>• Coral Reef Rehabilitation and Management Project (COREMAP TA)</li> </ul>
United States Agency for International Development (USAID)	<ul style="list-style-type: none"> <li>• ASEAN - US Cooperative Program on Marine Sciences Coastal Resources Management Project (Segara Anakan) (co-funded by ASEAN)</li> <li>• Natural Resources Management Project (NRMI) (Bunaken National Marine Park)</li> <li>• Proyek Pesisir, CRMP (North Sulawesi, Lampung, KalTim and Nationally), part of NRM II Program</li> </ul>
USA	<ul style="list-style-type: none"> <li>• Columbia University - Indonesia Project on Marine Tracers</li> </ul>
Canadian International Development Agency (CIDA)	<ul style="list-style-type: none"> <li>• Environmental Management Development in Indonesia Project (EMDI) Phase I, Phase II, Phase III</li> <li>• Collaborative Environmental Project in Indonesia (CEPI)</li> <li>• ASEAN – Canada Cooperative Program on Marine Science</li> <li>• ASEAN – Canada Marine Pollution Criteria</li> </ul>

Norway Agency for Development (NORAD)	<ul style="list-style-type: none"> <li>• Integrated Marine and Coastal Biodiversity Management Project,</li> <li>• Sea Watch</li> </ul>
Australia Agency for International Development (AUSAID)	<ul style="list-style-type: none"> <li>• ASEAN - Australia Living Coastal Resources Program</li> <li>• ASEAN - Australia Regional Ocean Dynamics</li> <li>• ASEAN - Australia Coastal Resources Management Project</li> <li>• ASEAN - Australia Economic Cooperation Program, Phase III (Coastal Zone Environmental &amp; Resources Management Project)</li> </ul>
Japan International Cooperation Agency (JICA)	<ul style="list-style-type: none"> <li>• Coastal Resources Inventory Project</li> <li>• Urban Drainage and Waste Water Disposal</li> </ul>
Japan - Overseas Economic Cooperation Fund (JPN-OECF)	<ul style="list-style-type: none"> <li>• Environmental Study Center Development (PSLs)</li> </ul>
Japan	<ul style="list-style-type: none"> <li>• ASEAN - Japan Management of Multi-species and Multi-gear Fisheries Project</li> <li>• Japan - Indonesia JAMSTEC Project on Indonesian Through Flows</li> </ul>
Republic of South Korea	<ul style="list-style-type: none"> <li>• ASEAN-ROK Industrial Use of Marine Biological Resources</li> </ul>
Multi-national & Multi-agency sponsored	<ul style="list-style-type: none"> <li>• International Coral Reef Initiative (ICRI)</li> </ul>
World Wide Fund for Nature (WWF)	<ul style="list-style-type: none"> <li>• Strategy on Coral Reef Ecosystem Conservation and Management (with MLH &amp; EMDI)</li> <li>• Primary Environmental Care (PEC) Project</li> </ul>
Asian Wetland Bureau	<ul style="list-style-type: none"> <li>• Bintuni Bay &amp; Pulau Dolok Reserves, Wasur National Park (Irian Jaya)</li> </ul>
The Nature Conservancy (TNC)	<ul style="list-style-type: none"> <li>• Komodo National Park (Marine component)</li> </ul>

Adapted from : Ministry of State or Environment (1996)

Four major goals with respect to coastal and marine resources development were outlined in Repelita VI: (1) to support and expand coastal and marine-related enterprises throughout Indonesia, particularly those areas which are still underutilized such as the eastern part of the country; (2) to support and strengthen the offshore structure industries; (3) to strengthen the national sovereignty and jurisdiction over its maritime territory by mapping the boundaries of its continental shelves and the Exclusive Economic Zone; and (4) to gather, integrate and provide more readily available all coastal and marine-related data through the establishment of a marine geographic information system (MGIS) network.

As far as the expansion of coastal and marine-related enterprises is concerned, specific targets were set out in Repelita VI. These include increasing fisheries production (capture and aquaculture) by 5.2% annually thus reaching 55% level of the current estimated Maximum Sustainable Yield (Priyono et al., 1997). By hosting 6.5 million tourists annually, the tourism sector was targeted for an annual growth rate of 12.9% yielding a foreign exchange revenue of US\$ 8.9 billion (Ministry of State for Environment, 1996). These tourists were expected to be mainly attracted by Indonesia's diverse natural and cultural attractions. Furthermore, the shipyard industry was to be expanded, especially in Eastern Indonesia.

Based on the goals, policies and programs of coastal and marine resources development in Repelita VI, it is clear that on paper at least, Indonesia has broad policies and programs for coastal and marine resources development. Meanwhile, the quality of coastal and marine environments, particularly in densely populated and developed areas like the North Coast of Java and the Straits of Malacca, is continuing to decline, several fish stocks have been harvested beyond their renewable capacity, and critical coastal habitats, especially coral reefs and mangroves, are under siege at the level that threaten their sustainable capacity. Many coastal communities are also still in poverty.

The causes of this poverty are highly variable and not all coastal communities are affected equally (pers. comm. Brian Crawford). For example, communities in areas of Eastern Indonesia tend to have access to a broader range of unexploited marine products than communities in Java. Many communities have multiple sources of income often independent of marine fisheries (see, for example, Pollnac et al., 1997).

The current economic crisis, political turmoil and lingering impacts of El Nino (see, for example, Dutton and Crawford, 1998) have further focused attention on the plight of coastal communities. Food aid and other social safety net programs are now in place to assist the worst affected communities. However, analysts realize that a broader view of these issues and trends is needed. For example, the USAID-supported coastal resources management project (Proyek Pesisir) has a central tenet that such issues can only be dealt with in the broader context of governance reform (Dutton, et. al., 1998).

As attachment A indicates, the large amount of current legislation pertaining to coastal and marine resources management fails to provide an adequate legislative framework for coastal and marine resource management. Although existing legislation addresses the issues of sustainability, the conservation of remaining biological resources and the affordability of pollution control, concern exists about how to implement and enforce these regulations. It is widely recognized that the lack of effective implementation and enforcement of the existing regulations seriously threatens the prospect of achieving sustainable development (see Sloan and Sughandy, 1994).

Up until to the present, the management of Indonesia's coastal and marine resources development have largely been carried out through sectoral and piece-meal approaches. Integrated Coastal Management (ICM) approaches have been implemented only recently on a pilot project basis, such as those underway in the provinces of North Sulawesi, Lampung, and East Kalimantan (Proyek Pesisir, 1998). To date there has been no single institution or a coordinated institution at national, provincial, and let alone at local levels, which looks after coastal and marine resources development, right from planning to implementation stages. Equally significantly, at the time of conception of the MREP project (early 1990s), the human resources and institutional capacity to develop integrated coastal management (ICM) programs was extremely weak (Sloan and Sughandy, 1994).

### **III. THE MREP PROJECT AND INTEGRATED COASTAL MANAGEMENT**

#### **Project Objectives**

The Marine Resource Evaluation and Planning (MREP) project was planned to be a model of an integrated and interdisciplinary approach for the management of Indonesia's sustainable coastal and marine resource development. The project was designed to achieve two major objectives, namely: (1) the strengthening of institutional capabilities, particularly at provincial and district levels,

with respect to the integrated planning and management of coastal and marine resource development, and (2) the establishment of a coastal and marine geographic information system at national, provincial and district levels (Ginting and Dutton, 1999). The project started effectively in 1993 with a planned duration of five years and was funded via a \$33 million loan from the Asian Development Bank.

To achieve those objectives, the project incorporated four main components: (1) coastal and marine spatial planning and management, (2) coastal and marine databases, (3) coastal and marine resource information system and technical support, and (4) project management activities (ADB/GOI, 1992). The proposal relationships between main project activities are presented in Figure 1.

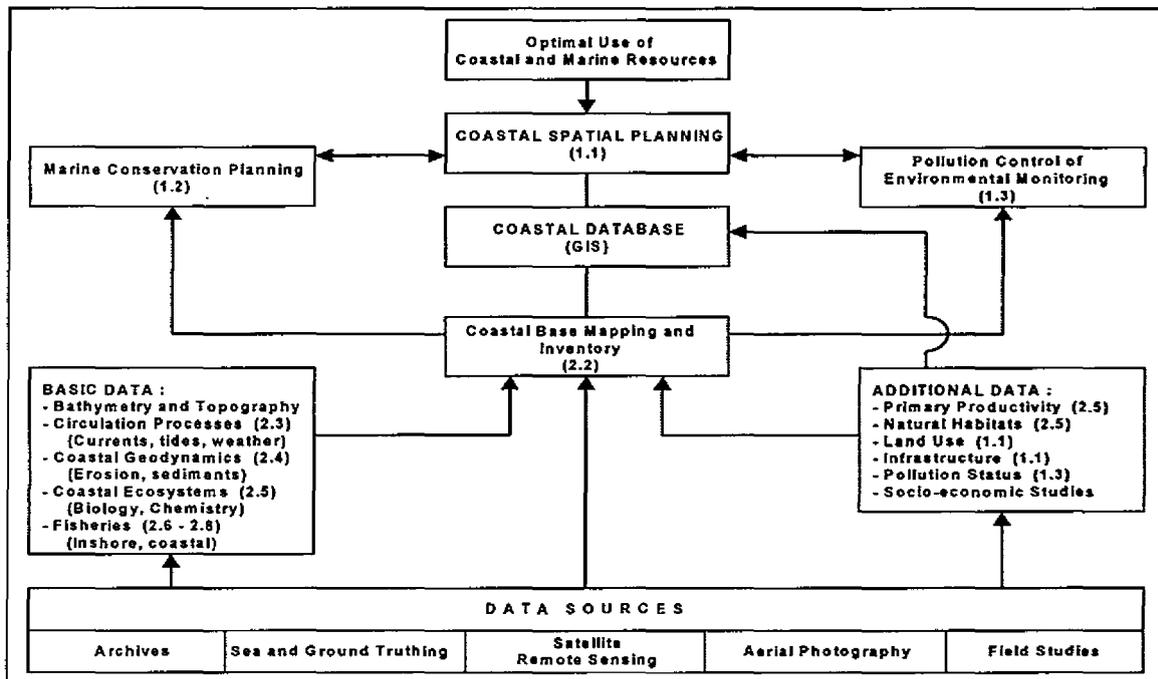


Figure 1. Flow Diagram for Coastal Spatial Planning Data Application under MREP

### Project Scope

Because of the vastness of Indonesia's coastal and marine areas, the geographical scope of the project was limited to priority areas which cover ten MCMA's (Marine and Coastal Management Areas) and three SMA's (Special Management Areas) (Figure 2). MCMA planning was set in the context of broader provincial planning and intended to complement the land (terrestrial) area planning system established under the parallel ADB-supported Land Resources Evaluation and Planning (LREP) projects. MCMA's defined under MREP included Bangka Strait of South Sumatra province; Situbundo coastal district to Kangean islands of East Java province; Balikpapan coastal district to Sangata of East Kalimantan; Denpasar, Karang Asem, Gianyar and Klungkung districts of Bali province; Mataram and West Lombok districts of West Nusa Tenggara province, Kupang Bay to West Timor of East Nusa Tenggara, Ujung Pandang to Majene districts of South Sulawesi; Manado district to Karakelang islands of North Sulawesi, Moluccas, and Biak Numfor of Irian Jaya Province (BCEOM, 1998). MCMA's varied in scale from 1,500 to 15,000 square kilometers. The SMA's were primarily of national interest, focusing on the development of a national approach to marine area

planning, mainly the internationally important shipping lanes which are vulnerable to pollution resulting from shipping accidents, i.e. the Straits of Malacca, the Strait of Lombok, and the Straits of Makassar.

### Project Structure

The multi-level, multi-agency project management structure of MREP is shown in Figure 2.

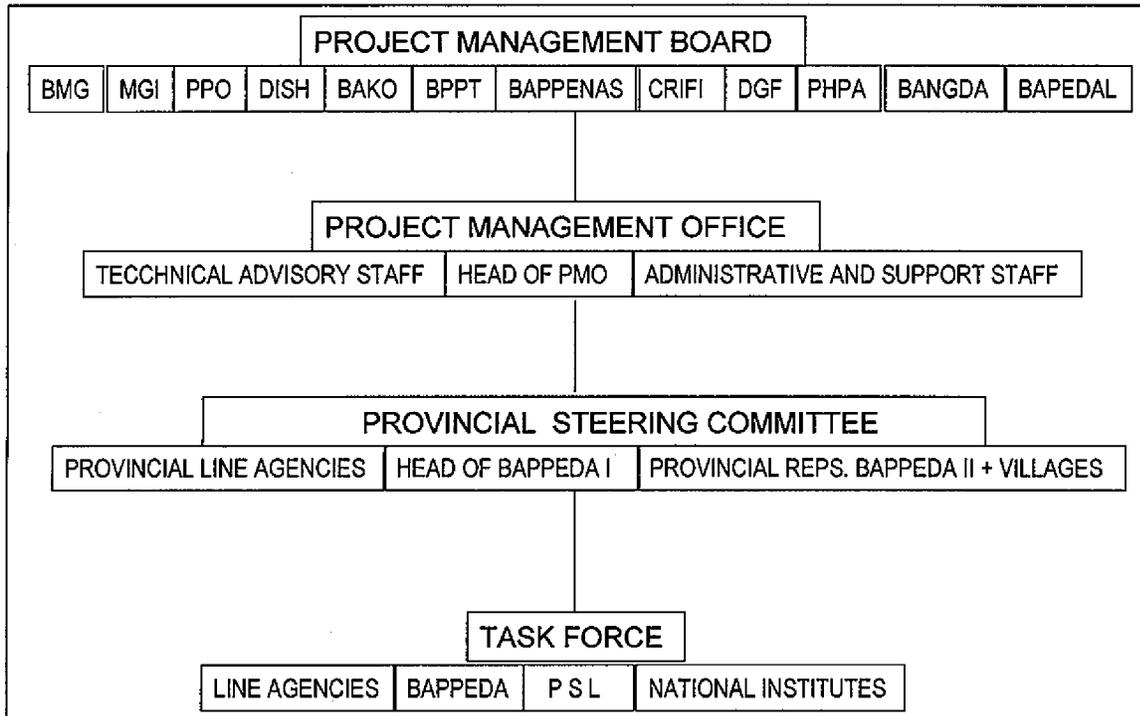


Figure 2. MREP Management Structure

At the national level, the overall project coordination was undertaken by a Project Management Board (PMB) chaired by Bappenas (Deputy Chairman V for Regional Development). All national level agencies were represented in the PMB at senior level. Provinces would be represented by the Directorate General for Regional Development of the Ministry of Home Affairs (Ditjen BANGDA). The PMB was responsible for policy decisions and general project management including agreeing programming schedules and the setting of priorities.

The PMB was served by a Project Management Office (PMO) based in Jakarta. The PMO was a legal entity headed by a senior Indonesian administrator seconded from a relevant ministry. The head of the PMO acted as Executive Secretary to the PMB. The PMO included a technical advisory group (TAG) headed by the Senior Technical Advisor (STA) to the project. All technical assistance utilized by the project was coordinated by the PMO (TAG) and all technical advisors were responsible, in the first instance, to the PMO.

The terms of reference for individual advisors specifically stated their responsibility to the PMO as well as to any individual agency to which they may be assigned. The PMO (TAG) recruited staff from the participating agencies for agreed periods to fulfill specific advisory or analytical functions. Four or five technical staff were needed at any given time. The TAG acted as a pool of expertise to support the project as and when needed. Specific experts were assigned from

the PMO pool to individual agencies for limited periods and then returned before performing similar assistance to another agency. The linkage between staff of the PMO (TAG) and participating agencies was provided by the Project Implementation Coordinator (PIC) in each agency. The PIC was the senior staff member responsible for overseeing the projects work programme within his/her agency. The execution of the project was shared by individual agencies and the PMO. Each PIC coordinated with the PMO with respect to:

- i. the preparation of tender document evaluation of bids and award of contracts;
- ii. the arrangements for the undertaking of civil works and phasing thereof;
- iii. preparation of staff training schedules, selection criteria and location of courses;
- iv. the engagement of internal and local consultants.

At the provincial level the project activities were overseen by a Provincial Steering Committee (PSC) chaired by the head of BAPPEDA I. The PSC comprised representatives from concerned provincial line agencies and from the lower levels of government within the province. The PSC was responsible for all project activities within the jurisdiction of the province, include providing guidance on policy issues, the programme of activities in the province, relationships with local communities and obtaining the support of concerned line agencies. The PSC was also responsible for ensuring the provision, through the project, of the facilities necessary for implementing the spatial planning component. Finally, the PSC was responsible for directing the work of the Provincial Task Force (PTF) charged with undertaking the planning exercise. The precise composition of the PTF was the subject of discussion between PMO staff, the BAPPEDA and the appointed PTF leader. The latter was appointed by the provincial BAPPEDA on the recommendation of the PMO.

### **Key Outputs**

MREP documents (see for example, BCEOM, 1998; BAKOSURTANAL and BANGDA, 1998) provide an overview of the vast range of specific products and outputs generated during the five year life of MREP activity. Of particular note are:

- (a) Base Maps, Inventory and Databases – a new set of 197 base maps (LPI= coastal environmental maps) at scales of 1:50,000 and 1:250,000 were produced for MREP by BAKOSURTANAL in coordination with a range of scientific, survey and technology agencies, a further set of thematic maps, coastal resources inventories and databases were also produced, including:
  - fisheries database and thematic maps showing locations of cold storage facilities, types of fishing gear in use, distribution of fishing grounds, etc.
  - marine and coastal ecosystems databases and thematic maps showing location/distribution of coral reefs, mangroves, etc.
  - land use database and digital land use maps covering some 3.5 million ha at a scale of 1:50,000.
  - meteorological database consisting of thematic maps of rainfall, temperature, wind climate, etc.

- (b) Marine Resource Information System – comprising a marine data catalogue and geographic marine resource information system (GMRIS). Products guaranteed under this activity included:
- Training manuals and technical guidelines on applications of key software systems (e.g. Arcview 2, IDRIS I, ERMapper, etc.).
  - Q/C, performance standards and metadata management procedures for mapping/documentation (e.g. SWIM-shallow water mapping algorithm)
  - Database establishment, linking and archiving including establishment of a radarsat database and GMRIS Master Node in BAKORSUTANAL
  - Demonstration GIS – built during an integrated period of information systems and coastal planning known as the “Lombok Magic Month”
  - Glossary of terms (bilingual) created
  - Data catalogue/directory constructed and linked with system for reference to other information sources (i.e. Indonesian Spatial Information Digest).
  - LANs established in various nodes and linked (where appropriate) with world wide web protocols.
- (c) Improved Human Resources Capacity – in addition to extensive national and international training, courses (e.g. 2297 person months of formal training; 2021 in Indonesia and 276 in overseas courses), MREP was also responsible for establishing upgraded training capacity in Indonesian institutions (e.g. Centre for Coastal and Marine Resource Studies at IPB) and for numerous local “on the job” training initiatives. These produces a large volume of training materials using a range of media (see BCEOM, 1998).
- (d) Provincial Data Centres (PDCs) – conceived as being decentralized nodes for data capture, processing and dissemination in support of ICM, some 10 PDCs were established in the Provincial Planning Agency of each participating province. Each PDC was equipped with a range of GIS hardware and software and staff trained to undertake all necessary local data processing as well as more advanced data capture/analysis (e.g. remote sensing).
- (e) Marine and Coastal Planning and management – following initial establishment of a four tier planning framework (comprising strategic, zoning, management and action plans), and trialling of planning methods (e.g. during the Lombok “Magic Month”), a comprehensive set of planning guidelines were prepared (in hard copy and CD-ROM format – see BCEOM, 1998). These guidelines were tested, refined and updated continuously to produce Indonesia’s first set of Provincial coastal strategic plans (e.g. DitJen BANGDA and IPB, 1998a), a range of local area management plans (for five marine national parks), emergency response management plans (for oil spills), draft zoning plans for MCMAs and miscellaneous planning guidelines (e.g. on public involvement in coastal management; see DitJen BANGDA and IPB, 1998b).

## **Review and Conclusion**

In a candid and comprehensive review of MREP, the project secretariat (1998) sought to identify lessons which might be useful in guiding future projects of this type. These included :

- (a) Project Administration and Coordination – due to delays and difficulties in achieving required levels of coordination it was noted that future projects could be improved by adoption of a single-agency executive structure.
- (b) Project Preparation and Schedule - given the rapidity of technological change and the innovative/integrative nature of the project, greater capacity for ongoing project modification is needed. Additionally improved links between data users and collectors are required to ensure efficiency of data collection.
- (c) Data Collection and Organization – as was apparent in establishing Provincial Data Centres in each MREP Province, a much clearer definition of task and responsibilities is needed; i.e. rather than simply initiate a task because it is the project schedule, it is essential to obtain a common understanding of why the initiative is planned, who will be affected and how the initiative can best be adapted to local/national needs and sustained over time – project reviewers were especially critical of the lack of the resolution on the future of PDCs when MREP ended.
- (d) Institutional Strengthening/Training – in addition to streamlining procedures for equipment procurement, it is essential to more carefully consider the institutional context for equipment introduction/use. Specifically, it is considered that a greater emphasis on “on the job” training will produce more effective/efficient skills development. One of the few follow-up surveys on training impact noted that some 36% of trainees from one Province...“never applied the skills and knowledge acquired during training”...(BAKOSURTANAL and BANGDA, 1998).
- (e) Spatial Planning and Management – the planning guidelines and models produced under MREP represent a significant improvement in national ICM capacity. However, considerable additional development and refinement (e.g. of methods for improved stakeholder involvement in ICM and clarification of the legislative/administrative framework for ICM) is needed (DitJen BANGDA and IPB, 1998b). The current COREMAP and initiative proposed MAREMAP (second stage of MREP) project will thus be pivotal in the transition from planning to implementation of an effective ICM system in Indonesia.

One further lesson of note is that flexibility and internal learning are key ingredients for success in a multidimensional project of this type. The previously noted “magic month” exercise held in Lombok in late 1997 represented a key step in the integration of data collection/information management and data application/coastal planning activities (BAKOSURTANAL and BANGDA, 1998) – that exercise reinvigorated all involved to focus on the essential practical steps to achieve project objectives. Such adaptive learning is likely to be a continuing feature of ICM in Indonesia, particularly as the reformation and regional strengthening of natural resources governance continues in the post Soeharto era.

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**Attachment A. Partial summary of national level legislation related to the protection, exploitation and management of the coastal and marine environment.**

Legislation	Date	Description
Joint Decree Security & Defense/Chief of Staff - Armed Forces Kep/B/45/1972 Finance SK/901/M/1972 Justice Kep/799/MK/III/12/1972 Communication J.S. 8/72/I Attorney General Kep/085/J.A./12/1972	1972	Nation Marine Security Coordinating Agency (BAKORKAMLA)
Ministerial Decree Mining & Energy No. 4	1973	Prevention and Handling of Water Pollution from Oil Exploration and Exploitation
Act No. 1	1973	Continental Shelf
Government Regulation No. 17	1974	Controlling the Implementation of Exploration and Exploitation for Offshore Oil and Natural Gas
Presidential Decree No. 31	1975	National Coordinating Committee for the Resolution of National Area and Sea Bed Jurisdiction (PANKORWILNAS)
Ministerial Decree Agriculture No. 35	1975	Determination of Several Types of Wild Animals to be Protected (Dolphins)
Ministerial Decree Agriculture No. 607	1976	Areas for Catching Fish
Presidential Decree No. 18	1978	Ratification of International Convention on Civil Liability for Oil Pollution Damage
Presidential Decree No. 19	1978	Ratification of International Convention on the Establishment of an International Fund for Oil Pollution Damage
Presidential Decree No. 28	1978	Establishment of Ministry of State for Development Supervision and the Environment (PPLH)
Presidential Decree No. 43	1978	Ratification of Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)
Ministerial Decree Agriculture No. 327	1978	Determination of Several Types of Wild Animals to be Protected (Whales, Dolphins, Crocodiles, Leatherback Turtle)
Ministerial Decree Agriculture No. 716	1980	Determination of Several Types of Wild Animals to be Protected (Whales and Gray, Olive and Loggerhead Turtles)
Presidential Decree No. 39	1980	Abolishment of Trawl Nets
Ministerial Decree Agriculture No. 607	1980	First Stage in Implementing the Abolishment of Trawl Nets
Ministerial Decree Agriculture No. 633	1980	Implementation Directive on the Abolishment of Trawl Nets

## Attachment A (continued)

Joint Decree Communication & Mining and Energy No. DKP. 49/1/2/27 Kpts./DM/ MIGAS/198	1981	Standard Operating Procedures for Combating Oil Pollution in the Malacca/Singapore and Lombok/Makassar Straits
Act No. 4	1982	Basic Provisions for the Management of the Living Environment
Presidential Decree No. 25	1983	Restructuring PPLH as the Ministry of State for Population and Environment (KLH)
Act No. 5	1983	Indonesian Exclusive Economic Zone
Act No. 9	1985	Fisheries
Ministerial Decree Agriculture No. 473a	1985	Determination of Total Allowable Fish Catch
Act No. 17	1985	Ratification of Principles of the Archipelagic Concept and United Nations Convention on the Law of the Sea (UNCLOS)
Government Regulation No. 29	1986	Analysis of Impacts to the Environment (AMDAL)
Presidential Decree No. 26	1986	Ratification of ASEAN Agreement on the Conservation of Nature and Natural Resources
Ministerial Decree Communication No. 167	1986	International Certificate for Petroleum Ships and Hazardous Waste
Presidential Decree No. 46	1986	Ratification of International Convention for the Prevention of Pollution from Ships (MARPOL)
Ministerial Decree Forestry No. 12	1987	Determination of Several Types of Wild Animals to be Protected (Black Coral, Giant Clams and other marine invertebrates)
Ministerial Decree Tourism Postal Telecommunication No. 97	1987	Provisions on Water Tourism Undertakings
Ministerial Decree Population and Environment No. 2	1988	Guidelines for Environmental Quality Standards for Water, Wastewater, Air and Sea Water
Ministerial Decree Mines and Energy No. 185K	1988	Technical Guidelines on Environmental Information and Environmental Impact Analysis for General Mining, Oil and Gas Mining and Geothermal (Offshore tin mining)
Ministerial Decree Agriculture No. 417	1988	Utilization of the Fishery Resources in the Indonesian Exclusive Economic Zone
Ministerial Decree Tourism Postal Telecommunication No. 17	1988	Implementation of Provisions on Water Tourism Undertakings
Ministerial Decree Tourism Postal Telecommunication No. 85	1988	Rules on Cruise Line Enterprises
Ministerial Decree Mines and Energy No. 1158	1989	Provisions on Implementation of Analysis on Environmental Impact in Mining and Energy Undertakings
Ministerial Decree Forestry No. 687	1989	Utilization of Recreation Forests, Tourism Forests, National Parks, Grand Forest Parks and Marine Tourism Parks
Act No. 5	1990	Conservation of Living Natural Resources and their Ecosystems
Act No. 9	1990	Tourism
Government Regulation No. 15	1990	Business in Fisheries
Government Regulation No. 20	1990	Water Pollution Control
Presidential Decree No. 23	1990	Establishment of Agency for Environmental Impact Management (BAPEDAL)
Presidential Decree No. 32	1990	Management of Protected Areas

## Attachment A (continued)

Directorate General Fisheries Decree No. IK/220/D4.744/91K	1991	Catching Fish with Prohibited Substances/Instruments
Ministerial Decree Population and Environmental No. 3	1991	Water Quality Standards for Activities Already in Operation
Presidential Decree No. 23	1991	List of Business Fields Closed to Investment (Appendix 1 No. 56, Business in the Utilization and Exploitation of Sponges which is closed in relation to the Law on Foreign and Domestic Investment
Ministerial Decree Population and Environment No. 103	1992	Quality Standards of Liquid Waste (waste discharges from coastal developments)
Act No. 24	1992	Spatial Use Management
Presidential Decree No. 44	1993	Restructuring of the Ministry of State for Population and Environment (KLH) as the Ministry of State for Environment (LH)
Government Regulation No. 51	1993	Revision of Environmental Impact Analysis (AMDAL)
Government Regulation No. 19	1994	Dangerous and Toxic Waste Management
Act No. 5	1994	Ratification of the Convention on Biodiversity
Act No. 6	1994	Ratification of Convention on Action Plan for Climate Change
Ministerial Decree Agriculture No. 375/Kpts/IK.250/5/95	1995	Ban on Catching the Napoleon Wrasse Fish ( <i>Cheilinus undulatus</i> )