

# A Tale of Two Initiatives: Integrated Coastal Management in Xiamen and Batangas Bay Region

Thia-Eng Chua

*East Asian Seas Partnership Council  
Partnership in Environmental Management  
for the Seas of East Asia (PEMSEA)  
c/o Dept. Environmental and Natural Resources Compound  
Visayas Avenue, Quezon City 1100, the Philippines*

E-mail: [chuate@pemsea.org](mailto:chuate@pemsea.org)

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Two parallel initiatives on the application of Integrated Coastal Management approach in Xiamen (PR China) and the Batangas Bay Region (Philippines) for achieving sustainable coastal development were assessed in relation to Integrated Coastal Management (ICM) applicability, effectiveness, replicability and scaling up in two different political, socio-economic, ecological and cultural settings. The paper analyzed the conditions under which various policy and management interventions were made and how they contributed to policy reforms, integration of sectoral policies and interagency functions to reduce policy conflicts and overlapping responsibilities. The importance of stakeholder participation and creating an informed public are stressed in relation to strengthening political commitments and building enabling environment for management actions.

The results obtained over a span of 14 years suggest that the ICM approach is doable and effective in facilitating policy reforms, improving interagency and multisector coordination. ICM is also as efficient through its management framework, planning and implementing processes as well as its interagency, multi-stakeholders consultative platform for the implementation of various coastal programs. The paper draws conclusions on coastal governance from the lessons learned and identifies essential elements that are instrumental to effective implementation of the ICM program as well as room for improvement.

Finally, the paper describes current efforts in codifying the ICM framework. Further, it outlines an improved ICM program development and implementation process using international standards for quality and environmental management and appropriate documentation through the use of a “State of the Coasts” reporting format. A complete ICM system has now evolved, the application of which enables one to document the required processes and actions so that the outputs and status can be effectively measured and assessed against its set objectives.

**KEYWORDS** integrated coastal management; coastal governance; sustainable development; coastal planning; coastal zoning

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## 1. Introduction

Integrated Coastal Management (ICM) is defined as “a natural resource and environmental management system which employs an integrative, holistic management approach and an interactive planning process in addressing the complex management issues of the coastal areas” (Clark 1996; Cicin-Sain and Knecht 1998; Chua 2008). ICM integrates planning and management of the watershed, river basin and coastal waters; addresses the consequence of interactions between the ecosystems and human activities on land and sea; administers policy and management actions that would balance human activities and protection of the functional integrity of the terrestrial and marine ecosystems.

In a broad sense, the ultimate goal of ICM is sustainable coastal development. Achieving ICM is a long and complicated process but is necessary considering that over half the world population will be located in urban coastal centers by 2015. Pressure from human activities (such as human settlement, food supply, water use, sanitation, livelihood and other socioeconomic activities) on coastal ecosystems will increase as a result of coastal population movement (Chua 2004, 2006).

## 2. Initiatives at the Local Level

In 1993, both Xiamen and the Batangas Bay Region were selected as ICM demonstration sites (Fig. 1) under a regional programme co-financed by the Global Environmental Facility (GEF). The sites were to test and verify the effectiveness of the ICM approach and potential for ICM demonstration.

The two ICM initiatives being implemented by the local government of Xiamen (PR China) and that of Batangas Province (Philippines) are guided by the ICM Project Development and Implementation Cycle (commonly known as the ICM cycle), which consists of a cyclical process (Fig. 2) involving various stages of planning and implementation of an ICM program: preparing, initiating, developing, adopting, implementing, refining and consolidating (Chua and Scura 1992; Chua 2006, 2008). Both are areas where tiny fishing villages once abound. They share similar development and management problems during the early stages of the ICM initiatives: (a) both became progressively urbanized and were (and still are) national centers for industrial development; both local governments placed great efforts to attract international investment to boost a diversified economy, however, less effort was paid on environmental concerns; (b) the per capita income of both areas compared to their national average were rated as moderate, but the pressures for economic development



Fig. 1. Location of the two PEMSEA ICM demonstration sites.

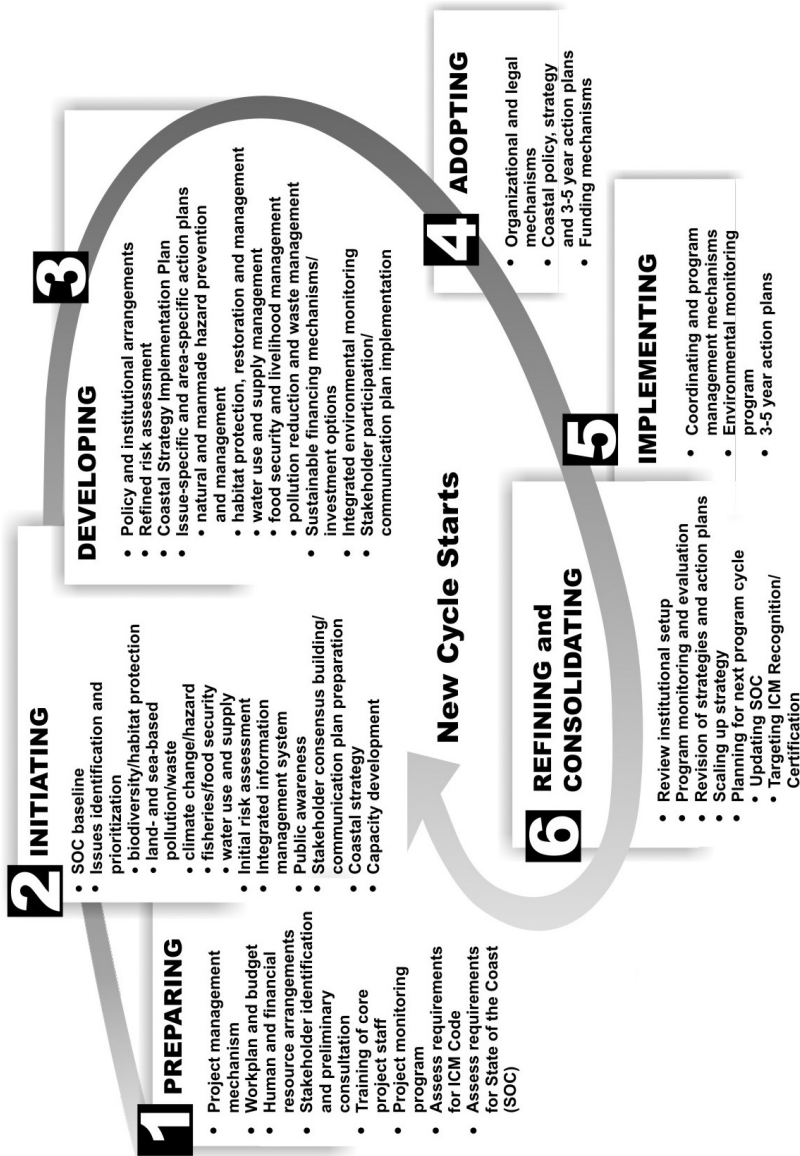


Fig. 2. ICM project development and implementation cycle (Source: Chua 2008).

were high; (c) both practiced sectoral planning (e.g. fisheries, transport, mining, port and harbor), mostly on land use and very little or none on sea-use; (d) their line agencies (e.g. transport, fisheries, mining, environment, enforcement, planning) had (and still have) overlapping functions related to coastal management; (e) extensive multiple uses of coastal lowland and adjacent waters began to create negative environmental impacts and posed serious threats to habitats and natural resources.

However there are differences between the two areas, namely:

1. They are operating in different political, social and cultural systems. Xiamen operates in a socialist system—centrally controlled, but with certain degree of autonomy as one of the five autonomous economic centers of China. Batangas, on the other hand, is democratic, with a high degree of decentralization.
2. The governance structure in Xiamen consists of a government machinery led by the mayor and a party machinery led by a Communist Party Secretary. Government operation must be led by Party principles and decisions. The mayor is generally a Deputy Secretary of the Party. In the case of Batangas Province, the elected governor is the administrative head of the local government and has the legislative right to make decisions based on the Local Government Code. Municipalities and cities are headed by elected mayors.
3. Religious influence in Batangas Province is predominantly Roman Catholic, while there is no religious influence in Xiamen.

The ICM projects were launched in early 1994. Each project was able to complete the first ICM Development and Implementation Cycle in about six years. Essential information on the elements of coastal governance (policy, strategic action programs, legislation, institutional arrangement, financing,

stakeholder consultation, information management and capacity development) were acquired and ICM program formulated. During the first ICM cycle, GEF's contribution to total project funds was about half to two-thirds of the total amount allocated for the two projects. The remaining amount came from the local governments and counterpart contributions from the private sector, as in the case of Batangas Bay.

From 2000 to 2007, a second program cycle was started to implement activities identified in their action plans. In this stage, the local government covered almost 90 percent of the total costs while GEF's contribution was used mainly to support incremental cost such as preparation of case studies and to support the development of ICM training centers.. A third cycle will begin in 2008 and focuses on geographical and functional scaling up of ICM practices.

### 3. Assessment of Key Activities and Achievements

The ICM initiatives at both study sites were able to produce the needed outputs as determined by each stage of the ICM program development process such as coastal strategy, issue- or site-specific action plans, communication plans, risk assessment reports, ICM policy, local ordinances, etc. The timely delivery and quality of outputs, however, are dependent on available technical and management capacity of the local governments. Both sites were able to secure the needed expertise from national and local universities and research institutions (PEMSEA 2006a, b; Chua 2006).

While the initiatives in the two sites differed in terms of level of inputs (such as budget, time, expertise), delivery of outputs (e.g. governance framework, action plans, studies), effectiveness of enforcement of action plans and measurable impacts, they did share the same vision for sustainable development and environmental concerns, as

well as the approaches and strategies. More importantly, they were able to follow the same path (stages of ICM cycle) towards sustainable coastal development amid political, socioeconomic and ecological differences and complexities. These initiatives essentially tell the same tale.

Assessment of the key activities and accomplishments related to coastal governance and the implementation of strategic action plans of the two initiatives are given in Tables 1 and 2 respectively.

### **3.1. Implementing activities to strengthen coastal governance**

Under the context of governance, key activities undertaken at the two sites (Table 1) focused on: (a) creating a shared vision to build and synergize interagency and stakeholder cooperation for policy and management priority; (b) formulating local coastal sustainable development policy that could streamline sectoral policies (such as fisheries, marine transport, port, tourism) in line with the sustainable development principles; (c) establishing a coordinating mechanism for integrated planning and management; (d) creating enabling legislation to strengthen law enforcement; (e) promoting stakeholder involvement and participation within and across sectors to reduce interagency and sectoral conflicts; (f) reducing multiple use conflicts especially through science-based sea-use zoning plans and permit systems; (g) sharing database and information within and across sectors to increase management effectiveness and cost-efficiency; (h) creating an informed public to exert public pressure against policy or management decisions harmful to the environment; (i) integrating capacity development into ICM development process through encouraging horizontal and vertical learning so as to prepare a critical mass of local expertise; (j) financing and sustaining the ICM

program using local resources by integrating ICM into the local economic development agenda and utilizing bilateral and multilateral assistance for large environmental improvement facilities (Chua 2006).

Significant progress has been made at both sites in the abovementioned activities related to governance. However, there are considerable policy and management deficiencies that need further improvement including those related to coastal reclamation, transboundary pollution control, response to climate change, effective implementation of international instruments, and local and national policy integration and coordination, as well as translating political commitments into financial allocation for management actions.

### **3.2. Implementing a long-term coastal strategy and action plans**

Long-term strategic environmental management plans have been developed for both sites as part of the ICM initiatives (ITTXDP 1996; PG-ENRO 1996). The strategic plans normally considered a timeframe of at least 25 years and are guided by the shared vision. The plans were developed after a thorough profiling of the coastal areas, identification of key issues, risk assessments and extensive consultation with stakeholders to reach consensus on the priority areas for actions. The strategic action plans for Xiamen and Batangas Bay Region are being implemented by the two local governments although at different scales and speed (Table 2). The biggest challenge to both local governments, however, is to implement issue or site-specific action plans which require substantive financial and human resources.

Key activities undertaken by the two sites during the last 14 years, include implementing a waste management plan to address solid, hazardous, industrial and domestic wastes. The waste management plans have

**Table 1.** Assessment of the performance of ICM implementation related to the key objectives under the governance component of the ICM program.

|   | Xiamen, PR China   | Batangas Bay Region, Philippines  |
|---|--|---|
| Background: The need for ICM initiatives              | Population growth from 1.25 m (1995) to 2.25 m (2005) largely due to migration from rural areas; designated as one of five national Special Economic Zones; GDP (1995) 25 billion RMB; 88 billion RMB (2004); rapid economic transformation from primary sector (fisheries and agriculture-based) to secondary and tertiary sector development (manufacturing and services); multiple use conflicts intensified, environmental damage severe; policy and management deficiency and lack of managerial capacity hinder sustainable development. Initiate ICM practice in 1994 till present. | Population: 0.825 m (1995), 0.964 m (2000) with annual birth rate of 2.2–3%; GDP (national): \$4200 (2002); one of key national economic development area: the Calabarzon. Transformation from primary sector (fisheries, agriculture) to mainly secondary sector (manufacturing industries, port, shipping); multiple use conflicts intensify, pollution and ecosystem damage severe; policy and management deficiency, poor enforcement and inadequate local technical, financial and management capacity threaten sustainable development. Initiate ICM practice in 1994 till present. |
| Creating a shared vision and a stakeholders' platform | <b>Established shared vision:</b> modernized, industrialized, port and garden city; interagency consultation mechanism established; inadequate consultation with other stakeholders  | <b>Established shared vision:</b> environmentally sound port and maritime economy; interagency, multisectoral consultative mechanism established; periodic meetings of stakeholders   |
| Formulating an ICM policy                             | <ul style="list-style-type: none"> <li>• Local policy with clear direction;</li> <li>• Integrated sea use into land-use planning;</li> <li>• Strong political will and financial commitment secured;</li> <li>• Inadequate policy direction on land reclamation</li> </ul>   | <ul style="list-style-type: none"> <li>• Local ordinance to implement ICM secured;</li> <li>• Moderate political will;</li> <li>• Financial commitment limited;</li> <li>• Inadequate policy on land reclamation, sea-use zoning scheme, fisheries management</li> </ul>  |
| Establishing a coordinating mechanism                 | <ul style="list-style-type: none"> <li>• Legally instituted interagency coordinating mechanism established with an interdisciplinary expert group;</li> <li>• Chaired by mayor with concerned agencies as vice chairs and membership composition with representation from concerned agencies and committees;</li> </ul>  | <ul style="list-style-type: none"> <li>• Initial Batangas Bay Coastal Resource Management Council reorganized into a Batangas Bay ICM Board, supported by a technical working group;</li> <li>• Each municipality forms its own Municipal ICM Board, chaired by its own mayors;</li> </ul>  |

|  |   |   |
|--|---|---|
|  | <ul style="list-style-type: none"> <li>• Undergone transformation in Phase II, membership reduced from 22 to 14 to increase efficiency and effectiveness;</li> <li>• PMO: Marine and Fisheries Bureau.</li> </ul>   | <ul style="list-style-type: none"> <li>• New Batangas Environmental Protection Council established, with the provincial governor serving as chair;</li> <li>• BEPC directly linked with the Provincial Development Council so that environmental concerns and decisions can receive priority consideration by the PDC. The three-tiered organizational structure enables coordination of ICM activities at all levels of government.</li> </ul> |
| <p>Enabling legislation to strengthen enforcement</p>                | <ul style="list-style-type: none"> <li>• Several environment and marine-related legislation and ordinances enacted by the Xiamen Municipal Government</li> <li>• Integrated law enforcement mechanism established, with law enforcers from major marine-related law enforcing agencies This is effective in reducing conflicts between enforcing agencies, removal of cages and rafts clogging the navigational channel and implementation of the sea-use zoning scheme.</li> </ul> | <ul style="list-style-type: none"> <li>• Modification or refinement of existing ordinances made at provincial and municipality level</li> <li>• Law enforcement requires stronger political will and capacity of the enforcing agencies to effectively regulate commercial trawling in municipal waters, illegal fishing, pollution from small and medium industries, and solid waste disposal.</li> </ul>                                      |
| <p>Promoting stakeholder involvement and participation</p>           | <ul style="list-style-type: none"> <li>• Scientific advice through the Interdisciplinary Expert Group but not the citizenry;</li> <li>• NGOs do exist but mostly in the form of government-controlled specialized associations; and</li> <li>• Public awareness raised through media and education.</li> </ul>  | <ul style="list-style-type: none"> <li>• Public hearings done for major infrastructure projects;</li> <li>• Stakeholders represented in various ICM board; and</li> <li>• Stakeholder consultation appropriately organized.</li> </ul>  |
| <p>Reducing multiple use conflicts through sea-use zoning scheme</p> | <ul style="list-style-type: none"> <li>• Sea-use zoning scheme established with appropriate legislation;</li> <li>• Effectively resolved conflicts between raft and cage culture and ship movements in the navigational channel, provided greater protection for endangered species by establishing conservation zone;</li> <li>• Effectively stopped sand mining and rehabilitation of a public swimming beach, removal of heavy industry outside the city limit.</li> </ul>       | <ul style="list-style-type: none"> <li>• The zoning scheme ensures a clear navigational route for vessels entering and departing the Batangas port and oil refinery terminals;</li> <li>• The marine protected area in the Municipality of Mabini reduces competing use by law;</li> <li>• Zoning scheme has no legal personality.</li> </ul>   |

Table 1. (cont.)

|   | Xiamen, PR China  | Batangas Bay Region, Philippines   |
|---|---|--|
| Sharing of database and information             | <ul style="list-style-type: none"> <li>• Integrated Information Management System for Coastal and Marine Environment (IIMS) established;</li> <li>• Integrated environmental quality monitoring program established to share data with participating agencies.</li> </ul>   | <ul style="list-style-type: none"> <li>• IIMS established and data enriched through new sources;</li> <li>• Managed by the environmental office (ENRO) of the province.</li> </ul>   |
| Creating an informed public                     | <ul style="list-style-type: none"> <li>• Media plays a major role in keeping the public aware and informed through local newspapers, radios and television;</li> <li>• ICM well advertised through research and educational institutions;</li> <li>• Beach cleanup campaigns.</li> </ul>  | <ul style="list-style-type: none"> <li>• Regular radio program, programs on ICM on national television, features in newspapers;</li> <li>• Beach cleanup and tree planting campaigns;</li> <li>• Effective community platform.</li> </ul>  |
| Developing capacity through horizontal learning | <p>The diversity of activities developed and implemented under an ICM program provides ample opportunity for the participating stakeholders to learn from each other. Wide range of topics under ICM include policy reforms, integrated planning, risk assessment, coastal zoning, legislation and ordinances, economic instruments, natural resource valuation, social analysis, financing sustainability, information management. Such informal learning through the ICM program has proven effective in developing a pool of local technical and management expertise.</p> |  |
| Financing an ICM program                        | <ul style="list-style-type: none"> <li>• Regular city budget;</li> <li>• Substantial collection of permit fees through sea-use zoning scheme implementation has strengthened the financial position of the Bureau of Marine and Fisheries which is the ICM coordinating body;</li> <li>• BOT and BOO initiated through for infrastructure development, and public-private sector partnership (PPP) explored.</li> </ul>   | <ul style="list-style-type: none"> <li>• Regular budget from provincial government; with contribution from the Batangas Bay Coastal Resource Foundation;</li> <li>• User fees collected from divers and tourists to the Mabini coral sanctuary helps to sustain local ICM program;</li> <li>• BOT and BOO explored, PPP tried but failed.</li> </ul> |

Sources: Chua 2006; ITTXDP 1996; MPP-EAS 1996; PEMSEA 2006a, b, c, 2007; PG-ENRO 1996



**Table 2.** Assessment of implementation of the strategic action plans of the two ICM initiatives.

|  | Xiamen, PR China   | Batangas Bay Region, Philippines   |
|--|--|--|
| Implementing a long-term coastal strategy and action plans | <p>Long-term Xiamen Strategic Environmental Management Plans formulated; adopted by city government and being implemented; revision made for Phase II.</p>   | <p>Batangas Bay Environmental Management Plans being implemented; revision made for Phase II.</p>  |
| Implementing waste management plan                         | <p>Successful in reducing pollutant load into the coastal water arising from agriculture, industries and domestic wastes.</p> <ul style="list-style-type: none"> <li>• By 2003, seven sewage treatment facilities were established. The city was able to treat 72.8% of the 140.76 million tons of sewage.</li> <li>• Most industrial wastewaters are being treated, with more than 93% of industrial wastewater discharged meeting the government water quality control standard.</li> <li>• Established sanitary landfills which are able to accommodate more than 90% of solid wastes.</li> </ul> | <p>Despite the integrated waste management plan, the scorecard has yet to be improved.</p> <ul style="list-style-type: none"> <li>• Most solid wastes are disposed in open dumps despite national regulation to close all dumpsites two years ago;</li> <li>• Waste recycling is widely practiced and greatly promoted;</li> <li>• No sewage treatment facilities;</li> <li>• No effective controls over agricultural waste discharge.</li> <li>• Industrial wastes are comparatively better managed. Most large industries are equipped with treatment facilities and oil terminals with oil reception facilities; small- and medium-sized industries have difficulty complying.</li> </ul> |
| Implementing oil spill preparedness and response plan      | <ul style="list-style-type: none"> <li>• Appropriate oil spill preparedness and response plan is available and implemented by the Maritime Transport Bureau and the Xiamen Port Authority;</li> <li>• No major spills reported.</li> </ul>   | <ul style="list-style-type: none"> <li>• Concerned oil companies have developed a tier-one response plan equipped with the appropriate booms and skimmers;</li> <li>• Regular exercises held in close cooperation with the coast guard and the Batangas Port Authority;</li> <li>• Readiness in addressing accidental spills;</li> <li>• No major spills reported.</li> </ul>  |
| Implementing a red tide response plan                      | <p>Frequency of red tide occurrence has been greatly reduced. This is attributed by experts to the decrease in nutrient discharge due to sewage treatment. Red tide monitoring and surveillance is part of the seawater quality monitoring implemented through integrated water quality monitoring plan.</p>   | <p>No red tide occurrence has been reported.</p>   |

Table 2. (cont.)

|  | Xiamen, PR China   | Batangas Bay Region, Philippines  |
|--|--|---|
| Implementing conservation, ecosystem protection and restoration plan | <ul style="list-style-type: none"> <li>• Rehabilitation of mangroves areas extended; conservation zone for lancelets and egrets;</li> <li>• Control over cruising speeds of vessels into the navigational channel where the endangered white dolphins are found;</li> <li>• Extensive landscaping has greatly increased vegetation cover.</li> </ul>   | <ul style="list-style-type: none"> <li>• Efforts made in rehabilitating mangroves; stopping conversion of mangroves into fish ponds, and establishment of network of marine protected areas;</li> <li>• Vegetation cover is comparatively higher, as the rate of urbanization is comparatively slower than that of Xiamen.</li> </ul>   |
| Providing basic water services                                       | <p>While Xiamen is located in Southern China and has access to river water supply, the rate of population increased from 1.2 m in 1994 to 2 m in 2007 making freshwater supply an increasing threat to city development.</p>   | <p>Despite being located in a tropical rainforest region and despite being fortunate to have plenty of freshwater sources, increasing contamination of river basins and overexploitation of underground water will soon pose a limit to province's future expansion. Long-term planning on water supply and use has yet to be developed.</p>  |
| Integrating fisheries and aquaculture management into ICM program    | <ul style="list-style-type: none"> <li>• Despite the lucrative market for fish and fishery products due to population increase and improved living standards in the city, fishing in Xiamen coastal waters has been increasingly difficult due to competing use conflicts. The once extensive eel fry gathering practice had to give way to the development of port and maritime transport. The western channel, once filled with fish cages, and oyster and mussel farms, is now cleared of these. More than 5,000 fishfarming households were either moved to new zoning sites or compensated by the city government to abandon the farming practice.</li> </ul> | <p>Fishing is no longer a lucrative industry and is limited to small-scale subsistence fishing in nearby coastal waters. As Batangas is getting more industrialized with increased varieties of industrial development along its bay areas, fisherfolks find it hard to compete with other maritime activities. Like Xiamen, Batangas Bay Region was once known for its small fishing "barangays" (villages). These are now gradually disappearing, being transformed as a result of urbanization-an unavoidable trend.</p> |

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|---|---|--|
| <ul style="list-style-type: none"> <li>• With the aquaculture zoning scheme, a large area of water space has been allocated for the development of mariculture. A permit system is required to use this water space, allowing for orderly development of the industry and better environmental quality for farm operation. Higher demand for live food fish has considerably increased the income of fishfarmers.</li> <li>• Much effort has been made in open stocking of the commercially important finfish and shrimp fry to augment existing stocks. The Marine and Fisheries Bureau was able to breed some endangered species, such as horseshoe crab, for release in open waters to enhance fish stocks.</li> </ul> | <p>City government was able to reduce the adverse impacts of typhoons to very low fatality through a comprehensive risk reduction disaster management plan.</p> | <p>Natural disaster preparedness and response plan, including typhoons and earthquake</p>  |
| <p>Managing natural disasters</p>   | <p>Sustaining livelihoods of coastal poor</p>   | <p>The Provincial Government and the Batangas Bay Coastal Resource Foundation implemented livelihood projects to increase livelihood opportunities in coastal communities especially for the coastal poor.</p> |

Sources: Chua 2006; ITTXDP 1996; MPP-EAS 1996; PEMSEA 2006a, b, c, 2007; PG-ENRO 1996.

had with varying degrees of success (Table 2, PEMSEA 2006b, c). While Xiamen had been rather successful in treating most of its wastes, it still faces considerable challenges in addressing non-point sources of pollution especially effluents arising from upstream and agricultural wastes. Batangas Bay Region, on the other hand, has yet to present a good scorecard for most of its solid wastes, agricultural and industrial wastes have yet to be effectively treated and monitored despite having a well-prepared comprehensive integrated waste management plan (MPP-EAS 1996).

Extra efforts have been placed in ensuring an efficient oil spill preparedness and response system as both port and shipping are instrumental to Batangas and Xiamen economy. In terms of the impacts of harmful algal blooms (or red tide), the efforts of Xiamen in reducing nutrient loads into the coastal water had been reported to be effective in reducing the frequency of red tides (PEMSEA 2006a, c).

Significant progress in implementing conservation, ecosystem protection and restoration plans have been made at both sites (Table 2). Neither site has placed sufficient attention on freshwater resource management, freshwater use and provision of water services. Freshwater services were initially not included in the ICM initiatives. The fact that freshwater use and supply issues were not identified as priority areas of concern site during the environmental profiling stage reflect: (a) the wrong impression that freshwater is always plenty in areas within tropical rainforests or near river basins; and (b) ignorance of the fast depletion of potable freshwater due to contamination and overextraction.

Integrating fisheries and aquaculture management into ICM programs is an important strategy for addressing: (a) the increasing transformation of rural coastal towns into urban centers; (b) increasing fish consumption and change in consumption

patterns and use in urban areas; (c) rapid deterioration of coastal waters near urban centers which might rendering aquaculture products less healthy for human consumption; and (d) overexploitation of fish stock in coastal waters. In most countries in Asia, fish consumption will increase in urban areas as rural people from the coasts move to settle in urban towns and cities. The consumption and use patterns of urban people are also different from the rural areas due to higher standard of living. However, aquaculture products (e.g. oysters and mussels) from nutrient-rich water in coastal bays and estuaries might be contaminated by bacteria and or accumulated high concentration of pesticides which render aquaculture products unfit for human consumption. The changing conditions described above require a paradigm shift in fishery management approach as coastal fishery management are directly related to changes and trends in coastal development and most of the management issues fall outside the fisheries sector. Fisheries, in the context of urban development in Xiamen and the Batangas Bay Region, had been marginalized! Thus it was an essential consideration to include impacts on the livelihoods of fishers and coastal communities in the equation of economic development for these two coastal areas.

Although natural and human-made disasters have been identified during the profiling stage, they were not considered as a major role of an ICM program and as such there were no concerted efforts on hazards management in the early phase despite the frequency of typhoons and earthquakes in the region. The 2004 Indian Ocean tsunami and the IPCC report on climate change have prompted the sites to take more proactive efforts. However, each hazard is being addressed individually, making it difficult for local governments to effectively cope with various hazards, both natural and man-made. An integrated natural and human-made disaster response and management plan is now being developed.

#### 4. Conclusions Drawn from the Two Initiatives

The two ICM initiatives helped answer several questions and provided important conclusions that are instrumental to the sustainability of the ICM approach and the replication and scaling up of ICM practices (Chua 2006).

*1) ICM approach is effective and ICM practices can be sustained locally.*

The two ICM initiatives clearly tell a single story that the ICM approach has proven to be feasible in different political, socioeconomic and ecological conditions. They tell us that the ICM framework can: (a) allow local implementation of the ICM program within a geographically defined, administrative boundary to institute policy and management changes; (b) create a common stakeholder platform; and (c) operate through an interactive process that generates incremental management gains, the accumulation of which can lead to economic and environmental sustainability. The two initiatives have proven to be sustainable as the operation of ICM practices had been based largely on self-financing by the local governments. The two initiatives have provided testimony that ICM works both conceptually and practically, although the pace and level of achievements may vary according to the local political and socioeconomic conditions, as well as on local technical and management capacity.

Despite the lack of a legal personality, both ICM initiatives has survived several changes of local administration. Over a span of 14 years, local administration changed three times in Xiamen and four times in the Batangas Bay Region. The change of mayors and governors who head the ICM initiatives and who may come from different political affiliations, as in the case of Batangas Province, did not seem to deter the normal operations of the ICM activities.

*2) Successful ICM has strong influence on national policy and strategies on coastal governance.*

Implications of the two successful ICM initiatives have a strong bearing on the policy of the central government. The experience and success of the sea-use zoning system in Xiamen strengthened central government resolve to implement a nation-wide sea-use zoning program in China (PEMSEA 2006a). By 1997 a national sea-space utilization law was passed mandating all provincial, municipality, city and district governments to develop sea-use zoning plans. The Batangas Bay Region experience, however, has led to the scaling up of the ICM project in the Batangas Province and the signing of Executive Order 533 by the President of the Philippines, making ICM a national strategy. E.O. 533 also mandates the development of a national ICM program plan.

The two ICM initiatives serve as working models for national implementation of ICM programs in the countries, thereby contributing to replication and scaling up. Learning from the do's and don'ts helps in saving time, effort and resources.

*3) The ICM Framework and process provide the essential scope and consultative platform for interactions with stakeholders.*

The broadbased ICM framework enables coastal managers to develop a governance framework which promote policy reforms, build coordinating mechanism and enact local legislation or ordinances. The ICM framework also provides a stakeholder consultative platform that enable stakeholders to identify and prioritize environmental and sustainable development issues, understand the implication of government policy, and contribute to the development of action plans. Built into the long-term strategy is a system of information gathering and management so that stakeholders can utilize the available information for developing and executing their plans of action.

Of equal significance is the evidence of an integrated planning and management process that allows a systematic, interactive and incremental approach through a stepwise process of analyzing the status, identifying pressures, determining causes, selecting options and mobilizing interagency, intersectoral and interdisciplinary efforts for management interventions.

- 4) *Despite the availability of a broad ICM framework and process, the lack of standardization and documentation weakens timely delivery of outputs and measurable impacts.*

The current ICM approach and practices have no quality assurance in terms of meeting standard requirements pertaining to governance or environmental management. Successful application very much depends on the intuition and experience of coastal managers. Although adaptive management allows management flexibility, the inadequacies in quality assurance in the current ICM framework and process would continue to weaken the effectiveness of ICM practices and therefore slow down the process of replication and scaling up.

With the exception of Xiamen, current ICM initiatives tend to focus more on the development of the governance framework than on on-the-ground actions. This has resulted in lack of visible outcomes. The downside of these initiatives is that it is difficult to hold the interest and enthusiasm of stakeholders.

During the first phase of ICM in Xiamen, some on-the-ground actions have already taken place such as the Yuandang Lagoon cleanup, the removal of heavy industries in Gulangyu (Gulang Island), the reconstruction of the coastal ring road, the restoration of the public beach and the landscaping of the city.

The scope of activities of an ICM program should not only include the clear definition of a governance framework, but should also undertake implementation of

some strategic action programs within the first program cycle.

## 5. Codification of ICM

The outputs and outcomes of the two ICM initiatives (Tables 1 and 2) suggest the need to strengthen current ICM concepts and practices by: (a) consolidating the current elements of governance into a broad but comprehensive coastal governance framework to ensure these major elements are being included in all future ICM program development; (b) identifying key actions that are normally required in most coastal management for addressing commonly met issues; (c) codifying ICM planning and implementation using available international standards to ensure quality management; (d) designing a documentation and reporting format that enables periodic monitoring of outputs and outcomes.

In a recent review of ICM concept and practices, Chua (2008) proposed a governance framework that includes six areas of concerns (see below). Governance framework and strategic action programs are two major components that must be carefully and thoroughly addressed in all ICM programs (Chua 2008). The essential elements of both the framework and strategic action programs form the core of the ICM Code being developed by the Partnership in Environmental Management for the Seas of East Asia (PEMSEA 2007). However, adaptive management (an management approach that takes into consideration of scientific uncertainties and incomplete information) still remains a major fundamental principle of sustainable development and continues to play a key role in shaping ICM program implementation (Imperial and Hennessey 1993; Chua 2006).

### 5.1. Governance

The major elements of the governance framework for ICM closely match the basic requirements for quality management under

ISO 9001 standards (ISO 2005; Chua 2006). These elements include: (a) policy, strategies and action plans; (b) coordinating mechanisms; (c) legislation; (d) financial sustainability; (e) information management and dissemination; and (f) capacity development. A description of these six elements are given in PEMSEA (2007) and Chua (2008).

### 5.2. Strategic action programs

Almost all coastal areas have to address a host of common issues that affect biodiversity, water supply, food security and livelihood of the coastal poor. These issues are interrelated but should be addressed through a set of strategic management programs through which common root causes, such as poverty, policy deficiency and capacity disparity (in terms of financial and human resources), can be addressed under the governance framework. Broad areas of concern such as risk management, habitat protection, pollution, water use, etc., that must be addressed, though not necessarily simultaneous. These five strategic action programs arising from essential management needs of local governments are: (a) natural and human-made hazards prevention, response and management; (b) natural habitat and cultural heritage protection, restoration and management; (c) water-use and supply management; (d) food security and livelihood management; and (e) pollution reduction and waste management. Details on each program are given in PEMSEA (2007) and Chua (2008). The implementation of each strategic action program can be measured and evaluated against international standards of environmental management using ISO 14001.

### 5.3. ICM Code

The Code is designed to ensure that future ICM practices can follow a standard code of practice that can help achieve sustainable

development goals. Implementation of the Code also ensures a common standard and criteria at which progress can be measured and evaluated. Compliance to the Code is on a voluntary basis. Thus the Code has no legal personality unless it becomes obligatory by law.

### 5.4. Documentation and reporting

The State of the Coasts reporting is a new PEMSEA initiative designed to measure on a regular basis the changing conditions of the coastal areas brought about by economic development and environmental management measures (PEMSEA 2007). The purpose is to improve the process of documentation of management interventions and ecosystem responses. The SOC documents existing conditions and new interventions, and tracks changes in trends.

With the implementation of the SOC, information pertaining to severity of the environmental conditions or the lack or inadequacies of policy or management measures can be easily detected.

## 6. The Way Forward

The two ICM initiatives have contributed to the evolution of the ICM concept and practices and have provided valuable information and insights for moving from a trial-and-error approach of coastal management to a systematic and codified ICM system. The implementation of the ICM Code will standardize ICM practices, impose mandatory documentation of the activities and process, and monitor progress and changes. The outcomes of such practices ensure not only accountability but also replicability and scaling up of ICM practices throughout the coastline; certainly a positive step towards achieving the goal of Agenda 21 (UNCED 1992).

## References

- Chua T-E. Integrated coastal management in transformation. *Tropical Coasts* 2004; **11**(1): 4–11.
- Chua T-E. The Dynamics of Integrated Coastal Management: Practical Applications in the Sustainable Coastal Development in East Asia. Global Environmental Facility (GEF)/United Nations Development Programme (UNDP)/International Maritime Organization (IMO)/Regional Programme on Building Partnerships on Environmental Management for the Seas of East Asia (PEMSEA), Quezon City, Philippines. 2006.
- Chua T-E. Coastal governance: A reflection of integrated coastal management (ICM) initiatives with special reference to the East Asian region. In: Chua T-E, Kullenberg G, Bonga D (eds). *Securing the Ocean: Regional and Global Perspectives*. GEF/UNDP/IMO Regional Programme on Building Partnerships on Environmental Management for the Seas of East Asia (PEMSEA) and Nippon Foundation. 2008; 371–402.
- Chua T-E, Scura LF (eds). *Integrative Framework and Methods for Coastal Area Management*. International Center for Living Aquatic Resource Management. Conference Proceeding 37, Manila, Philippines. 1992.
- Cicin-Sain B, Knecht RW. *Integrated Coastal and Ocean Management*. Island Press, Washington DC. 1998.
- Clark JR. Integrated management of coastal zones. FAO Technical Paper No. 327. Food and Agricultural Organization of the United Nations, Rome. 1992.
- Clark JR. Coastal Zone Management Handbook. CRC Press, Boca Raton, Florida. 1996; 694 pp.
- FAO (Food and Agriculture Organization). *Fisheries Management, FAO Technical Guidelines for Responsible Fisheries*. no. 4. FAO, Rome. 1997; 82 pp.
- Imperial M, Hennessey T. The evolution of adaptive management for estuarine ecosystems: The National Estuary Program and its precursors. *Ocean and Coastal Management* 1993; **20**: 147–180.
- IPCC (Intergovernmental Panel in Climate Change). *Climate Change 2007: The Physical Science Basis*. Summary for Policymakers. 2007; 2–18.
- ITTXDP. Strategic management plan for marine pollution prevention and management in Xiamen. MPP-EAS Technical Report No. 7. Integrated Task Team of the Xiamen Demonstration Project and GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas, Quezon City, Philippines. 1996; 60 pp.
- MPP-EAS. Integrated waste management action plan for the Batangas Bay Region. MPP-EAS Technical Report. No. 9. GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas, Quezon City, Philippines. 1996; 76 pp.
- PEMSEA. Sustaining benefits. GEF/UNDP/IMO Regional Programme on Building Partnerships in Environmental Management for the Seas of East Asia (PEMSEA), Quezon City, Philippines. 2005; 36 pp.
- PEMSEA. A perspective on the environmental and socioeconomic benefits and costs of ICM: The case of Xiamen, PR China. PEMSEA Technical Report. No. 17. GEF/UNDP/IMO Regional Programme on Building Partnerships in Environmental Management for the Seas of East Asia, Quezon City, Philippines. 2006a; 106 pp.
- PEMSEA. Securing the future through ICM: The case of the Batangas Bay Region. PEMSEA Technical Report. No. 19. GEF/UNDP/IMO Regional Programme on Building Partnerships in Environmental Management for the Seas of East Asia, Quezon City, Philippines. 2006b; 84 pp.
- PEMSEA. Xiamen: An ICM journey. PEMSEA Technical Report No. 18. GEF/UNDP/IMO Regional Programme on Building Partnerships in Environmental Management for the Seas of East Asia, Quezon City, Philippines. 2006c; 93 pp.
- PEMSEA (Partnership in Environmental Management for the Seas of East Asia). A regional mechanism facilitating sustainable environmental benefits in river basins, coasts and seas. PEMSEA IEC Material 2, GEF/UNDP/IMO Regional Programme on Building Partnerships in Environmental Management for the Seas of East Asia, Quezon City, Philippines. 2007; 80 pp.
- PG-ENRO. Strategic environmental management plan for the Batangas Bay Region. MPP-EAS Technical Report No. 3. Environment and Natural Resources Office of the Provincial Government of Batangas (PG-ENRO) and GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas, Quezon City, Philippines. 1996; 96 pp.
- UNCED (United Nations Conference on Environment and Development). United Nations. Rio Declaration on Environment and Development. 1992.