

**Integrated Coastal Management for Bay of Bengal:  
A Review on Best Practices and Lessons Learned from  
Indonesia, Malaysia, Myanmar and Thailand**

**FINAL REPORT**

Prepared for the

**Bay of Bengal Large Marine Ecosystem (BOBLME) Project  
Food and Agriculture Organization of the United Nations (FAO)**

Prepared by

**The WorldFish Center**

August 2010

## ACRONYMS

ASEAN	Association of Southeast Asian Nations
BOBLME	Bay of Bengal Large Marine Ecosystem
BOBP	Bay of Bengal Programme
CECU	Coastal Engineering Control Unit
CETC	Coastal Engineering Technical Center
COBSEA	Coordinating Body on the Seas of East Asia
COREMAP	Coral Reef Rehabilitation and Management Program
CRMP	Coastal Resource Management Project
DOF	Department of Fisheries
EEZ	Exclusive Economic Zones
FAO	Food and Agriculture Organization
FCLP	Fisheries Comprehensive Licensing Policy
ICM	Integrated Coastal Management
ICZM	Integrated Coastal Zone Management
LMEs	Large Marine Ecosystems
MFF	Myanmar Fisheries Federation
MMAF	Ministry of Marine Affairs and Fisheries
MNP	Marine National Parks
MONRE	Ministry of Natural Resources and Environment
MREP	Marine Resources Evaluation and Planning
MSY	Maximum sustainable Yield
MTJA	Malaysia-Thailand Joint Authority
NCEC	National Coastal Erosion Control Council
NGOs	Non Government Organizations
PEMSEA	Partnerships in Environmental Management for the Seas of East Asia
SEAFDEC	Southeast Asian Fishery Development Centre
TAO	<i>Tambol</i> Administrative Organisation
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme

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## EXECUTIVE SUMMARY

This literature review on Integrated Coastal Management (ICM), appraises the concepts, theories and case studies on ICM. The review specifically covers case studies in the Southeast areas of the Bay of Bengal comprised of coastal regions in four countries: Indonesia (Northern Sumatra provinces), Malaysia (West Coast of Peninsular Malaysia), Myanmar and Thailand (West Coast).

The review was conducted over a period of six weeks (June 2010 to July 2010). Literature for this review was largely obtained through (1) a secondary data search from various electronic library databases; (2) a wider web-search to locate case studies through localised project websites and case studies that are not documented in academic literature; and (3) to a limited degree expert input.

The major findings of the review are as follows:

- The review on the status and threats to the coastal area and resources in the four focal countries reveal what Cicin-Sain and Knecht (1998) call ecological effects and multiple-use conflicts. This underlines the importance of the adoption of ICM.
- International experience suggests that ICM does not come about automatically but requires stimulus . In all countries reviewed, it is the recognition of a specific sectoral coastal management problem that triggered ICM initiatives. Overfishing in Indonesia, coastal erosion in Malaysia and coral reef pollution in Thailand are some examples of the problems that stimulated government response that led to the adoption of ICM. Interestingly, socioeconomic conditions such as poverty and threat to livelihood were not the causal reason that propelled governments to experiment with the ICM approach in the countries reviewed.
- The review on scale issues identified that scaling up (linking local actions to a higher level context of management) or scaling out (replication of ICM approaches from one place to others) are still persisting challenges. Project efforts commonly remain in the domain where they have been initiated. However, ICM is a process. The pilot programmes have demonstrated that it is optimum if ICM initiatives are started based on one major coastal issue, and then gradually factor in other coastal related problems. There is high risk to starting any ICM initiative on an ambitious scale as its very complexity can cripple it from the start. However, ICM initiatives have to gradually scale up beyond a sectoral focus. To have any real positive impact on the coastal areas multiple coastal issues and multiple stakeholders must be included.
- The review of good practices highlights the importance of the balance between short term and long term gains e.g.: community having access to micro credit programmes (short term gains) while participating in replanting of mangroves and coastal forests along the coastal areas (long term gains); participation and incorporation of local people and their knowledge in developing coastal management plans; the decision of agencies responsible on ICM pilot programmes to be based close to primary users; political will from government to support ICM practices and; localised creative

dissemination efforts such as folk dramas and radio programmes that include community members are more successful as ICM dissemination tools.

- The review of practices highlights that most pilot programmes despite being termed as ‘integrated management’ are still focused within one major sector: the fisheries. The programmes rarely move on to include other coastal related problems; some of the pilot programmes are too small in scale to have any real impact; there is no budget to hire individuals from coordinating sectors during the lifespan of the pilot programmes; there is no appropriate communication strategies to enable information exchange and information dissemination on ICM related issues; there is no reliable assessment and community participation in developing ICM plans; and ambiguous definition of governmental and community responsibilities in the ICM plans.

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Coastal areas are highly valuable in many ways. The combination of freshwater and salt water in coastal estuaries creates some of the most productive habitats for aquatic life forms. Coastal land is often naturally formed by long established coastal forests of mangroves and other vegetations. Both the aquatic and terrestrial sections of the coast provide ecological services such as natural buffers from storms, hurricanes and tsunamis, in addition to being the source for various livelihoods and good modality for various infrastructure developments. Hence, as pointed out by Cicin-Sain and Knecht (1998), for most coastal nations coasts are an asset of incalculable value and an important part of the national patrimony. With that in mind, it should not be a surprise that coasts, which only represents 10 percent of the earth surface, have become major sites for extensive and diverse economic activities and the home for more than half of the world's population (Chua 1993).

The opportunities and subsequent human use have made coastal zones the site of complex problems. Its value is diminishing quickly, some even lost. Pollution of coastal waters have greatly reduced the production of fish. Dead coral reefs and clearing of mangrove forests have left coastal areas vulnerable to storms and tsunami waves (Kanagaratnam et al 2006). Ocean activities impact land-sea interface activities, and vice-versa. One example is the rapid development of sea communication and increased navigation traffic as a result of expanding maritime trades between countries within and outside of the region (Chua 1993). This has triggered multiple problems in and along the coastal areas from events such as oil spills. Oil spills in the coastal water not only impact the well-being of marine resources, coastal vegetation and the coast's natural look, but has adverse effects on fisheries and coastal tourism livelihoods. In addition, the presence of various stakeholders with different, often conflicting interests and action, has made coastal zones prone to conflict (cf. Chua 1993).

The complex nature of the coastal problem had called for an innovative management or governance practice. The traditional way of independently managing each sector through specific institutions (e.g.: fisheries and aquaculture through Department of Fisheries, mangrove through natural resource department, quality of water through environmental department) has done little to address the problems. Thus, over the years rational management initiatives of integrating and decentralising the management of coastal resources, by involving primary users, have emerged (see Nasuchon and Charles 2010; Pollnac and Pomeroy 2005; Nielsen et al. 2004; Viswanathan et al. 2003; Chua 1998; Cicin-Sain and Knecht 1998; Meltzer 1998; and Chua 1993). This approach, proposed as an alternative for combating the problems in coastal zones is widely known as Integrated Coastal Management (ICM) or Integrated Coastal Zone Management (ICZM) (Christie 2005). However, actual implementation, coordination, and communication of these initiatives are slow (Nielsen et al. 2004; Viswanathan et al. 2003; Hidayati 2000; Chua 1998; and Cicin-Sain and Knecht 1998).

While the adoption of ICM addresses the issues of coastal sustainability and conflict by focusing on collaborative linkages (sectoral and level of management), a different but complementing theoretical development addresses these two issues through looking at the roles of stakeholders in resource management/governance. In this regard, the review distinguishes three management approaches: (1) centralized management; (2) community-based management and (3) collaborative management (co-management). The last two management approaches came out as the critics and correction to the weaknesses and failure of the first management approach (Nielsen et al. 2004; Viswanathan et al. 2003). It is widely believed that the participation of community and other non-governmental institutions in any management initiative will increase the effectiveness and efficiency of the coastal management (for some examples of comprehensive reviews see Nielsen et al. 2004; Viswanathan et al. 2003; Balland and Platteau 1996; McCay and Acheson 1987).

This literature review forms part of the ongoing larger ‘stocktaking’ exercise on the extensive body of literature available on ICM, community-based management and co-management practices in the Bay of Bengal region. This is being done through the Bay of Bengal Large Marine Ecosystem (BOBLME) Project. The Bay of Bengal – home to over 400 million people - is one of the most populous areas in the world, with majority of its population in poverty and relying heavily on the area’s rapidly degrading coastal resources. While extensive documentation on the condition of resources has been done through the project, it is timely now to assess the past and on-going management initiatives. As part of fulfilling the latter, this review is focused specifically on ICM, community-based management and co-management practices in and around the Southeast areas of Bay of Bengal, which is encompassed by four countries: Indonesia, Malaysia, Myanmar and Thailand. This review aims to identify practices that work and practices that should be avoided while managing the coastal resources in an integrated approach. A similar review is currently underway for the four south Asian BOBLME countries that includes Bangladesh, India, Maldives and Sri Lanka.

## **1.2 Basic concepts and definitions**

### ***Coastal areas***

The coastal area commonly represents the interface between the land and the sea (Cicin-Sain and Knecht 1998). However, the concern and interest are concentrated on that area in which human activities are interlinked with both the land and the marine environments (Scura et al. 1992). The area in concern includes coastal floodplains, coastal forests including mangroves, marshes, and tidal flats, as well as beaches, dunes, coral reefs (Scura et al. 1992; Meltzer 1998) and marine fisheries because the bulk of the world’s marine fish harvest is caught or reared in coastal waters (UNDP et al. 2001).

### ***Integrated Coastal Management (ICM)***

A wide array of terms has been used to describe the governance and management of human activities in coastal areas including: coastal zone management, coastal resource management, coastal management, integrated coastal zone planning, and coastal panning (Tabucanon 1991; Meltzer 1998; Pomeroy and Ahmed 2006). The term ‘integrated coastal zone management’ (ICZM) and ‘integrated coastal management’ (ICM) are now preferred by both academics

and practitioners and are the terms commonly used in the literature since the 1990s (PEMSEA 2007; UNEP 2005; Meltzer 1998; Cicin-Sain and Knecht 1998).

There are a number of ICM definitions in the literature but most have common phrases such as ‘integration’ and ‘coordination’. One of the first global plans of action that emphasised the concept of ICM/ICZM can be found in Chapter 17 of Agenda 21 when it was put forward in 1994. Johnston’s (1995) review on Chapter 17 of Agenda 21 revealed a definition of ICM that emphasised integration: “ICM is idealized as a resource management system which employs an integrative, holistic approach and an interactive planning process in addressing the complex management issues in the coastal area”.

Cicin-Sain and Knecht (1998) through their extensive review of the global literature extended the definition of ICM to explicitly include the areas of protection under ICM initiatives and the importance of political recognition: “ICM is a continuous and dynamic process by which decisions are made for the sustainable use, development, and protection of coastal and marine areas and resources. This is done by ensuring that the decisions of all sectors (e.g. fisheries, oil and gas production, water quality) and all levels of government are harmonized and consistent with the coastal policies of the nation in question. A key part of ICM is the design of institutional processes to accomplish this harmonization in a politically acceptable manner”.

The definition provided by the authors above clearly outlines that ICM is built on the essential elements of integration and coordination. Through these elements, it will be possible to provide a common framework to conserve and manage resources sustainably, while possibly reducing the negative impacts of multi-sectoral activities on the coastal areas. It is evident that problems on one part of the coastal area can affect the well-being of other coastal areas (example in the event of oil spill or heavy effluent discharge). As such, ICM initiatives, if in place, can be used to resolve problems that easily arise from the multiple uses of coastal areas which in most cases not only cross into other coastal areas within the boundary but across the boundary of countries as well. Therefore it is very appropriate that trans-boundary initiatives are adopted, such as the LME approach.

### ***Community-based management***

Community-based approach focuses on people’s participation in the planning, implementation and evaluation of coastal resources (Ferrer and Nozawa 1997). It is an approach through which communities are given the opportunity and responsibility to (1) manage in a sustained way the community resources, (2) define or identify the amount of resources and future needs, and their goals and aspirations, and (3) make decisions affecting their common well-being as determined by technical, socio-cultural, economic, political and environmental factors. As Pomeroy and Ahmed (2006) aptly point out, the emphasis is on communities and at its core is the community organisation. Berkes’ (1989) work on communal property rights highlights five important reasons why community initiated management would work better than government initiated management: this includes livelihood security, conflict resolution, cohesive relationships, resource sustainability and ecological sustainability.

Traditionally, community-based initiatives have long existed among many indigenous societies (McCay and Acheson 1987; Rudde and Akimichi 1984; Ruddle and Satria in press).

They voluntarily have managed and utilised the coastal resources in a sustainable way by practising open and closed seasons or having local councils that enforce rules on the use of resources. The works of Johannes (1978, 1981, 2002) discuss in depth such traditional practices in the Oceania / Micronesia region. Anthropological work done by Nowak in the 1980s (2008) among the B'tsisi community on the West Coast of Malaysia revealed that they practised diverse livelihood strategies, primarily to avoid over-exploitation of resources and to allow time for resource regeneration. However, in a more recent follow up study, it was found that their effort has been undermined by development activities by outsiders. Other examples of traditional community based initiatives that are still practised are largely found in Indonesia, such as the *panglima laut* ('sea commander') system in Aceh, the *ikan larangan* (closed fishing season) system in West Sumatra, and the *lubuk larangan* (closed fishing season) system in Northern Sumatra (Yadava 2002). Another well known system is the *sasi* (traditional institution) system in the island of Maluku and *awig-awig* in Mataram, (see Novaczek et al. 2001; Adhuri 2002; Satria and Matsuda 2004).

However, while elements of traditional community-based management practices remain important in various locales and are supported by local institutions, these typically are unable to handle new forms of resource competition from users (such as outsiders, migrants, or commercial users from other sectors) who do not abide by these norms. In addition, very few have demonstrated long term resource sustainability, such as the well documented *sasi* system. Nielsen et al. (2004) and Viswanathan et al. (2003) in their global review on co-management initiatives, argue that the role of government as a legitimate stakeholder is equally important as the role of communities. This is because the complexity of current resource competition and the many categories of resource users. Thus, the role of government is essential in any management initiatives.

### ***Co-management***

The concept of co-management was introduced by Kearney (1984) while presenting the success of the Bay of Fundy Herring Fisheries revival in Canada in mid 1970s through a co-managed partnership between the fishers and the government. Co-management is seen as a basis to reform top-down management approaches which largely have failed to curtail over-exploitation of coastal resources and alleviate poverty among communities who depend for their livelihood on the increasingly depleting coastal resources (Nielsen et al 2004). Following a surge in acknowledgement of the failure of centralised management approaches in the management of coastal resources (see: Pomeroy and Ahmed 2006; Nielsen et al 2004; Susilowati 1999), and some weaknesses in a purely community-based management approach, the co-management approach has gained wider recognition as a promising option to govern coastal resources in a sustainable manner. However, there is an existing and steadily growing body of literature that warns us that co-management is not a panacea for all the problems of coastal resources management and its role in poverty reduction (Murray 2007; Viswanathan et al. 2003).

While there are many similarities between co-management and community-based management, there are differences in the focus of each strategy (Pomeroy and Ahmed 2006). These differences center on the level and timing of government participation in the process. A community-based approach is people-centered and community-focused. A co-management approach focuses on these issues while additionally on a partnership arrangement between the government and the communities dependent on the resources (Pomeroy and Ahmed 2006).

The government may play a minor role in a community-based approach; co-management, on the other hand, for the purpose of implementation will require a major and active government role.

### **1.3 Purpose of the assessment**

The purpose of this review is to:

- Identify and review relevant concepts/theories and definitions of ICM, community-based management and co-management for coastal related areas and resources.
- Identify ICM, community-based management and co-management related policies in the countries reviewed (Indonesia, Malaysia, Thailand and Myanmar).
- Identify scale and measurement issues related to the progress of ICM, community-based management and co-management practices in the countries reviewed.
- Identify ICM, community-based management and co-management practices that work and practices that should be avoided in the countries reviewed.
- Identify and review pilot programs on ICM, community-based management and co-management in the countries reviewed.
- Identify existing knowledge gaps concerning ICM initiatives.

### **1.4 Methodology**

This review involved two phases of secondary data collection. The first phase focused on a full literature search involving a comprehensive search of various electronic library databases. The second phase involved a wider grey literature search which was done through web-search tools such as Google to identify specific case studies through project websites, reports and papers that generally are not published in the formal academic literature.

All secondary data was collected and reviewed from June to July 2010.

### **1.5 Structure of the report**

This introduction chapter explains the rationale for this review and provides a brief background on the conceptualisation and definition of ICM and two of the popularised decentralised management practices: the community-based management and co-management initiatives. Chapter 2 briefly highlights the coastal characteristics for all four countries reviewed. Chapter 3 discusses the policies on ICM and the issue of scale in ICM programs in the four countries. The latter discusses whether the ICM is national, NGO or a grass-root level initiated program. While quoting specific pilot programs/case studies in the countries reviewed, this chapter also highlights specific characteristics that support the success of the management as well as practices to be avoided. The concluding chapter, besides providing key conclusion, briefly highlights the limitations of the review and existing knowledge gaps concerning ICM initiatives in the southeast areas of the Bay of Bengal.

## CHAPTER 2

### THE CONDITION OF RESOURCES IN THE SOUTHEAST AREA OF THE BAY OF BENGAL - THE CALL FOR ICM

This chapter will describe general characteristics of the coastal areas of the countries reviewed that surround the Bay of Bengal. The description will include the coverage of the area, main resources, their state and threats.

#### 2.1 Coastal resource condition in Indonesia

Four provinces in Indonesia<sup>1</sup> which include West Sumatra, North Sumatra, Aceh and Riau Provinces form the eastern most part of the Bay of Bengal LME, covering an estimated total area of 490,000 km<sup>2</sup>. The marine area of North Sumatra and the whole of Aceh and Riau encompasses the Straits of Malacca. The type and the state of resources available in this area are as follows:

- *Mangrove*. Data on mangrove forest coverage is not reliable. Some time series data taken indicate that the trend of mangrove coverage is increasing, while the general trend shows that mangrove area is decreasing. For example, in the east coast of Aceh, mangrove was severely deforested as a result of aquaculture development since the 1940s. This reached its peak in the late 1990s up to early 2000s (Zainun et al. 2007). However, it should be noted that the ranges of mangrove area as noted from these sources were between 390,335 and 966,295 ha (Purnomohadi 2003). This roughly indicates that the mangrove forests within the areas of focus are still quite large. Riau has the largest mangrove forest coverage amongst the four provinces. In the years of post-tsunami recovery, Mangrove Action plan (MAP) has actively rehabilitated 580 hectares of mangrove forests in Riau and North Sumatra, Indonesia.
- *Coral reefs*. The Straits of Malacca is dominated by muddy coastal area. This does not facilitate good ground for coral reefs. However, most coral reefs are found in the North Sumatra and Riau which have different coastal characteristics. A survey by COREMAP (2002) indicates that the condition of the coral reefs along this stretch of coasts falls into the poor category (43 percent heavily damaged, 50 percent damaged, only 2 percent in good and 5 percent in excellent conditions).
- *Sea grass*. Information on the coverage of sea grass is only available for West Sumatra Province. Mangrove and Coastal Area Research Center, Faculty of Fisheries, University of Bung Hatta, cited in Purnomohadi (2003), noted about 75 ha of sea grass bed were available in the province. Sixty seven ha of the beds were observed to be in good condition.
- *Fisheries resources*. The territorial fishing ground of Indonesia in the Straits of Malacca is estimated at 5,500 km<sup>2</sup>. The total MSY for this area was about 270,000 tonnes per year (1980s). The projected MSY specifically for the Western coast of Sumatra was estimated 298,936 ton per year (MMAF Regional Office North Sumatra 2002). Fisheries resource

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<sup>1</sup> The main reference of this section is largely based on the work done by Purnomohadi (2003).

assessment conducted by MMAF in early 2000 found that all marine resources in the Straits of Malacca were overexploited. Similarly, in the Indian Ocean, including West and North Sumatra provinces, demersal species and shrimps are experiencing a similar fate (Fox, Adhuri and Resosudarmo 2005).

Assessment on the threats to the above resources identified several causes: (1) intensive and destructive exploitation of the resources such as mangrove cutting for fire woods, pulp, and charcoal, dynamite and cyanide fishing, trawl fishing, sand mining, to name a few; (2) conversion of the area and resources for alternative use such as the conversion of mangrove into fish pond for aquaculture, the development of marketing facilities, harbours and industries; (3) pollution through oil spills, heavy chemical discharge and sewage from land based activities/sector (Yuniarti 2007; Purnomohadi 2003). We should add to this (4) natural disasters such as the tsunami that devastated the coastal habitat and killed more than 200,000 people in Aceh in 2004.

## 2.2 Coastal resource condition in Malaysia

Eight states along the west coast stretch of Peninsular Malaysia<sup>2</sup> encompass the Bay of Bengal. It stretches from Perlis, the northern most state to west Johor, the southernmost state. The marine water extends about 600 nautical miles long with various widths between 220 to 8 nautical miles. The type and the state of resources available in this area are as follows:

- *Mangroves*. In 1990s, the mangrove coverage on the west coast of Malaysia was estimated to be 17 percent of the total mangrove forests in Malaysia. That meant around 108,800 out of 640, 000 ha (Annual Report of Forestry Department 1995). They were not evenly distributed. The state of Perak had the largest mangrove forest coverage (46,102 ha) and Malacca had the smallest mangrove coverage (238 ha). The common species are the same as mangroves in Myanmar. These are *Rhizophora*, *Sonneratia*, *Avicennia*, *Bruguiera* and *Xylocarpus* spp.
- *Coral reefs*. The muddy coast of western Malaysia is not a feasible area for the growth of coral reefs. However, they can be found in small patches around the islands of Langkawi, Pangkor, the coastal stretch along the state of Negeri Sembilan and off the coast of Port Dickson. A post-tsunami coral reef survey around Langkawi found that sedimentation and re-suspension of fine silt onto the reefs was found at all sites (Lee et al. 2005). However, the findings of the survey highlight that this problem might have already existed before the tsunami.
- *Sea grass* was found in areas stretching from southwest of Johor to the island of Langkawi in the north.
- *Fisheries*. Talib, Tan and Yasin (2003) noted that the potential yields per year in the west coasts of Malaysia (>30 nautical miles) in 1986-87 was 11,300 and 16,650 for demersal and pelagic fish respectively. This indicated that the total potential of fisheries resources was 27950 ton per year. On the same year the total landing was 29,901. Added by the fact that the trawl survey around Langkawi and Pangkor Islands revealed that stock density from 1971 to 1997 has been decreasing, overexploitation of fisheries resources has been

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<sup>2</sup> The main reference of this section is largely based on the work done by Omar (2004).

evident since 1971. More recently, a post-tsunami assessment indicated that the abundance of coral reef fish along the west coast of Malaysia was low and comparatively it is lower than the abundance level in the Indo-Pacific area (Lee et al. 2005).

Assessment on the threats to the above resources identified several causes including land based pollution and marine based pollution (Omar *ibid*). The sources for the land based pollutions are sediment run-off, industrial waste, domestic waste, agricultural and animal waste and heavy metal. On sea based pollution, Omar noted shipping activities (oil spill and other discharge), small vessel discharge, aquaculture development (chemicals), domestic discharge (from coastal population) and reclamation. Specific to coral reefs, early and recent reviews (Liew and Hoare 1982; ASEAN 2009) found that the biggest human induced threats were exploitation for commercial and tourism purposes as well as siltation and sedimentation caused by development projects. These have subjected corals to stress and leaching resulting in deterioration of coral reefs.

### 2.3 Coastal resource condition in Thailand

Six provinces, Ranong, Phangnga, Phuket, Krabi, Trang and Satun on the west or Andaman Sea coasts of Thailand<sup>3</sup> encompass the Bay of Bengal LME. The coastline covers an estimated area of 750 km length with 116,280 km<sup>2</sup> marine waters within the EEZ. The type and the state of resources available in this area are as follows:

- *Mangrove forests*. In 2000, the total mangrove forests in Thailand's Bay of Bengal coastal area was 176,486 ha (Royal Forest Department 2000). These mangrove forests are distributed in Ranong, Phangnga and the west coast of Phuket, Krabi, Trang and Satun provinces. Compared with 1971 in which the mangrove was 231,400 ha, it is noted that within 29 years Thailand had lost 54,914ha or 23.7 percent of the forest. In the last two decades, however, some re-forestation had taken place. Local communities, private business, NGOs and government have contributed their resources towards this activity.
- *Sea grass*. Changsang et al. (1988) and OEPP (2003) estimated a stretch of 29 km<sup>2</sup> sea grass beds on the west coast of Thailand. They were mostly located from Chaomai Beach to Muk Island and off Talibong Island in Trang Province, Phangnga Bay and Lanta Bay in Krabi Province. Some degraded sea grass was found in Phuket waters.
- *Coral reefs*. In 1999, Thailand's Andaman Sea was the home to an estimated 78.55 km<sup>2</sup> of coral reef (OEPP 2003). Pongsuwan (2002) found that their conditions was healthy (12 %), fair (33.6 percent), poor (26.6 percent) and very poor (23.3 percent).<sup>4</sup>
- *Fisheries resources*. Assessment conducted in 1970 to 1990s found that the MSY of the coastal area (from 10-90 m depth) was between 154,000 – 230,000 metric tonnes (Isarankura 1971; Marr et. all 1976; Bhatiyasevi 1997). Out of the above calculation, pelagic fish was estimated about 136,600 metric tonnes. It was also noted that although exploitation level data was scarce, some indications pointed out the possibility that demersal resources had been overexploited since 1971.

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<sup>3</sup> The main reference of this section is largely based on the work done by Juntarashote (2004).

<sup>4</sup> The criteria for this evaluation are based on the ration between live and dead corals. <sup>≥</sup> 3:1 = very healthy, 2:1 – healthy, 1: 2 = poor, 1<sup>≈</sup>3 = very poor.

Assessment on the threats to the above resources identified four sources: (1) land based activities such as agriculture, industry and service sectors, particularly tourism; (2) destructive fishing gears such as trawls and push nets; (3) discharge of waste from aquaculture, especially chemicals used in the practice; (4) oil spills from cargo transportation and tourism industries as well as fishing vessels. Additionally, if the above sources take the form of anthropogenic threats, we should also add a natural threat. Examples of a natural threat are disasters such as the tsunami and the booming of particular predator that disturbs the ecological balance.

## 2.4 Coastal resource condition in Myanmar

The coast of Myanmar<sup>5</sup> consists of three zones: the Rakhine Coastal Zone, the Ayeyawadi Deltaic Coastal Zone and the Tanintharyi Coastal Zone. Each covers a land area of 367,780 km<sup>2</sup> (750 km in length), 57,607 km<sup>2</sup> and 77,684 km<sup>2</sup> (includes the area of 800 islands and the coastal area of the mainland) respectively. The total coastal line is 2280 km. The total Myanmar continental shelf is about 230,000 km<sup>2</sup> and 486,000 km<sup>2</sup>. This is the area of the Exclusive Economic Zone (EEZ). The type and the state of resources available in this area are as follows:

- *Mangrove forests.* In the early 1900s there were about 720,100 ha of mangroves. In 2000-2001 there were only 320,604 ha (274,795 ha reserved forest and 29,239 ha conserved and planted till 2000) found in the coasts of Myanmar. The types of mangrove species found along this coast are *Rhizophora*, *Sonneratia*, *Avicennia*, *Bruguiera* and *Xylocarpus* spp.
- *Coral reefs.* 147 species of coral were identified as the population of coral reef in Myanmar. The majority of these species were found in the Tanintharyi (93 species) coastal area, followed by Rakhine (51 species) and Delta areas (3 species).
- *Sea grass.* Soe Htun et al. (2001) identified 9 species of sea grass in Myanmar waters mostly occurring in Rakhine and the Tanintharyi coastal regions.
- *Fisheries resources.* Fish biomass was calculated about 1.0 million tons for pelagic fish and 0.75 million tons for demersal fish, with annual MSY at 0.5 million tons and 0.55 million respectively. This means that total annual catch potential was 1.05 million tons. Although, fisheries catch statistics noted that the production was only 0.88 million tons in 1999-2000 (FAO 2001), when the estimates of discarding and poaching practices are taken into consideration, it is estimated that fish exploitation has reached the MSY level. Time series research (1990-2000) found that Hilsa (*Tenualosa ilisha*) was over-exploited (Aung 2001).

Assessment on the threats to the above resources identified several causes which include cutting of mangrove trees for fire wood and charcoal production, and conversion of mangrove areas for aquaculture development and agriculture. Pe (Undated) noted that reefs of the Latitude 11° N had suffered much destruction due to dynamite fishing, anchor damage, trampling and overfishing. Illegal near shore trawling was identified as the main threat to sea

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<sup>5</sup> The reference of this section is largely based on the work done by Pe (2004).

grass. Water pollution by industrial wastes, oil spills also contributed to the damage of the resource.

Finally, from the brief description above it can be noted that all four countries reviewed share similar trends and conditions of their coastal resources. Mangroves, sea grass, coral reefs and fisheries resources are declining. The source of threats are similar, many attributing to land and marine based activities, and to a smaller degree, naturally occurring disasters such as the tsunami.

Cicin-Sain and Knecht (1998) noted that ecological effects and multiple-use conflict are the reasons that legitimise the use of ICM. They argue that:

‘[t]he major reasons why an integrated management approach is needed for managing oceans and coasts are twofold: (1) the effects ocean and coastal uses, as well as the activities farther upland, can have on ocean and coastal environments and (2) the effects ocean and coastal users can have on one another.’

The above ecological characteristics use pattern and the condition of resources depict a circumstance where there is a need for integrated coastal management (ICM) in the countries reviewed.

## CHAPTER 3

### POLICIES, SCALE AND PRACTICES - WHAT WORKS AND WHAT DOES NOT WORK

#### 3.1 Policies related to ICM

In the Southeast Asian region, initial policies on coastal management were primarily developed to manage coastal erosion problems and fisheries conflicts. However, in recent years governments have made efforts at addressing a broader range of sectoral interests as the concept of integrated coastal management has gained political support. In all the countries reviewed, with exception of Myanmar, there are policies related to the management of coastal areas and resources using the ICM approach. Moreover, there have been a number of pilot programs that could be related to ICM initiatives in the region.

#### *Indonesia*

The evolution of ICM in Indonesia started in the early 1980s after the establishment of the Ministry of Environment. In the 1990s, international and bilateral donor agencies also introduced ICM through their programs. These initiatives were directed at establishing the concept of ICM and were accompanied by efforts to improve the administrative capacities of local governments in the coastal zones (Siry 2006). One of the major programmes was the Marine Resources Evaluation and Planning (MREP) program in 1993. This program exercised integrated and multi-sectoral disciplines at site specific coastal areas in ten provinces in Indonesia (Cicin-Sain and Knecht 1998, 402-403). It was directed to foster capacity building to develop plans and manage the selected sites through an integrated approach. From 1997 to 2003, another project called Coastal Resource Management Project (CRMP) funded by USAID and implemented by the Coastal Resource Center, University of Rhode Island, together with their Indonesian partners was implemented. The purpose of this project was to strengthen participatory and decentralized coastal resources management in Indonesia (Hanson et al 2003).

The Coral Reef Management Program (COREMAP) was primarily started with the focus on coral reef conservation. However, over the course of implementation, the program has included other sectoral issues pertaining to the coastal resources. Thus, their approach reflects the use of ICM. This program has been implemented in thirty-five sites all over Indonesia since 1998 and will continue to 2015 (Cicin-Sain and Knecht 1998; [http://www.coremap.or.id/tentang\\_coremap/mengenal\\_coremap/](http://www.coremap.or.id/tentang_coremap/mengenal_coremap/))

In the post-reformation (after 1999), policies that were established relating to ICM were initially more focused towards decentralising the management of coastal resources. Two new laws were established. The endorsement of Law 22/1999 (later revised as Law 32/2004) transfers the right to manage coastal area to the local governments. District government is stipulated to have the right to manage marine coastal area from zero to maximum 4 nautical miles to the sea. The provincial government has the right to manage coastal marine area beyond district management area up to 12 nautical miles. The Law also recognises the right of traditional communities to govern their territory by their own tradition. This includes traditional marine resource management such as *panglima laut* – traditional resource

managers in Aceh of Northern Sumatra Indonesia and the traditional fishing rituals in West Sumatra such as *malimau pasie*, *malimau kappa* and *alek pasie*. The second law (Law 25/1999) is focused on the financial issues related to the decentralization of political and resource management. This includes the distribution of revenue derived from resource extraction.

In 2002, the Ministry of Marine Affairs and Fisheries issued a decree on General Guidance for Integrated Coastal Management (Keputusan Menteri Kelautan dan Perikanan No.10/MEN/200). As it is explicitly stated in the title, this decree adopts an Integrated Coastal Management approach. This decree is a response to both laws on decentralization and an anticipation for possible inter-sectoral and horizontal/vertical inter/intra governmental conflicts. The decree is meant to integrate sectoral planning, the planning of different level of government, land-based and marine-based ecosystems as well as to integrate science and management.

In the latter stage, the Indonesian Government passed a law that strengthened the above ministerial decree. This is the Law No. 27, 2007 on Coastal and Small Island Management. This law defines coastal as an area between the inland boundaries of coastal sub-district up to 12 miles to the sea. Like the decree, the law states that the management planning of the coastal area should employ integrated coastal management approach. This is done through the integration of regional sectoral plans, which emphasises harmonisation. This law also acknowledges the right of traditional communities to manage their coastal resources by traditional law/regulation. However, due to resistances from various stakeholders over some articles on the potential privatisation of the coast (Hak Pengusahaan Perairan Pesisir or HP3), the law is being legally reviewed.

On the ground, however, the formulation of the above policies has produced mixed results. On the one hand, it positively re-established the role and institutionalised the rights of local communities over the management of coastal resources and recognised the crucial role of local governments. Some pilot programs which begun as purely community-based ICM, later adopted the co-managed approach when local government provided their support. For example, Satria and Matsuda (2004) recorded the case of the revitalization of traditional ICM management in Lombok (called *awig-awig*) which was supported by the district government. The primary function of *awig-awig* is to manage the coastal areas for fisheries, conservation and tourism purposes. In Aceh, the practice of *Panglima Laot*, the traditional governing body and rules for coastal resources, particularly marine, was revitalized and protected by provincial law (called *Qanun*)(Kurien 2010). These cases have generated optimism that decentralization would lead to better resource management.

On the other hand, a closer review also reveals that decentralisation of ICM initiatives in Indonesia was problematic. Siry (2006) points out that there are already uncoordinated actions by local governments who have been establishing their local acts (*Peraturan Daerah/Perda*) which are more concerned with revenue raising than with ecological and sustainable principles which consequently has led to the unsustainable mining of coral and sand. Coupled with lack of budget for local governments to make any effective changes to their capacity in managing the coastal related problems and the instrumental approach adopted towards decentralisation of ICM practices, conflict over management of coastal resources continues to occur despite polices and laws that have been developed to address this very problem.

## *Malaysia*

In Malaysia, initially the realisation for the need of coastal management approach was triggered based on concerns over the worsening coastal erosion. However, the initial development of policies related to coastal management was focused in the fisheries sector. In 1981, the Malaysian government introduced a Fisheries Comprehensive Licensing Policy (FCLP) (Ahmad 1994; Mohammed 1991) which was the first policy that actually had some significant positive impact on the management of coastal fisheries. Before the introduction of the policy resources were increasingly overexploited and conflicts between traditional fishers and trawlers were on the rise. The policy enforced type of gears and number of boats or vessels that could operate in specific fishing zones. In addition, the policy also introduced relocation efforts for surplus fishers with the long term aim to reduce the number of fishers (Siry 2006; Mohammed 1991) and thus reducing fishing pressure. Among the relocation efforts included is registration of fishers, boat buying back scheme, alternative livelihood training, land resettlement and credit assistance (Siry 2006; Mohammed 1991). Through this policy effort, numbers of fishers reduced significantly and fishing pressure reduced considerably. While the policy is sectoral based, in its implementation, various governmental departments including the department of Agriculture, Social Development and Coastal Guards were involved in the various activities including alternative livelihood trainings, credit assistance to enforcement. Evidently, this form of 'integrated' approach in managing coastal fisheries led to the success of reducing the number of fishers and providing them with other essential livelihood skills<sup>6</sup>.

In mid 1980's, severe coastal erosion problems prompted the government to launch a National Erosion Study (1984-85). Two institutions related to coastal zone management were established - (1) the Coastal Engineering Technical Center (CETC) - which later was known as Coastal Engineering Control Unit (CECU) and (2) the National Coastal Erosion Control Council (NCECC) (Cicin-Sain and Knecht 1998). The former is under the Department of Drainage and Irrigation, while the latter is made up of representatives of various federal and state government bodies. The former was responsible for implementing coastal erosion control, engineering works for critical coastal areas and provided technical support to NCECC which functions as the coordinating body for coastal development.

The policy of Environmental Impact Assessment applies to all large scale development in 1987 is another indication that Malaysian government started to apply an integrated perspective (Cicin-Sain and Knecht 1998).

In 1992, Malaysia formally established its first National Policy on Coastal Resource Management which aimed to develop coastal resource programs in a more integrated, systematic and scientific manner (Siry 2006). It was not until 1996 that implementation of ICM activities were initiated in Malaysia. The majority of the nation's ICM efforts are

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<sup>6</sup> The drop in the number of fishers in Malaysia by almost 70 percent from early 1970s' to late 1990's (Ahmad 1994), may not be only caused by the introduction of a comprehensive policy, but coupled with the industrialisation process that significantly changed the economic structure of the country and opened up vast amount of employment in industrial based sectors.

concentrated in the state of Sabah and East Malaysia (Nasuchon 2009). Fewer initiatives are observed in the West Coast of Peninsular Malaysia (see Saleh 2008).

### *Thailand*

In Thailand there are a number of bi-sectoral based laws related to coastal resource management but the responsibility of implementing these lies in the hand of a single institution. For example, the Nature Conservation Act includes the management of water-based marine parks, along with land-based gazetted forests. This Act is under the responsibility of the Royal Forestry Department (Nasuchon 2009). There is no review on this specific Act, hence information such as whether the Forestry Department staff are equipped with the knowledge and skills on Marine National Park (MNPs) management is not available.

In Thailand, there is no specific policy that has ICM terminology in it. However, the Natural Resource Exploitation Act groups several sectors and agencies under this Act which includes the Forest Act of 1941, the Fisheries Act of 1947, the Minerals Acts of 1967, the Petroleum Act of 1971, and the Tourism Act of 1979. The integration between multiple sectoral and coordination of various organisations makes this Act the closest referral to any policy related ICM initiatives.

The National Parks Act B.E. 2504 (1961) has functions of ICM since it outlines the coordination of several agencies and across several coastal resources including fisheries, mangroves, coral reefs, to name a few. The Act prohibits any kind of fishing in the MNPs. In the Andaman coast, there are 16 MNPs. They are protected, managed and operated by the Department of National Park, Wild Life and Plant Conservation, Ministry of Natural Resources (Panjarat 2008).

The west coast of Thailand was among the areas that were severely impacted by the 2004 Indian Ocean tsunami. In 2006, a specific Act was approved to rehabilitate the coastal resources that were affected due to the tsunami. The Notification of Environment Protection the Impact Area of Tsunami in Krabi, Trang, Phang-Nga, Phuket, Ranong and Satun Province, B.E. 2549 (2006; the “Notification”) was established by the Ministry of Natural Resources and Environment with the purpose to rehabilitate the coast and its environment impacted by the tsunami (Panjarat 2008). While the Act naturally requires the coordination of several agencies to implement relevant rehabilitation activities, nothing in the Act itself stipulates the name of those coordinating agencies.

In 2002, a new department was established within the new Ministry, the Ministry of Natural Resources and Environment (MONRE) (Nasuchon 2009; Panjarat 2008). All agencies involved in the management of natural resources and environment were placed under the MONRE. The new Department of Marine and Coastal Resources (DMCR) has the key responsibility in managing conservation initiatives of the coastal ecosystem that includes both living and non-living in the areas.

The government of Thailand drafted its first policy on the decentralisation of coastal resources management in 1992. The policy came into effect in 1997 (Nasuchon 2009). Based on Article 283, it should be noted that the decentralisation process was solely institutionalised for power sharing between the federal and local government and not between government agencies and local communities. The Article provided a mandate to local government

agencies to independently formulate policies; and formulate administration, finance and personal management procedures. It was a process of decentralisation from the federal level to the state and/or provincial level.

Similar to other countries reviewed, in Thailand, there is no specific policy on community-based management or co-management arrangements between government agencies and communities. However, the country's Eighth National Economics and Social Development Plan (NESDP 1997-2001) emphasises community involvement in the management of natural resources (Nasuchon and Charles 2010; Tokrisna 1999).

Despite the absence of policies for bottom-up ICM, there are institutions placed at the provincial level, known as the *Tambol* Administrative Organisation (TAO). The TAO play an important role in representing community concerns at higher levels in the government. The TAO is represented by two community members from each village within the Province and they serve a four year term. The function of TAO is to represent community problems to the federal or provincial government (depending on the issue) and to conduct community-based projects that are relevant to the development of the communities. One interesting aspect of the TAO is that it is financially independent as it is funded through local tax collection.

In Thailand, community based management programs begun in the late 1990s with the support of development agencies and the government. In 1999 a pilot project on community-based fisheries management was established at Bang Saphan Bay, East Coast of Thailand to address the growing conflict between small scale fishers and trawlers (Nasuchon and Charles 2010). A territorial user's right was established based upon a legal framework established by DOF and monitored by the community. Evidently, in the absence of policies, localised legal frameworks may work well.

## ***Myanmar***

In contrast to all other countries reviewed, information on ICM practices in Myanmar is scarce. It is difficult to determine if the scarcity lies in lack the of ICM practices or in the lack of documentation effort.

In Myanmar, until the mid-90s, the Ministry of Agriculture<sup>7</sup> was solely responsible for the management of agricultural, fisheries and forestry. However, by the late 90s, the government realised the need for independent management of each sector given their strong growth. As such separate Ministries were created to manage each sector. At the grass-root level, if conflicts arise due to overlapping decisions between these sectors, then it is the prerogative of local authorities (such as the Peace and Development Council at the state or division level) to intervene and find the best solution in solving the problems.

Given that institutionally, each sector is managed and developed independently, naturally there is absence of any ICM related policies in Myanmar. However each sector (agricultural, fisheries and forestry) has its own development plan. Similar to other countries, fisheries management plans were among the first to be developed in Myanmar.

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<sup>7</sup> Information on the sectoral structure of coastal resources in Myanmar was obtained from notes presented by Mr. Tun Win, Director of Research and Development Division, Department of Fisheries, Myanmar [www.fao.org/forestry/13087-1-0.pdf](http://www.fao.org/forestry/13087-1-0.pdf)

At this point, it should be noted that this review did not find any documentation on community-based organisations or traditional governance structures that are responsible for coastal management at the grass-root level in Myanmar. However, within the fisheries sector, the Myanmar Fisheries Federation (MFF) represents the interest of fisheries stakeholders. It is interesting to note that the Federation, while is registered as an NGO, is in-fact developed and managed by the government through the Ministry of Livestock and Fisheries. Although MFF has no legislation power, it is involved in the management aspects of fisheries which include training, demonstration, information and creating awareness.

### ***Joint policies – across countries***

There is increasing recognition that an ICM approach must formally include trans-boundary coastal issues to address the conflicts of fishers crossing the boundaries and pollutions caused by oil spills and heavy effluence discharge. In the southeast areas of the Bay of Bengal, some of the areas claimed as territorial seas include areas between Indonesia and Malaysia, Malaysia and Thailand and Thailand and Myanmar. There are existing regional initiatives to support ICM. Within the region, a Regional Action Plan for the Southeast Asian Seas was drafted in 1979 and adopted by five countries. A coordinating body on the Seas of East Asia (COBSEA) was formed to serve as the overall authority to determine the content of the action plan, to review its progress, and to approve a programme for its implementation.

There are a number of joint bilateral policies in extracting coastal resources through an integrated approach. For an example, both Malaysia and Thailand have a joint authority to explore and exploit the resources of the seabed in a defined area (where there is overlapping claims of continental shelf of both countries) in the Gulf of Thailand since 1979. In 1990, the effort was renewed through the establishment of the Malaysia-Thailand Joint Authority (MTJA).

### **3.2 Scale**

In the countries reviewed, all pilot programs are conducted largely at a sectoral level and are primarily focused within a small stretch of the coastal zone.

#### ***Pilot programmes to national programmes***

To date, most of ICM initiatives in the countries reviewed are pilot programmes. In all the cases, it was noted that initiatives cover a single part of the coastal zone only. For example, in the case of West Coast Malaysia, recent ICM initiatives are focused in the island of Langkawi. There is no indication in project documents on why the island was chosen as a site to implement the pilot programme.

In the early stages, it makes sense to begin initiatives on a small scale given that resources (budget and staffing) are limited (Cicin-Sain and Knecht 1998). However it should be noted that for most of these pilot programmes, their underlying objective is that they will be scale up to include other coastal regions in the country. However, the review did not find any instances of successful scaling up of ICM pilot programmes. For example, from the earliest ICM pilot programmes conducted in Indonesia, Malaysia and Thailand in the late 1980s through the ASEAN-US programme, there is no evidence to indicate that the outcome of the programme were scaled into larger coastal management programmes in those countries.

However, some of the pilot programmes, while was not scaled to a larger national programme, on the other hand, did influence national policies on ICM or led to the establishment of local management institutions. The Coastal Resource Management Project (CRMP) in Indonesia concludes that ‘the project has served as incubator to present and test new ways for coastal resource management ... contributed useful experience that has helped both local and national response to decentralization’ (Hanson, at. al. 2003). At site specific level, CRMP and Coral Reef Management and Rehabilitation (COREMAP) have successfully established local level management institution supported by local (district) regulation (see for example Bintan District (Riau) regulation on Coral Reef Management).

### ***Sectoral focus to multi-sectoral focus***

Most pilot programmes covered by the review are sectoral focused. Predominantly management initiatives are focused in the fisheries sector. In the post-tsunami period, a growing number of programmes have also focused on mangrove rehabilitation.

### ***Central management to decentralised management***

In the case of Indonesia and Thailand, there is evidence of decentralised management of the coastal resources. Indonesia’s decentralisation reforms and Thailand’s constitutional authority granted to TAO and rights provided to NGOs operating in both countries, are evidence on power sharing that is being addressed generically between grass-root organisations and government agencies in managing coastal resources. In Malaysia and Myanmar, there is evidence of a more centralised management of the coastal resources. However, in all countries reviewed (except Myanmar<sup>8</sup>), there are on-going pilot programmes on co-management arrangements between government based agencies, international agencies, local non-governmental organisations and communities. In the case of Indonesia and Thailand, most pilot programmes were initiated by non-governmental organisations with the assistance of international donor agencies. In the case of Malaysia, most pilot programmes were initiated by governmental departments (largely fisheries) in coordination with international and local non-governmental organisations.

There are limited documented cases of community participation in the setting up of management objectives for ICM initiatives in the countries reviewed. One case study that indicated a community’s participation in the setting of management objectives in managing their coastal resources through an integrated approach was through the community-based fisheries management in post-tsunami Aceh project implemented by the WorldFish Centre and funded by the Force of Nature Foundation from 2007 to 2009.

In most of the pilot programmes reviewed, there is lack of indication if the community actually participated in the development and discussion of the management plans. There could be situations in which community participation has been limited to the implementation process – what Nielson et al. (2004) terms as the “instrumental co-management approach”. In addition, given there is lack of clarity on community functions arising from the absence of co-management or community-based management policies, there is at the grass-root level some scepticism over this form of partnership. This could be the reasons why there are cases

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<sup>8</sup> The Review was not able to identify any pilot programs on ICM or community based ICM in Myanmar. It is not clear if this is due to the absence of any ICM or community based ICM initiatives in Myanmar or if there is any programs, then it is not being documented.

where the community is sceptical to accept management responsibility such as indicated through the pilot programmes in Malaysia.

As an important point of contrast, Kearney (1984) points out based on his review of the first successfully introduced co-management initiatives in coastal resources, i.e. reviving the Bay of Fundy Herring Fisheries in Canada from 1976 to 1978, it was primarily the decision of fishers to restructure the herring fisheries that brought about the success. Of course, the commitment of the government and its many supportive measures were absolutely essential to the success of the Bay of Fundy project. But, as rightly pointed out by Kearney (1984), it is the question of emphasis. The decision of the fishers to restructure, to accept substantial management responsibilities and to co-operate with government agencies made the critical difference.

### ***Inter-sectoral and cross-scale interactions***

With coastal fisheries stalling and demand for fish growing, many countries have turned towards developing their aquaculture sector to close the supply gap. Over the decade, the expansion of aquaculture has led to a rapid growth in fish production. However, while it increases the supply of fish, it equally demands more of the natural stock which is used as food for the cultured fish stock. Nearly one-third of the world's wild caught fish is consumed as fish feed (Dey et al. 2007). As aquaculture industry in the region continues to exhibit steady growth, the threat on their coastal fisheries is likely to increase. In addition, large scale ponds have been constructed to support fish culture activity along the coastal areas of Indonesia, Malaysia and Thailand. This was made possible by clearing large strips of mangrove and other coastal forests along the coasts (Kanagaratnam et al 2006). One key issue is the pollution caused by these large-scale ponds that are directly discharged into the coastal waters. Although policies related to coastal aquaculture has emerged, enforcement related to these policies is still weak.

### **3.3 Good practices**

1. *Stakeholders' participation in all steps of management is the key to the success of ICM.* Participation is not only a means of *communication* but includes the facilitation of negotiation to reach an agreeable management plan and sharing of knowledge and skill for capacity building (WorldFish 2010). This was demonstrated through the pilot project on community-based fisheries management in post-tsunami Aceh.
2. *Community members who see some immediate results of their management efforts have higher tendency to continue their participation in management initiatives.* Trainings and awareness rising can provide the initial understanding of why these initiatives are needed, but only observable results can sustain a programme as the pilot programmes / case studies reviewed have shown. In Thailand, the potential of coastal management initiatives to increase revenue from eco-tourism is used as an incentive to sustain community participation (Panjarat 2008). Furthermore long term gains must be complemented by short term gains, i.e.: coastal rehabilitation efforts are long terms gains that must be complemented by short term livelihood activities that supply income to the community involved. This also sustains their participation as observed through the pilot programme on community-based fisheries management in post-tsunami Aceh.

3. *The decision for staff or team members of coordinating agencies to be based in programme sites during implementation stages enhances closer rapport with community.* In addition this helps in building of trust and confidence among community members towards the pilot programme and towards the ‘new people’ who have arrived in their community to work on issues that directly relates to their livelihood. As pointed out by Pomeroy and Ahmed (2006), communities generally are reluctant and sceptical to take on the responsibility of co-managing their coastal resources. Hence, constant communication and understanding between all stakeholders will increase chances of social cohesion as pointed out by Saleh (2008) based on their final project evaluation on the integrated coastal resource management project conducted in the island of Langkawi, along the west coast of Peninsular Malaysia from 2003 to 2007.
4. *Complementing scientific information with local indigenous knowledge enables better integration of coastal management efforts.* There is lack of documented evidence of integration between local knowledge and practice and scientific information in coastal management. However, evidence of this effort did emerge in project documents during the massive tsunami rehabilitation programs that took place since 2005 in the region. Mangrove re-plantation programs that utilised community knowledge had higher survival rates as the community shared their knowledge on where and how best to re-plant in comparison to re-planting efforts that were done randomly (Kanagaratnam et al. 2006). Similarly the use of *panglima laot* institution in the post-tsunami fisheries rehabilitation of Aceh has helped appropriating the assistance provided with local condition and community needs.
5. *Sufficient political will is necessary to ensure recognition for ICM efforts and commitment of all stakeholders to its implementation.* While the participation of all stakeholders in the management plan are essential to the success of ICM, it is even more crucial to have the verbal support of government at the national and provincial level. This sustains community participation who view a programme as more legitimate with the verbal support from their government, as demonstrated in the pilot programme in Malaysia. In addition, there is better collaboration among all stakeholders during the project implementation and chances to mitigate conflicts are higher when there is solid involvement from the government side. This was demonstrated through the pilot programme on community-based fisheries management in post-tsunami Aceh where the involvement of the deputy head of Aceh Jaya district ensuring transparency and accountability of community leaders involved in post-tsunami coastal rehabilitation projects, mitigated conflicts between community members, *Panglima Laot* and leaders of the aquaculture farming group. Furthermore, any verbal support from the national government will ensure the sustainability of ICM practices and continuous budget allocation to run the programme when international donor agencies exit the programme.
6. *Flexibility and successful negotiations are required to establish better coordination and collaboration within ICM programmes.* The involvement of various stakeholders and the fact that each stakeholder has different interest, priorities and working culture pose serious challenge for successful coordination and collaboration. Flexibility and good negotiation are the key requirement to cope with this challenge. In most ICM pilot programmes, continuous discussion and negotiation is required. For example, in deciding where re-greening initiatives can take place and which areas can be used for livelihood related activities. The dilemma of coastal protection role versus the coastal exploitation role

indicates that there is strong demonstration that negotiation and discussion are a continuous process to ensure ICM works.

7. *ICM as a process.* Problems associated with coastal zones and resources are complex and dynamic. In this circumstance, the establishment of a comprehensive planning and implementation of ICM along the full length of any national coast is difficult. It is best if ICM is implemented through a gradual process. ICM can take in the shape of one pressing problem in the coastal area, followed by the inclusion of other problem. For example, as demonstrated in the pilot programme on community-based fisheries management programme in Phang-Nga Bay, Thailand from 1995 to 1999, the programme was primarily a response to the continuing degradation of fisheries resources and increasing poverty in rural communities. However towards the end of the programme other coastal management activities were carried out including reforestation of mangroves in the Bay, replanting seagrass, placing of artificial reefs and sea ranching. The understanding of ICM as a process among all stakeholders will facilitate the gradual but responsive and dynamics development of ICM planning and implementation.
8. *Localised creative dissemination efforts such as folk dramas and radio programmes that include community members are more successful as dissemination tools.* The review did not identify any pilot programmes in the southeast areas of the Bay of Bengal that identified the most successful dissemination method on coastal management to its primary users and the general public. In the case of Bangladesh, the success of its community based approach in managing the inland based aquatic resources is largely due to people orientated dissemination method. Coordinating agencies presented and disseminated information (along with the participation of community members) through folk dramas and songs – which is very much part of the local communities' culture. This was one of the most effective channels of ensuring knowledge transfer at the grass-root level. In Batangas Bay of the Philippines, an ICM pilot programme implemented by PEMSEA successfully used the local radio station to disseminate information on the negative implications of any coastal development projects. This effectively drew out public support against any projects that did not meet the environmental guideline.

### **3.4 Practices to avoid**

1. *Most pilot programmes are still very much sectoral based.* Agenda 21 argues the need to integrate the management of the entire spectrum of coastal and marine areas, including Exclusive Economic Zones. However, most pilot programmes (despite being termed as 'integrated management') are still focused within one major sector. Most of the pilot programme identified on integrated coastal management within the Bay of Bengal is focused on fisheries. No doubt fisheries are a good entry point as issues on contamination on fisheries resources and loss of fishery habitat that directly affects the survival of some species gets better national coverage and public attention than other coastal issues. However, few pilot programmes have demonstrated the ability to include other coastal related issues into their management plan gradually. Pilot programmes that gradually work towards including other sectoral problem in the coastal management plan will then be able to address other coastal problems that usually arise from inter-sectoral interaction such as the impact of aquaculture expansion on the natural fish stock through its reliance for fish feed and disposal of non-degradable materials into the coastal waters due to the expansion of tourism facility close to the coast.

2. *Some of the pilot programmes are too small in scale to have any real impact.* The argument is often made for integrating coastal management with national development planning, but given the high frustration level of even the best informed members of bureaucracy, it has been suggested that experiments should be undertaken on two tracks, the non-official (non-binding) as well as the official. Not surprisingly, there is a tendency to resort to experiment in integrated coastal zone management at the “micro” level, rationalised further by the desirability of involving the local coastal community (Johnston 1995). There are two limitations to conducting small scale pilot studies. Firstly, given that the impact is not evident, there is high reluctance among central and state governments to allocate higher budgets for integrated coastal management initiatives. Secondly, even if governments want to invest, there is high risk in trying to replicate small scale case studies into larger developmental work. To begin with, most small pilot case studies lack an integrated approach.
3. *Inadequate budgets hinder effective inter-agency coordination.* In the ICM pilot programme on the island of Langkawi implemented from 2003-2007, the programme highlighted the problem of coordination amongst agencies. A deeper probe revealed that due to limitations of budget, lead organisations managing these pilot programmes were not able to hire staff from these coordinating agencies. Integrated coastal management initiatives require, naturally, integration and coordination across sectors. For example, initiatives related to coastal aquaculture will require cooperation between various governmental departments ranging from fisheries, natural resources, land and water quality, not to mention several NGOs with different sets of expertise. However, in most cases there is no budget allocated for hiring individuals from each of these coordinating sectors during the lifespan of the pilot programmes (Saleh 2008). The lead agencies usually obtain collaborations of these coordinating agencies through networking or goodwill relationship, which usually limits the participation of those individuals from the coordinating agencies as they have other work commitments going on.
4. *Pilot programmes often lack appropriate communication strategies to enable information exchange and information dissemination.* In most pilot programmes, the importance and the ways to manage coastal resources sustainably has to be effectively transmitted to local people to encourage their willingness to take on the responsibility of caring for their coastal resources. In the southeast areas of the Bay of Bengal, most lead agencies tend to rely on public speeches or printed materials to disseminate information on coastal management. While this may reach the primary users of the coastal areas and the general public, its effectiveness remains untested. This review sums that there is lack of localised creative dissemination efforts that includes community members in the dissemination process. In contrast, in the case of Bangladesh, the success of its community based approach in managing the inland based aquatic resources is largely due to people orientated dissemination method. Coordinating agencies presented and disseminated information (along with the participation of community members) through folk dramas and songs – which is very much part of the local communities’ culture. This has been proven and demonstrated as one of the most effective channels of ensuring knowledge transfer at the grass-root level.
5. *Management plans are implemented despite a lack of reliable assessment and community participation in developing those plans.* In the region, this was evident during the massive

tsunami reconstruction and rehabilitation period. There is documented evidence of boat as aid for fishers that was distributed, but was not suitable with local condition and community needs (Adhuri et al. 2006). This not only highlights the wastage, but it created conflicts within the local community (among those who got boats that could be used versus those who got boats that could not be used) and a threat to the sustainability of the resources as the number of boats distributed were far more than what there was before the tsunami. In any ICM initiative, assessment which involves the feedback and the participation of wider stakeholders play an integral role before management plans are put into action.

6. *Ambiguous definition of governmental and community responsibilities makes communities reluctant to participate in pilot programmes.* It is not conclusive from pilot programmes reviewed if communities are simply reluctant to be part of an experimental project or if they are not convinced to take on the responsibility of managing their coastal resources, given their view that it is also the governments' responsibility. For an example, in Malaysia despite being repeatedly recommended in many governmental strategy and policy papers, community-based ICM lacks demand from the grass-root level. A review on this leads back to how community's responsibility has been defined, which refers back to the difference between co-management and community-based integrated coastal management. As stated in the early part of this review, while there are many similarities between co-management and community-based ICM, there are differences in the focus of each strategy (Pomeroy and Ahmed 2006). These differences center on the level and timing of government participation in the process. Pomeroy and Ahmed (2006) argue that the government may play a minor role in a community-based approach; co-management, on the other hand, for the purpose of implementation will require a major and active government role. In the case of Malaysia, community members may be more willing to participate in co-managed approach of ICM which emphasizes strong participation of governmental sectors, in comparison to a purely community-based approach. As some of fishermen voiced out, not all functions can or should be financed and managed in a decentralised approach (Siry 2006).

## CHAPTER 4

### CONCLUSION, LIMITATIONS & RECOMMENDATIONS

#### 4.1 Conclusion

The review on the status and threat to coastal areas and resources in the southeast areas of the Bay of Bengal reveal the presence of what Cicin-Sain and Knecht (1998) call ecological effects and multiple-use conflicts. This call to the importance of the adoption of ICM. International experience suggests that ICM does not come about automatically but requires some drive. In all countries reviewed except for Myanmar, it is the recognition of specific coastal sectoral management problems that triggered ICM initiatives. Overfishing in Indonesia, coastal erosion in Malaysia and coral reef pollution in Thailand are some examples of the problems that stimulated government response that led to the adoption of ICM. It is interesting to note that socio-economic conditions itself such as poverty and threat to livelihood was not the causal reason that propelled governments to experiment with the ICM approach.

In recent years the concept of ICM, in the countries reviewed, has gained some political acknowledgement. In all the countries reviewed, with exception of Myanmar, there are policies related to the management of coastal areas and resources using the ICM approach. In the case of Indonesia and Thailand, there is more evidence of devolution of power sharing at the local level in the management of the coastal areas and resources. However, in the case of Malaysia and Myanmar, there is a stronger central management of the coastal areas and resources. However, in Indonesia, Malaysia and Thailand there are centrally and community managed pilot ICM programmes that have been conducted and some are still in active implementation.

The review on scale issues identified that scaling up (linking local to a bigger context of management) or horizontal scaling (duplication of ICM from one geographical location to another) are still persisting problems. Projects commonly stay in the scale of what they have been initiated. It has been stressed that ICM is a process. The pilot programmes have demonstrated that it is best if ICM initiatives are started based on one major coastal issue, and then gradually includes other coastal related problems. There is high risk to start any ICM initiative on an ambitious scale as its very complexity can cripple it from the start. However, the argument is also put forward that any ICM initiative has to scale up gradually (and not remain sectoral focus) to include multiple-coastal issues involving multiple-stakeholders to have any real positive impact on coastal areas.

The review of good practices highlights that the success of ICM pilot programmes is facilitated when there is some form of evidence of success from the initial stages. For example, in the case of Thailand, eco-tourism was promoted as an alternative source of income during fish ban periods. Positive returns from eco-tourism attracted other community members to join in the idea of practising alternative source of income while reducing fishing pressure. In addition, when implementing agencies are based closely to the community, there is higher trust and confidence from community members towards the ICM programme. Also, incorporation of local knowledge and political will from government to support ICM

initiatives does make a difference. On the other hand, practices to be avoided highlight the importance of the balance between short term and long term gains through proper assessments. In addition, for ICM programmes to be mobilised, it is crucial that the community recognise the need for ICM initiatives.

#### **4.2 Limitations**

1. *Wide literature on the conceptualisation of ICM, but limited literature on the actual implementation in the region, and even more so of countries reviewed.* In the course of this review, it was noted that there is vast amount of literature focused on the conceptual aspects of ICM, but very few that focused on the practical aspects of ICM. While most the literature stresses the importance of integration, relatively few documents address the challenges and means to achieve it, and even fewer on ICM related pilot programmes and its impact. Information on non-fisheries sectors was also limited.
2. *The short time allotted for this review meant it was restricted to readily available documents.* A longer timeframe would have enabled a deeper investigation on governmental documents that are not available through web search, but may have been obtained through direct interaction with government agencies. Additionally, discussions with officials and practitioners would have allowed a deeper understanding of the issues.

#### **4.3 Recommendations**

1. The review recommends convening a dialogue to compare experiences among officials from the countries reviewed, field practitioners, and development agency representatives to explore how these findings compare to their own experiences and to strategise on approaches to address these through the regional BOBLME mechanism.
2. In the absence of multi-sectoral ICM, the screening of development projects on coastal areas exclusively depend on environmental impact assessments (EIA). However, unsustainable development along the coastal areas of countries reviewed indicates that EIA's as an assessment mechanism may not be sufficient. EIA generally does not take into account the combined impacts of multiple projects (Chua 1998). There must be non-permanent panel members representing various environmental related governmental, advocacy and non-governmental agencies that conducts independent assessments to validate the EIAs. A constantly changing panel and representation from various agencies will prevent control of such crucial decisions in the hands of one agency or one single assessment.

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Annex 1: Summary of ICM related Pilot Programmes/Case Studies reviewed

No	Pilot Program	Year	Funded	Focus		Source
				Sectoral	Multi-sectoral	
<b>INDONESIA</b>						
1	Community -based fisheries management in post-tsunami Aceh, Indonesia project	2007-2009	Force of Nature (FON)		√	WorldFish Centre (2010)
2	'Ikan larangan' custom in West Sumatra, Indonesia: a traditional community based approach	on going custom		√		Susilowati (1999)
3	Coral Reef Management Program(COREMAP). (1998-2015)	1998-2015		√		Cicin-Sain and Knecht (1998); <a href="http://www.coremap.or.id/tentang_coremap/mengenal_coremap/">http://www.coremap.or.id/tentang_coremap/mengenal_coremap/</a>
4	Revitalization of Awig-awig in Lombok	On going	Local community assisted by local NGO	√		Satria and Matsuda (2004)
5	Panglima Laot Management in Aceh	On Going (Post-tsunami)	Various	√	√	Kurien (2010); <a href="http://panglimalaotaceh.org/">http://panglimalaotaceh.org/</a> ; WorldFish Center (2010): Panglima Laot Lhok Ie Meulee
<b>MALAYSIA</b>						
6	Integrated Coastal Resource Management in Pulau Langkawi, Malaysia.	2003-2007	Government	√		Saleh (2008)
7	Traditional community-based approaches practised among the Btisi' indigenous community in Selangor, West Coast Malaysia	past		√		Nowak (2008)

8	National Coastal Erosion Control Sector Project.	1992-2000	Government	√		Country level project document not available for detailed review
9	Coastal Resource Management Plan for South Johor, Malaysia (CRMPSJ)	1986-1992	ASEAN-USAID		√	Chua (1998)
<b>THAILAND</b>						
10	Community-based fisheries management in Phang-Nga Bay, Thailand	1995 - 1999		√		
11	Conservation of coastal wetland ecosystems through promotion of community based management in Trang Province, Thailand		NGO		√	Yadfon Association, Thailand  <a href="http://webgis.start.or.th/iwlearn_archived/www.loicz.org/projects/documents/008170/index_0008170.html.html">http://webgis.start.or.th/iwlearn_archived/www.loicz.org/projects/documents/008170/index_0008170.html.html</a>
11	Coastal Habitats and Resources Management (CHARM) project	2002-2008	Government -EU		√	<a href="http://webgis.start.or.th/iwlearn_archived/www.loicz.org/projects/documents/008170/index_0008170.html.html">www.loicz.org/projects/documents/008170/index_0008170.html.html</a> Country level project document not available for detailed review
13	Coastal Resource Management Plan for Thailand (CRMPT)	1986-1992	ASEAN-USAID		√	Country level project document not available for detailed review

## **Annex 2: Detailed review of some ICM Pilot Programmes / Case Studies**

### **Case study 1: A review on the pilot project on community-based fisheries management in post-tsunami, Aceh, Indonesia – Diagnosis, planning and option testing (2007-2010)**

In the 2004 post tsunami event, there was concern that rehabilitation responses have been developed without regard to longer-term impacts and may, in some cases, be highly visible but not necessarily well-considered options (Pomeroy et al. 2006). There was realisation for a greater need to consider sustainable and integrated livelihood and ecosystem rehabilitation that strengthens the resilience of communities to cope with future threats from natural disasters, socio-economic change or political crises. In response to this concern the WorldFish Center has initiated a two year project (2007-2009), funded by the Force of Nature Foundation. The purpose of this project was to provide the basis for longer-term planning and development of sustainable, integrated, and community-based approaches to the management of fisheries and aquaculture based livelihoods. Specifically through the project, critical habitats such as mangroves and coastal forests in support of livelihoods and coastal protection were rehabilitated.

There were five stages to the implementation of the project. The first stage focused on assessments which included quantitative surveys on socioeconomic and resource conditions, focus group discussions and spatial analyses on areas to be rehabilitated. The second and third stage included discussions on livelihood and management options, in which the options were later tested. Among those options that were implemented or in other words experimented was:

- a) the role of traditional fisheries management (*Panglima Laot*). Mapping of management areas and fishing grounds and awareness raising of regulations were conducted to support the previous traditional regulations and to bring new management regulations;
- b) replanting of mangroves and other coastal forests. Community members were consulted on methods of planting and areas in which was best to replant the mangroves.
- c) post - harvest support in the form of fishing drying materials and development of co-operative group for women were specifically tested. Other options were also carried out including assessing alternative products/packaging and the feasibility of local ice production;
- d) mud crab were tried out in unused fish ponds (locally known as *tambak*);
- e) lobster culture which included the collection of wild seed (i.e. puerulus) for on/off-shore culture;
- f) tilapia fish cage culture was tested.

The fourth stage of the project included the drafting of the coastal management plan. In this phase continuous discussions and negotiations involving fisher, women, local governmental agencies and other NGOs took place. The final stage of the project emphasised on creating local awareness and continuing the communication, even well-beyond the project timeframe.

Key outcome of this project included the continuous participation of community members in all stages of the project and the willingness of the community to continue the activities of the successful tested management options.

Source: *The WorldFish Center (2010)*.

**Case study 2: A review on the ‘ikan larangan’ custom in West Sumatra, Indonesia: a community initiated community based approach**

Not much review and follow-up studies have been done on the traditional community initiated ‘*ikan larangan*’ custom. It is a custom that has been practised by the *Minangkabau* tribe who largely populate the Western areas of Sumatra island of Indonesia, namely Padang Pariaman, Pasaman and Agam districts where this custom is still very much practised. The ‘*ikan larangan*’ custom literally means *forbidden fishing*. This is a custom that is practised to enforce the close fishing season. While the custom is being enforced, communities do not fish in the water-bodies. Among the purpose of this custom is to allow for the fish spawning season. This will ensure they have sufficient fish supply during open season which in turn ensures their food security. Susilowati (1999) also points out that one key reason is to allow particular fish species to clear the domestic waste in the water-body so as the water quality is clean and can be used for washing, bathing and praying. There are three types of ‘*ikan larangan*’ custom, namely traditional, semi-traditional and modern (Susilowati 1999). The division of the types are based on the time period in which the community began to adopt the ‘*ikan larangan*’ custom and the leader who governs the custom at the locality. In this case, based on Susilowati’s (1999) fieldwork survey, modern means community only began to practise the custom since late 1990’s and is usually governed by an elected group of members. The traditional type traces way back to the time of their great grand-parents and during the Dutch colonial period, where the custom was practised for the sole purpose of ensuring food security and is usually enforced by the religion leader. One of the key characteristics of the ‘*ikan larangan*’ custom through time is that the community members are very strongly committed to self-monitoring and managing the resources.

Source: *Susilowati (1999)*.

**Case study 3: A review on the pilot programme on integrated coastal resources management in Kuala Teriang, Langkawi, Malaysia (2003-2007)**

The programme implemented by SEAFDEC and Department of Fisheries (DOF) Malaysia was funded by the Japanese Trust Fund. The purpose of the programme was to test communities’ response towards co-management and community based resource management (CBRM) approach. While there is already a DOF initiated fishers economic group (locally known as *Kommuniti Pengurusan Sumber Perikanan, KPSP*<sup>9</sup>) represented and managed by fishermen, part of the objective of this pilot programme is to scale up the functions, responsibilities and empowerment of fishers through this existing community based institutional arrangement. There was also a specific women economic group, locally known as *Kumpulan Ekonomi Wanita (KEW)*. Among the projects conducted under the programme are local business developments for fisher and women groups, setting of coastal management plans, community volunteer in coastal related management work, crab bank, mangrove replanting, installation and maintenance of artificial reefs and fish enhancing devices, and providing coastal management trainings to fisher groups. The programme highlighted the need to place staff from DOF in the pilot site to enhance closer rapport with community members. There was challenge in convincing community to participate in the pilot

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<sup>9</sup> Formerly known as Kumpulan Ekonomi Nelayan, KEN

programme as questions on the sustainability of DOF's participation in the programme and project activities that hampered on community members regular work emerged. There was also the problem of inadequate budget to hire full time staff to be involved in the implementation stages of the programme. On the positive side, through continuous communication and negotiation between the DOF and fisher groups, they (fishers) participated voluntarily in the coastal management related activities. Project documentation indicates that community are confident to continue with the management of coastal related issues with the support of DOF even after the completion of the pilot programme.

One of the key achievements from the pilot programme is the drafting of the Fisheries Resource Management Plan (FRMP) through stakeholders' consultation. The management plan includes the zone to be demarcated as community's fishing ground, a local enforcement unit and resource enhancement activities. While the project document states that the final draft of the management plan was submitted to DOF for refinement by the legal advisors, there is no indication if the management plan is being actively adopted by the community.

The economic activities planned under the fisher and women group was recorded as the most successful activity under the programme. There is indication that the income from the various small medium business such as ice making, repairing boats and production of snacks within a relatively short terms increased the interest of community members towards the programme's long term goal of empowering community through community based approach in managing the coastal resources. The conclusion of the programme report is that it has successfully introduced the CBRM concept to the community members. However community are not fully prepared to independently manage the coastal resources, especially fisheries, They are willing to cooperate fully with the DOF to co-manage the fishery resources.

*Source: Saleh (2008).*

#### **Case study 4: A review on the traditional community-based approaches practised among the Btsisi' indigenous community in Selangor, West Coast Malaysia: fragility on traditional approaches**

Traditionally, communities are known to have practised diverse livelihood activities to ensure sustainability of their resources without the intervention of law. This practise formed the basis of a community-based resource management adaptation (Nowak 2008). However, over a period of time, their efforts are undermined by development activities conducted by external parties. This was observed among the Btsisi' indigenous community who live in the mangrove coasts along the West Coast of Malaysia covering the state of Selangor. Based on anthropological fieldwork conducted between 1980 and 1982, Nowak (2008) elaborates that traditionally Btsisi' households practised diverse livelihood strategies which included hunting, gathering in the lowland and mangrove forests, swiddening, sea and strand fishing, and collecting mangrove and fauna. The reason for their diversification is not only due to seasonality, but the need to avoid over-exploitation of specific resources. Community members usually temporarily deferred from performing certain activities to allow time for resource regeneration (Nowak 2008). However, in a more recent follow up study, Btsisi' people have pointed out that their livelihood options are decreasing. Since mid-1990's, the expansion of the commercial oil palm plantation on Btsisi' land has brought certain livelihood options such as hunting, gathering and planting swiddens to an end. Heavy effluent from the palm oil-processing mills has caused negative effect to fisheries stock. While Btsisi'

people rejected work at the mills due to poor pay, outsiders were brought in to fill in positions, hence taking away the bargaining power of Btsisi' people. Having limited choice, many households returned to fishing, putting stress on resources already on intense pressure. Moreover, traditional fishing using palisade traps and stupefaction has been restricted through government intervention. Now, fishing is an expensive activity as most can't afford to maintain boats or purchase their fishing licenses. In addition, there is competition over resources in the form of large boats owned by Chinese who fish regularly in the area. Viswanathan et al (2003) points out that traditional based community-based management arrangement are fragile and more than often, they fail to protect resources as they did in early days when development precedes. However, there are a number of traditional management approaches within the region that have sustained through time (see Novaczek 2001 for the traditional 'Sasi Laut' arrangement in Maluku, Indonesia).

*Source: Nowak (2008).*

### **Case Study 5: Coastal Resource Management Plan for South Johor, Malaysia (1986-1992)**

The ASEAN/US Coastal Resource Management Project arose from existing coastal resource management problems. The project was implemented in 6 sites in Southeast Asia. South Johor was designated as the pilot site for CRMP Malaysia. South Johor was chosen as a pilot site since it has the longest coastline in the country and was facing a major coastal deterioration problem. As part of the outcome from the project, specific action plans were developed for coastal forest, water quality, GIS mapping on coastal management and coastal erosion. Primary objective of the project was to raise public awareness of the importance of the coastal resources and to adopt the integrative approach in addressing the many environmental and multiple resource-use conflicts.

One of the highlights of the project was the establishment of performance indicators from the start of the project itself. Given that ICM is a complex process, performance indicators were crucial to assess the effectiveness, impacts and sustainability of the on-going ICM activities. The project outcome also highlights that it is important to determine management boundary from the start. This would help to determine the geographical scope that is covered by the action plan. Chua (1998) argues that it is a practical advantage to limit a management boundary within the administrative jurisdiction of the local government.

One of the limitations of the project design was that it did not allow for the establishment of specific institutional arrangements to execute the action plans. A change in the local implementing agencies, i.e., the mayor or governmental department head easily affected the commitments to implement the action plan. The project outcome argues that a legally constituted institutional arrangement will make it difficult for such change to occur (Chua 1998). The outcome of this project also warned on the usual strategy of collecting massive amount of information through surveys, mapping and discussion with stakeholders during the early stages of the project. However, at the planning and development phase of the ICM plan, it was noted that much of the data gathered were not utilised. While there is recognition that the project has made significant contributions to knowledge, especially on the complexity of the multiple-use of coastal areas and resources for multiple purposes, the voluminous databases are not used in framing subsequent management interventions.

*Source: Chua (1998) and Malaysian Coastal Resources Study Team and Ministry of Science, Technology and the Environment of Malaysia (1992).*

### **Case study 6: A review on the pilot project on Community-based fisheries management in Phang-Nga Bay, Thailand (1995-1999)**

The community-based fisheries management program in Phang-Nga Bay was a response to the continuing degradation of fisheries resources and increasing poverty in rural communities. Fishing is the dominating activity among the 114 villages in the Phang-Nga Bay. In late 80s, decline in fish catch begun to threaten fishers livelihood. In addition, trawlers and push-net fishers illegally fished around the near shore areas of the Bay which caused tension among the traditional fishers and those illegal fishers. Two early programs focused on the development of community organisation and coastal resource rehabilitation. This was organised by the Environmental Conservation Association, which later the Asia Foundation continued to fund. Outcome from the early programs was the consensual agreement to ban trawlers and push net fishers within 3 km zone of the Bay. Community members joined hand with the DOF, local NGOs and the Southern small scale fishereis association to enforce and monitor coastal areas from illegal fishing activities. An assessment on the outcome of this early initiative indicated that the income of small-scale fishers almost doubled after the intervention (Tokrisna 1999). As a continuation, the CBFM Phang-Nga Bay project started in late 1995, in colloboration with the Bay of Bengal Program (BOBP). The purpose of the project was to change the perceptions and attitudes of fishers from being a user to being a manager. One key success of the project was the establishment of a central market for the auction of fish catch that removed the role of middle men effectively (Panjarat 2008). In addition, other coastal management activities were conducted through the project. This included reforestation of mangroves in the Bay, replanting seagrass, placing artificial reefs and sea ranching (Tokrisna 1999).

*Source: Nasuchon (2009); Panjarat (2008); Pimoljinda and Boonraksa (1999); Tokrisna, Boonchuwong and Janekarnkij (1999).*

### **Case study 7: Conservation of coastal wetland ecosystems through promotion of community based management in Trang Province, Thailand – a review on multiple projects conducted by Yadfon Association**

The review team did not have access to each project document, except for a document concluding the achievements of the multiple livelihood and conservation projects done in the Trang province.

Yadfon Association, a local NGO, has been working with communities along the coastal areas of Trang since 1985. Prior to this, logging of mangrove forests, waste water discharge from coastal shrimp culture and use of large fishing gears such as drag net was negatively impacting the condition of the coastal resources in this area. This affected the livelihood of communities depending on the resources. Initial focus was on conservation efforts. Through the first project, in collaboration with the local provincial authority, an area of 939 200 square meter of mangrove forests were rehabilitated. This small success generated interest among the larger community to join in discussions organized by the Yadfon Association. Discussions led the development and implementation of varied community livelihood projects such as cage-fish culture, raising domestic animals, group saving programme and a

cooperative buying programme which enabled fishers to purchase equipment and gasoline at reduced rate. Along with initiatives in diversifying livelihood activities, community also agreed and declared seagrass conservation zones within the traditional fishing grounds.

*Source: Charmsnoh, Yadfon Association*

### **Case study 8: Coastal Habitats and Resources Management (CHARM) project, Thailand (2002-2008)**

CHARM was a programme jointly supported by the Royal Thai Government and the European Union. It is the first type of a national programme that was implemented at a large scale involving six provinces at the local level. The purpose of the programme is to establish the coastal habitats co-management framework and procedures in two Southern Thailand areas that can serve as models to be replicated elsewhere in the country.

The key focus of the programme is the promotion of the co-management approach at different scales of intervention through local government unit and communities to manage the coastal areas and resources sustainably while ensuring the well-being of coastal communities. The outcome of the programme led into a co-management arrangement scheme to improve coastal governance. The scheme was placed in the overall framework of His Majesty The King of Thailand's "Philosophy of the Sufficiency Economy" as reflected in the Ninth (2002-2006) and now Tenth (2007-2011) National Economic and Social Development Plans to achieve a balanced development and proper well-being for Thai people. Through the programme, agreements have been promoted and signed at village, Tambon /Municipality, province, or seascape levels on commitments from community organizations and local government which signals the beginning of a long-term effort between stakeholders themselves and with the authority and the financial capacity in managing the coastal areas and resources. However, the commitment of the co-management scheme on ICM agenda highlights that government commitment is essential to support the process.

Among the practices that worked well within the programme is the development of community-based tourism (CBT) which has been a successful and meaningful activity. It not only generated a wider interest among community members, but there was stronger positive link between community-based income-generating and conservation activities. The other success highlighted is the continuous development of livelihood options which then sustains marine conservation initiatives. In the case of CHARM, while initial stages of the programme was focused on single village occupational group development, over the duration of the programme this evolved to multiple village occupational groups and then to occupational group networks legalized as *community enterprises* and *community network enterprises* under the support of the Agriculture Extension Department. An example of this can be found in Chalong Bay where CHARM has been engaged with the fishing community network from three Tambon located in the bay. The formation of thematic occupational group networks also enabled these groups to develop their own saving system, access funds from rural banks, increase marketing power and share transport costs.

One of the short comings highlighted of the programme was the lack of initiative to include private sector as stakeholders in the co-management process. While CHARM did work with the diving industry in Phang Nga Bay and some tourist operators, the programme did not consult with shrimp farmers and commercial fisheries as stakeholders. For some reason, the

Department of Fisheries made the choice not to overlap its specific policies in regard to these groups. It is argued in the programmes document that since private entrepreneurs including commercial fishery fleet owners are becoming more aware about the environmental issues, they should be more systematically included in regional and local discussion and co-management arrangements.

*Source:* [http://webgis.start.or.th/iwlearn\\_archived/www.loicz.org/www.loicz.org/projects/documents/008170/index\\_0008170.html.htm](http://webgis.start.or.th/iwlearn_archived/www.loicz.org/www.loicz.org/projects/documents/008170/index_0008170.html.htm)



# Integrated Coastal Management for Bay of Bengal : Findings from Indonesia, Malaysia, Thailand & Myanmar

**Colombo, 28-29 July 2010**



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**WorldFish CENTER**

## Outline

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6. Good Practices
7. Practices to Avoid
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9. Concluding Remarks
10. Example on Community-based ICM in Aceh (if time permits)



## 1. Introduction

Purpose of the literature review:

1. Identify and review relevant concepts/theories and definitions of ICM, community-based management and co-management
2. Identify ICM, community-based management and co-management related policies
3. Identify ICM, community-based management and co-management practices that work and practices that should be avoided
4. Identify and review pilot programs on ICM, community-based management and co-management in the countries reviewed
5. Identify existing knowledge gaps concerning ICM initiatives



## 2. Basic Concept and Definition

**Integrated Coastal Management:**

"is a continuous and dynamic process by which decisions are made for the sustainable use, development, and protection of coastal marine areas and resources. This is done by ensuring the coordination of all sectors (e.g., fisheries, oil and gas production, tourism) and all levels of government are harmonized with the coastal policies of the nation in order to accomplish this harmonization in a politically acceptable manner" (Sarin-Sain and Knecht 1998)

Coordinate the initiatives of the various coastal economic sectors toward long term optimal social and economic outcomes, including resolution of use conflicts and beneficial tradeoffs (Burbridge, Koesoebiono and Dahuri 1985)

*Integration – Harmonization – Collaboration!*



## 2. Basic Concept and Definition (cont.)

**Community-based Management:**

an approach through which communities are given the opportunity and responsibility to manage in a sustained way the community resources, define or identify the amount of resources and future needs, and their goals and aspirations, and make decisions affecting their common wellbeing as determined by technical, socio-cultural, economic, political and environmental factors (Ferrer and Nozawa 1997).

Can be traditional community-based, or newly formulated community-based management

**Collaborative management (Co-management):**

a partnership arrangement between the government and the communities dependent on the resources (Pomeroy and Ahmed 2006)



## 3. The State of Bay of Bengal of the Country Focus: the Call for ICM

Main resources:	Status:	Cause:
Mangrove	Declining (coverage)	<i>Ecological effects and multiple-use conflict!</i>
Coral Reefs	Mostly moderate to poor/damage	
Seagrass beds/Sea Weeds	Degrading	
Fisheries	Over-exploited (Demersal)	

*The call for ICM*



## 4. Policies: Early Initiatives on ICM

The first ICM initiatives at the national level:

Indonesia: Overfishing; Marine Resources Evaluation and Planning (MREP) project in 1993 focused in capacity building activities that enabled development & management of ICM plans, 10 provinces

Malaysia: Coastal erosion; National Erosion Study 1984-85; 47 critical sites identified; two institutions related to coastal zone management established – the Coastal Engineering Control Unit (CECU) & National Coastal Erosion Control Council (NCECC)

#### 4. Policies: Early Initiatives on ICM

The first ICM initiatives at the national level:

Thailand: Coral reef destruction, mangrove deforestation, fishery stock decline; Phuket Island Action Plan (pilot study 1986-1989, implemented in 1992)

1993 community-based fisheries management program in Ban Don Bay & Phang-Nga Bay

Myanmar: No documentation of early ICM initiatives.

#### 4. Policies on ICM

Indonesia: Environmental Impact Assessment (AMDAL)  
Laws on Decentralization  
Law No. 27, 2007, on Coastal and Small Island Management

Malaysia: Environmental Impact Assessment (EIA) Order, 1987, on large scale developmental project such as conversion of mangrove swamps, port expansion, coastal reclamation, construction of resorts

National Policy on Coastal Resource Management, 1992 (implementation started in 1996)

#### 4. Policies on ICM

Thailand: Multi or bi-sectoral laws that refer to integrated approach towards managing the coastal zones. Natural Resource Exploitation Act (groups 5 other Act, which includes the Forest Act of 1941, the Fisheries Act of 1947, the Minerals Acts of 1967, the Petroleum Act of 1971, and the Tourism Act of 1979);

*The establishment of Tumbol Administrative Organisation (TAO): to represent community problems to the federal or provincial government and to conduct community-based projects*

#### 5. Co-management/Community based ICM initiatives

No	Pilot Program	Year	Funded	Focus		Source
				Sectoral	Multi-sectoral	
<b>INDONESIA</b>						
1	Community -based fishereis management in post-tsunami Aceh, Indonesia project	2007-2009	Force of Nature (FON)		✓	WorldFish Centre (2010)
2	'likan larangan' custom in West Sumatra, Indonesia: a traditional community based approach	on going custom		✓		Susilowati (1999)
<b>MALAYSIA</b>						
3	Integrated Coastal Resource Management in Pulau Langkawi, Malaysia. (2003-2007)	2003-2007	Government	✓		Saleh (2008)
4	Coral Reef Management Program (COREMAP), (1998-2015)	1998-2015		✓		Cicin-Sain and Knecht (1998)
5	National Coastal Erosion Control Sector Project. (1992-2000)	1992-2000	Government	✓		ADB (2002)
6	Coastal Resource Management Plan for South Johor, Malaysia (CRMPSJ)	1986-1992	ASEAN-USAID		✓	Chua (1998)
<b>THAILAND</b>						
7	Community-based fisheries management in Phang-Nga Bay, Thailand	1995 - 1999		✓		
8	Coastal Resource Management Plan for Thailand (CRMPPT)	1986-1992	ASEAN-USAID		✓	Chua (1998)

#### 6. Good Practices

1. Stakeholders' participation in all steps of management is the key to the success of ICM
2. Community members who see some immediate results of their management efforts have higher tendency to continue their participation in management initiatives.
3. The decision for staff or team members of coordinating agencies to be based in programme sites during implementation stages enhances closer rapport with community
4. Complementing scientific information with local indigenous knowledge enables better integration of coastal management efforts

#### 7. Practices to avoid

1. Pilot programs are still very much sectoral based.
2. Some of the pilot case studies are too small in scale to have any real impact.
3. Inadequate budgets hinder effective inter-agency coordination.
4. Management plans are implemented despite a lack of reliable assessment and community participation in developing those plans.
5. Ambiguous definition of governmental and community responsibilities makes communities reluctant to participate in pilot programs.

### 8. Scaling Issues

1. The review did not find any instances of successful scaling up of ICM pilot programs
2. Most pilot programs reviewed are sectoral focused
3. Indonesia's legal reforms and Thailand's Constitutional authority granted to TAO and rights to NGOs are examples of decentralisation in the management of coastal problems.

### 9. Concluding Remarks

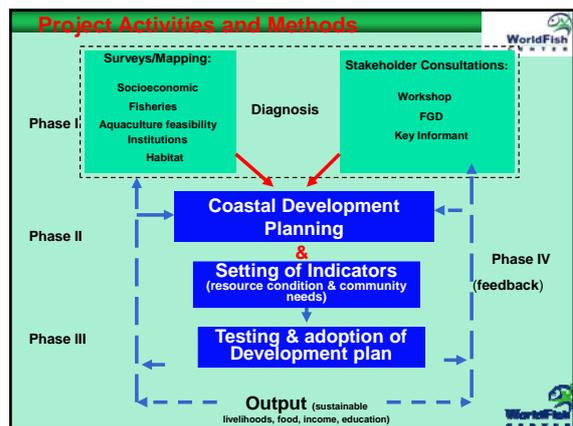
1. The review on the status and threats to the coastal area and resources in the four focal countries reveal 'ecological effects and multiple-use conflicts.' This underlines the importance of the adoption of ICM
2. International experience suggests that ICM does not come about automatically but requires some impetus. (Starts from specific sectoral coastal management problem that triggered ICM initiatives --overfishing in Indonesia, coastal erosion in Malaysia and coral reef pollution in Thailand.
3. The review of good practices and practices to avoid highlights the importance of the balance between short term and long term gains, participation and incorporation of local people and knowledge, and political will from government to support the ICM.
4. Our review on scale issues identified that scaling up (linking local actions to a higher level context of management) or scaling out (replication of ICM approaches from one place to others) are still persisting challenges.

### 10. An Example: ICM project in Post-Tsunami Aceh

Lhok Kreut / Pulau Raya (Aceh Jaya District)

Blang Monlung  
Meunasah Kulam  
P. Raya  
Lhok Kruet

Aceh Province



ENVIRONMENTAL SUSTAINABILITY

LIVELIHOOD DEVELOPMENT

Blang Monlung  
Meunasah Kulam  
P. Raya  
Lhok Kruet



