

# tropical coasts

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## Good Practices in Governance, Food Security, and Habitat Management

- **Treasuring Our Heritage, Banking in Our Future**
- **Food Security and Livelihood Management**
- **Pursuing Sustainable Development through National Coastal and Ocean Governance**
- **Addressing Transboundary Issues through Regional/Subregional Seas Cooperation: Initiatives in East Asia**
- **Innovative Techniques Towards Reaching Sustainable Development Goals**

# Making Blue Diamonds last forever

Beyond the various diatribes on the proper approach to coastal and ocean management, integrated coastal management (ICM) has proven to be a dynamic approach that straddles the full spectrum of coastal and ocean management: from governance, to the comprehensive consideration of various sustainable development aspects, to the implementation of tools and techniques, which then provide lessons that feed into more responsive instruments of governance. Within the context of the most pressing issues facing marine environments, ICM provides an integrated and comprehensive approach that provides a holistic view that can produce verifiable results.

This issue of *Tropical Coasts* expounds on the challenges and good practices in Ocean and Coastal Governance; Habitat Protection, Restoration and Management; and Food Security and Livelihood Management. It features discussions held during the International Conference on Sustainable Coastal and Ocean Development during the East Asian Seas Congress in Manila, Philippines, on 23-27 November 2009. The third triennial EAS Congress, hosted by the Government of the Philippines and co-organized by the Philippines Department of Environment and Natural Resources, attracted 1,480 participants, 100 exhibitors, 51 co-conveners and supporting organizations, and numerous sponsors.

The keynote speech of Singapore Ambassador-at-Large Tommy Koh at the opening session stressed the role of effective coastal and ocean governance in mitigating the effects of climate change. He cited as an example the provenance and current state of UNCLOS, recognized by some to contain the most comprehensive and progressive international environmental law of any modern international agreement. Ambassador Koh also shared Singapore's experiences in marine resource management and the country's plan to implement ICM to achieve full top-to-bottom integration in their coastal policies, plans and programs.

The **Treasuring Our Heritage, Banking in Our Future** article explores the concept of biodiversity, its role in promoting environments to flourish, economies to develop, and humanity to prosper, and how it faces degradation from human activities. Focus is directed on how marine habitats and ecosystems are facing the increasing threat of destruction. The unique ecological challenges faced by several key biodiversity hotspots — our blue diamonds — are expounded in an article on innovative and indigenous approaches taken by local communities to address biodiversity issues.

**Food Security and Livelihood Management**, on the other hand, underscores the importance of marine environments in providing a healthy food supply, livelihood and economic prosperity. Rapid urbanization and an ever ballooning population has increased the

demand for fish products, and this increased demand, along with climate change and other threats to food safety, are increasingly becoming major food security issues. The article explores possible avenues for addressing food security and sustainable aquaculture, and identifies challenges to sustainability and environmental awareness. The article identifies the role of marine environments in providing livelihood, both through fisheries and coastal tourism, and how local government-, community-, and private-sector- led efforts are the forefront in promoting sustainable coastal tourism and conservation.

Reporting on the progress made in integrated coastal and ocean management at the national level, the article on **Pursuing Sustainable Development through National Coastal and Ocean Governance** enumerates the legal instruments and programs adopted by various countries towards this end, and narrates each country's experiences in coastal and ocean governance. Beyond the boundaries of the countries, the article **Addressing Transboundary Issues through Regional/Subregional Seas Cooperation: Initiatives in East Asia** describes the various initiatives of different organizations to reduce threats to coastal and marine ecosystem services in regional and subregional sea areas.

Coming full circle, various approaches to coastal governance are explored in **Innovative Techniques Towards Reaching Sustainable Development Goals**. Implemented in various forms and scales, these initiatives have made progress on multiple fronts: programs have been established, stakeholders engaged, thousands of people trained, collaborations advanced, policies adopted, lessons learned and integrated, and experiences shared. The challenges now at the forefront of coastal and ocean management demand new information and capabilities, and the techniques enumerated in this article hopefully can spark new and innovative solutions.

The EAS Congress 2009 provided a rich venue for sharing knowledge about the multitude of challenges faced by various stakeholders in ensuring that the attainment of economic prosperity is not made at the expense of the environment. The progress reported and lessons shared during the week-long event was testimony to the efficacy of an integrated approach to coastal and ocean management. While significant progress has been made on various fronts, much still needs to be done if the region is to attain its goal of implementing ICM programmes in at least 20 percent of the region's coasts and adopting national coastal and ocean policies in 70 percent of the countries by 2015. It is hoped that the lessons that you will find within these pages will inspire you to think differently when addressing issues hindering the attainment of sustainable development.

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## HABITAT PROTECTION, RESTORATION AND MANAGEMENT

# Treasuring our Heritage, **BANKING** IN OUR **FUTURE**

*A true conservationist is a man who knows that the world is not given by his fathers, but borrowed from his children.*

— John James Audubon  
Wildlife Artist and Author

Biodiversity or biological diversity – “the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems” (GEF, 2010). Simply, it is the “diversity of life on Earth.” However, this diversity is not simple; it has many facets and complicated interconnections. More than just the number of animal, plant, fungal, protists, bacterial and viral species and areal coverage of habitats, biodiversity includes the relationships connecting us all to one another. This richness and variety of life and ecosystems plays an essential role in keeping our world, our home, functioning.

### Crucible of creation

In the past decade or so we have only begun to better appreciate the ‘global commons’ — the entire biosphere and biodiversity. The preoccupations of our daily lives often make us oblivious to the dangers threatening fragile ecosystems around the world or we just easily choose to ignore and disregard our responsibility to take care of the Earth, our home. However, we can only continue to ignore these threats at our peril. The vast and astounding variety of life on Earth is rapidly disappearing right before our eyes. Thousands of species face extinction. Thousands have already been lost. Approximately 13 million hectares of the world’s forests are lost each year, an area the size of Greece (Rizvi, 2011). Previous mass extinctions have occurred before, but not due to human activities.



*Photo: Ray Leyesa*

**Figure 1. Coastal Population and Shoreline Degradation.****Coastal population and shoreline degradation**

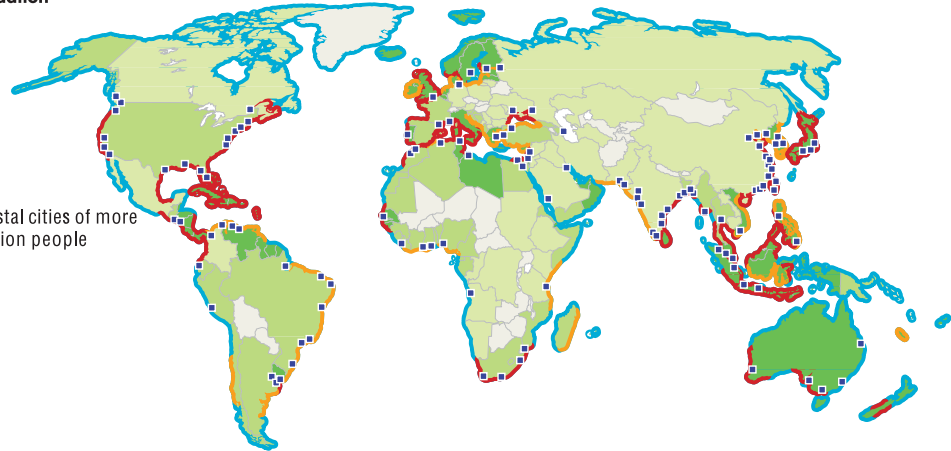
Population living within 100 km of the coast

- None
- Less than 30%
- 30 to 70%
- More than 70%

Shoreline

- Most altered
- Altered
- Least altered

Selected coastal cities of more than one million people



Source: Adapted from UNEP 2002b, based on Burke and others 2001, Harrison and Pearce 2001

Source: UNEP/GRID Arendal (as cited by Gomez).

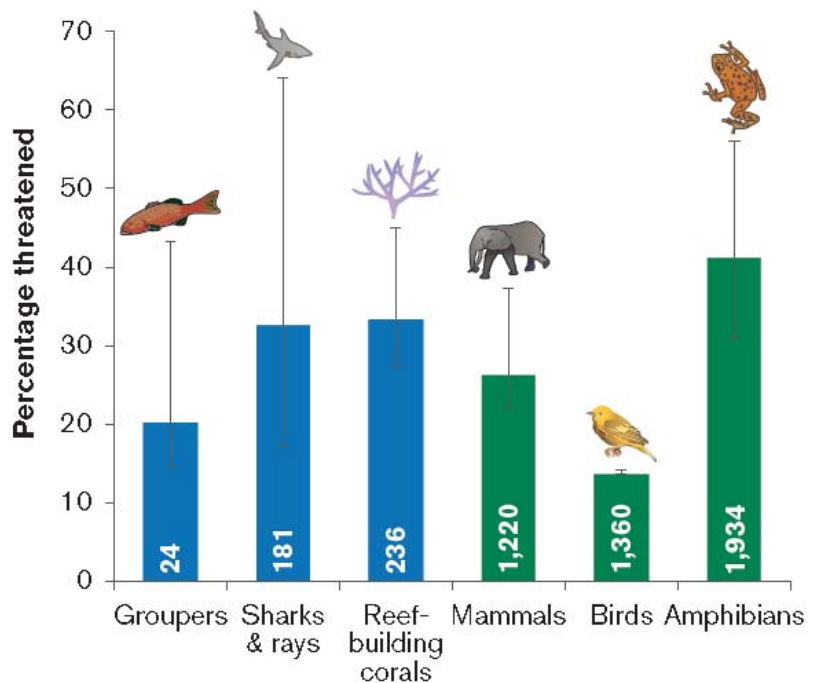
Only until recently have we come to recognize the variety and beauty of our marine world. The offshore zone exceptionally provides unique challenges — it is physically 'out of sight, out of mind' for most people, and benthic habitats in coastal and deep waters are even more so. However, much to our regret, coastal and marine ecosystems are in decline worldwide. Overfishing, runoff of nutrients and other land- and sea-based pollutants, habitat degradation (both in the uplands and coastal areas) and the increasing impacts of climate change are leading to ecosystem collapse in all the major coastal and ocean regions of the world (Wilkinson, 2004; Hughes, et al., 2005).

Coastal shorelines have been altered almost permanently (Figure 1). Growing human populations, increasing per capita consumption and rapid urbanization are contributing to coastal degradation. Areas near population centers are where coasts are being most degraded (UNEP, 2011). The area of biologically-productive land and sea used by humanity to provide the resources we use and to absorb our waste (or ecological footprint) is now about 1.5 times the Earth's available area able to generate an on-going (i.e., sustainable) supply of renewable resources and to absorb its spillover

wastes (or biocapacity) (Footprint Network, n.d.). Some nations in Asia, North America and Europe — ecological debtor countries — are using more than their proportionate share of Earth's biocapacity while others (ecological creditor countries), such as southern American and African nations, are using less than their proportionate share of global biocapacity. Asia is the region responsible for the fastest growing

carbon dioxide emissions from fossil fuels (GEO Data Portal, 2006). Climate is changing and sea levels are rising. Beyond certain thresholds, ecosystem services are destined to decline and then collapse with growing atmospheric carbon dioxide (Mumby, et al., 2011).

An estimated 80 percent of world fish stocks are fully exploited or overexploited. The world is resorting

**Figure 2. Threat rates for some marine and terrestrial species.**

Source: Kaufman and Tschirky, 2010.

to aquaculture in order to meet the demand for fish supply in the face of declining capture fisheries production (FAO SOFIA, 2008).

Moreover, many species — known and unknown — are facing extinction (Figure 2). For marine species, one in five grouper species, one in three species of sharks and rays, and one in three species of reef-building corals face extinction worldwide (Kaufman and Tschirky, 2010). This is the dilemma: loss of biodiversity and extinction are wholly irreversible — once a species is lost, it can never be brought back. Unfortunately, biodiversity is being lost today at a scale that will threaten the life-support systems that sustain societies and economies, particularly in the developing world (GEF, 2010).

Biodiversity is indeed vital to human welfare, allowing economies to develop and humanity to prosper. The loss or degradation of biodiversity can have important economic, social, and environmental consequences. Destroying forests and watersheds not only leads to the potential loss of ecosystems, but also creates economic costs with respect to water supply and use, and flood protection. Destroying mangroves and coral reefs has social consequences, impacting on people's livelihoods and lifestyles — including the unmeasured cost of losing cultural traditions. Moreover, due to increasing frequency and magnitude of natural hazards, our world is under ever-increasing pressures. Loss of ecosystems contributes to climate change and, at the same time, results in loss of natural protection from the impacts of climate change.

It is not enough merely to protect those biological resources that are known to be useful to humans now — we may also be losing the option value of potentially beneficial genetic resources and materials that are, as yet, undiscovered, but can have medicinal,

### Box 1. Why Blue Diamond?

- The blue diamond relates to the marine and coastal environment as one which produces wealth in terms of jobs, trade, livelihoods and ecosystem services like water recycling and shoreline protection;
- A diamond is the strongest form of carbon: Key coastal habitats such as mangrove forests, salt marshes, coral reefs and seagrass meadows provide an important and valuable carbon sink capacity. According to UNEP's Blue Carbon Report, the improved management and restoration of the oceans' blue carbon sinks would result in preventing an annual loss of approximately 10 percent of emission reductions we currently need. A diamond's strength also represents 'resilience,' which is crucial for coastal communities to mitigate against the negative effects of climate change;
- A diamond also signifies 'rarity': the habitats above are being lost four times faster than our rainforests and the rate of loss is accelerating;
- A diamond has many sides, i.e., it is 'multifaceted': This is because the marine and coastal environment is often the place where many interests meet, some interests related to land, some related to the sea. These 'interests' can be communities, NGOs, industry and services as well as local and national governments;
- A diamond has very strong atomic bonds: This represents strong bonds through cooperation and working together for those different interest groups and stakeholders that operate at the land-ocean interface. Developing bonds at the local, national, regional or international levels and a strong interlocking network of interest groups can significantly contribute to better management, to the benefit of all stakeholders;
- Finally, a diamond has great beauty and is valued by all. The purity or clarity of the diamond increases its value.

Source: UNEP GPA, 2011.

pharmacological or agricultural applications in the future. The wealth of species contained in tropical rain forests may harbor untold numbers of chemically or medically useful species. Likewise, many marine species defend themselves chemically, and this also represents a rich potential source of new important medicines.

#### Are diamonds forever?

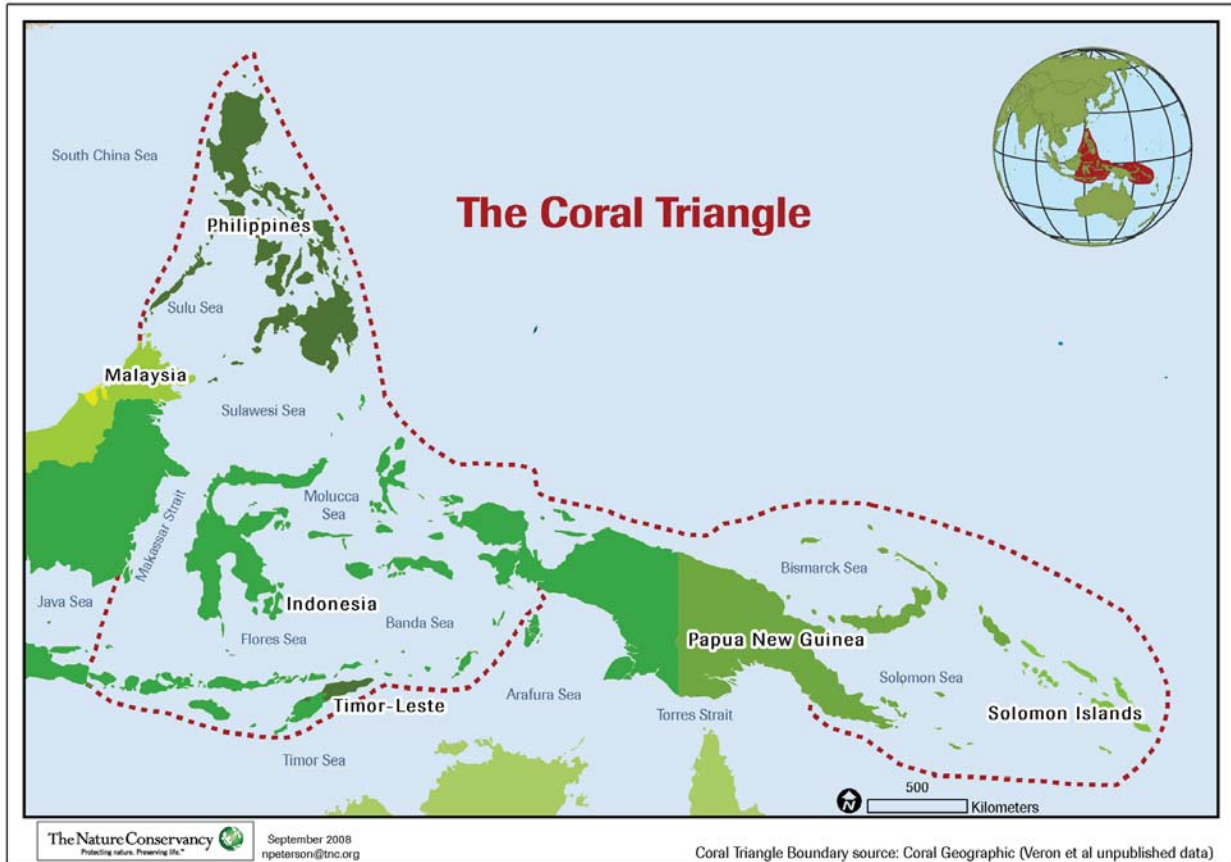
The marine and coastal environment is regarded as a 'blue diamond' in recognition of its significant 'value' and is an asset, which if invested in properly, will return or repay dividends over time (UNEP GPA, 2011) (Box 1). Such rare and exquisite treasures can be lost forever if management interventions and actions needed to protect them are not taken now.

The following are the key biodiversity hotspots — our blue diamonds — in the East Asian Seas region (PEMSEA, 2010):

#### The Coral Triangle

Referred to as the "Amazon of the Seas," the Coral Triangle is located along the equator where the Indian Ocean and Western Pacific Ocean meet. This region consists of portions of the waters and coastal regions of six countries: Indonesia, Malaysia, Philippines, Timor-Leste, Papua New Guinea (PNG) and Solomon Islands (Figure 3). The Coral Triangle covers an extraordinary expanse of ocean encompassing an area of 5.7 million km<sup>2</sup> or 1.6 percent of the coverage of the world's oceans (TNC, et al., 2008).

The Coral Triangle is recognized as an area of global significance, blessed with over 75 percent of known coral species, over 30 percent of the world's coral reefs, over 3,000 species of fish and one-third of the world's mangroves — the greatest extent of mangrove forests of any region. It also provides habitat to six out of the world's seven marine turtle

**Figure 3. Coral Triangle.**

species. It is the epicenter of marine life abundance and diversity on the planet, and home to over 600 reef-building coral species. The region's productivity and unique species assemblages and evolutionary significance make it a repository for the different species of the Indian Ocean and Pacific Ocean.

The region has a population of 360 million people with estimates suggesting that a third of whom are directly dependent on marine resources. The biodiversity and natural productivity of the Coral Triangle are under threat from poor marine management (unregulated coastal development, overfishing and destructive fishing), lack of political will, poverty, a high market demand and local disregard for rare and threatened species, and climate change. These threats are putting at risk livelihoods, economies and future market supplies for species, such as tuna (WWF, *n.d.*). Studies have highlighted the alarming decline of coral cover in this region due

to destructive fishing methods, pollution, siltation and sedimentation and global warming. Coral Triangle reefs have experienced severe mass coral bleaching and mortality events as temperatures have periodically increased.

#### *The Greater Mekong Subregion (GMS)*

The Greater Mekong Subregion (GMS) consists of the riparian states of the Mekong river basin, namely Cambodia, Lao People's Democratic Republic, Myanmar, Thailand, Vietnam and Yunnan Province of China (Figure 4). It is an area of significant ecological importance harboring globally important and irreplaceable elements of biodiversity. The region has a diverse geographic landscape, such as massifs, plateaus, fertile floodplains and deltas, forests, wetlands and mangroves. Biodiversity is disappearing at a rapid pace in the Greater Mekong Subregion. Rapid development in local economic corridors

has fragmented natural landscapes, isolating critical ecosystems and turning conservation areas into ever shrinking islands. Burgeoning infrastructure, likewise, facilitates poaching, endangered species trafficking and illegal wildlife consumption on a grand scale (USAID, *n.d.*).

#### *Yellow Sea*

The Yellow Sea (shared by the Republic of Korea, People's Republic of China and the Democratic People's Republic of Korea) is an extremely important eco-region supporting the needs of many people and many species (Figure 5). It is home to a number of threatened species, including the gray whale, the dugong, several species of sea turtle and shore birds (Mongabay.com, 2006). Yet, its ecological health is threatened by unsustainable development. Industrial pollution, oil spills, agricultural runoff and sewage discharges contaminate coastal and



marine waters of the Yellow Sea while river dams disrupt natural nutrient flows.

Particular challenges to conservation in the Yellow Sea eco-region include long-standing regional tensions, extremely rapid economic growth and development, and the migratory nature of many of its species. There are also few examples of successful habitat conservation available to decisionmakers in the region, and local conservation efforts alone cannot achieve a significant reduction in the rate of biodiversity loss as mandated by the Millennium Development Goals (Moore).

### South China Sea and Gulf of Thailand

Increasing levels of fishing effort, coupled with continuing decline in the total area of habitats critical to the life cycles of most species, have raised serious concerns for the long-term sustainability of fisheries of the South China Sea and Gulf of Thailand. The key barriers to effective fisheries habitat management in the South China Sea

and Gulf of Thailand include: (a) limited information regarding fish life cycle and critical habitat linkages and the role that marine habitats play in sustaining fisheries; (b) low level understanding among stakeholders, including fishers, scientists, policymakers, and fisheries and habitat managers of the linkages between fish stocks and habitats; (c) limited community acceptance of “protected” area-based approaches to marine management in Southeast Asia; and (d) limited effectiveness in national fisheries and environment departments and ministries with respect to the implementation of integrated fisheries and habitat management approaches (Siriraksophon, et al., 2009).

### Japan

The islands that make up the Japanese Archipelago stretch from the humid subtropics in the south to the boreal zone in the north, resulting in a wide variety of climates and ecosystems that can also be found in some other countries. About a quarter of the vertebrate species occurring in this hotspot are endemic, including

the Critically Endangered Okinawa woodpecker and the Japanese macaque, the famous “snow monkeys” that are the most northerly-living non-human primates in the world (CI, 2007). Japan has a relatively high diversity of amphibians as well, with 75 percent being endemic to the islands.

Japan’s increased interest in leisure has put a different type of strain on the natural environment. Forests are being cleared for ski resorts and golf courses. Coastal regions and wetlands are also being lost to development, principally agricultural expansion, river channelization and road building. On Hokkaido, the wetlands favored by nesting red-crowned cranes continue to be lost to development. One-third of almost 300 km<sup>2</sup> of marshland in Kushiro has been converted to agricultural, industrial or residential use since the 1970s.

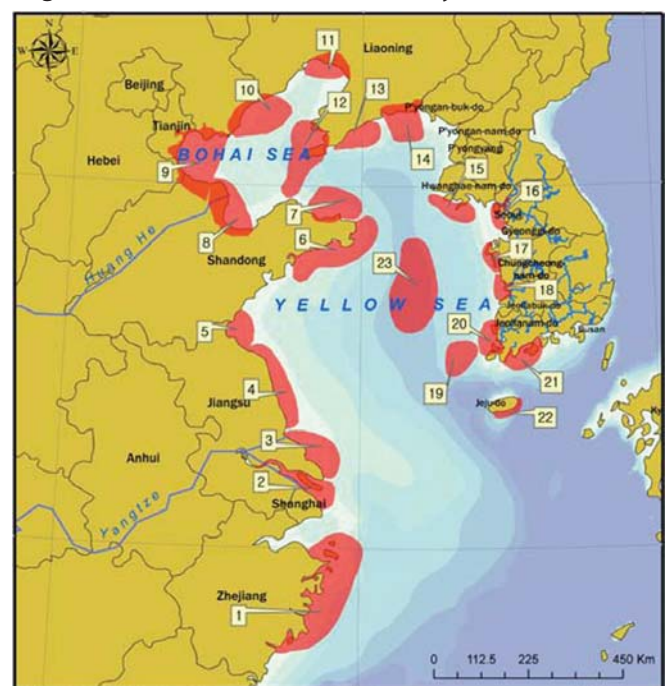
The decrease of fishery production (e.g., short-necked clam), the decay of seagrass fields, and the endangered species, like horseshoe crab, which are caused by changes in people’s

Figure 4. Mekong River.



Source: [www.mofa.go.jp/region/asia-paci/asean/relation/mekong.html](http://www.mofa.go.jp/region/asia-paci/asean/relation/mekong.html).

Figure 5. Yellow Sea – Potential Priority Areas (Choi).



Source: WWF- KORDI- KEI, 2008.

lifestyle and activities, such as forestry, fisheries, agriculture, waste disposal and treatment, construction, land reclamation, industries, and compounded by global warming, have triggered the development of plans for integrated management (*Ukita*).

### Conserving biodiversity: Fighting an uphill battle?

There are various international conventions and agreements that have been adopted and signed by countries. Sadly, these conventions and agreements have not been applied or enforced to anywhere near their potential to achieve desired outcomes. Country policies, national legislation and the obligations to international conventions and treaties are poorly implemented. Improving environmental awareness of central and local governments, communities and private sector is essential. Conservation is still sometimes perceived as an imposition that hinders the development of local economy and subsequently the welfare of local communities. Conservation is often considered by national governments as a low priority and something to be undertaken when the economy has already developed and resources are available. It is essential that such perspectives be turned around — conservation contributes to sustainable local development and costs may be higher in the future if conservation is not done now.

#### World Heritage Convention 1972

The United Nations has developed a system for designating “Biosphere Reserves,” which represent the world’s varied ecosystems and provide opportunities for scientific research and sustainable economic development based on ecological principles. Each reserve is intended

to contain the following parts, which more often are not strictly complied with:

- “a. A legally constituted core area or areas devoted to long-term protection, according to the conservation objectives of the biosphere reserve, and of sufficient size to meet these objectives;
- b. A buffer zone or zones clearly identified and surrounding or contiguous to the core area or areas, where only activities compatible with the conservation objectives can take place; and
- c. An outer transition area where sustainable resource management practices are promoted and developed.”

The World Heritage Convention\* is a high-profile global conservation agreement that can both recognize the outstanding importance and quality of our marine habitats, and help as a global mechanism to secure their conservation. The World Heritage Convention aims to promote cooperation among nations to protect heritage around the world that is of such outstanding universal value that its conservation is important for current and future generations. It is intended that, unlike the seven wonders of the ancient world, sites and properties on the World Heritage List will be conserved for all time. The challenge is that this Convention has not been adequately applied in the marine environment. The main obstacles identified to advance nominations of (marine) World Heritage Sites include: lack of knowledge on the nomination process; existing guidelines not necessarily being geared to the context of certain regions (e.g., Pacific); lack of knowledge on the implications of a World Heritage listing, which leads

to unwillingness to commit; lack of sufficient management and/or legal protection of potential World Heritage marine areas; and limited institutional capacity to prepare nominations.

#### Ramsar Convention 1971

The Convention on Wetlands (Ramsar, 1971) is an intergovernmental treaty that aims for the conservation and wise use of wetlands through cooperation between stakeholders, as a contribution towards achieving sustainable development. One of the obligations of Parties is that they should identify internationally important wetlands in their territory and place them on the Ramsar List. Wetlands can be considered as ‘Ramsar sites’ if they fulfill one of nine criteria that fall under two broad categories, i.e., if the site contains representative, rare or unique wetland types, or if the site is important for conserving biodiversity.

Under the Ramsar Convention, coastal wetlands include those areas that reach a depth of six meters at low tide, e.g., peat swamps, lagoons, mangroves, inter-tidal flats, coral reefs and seagrass beds. These coastal wetlands are internationally important for a variety of reasons, such as (*Young, 2009*):

- Providing ecosystem services: e.g., providing nutrients so the site can act as a nursery and feeding grounds for coastal fishery; protects coastal areas from typhoons and stabilizes shorelines;
- Habitats conservation: e.g., lagoons, mangrove forests, tidal flats, coral reefs, and seagrass beds;
- Biodiversity conservation: e.g., coastal plant communities (e.g., mangroves); mammals (e.g., dugongs); birds (e.g., migratory waterbirds), fish (e.g., Chinese Sturgeon); invertebrates (e.g., crustacean); reptiles (e.g., estuarine

\* The Convention Concerning the Protection of the World Cultural and Natural Heritage was adopted by the General Conference of UNESCO on 16 November 1972.

- crocodile and sea turtles);
- Providing livelihood: supporting local fisheries and aquaculture;
- Maintain traditional wetland wise use practices, such as the 'Chao Lae ("sea gypsy") in Thailand; and
- Recreation, tourism, education and public awareness: Many sites are valuable sites for nature tourism (e.g., scuba diving), and some have active wetland education centers that receive community support in providing education and awareness raising activities.

### Convention on Biodiversity 1992

In 2002, the 6<sup>th</sup> Conference of Parties to the Convention on Biodiversity (CBD) committed to achieving, by 2010, a "significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth." The International Year of Biodiversity was celebrated in 2010 to : (a) highlight the critical role that biodiversity conservation plays in reducing poverty, securing rights to natural resources, and creating sustainable income opportunities; (b) draw attention to the fact that we have collectively missed the global target we set out in 2002; and (c) serve as a wake up call to drastically change and strengthen the policies and processes, which the international community has set up to address global environmental issues. Commitment, political will, collaboration and more resources commensurate with the growing scale of the challenge are needed.

### Meeting Challenges

Though the situation varies between the countries, the general underlying impediments to effective management include: poorly developed national biodiversity and environmental legislation; inadequate institutional arrangements; lack of funding (for management, research, monitoring, surveillance and enforcement); weak

political will to implement laws and improve governance and management; insufficient scientific expertise and experience in marine environmental management; and limited community participation in monitoring, habitat restoration and management.

The need for clear institutional arrangements between different levels of government (central and local), and between government, communities and private sector must be dealt with. For example, in the Philippines, the case of the Baliangao Marine Sanctuary in Danao Bay illustrates how abrupt changes in institutional arrangements have affected the management of the marine sanctuary. From a community-led MPA to one headed by government, the locals felt losing ownership and representation in the management of the sanctuary (*Biña-de Guzman*). Assessment results show how this negatively affected the fish communities and other marine resources in the sanctuary. Ecological impacts of management failure imply that success in the management of the marine sanctuary relies on the stakeholders who

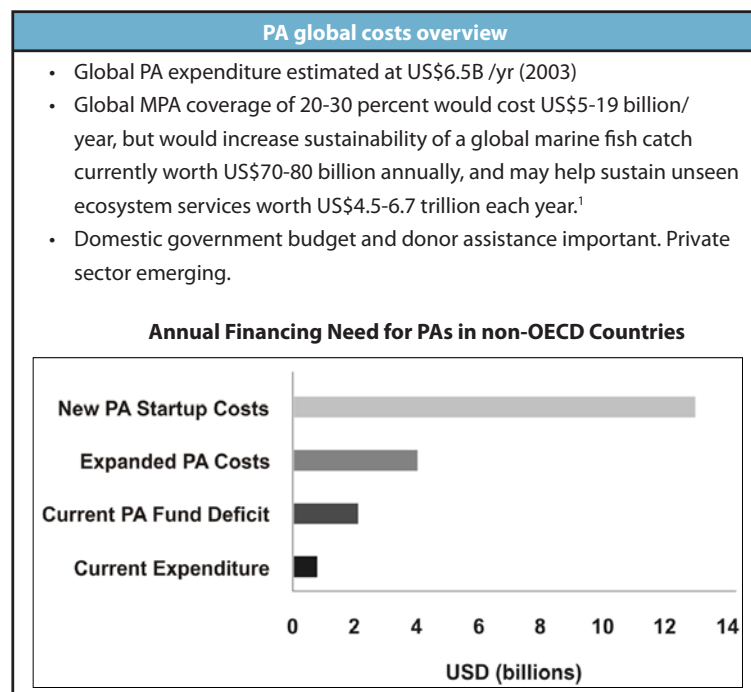
were the de facto guardians of the area. As a result, a thorough review of the existing policies related to jurisdiction over MPAs in the Philippines was recommended.

Assessments of watershed and coastal ecosystems conducted in Thailand identified human-induced activities as one of the major drivers for changes in the ecosystems. However, the legal mechanisms to implement an integrated approach are weak as the regulatory framework is complex and confusing, with overlapping jurisdictions (*Soonthornnawaphat and de Silva*).

Long-term costs and financing are not fully considered at the inception/objective setting stage. Short-term thinking has led to programs that are financially unsustainable in scale and scope. Not enough funding is a problem, but not having a clear understanding of how much you need in the first place and the costs associated with management over the long term is just as much a problem (*Claussen and Green*).

**Figure 6** shows the financing costs needed for protected area management

**Figure 6. Financing Needs for Protected Area (PA) Management versus the Economic-Environmental Returns.**



Source: CCIF Analysis, Center for Applied Biodiversity Science, 2003; PA Costs report, IFCA 2007 PA report. Notes: (1) Balmford, Gravestock, Hockley, McClean and Roberts, 2004.

in non-OECD countries. However, the return on the investment can be more than ten times in terms of marine fish catch and a thousand times more in terms of non-valued ecosystem services. Establishing effective marine protected areas (MPAs) and developing a national network of MPAs are still limited by inadequate scientific information, lack of coverage of many ecological processes by the current MPA network, and institutional and geographic (including communication) divisions. The usual ingredients for effective management of protected areas and conservation of habitats and biodiversity still need to be understood in order to be set in place: improved governance (e.g., transparency, communication, enforcement, accountability, use of information), clear scope of management coverage (including transboundary issues), enhanced capacities for management, enforcement and monitoring efficiency, partnership with communities, and access to financing (*Aliño*). Other difficulties include: lack of linkages between use and conservation; inadequate coordination among national process; and the need for stronger linkage between freshwater and marine management (*Wang Bin*).

Assessments, which are aimed at identifying common challenges and possible solutions to sustainable marine resource use, conservation and management, have to be done on a regular basis, and the results have to be shared to allow correction of mistakes and replication and scaling up of good practices. Integrated management approach, stakeholder and policymaker involvement, partnership building and outreach are important elements in ecosystem management efforts.

Ideally, before policymakers take decisions about whether to risk destroying a habitat for economic gain (such as a real estate and commercial development), they need to be able to assess the relative value of those gains

as well as the habitat and biodiversity at risk. However, most environmental amenities or biodiversity — landscapes, species like insects and birds, forest and coastal habitats — are not bought or sold and therefore a price cannot be set on their use without research or surveys and some form of policy intervention. Without collective action, overexploitation of such common assets is the likely outcome — resulting in the ‘tragedy of the commons’ — as can be seen in such destructive practices as “slash and burn” farming on fragile soils, overfishing and destructive fishing, conversion of rainforests to ranches and rubber tree plantations, conversion of mangroves into fishponds, etc. Non-sustainable extraction of resources (e.g., hardwood timber, mangroves) will eventually lead to the collapse of the industry involved, with all the corresponding economic losses. It is noted that even if ‘sustainable’ methods are used, for example when harvested forest areas are replanted, these areas are in no way an ecological substitute for the established habitats which they have replaced.

### The turning point: From vision to action

Biodiversity allows healthy environments to flourish, economies to develop, and humanity to grow and prosper. There are a wide range of management interventions [including marine protected areas (*Bina-de Guzman and others*), “sato-umi” (*Yanagi, McDonald, etc.*), reforestation (*Truong, Savaris*), reef restoration (*Yeemin, et al.*), artificial reefs (*Ismail*), artificial wetlands, etc.]. Proven approaches and models, such as community participation and marine protected areas, are available for addressing some environmental issues. Marine heritage sites and protected areas are important for significant reasons. They provide the most significant, front-line response to the global extinction crisis, and ensure conservation of biodiversity, continued flow of ecosystem services,

such as the provision of clean water and the protection of soil resources, and socioeconomic benefits to surrounding communities. These areas also help fulfill an ethical responsibility to respect nature and provide opportunities to learn about nature and the environment.

### Local efforts to maintain richness of life

The loss of important watersheds or carbon sinks and coral reefs means communities that once depended on the forest and sea for food, clean water and livelihood now need to spend what little income they have on basic necessities, exacerbating their economic hardship. Local actions are needed. Involving local communities in ecosystem management has proven to be particularly effective in developing countries.

Albeit limited, there are success stories. These commonly involve integrated management aspects, such as partnerships including local community-local government co-management and private sector participation, public awareness, appropriate legislation and enforcement, capacity development, and financing mechanisms. Good practices and initial outcomes show that local actions provide strong local benefits, sustain livelihoods, buffer climate change, and help maintain healthy oceans and richness of life. These stories need to be told, the lessons shared, and the actions replicated.

#### • Community Involvement in Coral Reef Restoration Projects in the Gulf of Thailand

The coral reef restoration project in Koh Mapling was done in collaboration with local fishers, NGOs and some volunteer groups. A low-cost coral reef restoration method was implemented covering a small area that could be easily controlled and managed for the benefit of ecotourism, education, public awareness, ecosystem restoration and research purposes. Good practices from the project



Coral restoration activities

were replicated in other sites, such as in Ao Mai Rood area. An important consideration in coral reef restoration is the simplicity of techniques and methods and the availability of cheap materials (Yeemin, *et al.*).

#### • Organizing Communities for Effective Mangrove Management

In Western Visayas in the Philippines, remaining mangroves are being destroyed due to weak implementation of mangrove legislation, resulting in disadvantaged coastal communities, depleted fishery resources, food insecurity, loss of sustainable livelihoods and vulnerability to typhoons. The four-year Community-based Mangrove Rehabilitation Project (CMRP) is being undertaken to serve as a model to stimulate government legislation and enforcement, and revert abandoned/underutilized fish ponds back to mangrove forest for sustainable livelihoods, poverty alleviation, and decreased vulnerability to natural hazards. The project demonstrated a formal structure for decisionmaking and project implementation, and a process for community organizing and addressing challenges, which include sustaining rehabilitation activities, securing tenurial instruments, sharing responsibilities with local governments, improving socioeconomic conditions

and mitigating impacts of climate change (Savaris, *et al.*).

#### • Protection and Rehabilitation of Seagrass Beds in Shandong Province, PR China

In the western Yellow Sea, the formerly extensive seagrass beds along the coast have largely disappeared in recent decades. There are now ongoing activities to rehabilitate these seagrass beds, such as: management and volunteer protection by local fishery company (fishery company in cooperation with the Yellow Sea Large Marine Ecosystem Project or YSLME); raising public awareness; implementing stakeholder training; improving management of the seagrass habitats; uploading the first dedicated website on seagrass of North China Sea ([www.seagrass.org.cn](http://www.seagrass.org.cn)); establishment of Germ Bank of Submerged Plants in the Sea off Chudao (Shandong Province Ocean and Fishery Department, 2009); and establishment of an MPA network for knowledge and experience exchange (Zhang).

#### Ridge to reef: protecting watersheds and coasts

An approach based on the “reef to ridge concept” that is similar to the ecosystem-based approach was

applied to coastal rehabilitation and management in Ranong and Phang Nga Provinces along the Andaman coast in Thailand. This approach utilized the bottom-up process, which is stakeholder-driven, building upon community-based organizations (CBOs). Formulation of the framework of action through participatory processes involving various stakeholders at multiple levels, ranging from village to national levels, proved to be successful (Soonthornnawaphat and de Silva). The CBOs — two forest and river conservation groups — with communities are managing and taking actions to protect important ecosystems within the watershed.

#### Greening the urban landscape

The restoration of the coastal green belt in Danang City, Vietnam, was made successful through community efforts, with heads of organizations playing a crucial role in getting the active participation of social organizations, business sector, and communities (Truong Cong Hai). An executive board, composed of leaders of departments, key sectors and agencies, coordinates all activities of the project and ensures participation of stakeholders in the project. Financial contributions from enterprises were received to aid project implementation.

#### Restoring life at the bottom

In February, 2008, Yokohama Port and Airport Technology Investigation Office, Ministry of Land, Infrastructure, Transport and Tourism, Japan, completed construction of a small ‘stair-type’ tidal flat along its existing seawall for ship mooring. The stair-type flat was expected as a new habitat for the benthic system in the coastal shallow water and tidal flat. Also, its proper configuration was expected to provide enough depth and fewer obstructions for ship mooring.

After its completion, recruitment of benthos was monitored. A new partnership was organized for monitoring, with the participation of the

Government Office, research institutes, universities, nongovernmental organizations (NGOs), and high school students. This demonstration site also provided elementary school students opportunities for observing a tidal flat ecosystem. Results of one-year monitoring show rapid recovery of the tidal flat ecosystem, and confirmation of morphological stability (*Oomura, Morohoshi and Hosokawa*).

### Go the distance

Some species have complex lifecycles. They spawn in one place, the young develop in another place, adults live in another, and then the adults may move yet someplace else to spawn or go back to where they were born/hatched. Many species also move among habitats over the course of a day. The broad-ranging behavior of migratory species, such as marine turtles (**Figure 7**), indicates a need to link information, experiences, financing and local communities across large marine ecosystems (LMEs) and projects towards a broader East Asian Seas network (*Nateewathana*).

#### • Living with the Black-Faced Spoonbill, the Symbol of Peace in the Yellow Sea

Ganghwa is an island of the Republic of Korea on the Yellow Sea. Surrounded by tidal flats of ecological importance, the island is also famous as a tourism site with its historical remains. As many species of birds take a rest or breed there, the island is regarded as an important point along the East Asian–Australasian migratory birds flyway. Black-Faced Spoonbills (BFS), *Platalea minor*, have especially drawn in international attention to this island, recognition that more than 50 percent of worldwide breeding pairs of BFS are breeding in this island and surrounding islets every year (*Han*).

A project, supported by the United Nations Development Programme/Global Environment Facility Yellow

Sea Large Marine Ecosystem project (UNDP/GEF YSLME) through its small grants programme, was aimed at conservation of BFS through development and execution of CEPA (Communication, Education, Public Awareness) activities. Through this project, the feeding habits of BFS were investigated in the rice paddies and tidal flats with participation of local residents. Through these activities, trust and communication channels with the residents were built. An exemplary rice paddy in Choji-ri village, Ganghwa Island, was designated to examine the wise use of rice paddies. In these paddies, where the local farmers cultivate rice by organic methods, the biodiversity associated with organic rice production was surveyed, investigating why organic rice farming is important as a feeding ground for the spoonbills. The project also involved working with local farmers, conducting an awareness program, and developing guidelines on management of paddy fields in the spoonbill's feeding areas during the breeding season.

Community-based monitoring with local residents was a very effective method of increasing public awareness. The PGA Wetland Ecology Institute monitored the BFS' feeding resources in tidal flats with fishers, and executed the rice field biological monitoring with farmers. The field knowledge of farmers and the fishers was very useful, and the project activities generated important opportunities for sharing of traditional knowledge with scientific researchers. On the other hand, the information provided

by the scientific researchers was helpful for the farmers and fisherfolk. A BFS stakeholder list was made through the project. The list includes NGOs, researchers, and many other individuals and organizations. Through this network, the stakeholders will continue to share knowledge and information on the BFS and its habitat. In addition, through the project, environment-friendly agriculture was strengthened, which will provide more food for the BFS. Ecological tourism using fishers' boats was discussed with the fishers. Conclusions from such discussions were transferred to the local government, and a good response from the government was obtained.

#### • Early Steps towards the Conservation of the Avian Biodiversity of the Yellow Sea

A small NGO in the large and flourishing civil society of RO Korea, Birds Korea is dedicated to the conservation of birds and their habitats in RO Korea and the Yellow Sea. The present research focus

Figure 7. Migration Pattern of Marine Turtles.



Source: Pilcher.

aims to fill in some of the information gaps on the avian biodiversity of open sea areas and islands (largely overlooked by recent Yellow Sea literature), and to measure population changes in shorebirds and other threatened waterbirds in response to habitat loss. In partnership with the specialist Australasian Wader Studies Group, Birds Korea conducted national shorebird surveys and the Saemangeum Shorebird Monitoring Program (2006-2008, and proposed again in 2010). For the first time in this region the survey measured the impacts of a large-scale reclamation project on migratory shorebirds across hemispheres, identifying a 20 percent decline in the global population of the Great Knot.

To improve its usefulness, the results of this research have been made freely available, online and in published reports, and have been supported by a range of educational and awareness-raising materials, including a book on the shorebirds of the Yellow Sea in Korean, Chinese and English. All such materials emphasize the value of birds as bio-indicators, and the theme of "Birds, Wetlands and People Are One".

As examples of conservation for avian biodiversity remain limited within the region, daily counting of birds at a small threatened urban inter-tidal wetland in Mokpo is being conducted. To help mitigate the development pressures that threaten this wetland and the wider Yeongsan Estuary, a booklet and Powerpoint presentation on "Wise Use Guidelines" were developed in consultation with government officials and local and international experts, with funding from the YSLME project. The guidelines include clarification of Ramsar guidance, site data, an outline of the values of and threats to the site, and examples of successful wetland management and restoration that are relevant to Mokpo City and the wetland. Throughout, the emphasis is on the benefits of wetland conservation to the city's image, tourism and environmental



Top: B.S. Park/Down: Happy Family Taiwan

education. By providing best information, and through continued consultation with the local government, the guidelines and examples will help in the conservation of this wetland, and be incorporated into the management of the wider estuary, and of other inter-tidal areas nationwide.

While this work has been effective and well-received by those open to conservation, ongoing and massive investment in unsustainable development projects, including coastal reclamation, remains. If much of the Yellow Sea's avian biodiversity is to be conserved, and if national and international obligations are to be fulfilled, then there is an urgent need to further improve information-sharing, to modify existing policies, and to strengthen existing conservation agencies (*Moore's*).

- **Yalu Estuary Reserve - Protection of Shorebird Habitat in China**

The Yalu Estuary Wetland National Nature Reserve is located on the

northern Yellow Sea coast of PR China. It is an important staging site for shorebirds during their northward migration on the East Asian-Australasian Flyway. To raise public awareness of the Yalu Estuary Reserve and the important role that it plays in the local community, many education and publicity activities for the general public have been developed including frequent talks to school students about the reserve. Now more and more local people are aware of the importance of the reserve. In addition, enforcement capacity within the reserve has been strengthened by increasing patrol times. This combination of improved cooperation with local government, improved public awareness activities and better enforcement has significantly improved the management of the reserve (*Jia Na*).

### Thinking beyond the canopy and the reef

A holistic governance system from top of the mountain to the sea is essential, with the participation of scientific

community and academe, with the natural science, social science and engineering given due consideration, and implementation of habitat restoration and management by various stakeholders.

In Japan, incidents of Minimata and itai-itai disease outbreaks, red tide, hypoxia, a fish catch reduction have triggered pollution reduction and resource management initiatives. *Sato-yama* and *sato-umi* have been revived to meld development objectives with environmental sustainability. The Japan sub-global assessment report (JSGA, 2009) provided the working definition of *sato-yama* and *sato-umi*.

*Sato-yama* and *sato-umi* can be defined as dynamic social-ecological coupled production systems comprising a mosaic of different ecosystem types producing synergy of a bundle of ecosystem services for human well-being, or simply, a multi-functional socioecological production landscape.

*Sato-yama* is rural landscape for agricultural and forestry production and livelihood comprising of communities, farmland, secondary forest, plantations, grassland, ponds, and irrigation and drainage systems.

*Sato-umi* is coastal landscape for fishery production and livelihood comprising of seashore, tidal flats, seaweed beds and grounds. As a new concept for coastal management, *sato-umi* is based on the successes of *sato-yama*. *Sato-umi* has been defined as “a coastal sea with high productivity and biodiversity under human’s interaction” and is based on full understanding of the sea, such as its production systems, productivity and material cycling (Yanagi). That is, we need to know the quantity of nutrients that are loaded from the coast, and what are the primary, secondary and tertiary productions in the area. We need to clarify what kinds of actions by mankind are permissible or prohibited in the coastal area from the viewpoint of

increasing production and biodiversity. These form the bases of permissible and prohibited human activities and how productivity and biodiversity may be enhanced.

The main characteristics of *sato-yama* and *sato-umi* include: diverse mix of ecosystem types producing a bundle of ecosystem services, depending on social, economic, and ecological parameters. In short, they are context- and/or place-specific (McDonald). Restoring ‘*Sato-yama*’ and ‘*Sato-umi*’ involves the reconstruction of social system of environmental-friendly fisheries, forestry and agriculture, recognition of the importance of ecological networks from forest to sea, and a new philosophy of environmental ethics relating to biodiversity (Ukita, *et al.*).

### Background

First written reference to *sato-yama* was in *Miscellaneous Stories of Kiso Mountain*, a book published in 1759 by forest manager Hyoemon Terauchi during the feudal Tokugawa Shogunate Era (1603-1867). The book recorded the livelihoods of rural mountain woodland communities and used the term *sato-yama* to describe the human managed mountainous landscapes surrounding those rural communities.

The term *sato-yama*, along with the nature views, lifestyles, cultural values, traditional knowledge and resource management practices embodied in the term, were reintroduced by forest ecologist Tsunahide Shidein the 1960s as agricultural woodlands. Shide’s revival of the *sato-yama* concept was in part a counter reaction to the fuel and chemical fertilizer revolutions

of the 1960s and the impacts rapid economic development were having on the social, cultural and natural landscapes of Japan.

*Sato-yama* has since evolved and is used in differing contexts. Among neo-traditional conservationists, *sato-yama* often broadly refers to traditional rural landscapes and has become for many a symbol of human-managed landscapes where humans and nature co-exist in a harmonious symbiotic relationship. As ecologists explore habitat modification and human use of natural landscapes, the *sato-yama* concept has evolved to include what is described as *sato-yama* landscapes comprising of *sato-yama*, cultivated lands (farmlands), and reservoirs (traditional man-made irrigation ponds referred to as *tameike* and natural wetlands inclusive); all elements linked together as part of the traditional agricultural land use system of Japan. In 1987, the area of *sato-yama* in Japan was about 4,500,000 ha, making up about 20 percent of Japan’s total area of forest of 25,000,000 ha (Yanagi).

The *Sato-umi* concept was first proposed by Dr. Tetsuo Yanagi of Kyushu University in 1998. Dr. Yanagi defined *sato-umi* as a coastal area where human interaction has resulted in a high degree of productivity and biodiversity, and where a deep relationship between human life and traditional culture has



Performance by the school children of Misaki Elementary School on *Sato-Umi*.





Collecting seeds



Selection



400,000 seeds!

Encase seeds in *Zostera* mat

Development of a new method for recovering *Zostera* bed in collaboration with fishers (Matsuda).

led to the co-existence of humans and nature. The original focus of sato-umi was the Seto Inland Sea area: communities' working together with researchers and policymakers to assess human impacts on the coastal marine environments and ecosystems.

There is growing recognition of sato-umi as a comparable term to sato-yama by policymakers in Japan as a potential model for sustainable marine and coastal resource utilization and management. The term/concept was incorporated into the 3rd National Strategy for Biodiversity (2007). The Sato-umi Creation Project was initiated by the Japanese Ministry of the Environment (MOE) in July 2008. Currently there are six pilot projects in Japan, and collected data from pilot projects will be used as the basis for a national Sato-umi Manual.

### *Sato-umi applied: Harvesting knowledge and sharing accomplishments*

The degradation of coastal ecosystem and decline of material circulation functions, which resulted in the decline of fisheries resources are some of the pressing problems Japan is currently facing. To address these problems, restoration activities, such as establishing sato-umi to provide

habitats for fish and shellfish were initiated. The activities that support the establishment of sato-umi include rehabilitation/restoration of seaweed beds and mudflats, and implementation of water pollution measures with the active participation of the local public organizations (See **Box 2**). Efforts to support the promotion and creation of sato-umi by the Ministry of Environment include creation of model projects on sato-umi, preparation of standard sato-umi plans, establishment of a sato-umi manual, selection of examples of advanced sato-umi activities, creation of a sato-umi website and data network, creation of publicity activities and provision of information overseas (Muroishi, et al.).

### Networking of marine protected areas: Need for a new blueprint?

#### Benefits of MPAs

A key management strategy to address many issues affecting marine and coastal ecosystems and resources is the establishment and implementation of marine protected areas (MPAs). An MPA is a coastal or offshore marine area that is managed to protect natural and/or cultural resources (Agardy and Staub, 2006). The most commonly

used international definition of MPA is given by the World Conservation Union (IUCN, 2008) as: "a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values."

MPAs are recognized as important and effective tools for managing and conserving our ocean and marine resources. Well-managed marine protected areas can deliver local financial, economic and social benefits to fisheries and other economic use sectors, especially to lower-income groups, and to hazard management. MPAs are being used in fisheries management and biodiversity conservation to safeguard ocean resources for future generations and enhance ecosystem resilience.

#### Significant Scaling up Needed

Our understanding of the interconnectedness of marine habitats and processes has highlighted the importance of moving beyond managing individual MPAs to networks of MPAs. Such larger-scale approaches are necessary to protect and conserve ecological processes. MPA Networks can be considered as a strategy to decrease necessary costs incurred for MPA management due to economies of scale (Balmford, et al., 2000). MPA networking can be used as a way to leverage funding due to decreased transaction costs and expected higher economic benefits (Aliño).

During the World Summit on Sustainable Development (WSSD) in 2002 and the 7th Conference of the Parties to the Convention on Biological Diversity (CBD COP-7) in 2004, countries targeted a global network of comprehensive, representative and effectively managed protected areas conserving 10 percent of terrestrial areas by 2010 and 10 percent of

## Box 2. Case Studies in Sato-Umi applications, habitat conservation and cultural preservation.

### Seagrass Bed Restoration and Management in Seto Inland Sea (*Matsuda*)

Tidal flats and seagrass beds in the Seto Inland Sea have drastically deteriorated mainly because of land-based human activities. It is therefore essential that efforts to restore both watersheds and coastal areas are implemented. The restoration of eel grassbeds in Akou Coast is a demonstration site for the sato-umi concept. Education and restoration activities were important components of the project. Strong community involvement in the project implementation made the restoration project successful. Sectors of the community discussed future plans and a Sato-umi Committee has been created to oversee the activities in the Akou Coast.

### The Ago Bay Initiatives in Japan (*Maegawa and Uranaka*)

The Environmental Restoration Project on Enclosed Sea, which was carried out from 2002 to 2007 in Ago Bay, aimed at making a better life through wise and sustainable use of the coastal environment. The project developed important conservation techniques and systems for environmental restoration, such as construction of artificial tidal flats, recovering seagrass beds, continuous monitoring system and environmental simulation model of the bay in collaboration with stakeholders, including fishers and the regional public office. A committee composed of a local government office, fisher's union, academe and other sectors of the community was created with the role of promoting the restoration of Ago Bay. The concept of sato-umi has been recognized as an alternative management option for the bay.

### Fushino River Estuary initiatives in Japan (*Ukita*)

Various problems have triggered the development of plans for integrated management of the Fushino river basin, from forest to sea. Successful restoration initiatives in Fushino River basin include planting seagrass, surveying horseshoe crab distribution, beach cleaning, river upstream cleaning and tree planting. These are conducted through the cooperation of local people living upstream and downstream. Local money was also provided to stimulate activities. Emphasis is given to local production and local consumption.

The conduct of scientific studies and learning from sato-yama and sato-umi systems, promoting environment-friendly practices in fishery, forestry and agriculture and encouraging living a 'slow life', are part of the restoration and management activities. As they say in Fushino, 'think of the source when you drink water'.

### Potential of Urban Wetland as a Target of Habitat Restoration and Management (*Furukawa*)

There are measures to restore coastal wetlands in urban areas with the use of sound ecological engineering, which was

incorporated in the restoration and development activities in Tokyo Bay. Urban wetland restoration involves top-down and bottom-up approaches, and has a high potential in sato-umi wherein both the natural science and social science are given due consideration. The top-down approach, which stems from a medium-term action plan, includes the restoration of urban wetlands as a priority action. The top-down approach requires adaptive management where a system for feedback from users in the implementation of new techniques is important. An example of the bottom-up approach is the construction of terrace-type wetlands, which allows public participation in monitoring and maintenance. Other wetland parks and restoration programs involved the participation of the private sector, schools, fisherfolk and local residents. The bottom-up approach requires an ecosystem approach wherein understanding of the situation, monitoring and analysis is done.

### Fusing development goals, habitat conservation and cultural preservation

Traditional Pacific Island cultures divided coastal areas within the community, such as the qoliqoli in Fiji and the ahupua'a in Hawai'i, where cultural practices, including fishing techniques and periods of no fishing, ensured the protection of important food and cultural resources (*Orbach and Karrer, 2010*). Industrialization and globalization caused a breakdown of traditional management structures and increased the stress on marine resources. Indigenous knowledge and traditional practices are now being harnessed in ICM sites and MPAs to address a wide range of issues.

### Implementation of Tri Hita Karana, a Local Wisdom of Bali to Maintain Agricultural Resources

The Balinese Hindu community believes that man is part of the whole universal system created by God. Tri Hita Karana or the harmonious relationship among man, nature and God, who brings welfare and happiness, constitutes an important aspect of the local wisdom in Bali, Indonesia. It is applied in the field of agriculture to maintain agricultural resources (*Suprapta*). The same philosophy is adopted in Bali's integrated coastal management program, and its Coastal Strategy for the Southeastern Coast of Bali. Adoption of such principle of balance among human, nature and God truly makes Bali a unique ICM site.

### Indigenous Approaches to Access, Control and Protection of Coastal Resources: A Review of Philippine experiences

There are several indigenous practices in the use, control and protection of coastal resources, such as the vanua and mataw, among traditional fishing communities in Batanes, northern Philippines and in Palawan, southern Philippines (*Ferrer*). Traditional practices of fishing communities living in harmony with nature involve harnessing the ecological knowledge of fishers, observing economic arrangements to protect the environment, and implementing organizational rules, taboos and rituals formulated by the association of users.

marine areas by 2012. This was in recognition of the significant and degrading impacts that humanity was having on the oceans, and that MPAs are widely accepted as a key tool for securing biodiversity and societal and economic benefits. An MPA network can be defined as “a collection of individual MPAs or reserves operating cooperatively and synergistically, at various spatial scales, and with a range of protection levels that are designed to meet objectives that a single reserve cannot achieve.”

While the number and extension of MPAs is growing, progress has been slow, even as countries strive to meet the WSSD target on establishment of representative networks of MPAs, consistent with international law and based on scientific information, by 2012. MPAs face many significant challenges, from direct degradation due to human pressures and weak protection, lack of political support, lack of sustainable financing, and climate change impacts. **Box 3** shows the international commitments on MPAs and the current status.

MPAs that have been established in ASEAN member countries in variety of forms and scales, from village and community level managed areas to large-scale nationally designated marine parks, and transboundary heritage sites, are considered as one of the effective tools and solutions to threats facing the coastal and marine environment. However, only a few (some 20-30 percent) of these MPAs are effectively managed (*Chu Hoi*). Most are inadequate to effectively conserve habitats and fishery resources, and protect rare and endangered species. Many times, successful MPA design is hampered by difficulties in communication between scientists, decisionmakers and user groups. The questionnaire survey conducted prior to the International Coral Reef MPA Network Meeting/4th ICRI East Asia Regional Workshop, 17-19 November

2008, Tokyo, Japan (Ministry of the Environment, 2009) revealed that only 2 out of 9 East Asian countries have their own MPA management effectiveness (MME) standards (*Morimoto, Tupper and Hibino*).

### Incentives to modify conventional MPA management

Various institutional arrangements, knowledge management, and participatory approaches have been applied in different degrees across the East Asian Seas Region. Enabling

conditions and a set of incentives should be considered in designing and developing MPAs and network of MPAs to increase effectiveness and management efficiency (**Box 4**).

### Economic and financial incentives

One of the most important keys to success is that conservation efforts and MPAs meet the urgent needs of local communities, particularly demands of local development, either economically or in terms of social welfare. Demonstration of the conservation actions that share benefits to the local economy or satisfy the

#### Box 3. International commitments and current global status of MPAs.

- **World Summit on Sustainable Development** (2002) called for establishing a global system of MPA networks by 2012, as part of a strategy to protect and restore marine biodiversity and to maintain the natural resource base for economic and social development.
- **Fifth World Parks Congress** (2003) called on the international community to create a global system of MPA networks that “greatly increases” the marine and coastal areas covered.
- **Evian Agreement signed by the G8 Group of Nations** (2003) called for the establishment of ecosystem networks of MPAs by 2012, consistent with international law and based on scientific information.
- **Convention on Biological Diversity** (2004) agreed to the establishment and maintenance of MPAs to contribute to a global network. Various regional agreements complement these global undertakings.

Current global marine protection targets aim to protect 10-30 percent of marine habitats within the next 2-4 years. Based on the MPA Global Database, current estimates of MPA coverage include the following (Wood, 2007):

- Approximately 5,000 MPAs have been designated worldwide.
- Approximately 2.58 million km<sup>2</sup>, 0.65 percent of the world’s oceans and 1.6 percent of the total marine area within Exclusive Economic Zones (EEZs), are currently protected.
- Only 0.08 percent of the world’s oceans, and 0.2 percent of the total marine area under national jurisdiction is no-take, where extractive uses are prohibited.
- Currently, the three largest MPAs are the: Phoenix Islands Protected Area (at 410,500 km<sup>2</sup>); Great Barrier Reef Marine Park (344,400 km<sup>2</sup>); and North-western Hawaiian Islands (at 341,400 km<sup>2</sup>).
- An immediate global concern is the need for rapid increase in MPA coverage in conjunction with scaling up of ocean management. The increase required to meet the targets is equivalent to another 35 countries creating an MPA the size of the Phoenix Islands Protected Area before 2012.
- The global distribution of protected areas is both uneven and unrepresentative at multiple scales, and only half of the world’s MPAs are part of a coherent network.
- A global review of MPA network programs is underway. It documents the experiences generated and variety of approaches taken to develop MPA networks (UNEP-WCMC, 2008).

Source: WCPA, 2008.

educational or cultural needs of people could dramatically change the mood of the area and earn local conservation advocates (*Choi and Kim*). Contribution to increasing fish catch and disaster risk-reducing benefits of protecting coastal habitats needs to be communicated properly.

An evaluation of the economic returns and impacts of artificial reefs on fisheries and the impacts of economic changes on the socioeconomic conditions of fisherfolk in west coast, Peninsula Malaysia, was done to show benefits and costs of such habitat restoration projects. The study showed that the deployment of these artificial reefs was one of the effective ways of improving the fisher's income and profitability (*Ilisriyani Ismail, et al.*).

Given the scale of effort currently underway to develop effective MPA networks in the Coral Triangle region, it is essential that effective and functional management plans and networks be designed, and that the resources required (human, political and financial) be understood and made available to ensure that these efforts succeed. This requires a management and financial framework and an overall MPA network design approach that considers the operational scenarios necessary to achieve the range of objectives for the MPAs in the region.

While the ecological and social aspects and effectiveness of marine protected areas (MPAs) are constantly being studied and evaluated, far too little attention is being placed on the design, economics and financing of operationally functioning MPAs and networks of MPAs. It is essential to strengthen the financial side of the planning and managing of MPAs. Managers of MPAs should move away from making financing as an afterthought once external fund sources run low. Although it is common to see 25-year management plans

#### Box 4. List of Possible Incentives.

##### Economic and Financial Incentives

- Using economic or market-based instruments to influence behavior change (and complement regulatory or command-and-control instruments);
- Promoting economically and ecologically sustainable resource exploitation;
- Promoting the 'green marketing' of products and services from the MPA;
- Demonstrating economic costs and benefits; and
- Developing business plans.

##### Knowledge Incentives

- Integration of local/traditional/indigenous knowledge;
- Maximizing scientific knowledge to guide/inform MPA decisionmaking;
- Developing mechanism for independent advice in the face of conflicting information and/or uncertainty; and
- Employing approaches that support collective learning, e.g., participative GIS, participative monitoring, workshops, etc.

##### Legal Incentives

- International-regional-national-local regulatory obligations;
- Clarity and consistency in defining legal objectives, jurisdictional boundaries, roles and responsibilities of different authorities and organizations;
- Legal or other official basis for cross-sectoral/cross-jurisdictional restrictions to support the achievement of MPA objectives; and
- Provision of financial and institutional resources for MPA governance, particularly law enforcement.

##### Participative Incentives

- Participative governance structures and processes such as stakeholder committees, stakeholder consultations, participative GIS planning, etc.;
- Transparent participation and decision-making processes; and
- Clear rules on the means and degree of participation from different groups.

##### Interpretative Incentives

- Public communication, education and awareness raising;
- Role of celebrity 'champions'; and
- Promoting recognition of the potential resource benefits from well-managed MPAs.

(which are heavy on science and management), financial budgets rarely look beyond a year or two (*Pilcher*). Better financial management will lead managers towards more effective MPAs, less reliant on outside sources and scales of economy savings that should encourage MPAs to scale up into networks. Moreover, financing

sources should not be limited to traditional sources, i.e., donors and government budget. The fisheries, economic, and risk-reducing benefits of protecting coastal habitats are clear and should provide a basis for local support. In Japan, local money 'Fushino' is provided by local communities to stimulate habitat restoration activities

(*Ukita*). In Danang, Vietnam, financial contributions from enterprises helped in the urban greening project of the city. Some MPAs derive at least part of the revenue to run the MPA from user fees, although it is more common to find MPAs that are heavily subsidized by governments and/or donors.

It is important to develop comprehensive management and financial (business) plans for MPAs and networks of MPAs in order to show clearly the rationale for the MPA, its goals, and a roadmap for reaching those goals. Business plans provide the governments and development partners with a concise summary of the services to be provided, clients/customers (constituents), activities to be undertaken (operational plan), management, financing, and mechanisms for the MPA authorities to monitor actions vis-à-vis goals and objectives, and review progress methodically. Such financial or business plans can give donors and investors (government, NGOs, donors, private sector) a sound appreciation of the need for funding, and where their investments will be best placed (*Claussen and Green*).

### Knowledge incentives

Scientific knowledge and research in the natural sciences (biology, ecology, chemistry, geology, oceanography, etc.) and the social sciences (economics, anthropology, political science, sociology, etc.), combined with documented traditional knowledge and practices, is necessary to the development of effective conservation programs, including MPAs and MPA networks. Most of the research done deals with the biophysical sciences, but there is increasing recognition of the importance of studying the human dimension in biodiversity and MPA management. Many national networks are still limited by inadequate scientific information and institutional and

geographic (including communication) barriers. Many ecological processes, such as freshwater-marine linkages are not covered by current MPA networks.

A review of marine turtle biological information from scientific research and local knowledge indicated that conservation is currently limited to certain aspects of the turtle lifecycle with inadequate protection, for example, of a migration bottleneck in the northern tip of Sabah. The use of biological information is important in designing a proposed network of MPAs for marine turtle conservation that takes into account the entire turtle lifecycle and spans political jurisdictions in the Sulu-Sulawesi Sea Marine Ecoregion (*Pilcher*). This also holds true for migratory birds. Migration patterns of species will have to be considered in the context of the distribution of their habitats (e.g., migratory waterbirds and wetlands in the case of the East Asian-Australasian Flyway Partnership Network).

The spotted seal (*Phoca largha*) is a coldwater marine mammal widely distributed in the North-Western Pacific Ocean, one of the second-class protected endangered animals in China and the only pinniped animal which naturally breeds in Chinese waters. Liaodong Bay of Bohai Sea is the southernmost point of eight breeding concentrations of spotted seals around the world. The results of genetic diversity analysis, using microsatellite markers, show that populations are at a low level, and have suffered a decrease in genetic variability. Conservation and management of the Liaodong Bay spotted seal colony will require many local efforts across its broad range.

Given the feedback loops between fish stock and habitat quality on one hand, and fishing activities and habitat quality on the other, the UNEP/GEF South China Sea Project and the Southeast Asian Fisheries Development

Center (SEAFDEC) worked through its Regional Working Group on Fisheries (RWG-F) to develop a regional initiative aimed at improving the management of fish stocks and their habitats. Fisheries refugia as defined by the RWG-F are, "Spatially and geographically defined, marine or coastal areas in which specific management measures are applied to sustain important species [fisheries resources] during critical stages of their lifecycle, for their sustainable use."

The key results of foundational activities include:

- Regionally agreed ranked lists of fish, cephalopod, and crustacean species of transboundary significance;
- A regionally agreed list of 82 threatened and near threatened species for the South China Sea and Gulf of Thailand;
- National meta-databases and GIS data relating to available information on fish stock status, fish early life history science, role of habitats as fish nursery and spawning areas, and management;
- Inter-governmentally approved guidelines for the establishment and management of fisheries refugia that constitute part of the ASEAN SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia;



**The spotted seal (*Phoca largha*)**

- Identification and characterisation of 52 known fisheries refugia;
- A set of 21 regionally agreed resource status and institutional indicators for use in assessing the effectiveness of fisheries habitat management measures in the South China Sea and Gulf of Thailand; and
- Costed regional and national plans for the operation of the regional system of fisheries refugia from 2009-2013 (*Siriraksophon, Paterson, Pernetta, 2009*).

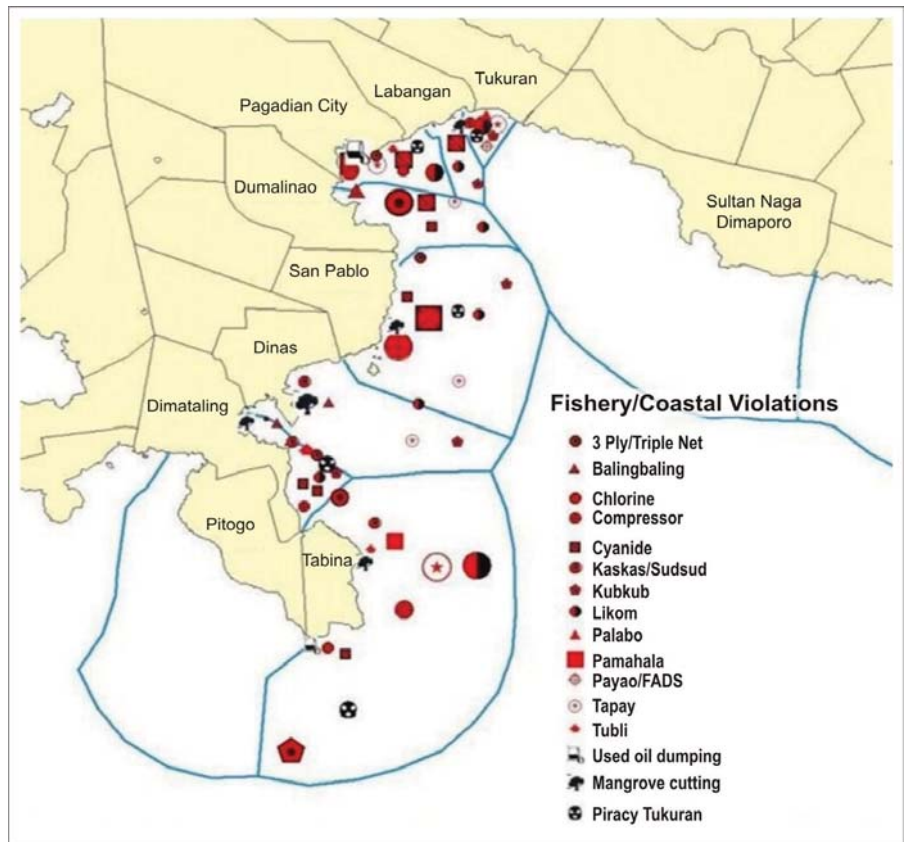
Sharing of experiences, lessons and scientific information through learning networks was recommended as a practical and immediate action. Ecological networks can then develop from these as needed. A sound scientific basis to design a resilient ecological MPA network is a must. In adaptive management, a feedback relationship exists in which scientific results are used to enhance MPA plans and management practices. Monitoring programs involving data collection, analysis, and discussion are critical to inform managers and other stakeholders regarding success or failure of management strategies. This knowledge enables managers to adapt management strategies to minimize adverse effects and maximize benefits.

### Legal incentives

Indonesia has scaled up its marine protected areas to cover 13.5 million hectares but still needs to do a lot more to strengthen management and collaboration at each scale from local, sub-national, national, and international; and address local issues, such as small-scale fisheries, while contributing to national and global objectives (*Kasasiah*).

Based on the experience in China, to be more effective, MPAs should be integrated into overall marine functional

**Figure 8. Inter-Local Government Units Collaboration on Coastal and Fishery Law Enforcement (*Aliño*).**



zoning, and increased funding be given to local MPAs comparable to what is being allocated to national MPAs (*Wang Bin*).

There are differences in emphasis among the management approaches under which the various MPAs have been established in Malaysia, including marine parks in Peninsular Malaysia, parks in East Malaysia, and international transboundary MPA management, taking the Turtle Islands Heritage Protected Area as an example (*Kaur*). It is critical to develop, and to make operational, collaboration based upon sound science and management needs, and balancing these with local conditions.

Networking among local governments with local MPAs resulted in creating synergies that led to improved governance, enhanced capacities

in monitoring and enforcement, management coverage and efficiency, advocacy and access to financing as shown in the case of the MPA network in the Camotes Sea and Illana Bay in the Philippines (**Figure 8**) (*Aliño*).

An agreed set of standards can help to improve the effectiveness of MPA management across the region.

### Participative incentives

The on-site conservation of biodiversity and habitats depend on the participation of local stakeholders who are the most active marine resource users and at the same time, potential advocates of conservation.

Empowered communities made prominent progress after three years of implementation as seen in their active participation in the protection of

the Muan tidal flat. The success of the project has opened opportunities for improving the MPA policy in RO Korea (*Jang and Choi*).

Community involvement in all levels and aspects of the management of the MPA and ICM facilitate resolution conflict, sharing of responsibility, rights allocation and ensures sustainable use of resources, as the individuals and communities diverse interests are taken into consideration (*Chu Manh Trinh*). The benefits to the communities are enough incentives to sustain public interest and involvement. The local people are not only consulted, but are also involved in the planning, implementation and monitoring of activities within the MPA and ICM.

Based on a participatory approach between communities and governmental officials at the local level coordinated by the Thailand Environment Institute (TEI) and Department of Marine and Coastal Resources (DMCR), sustainable management plans for natural resources were implemented. The activities resulted in organization of local community groups and networks for environmental conservation and protection with clear management plans and approaches of natural resources (*Meepriing*). The project also resulted in increased participation among local community members and school children in coastal and marine environmental activities as well as increased sharing of lessons learned between community leaders of the five

target sites [(1) Ao Chalong, Muang District, Phuket province; (2) Ban Thung Nang Dum, Kuraburi District, Phang-nga province; (3) Ban Tha Maprao, Klong Thom District, Krabi, and the Gulf of Thailand; (4) Ao Thung Ka Sawee, Muang Sawee District, Chumporn; and (5) Ban Khok Kham, Muang District, Samut Sakorn province]. The network for the conservation and sustainable management of natural resources for the Gulf of Thailand and Andaman has also been successfully set up for the protection of coastal and marine ecosystems.

### *Interpretative incentives*

Partnership with local governments, when wisely coordinated, could significantly contribute to raise local biodiversity conservation profiles. Because local governments are the major responsible authorities that permit coastal development, changing awareness of local governments is a crucial factor in habitat conservation. International conventions, such as CBD or Ramsar, as well as increased responsibilities of local governments in environmental protection through the decentralized and local autonomy system are identified as opportunities to initiate collaboration.

The terminologies and concepts used in conservation are recommended to be delivered in a more acceptable, and comprehensible way (*Choi and Kim*). It is because the field is less known to the general public and particularly to local people. Unfamiliar use of terminologies

such as 'biodiversity' tends to cause resistance. Strategic communication is a prerequisite for involving local people.

The small grant program of the WWF/KORDI Yellow Sea Ecoregion Support Project (YSESP) is supporting marine conservation actions of civil organizations since 2008. It aims at coming up with creative conservation actions that are proved effective on the ground, and in specific social, economic and political contexts at the local and the national levels. YSESP's small grant program offers practical lessons to raise the effectiveness of conservation actions. So far, the project has supported five organizations in RO Korea, whose activities vary from biodiversity monitoring to traditional folk plays. The small grant program had a focus on raising public awareness of biodiversity conservation and required active participation of local communities. Also, a partnership with local governments was recommended.

### *Cross-cutting issues and factors*

During the Regional Workshop on Gap Analyses for Marine Protected Areas in the ASEAN Region" in September 2009, the gaps identified included: management effectiveness and transboundary management; representation and effective MPA connectivity network; prioritization and identification of sites of global/regional significance to preserve biodiversity; coordination to share information, combine resources

### **Community-based monitoring**



Source: Han.

and conduct capacity building; management of migratory species; protection of threatened and wide ranging species; and transboundary MPA management (*Uriarte and Pollisco*). Gap analyses, sharing of lessons in addressing of transboundary issues, and analysis of successful experiences based upon providing livelihood benefits to poor communities, and application of integrated coastal management (ICM) to MPA management are the priority steps that need to be undertaken by ASEAN (*Chu Hoi*).

The MPA-IWRM-ICM interaction is being undertaken in Quang Nam, Vietnam where a demonstration project showing the interconnection between the Cham Islands MPA, integrated water resource management (IWRM) in Vu Gia–Thu Bon river basin and the Tam Hai coral and seagrass restoration in the south of the province through ICM activities is being implemented. The cooperation between the Cham Islands MPA and the ICM program in the Quang Nam coastal area will focus on biodiversity conservation and community livelihood improvement. Multistakeholder collaboration and community-participation cut across all component activities in the MPA and ICM exchange, including: (a) zoning plan development; (b) establishment of regulatory mechanism; (c) community-based livelihood improvement and impact assessment; (d) participatory assessment/ monitoring and evaluation; (e) initiation of alternative income generation activities; (f) participatory management plan development; and (g) participatory patrolling and enforcement (*Trinh*).

It was widely recognized and agreed at the workshops that MPAs are not the only solution. When MPAs are used in conjunction with other management tools, such as ICM and broad area fisheries management, they offer a

comprehensive strategy for marine conservation. The benefits that MPAs can deliver are also related to the effectiveness of management outside of MPAs (*Christie, et al. 2002; Cicin-Sain and Belfiore, 2005*).

## Making a world of difference: Conclusions and Recommendations

### *Why conserve habitats and ecosystems?*

Individual species and ecosystems have evolved over millions of years into a complex interdependence. This can be viewed as being analogous to a great jigsaw puzzle of inter-locking pieces. If you remove enough of the key pieces, then the whole picture is destroyed. With biodiversity, we have no idea how many key ‘pieces’ we can afford to lose before a collapse might happen; in some cases, we do not know which are the key pieces. The ecological and economic arguments for conserving habitats and biodiversity are therefore based on the premise that we need to preserve them in order to maintain our own life-support systems. Destruction of habitats disrupts natural processes and impacts human activities. Habitat loss and species extinction deprive humanity of resources for food, genetic stock, tourism, cultural identity, buffer to natural hazards and climate change impacts, and options for the future. Livelihoods and cultures are being irrevocably disrupted. Extinction of species affects the food chain and web of life.

### *How to conserve biodiversity?*

First, we have to make it a priority. Few would dispute that governments should aim to maintain biodiversity as well as encourage economic growth and alleviate poverty. These goals should not be seen as competing but rather complementary. Second, we need drastic changes in lifestyle. Available evidence indicates that,

in most regions of the world, the effects of economic activities degrade biodiversity. Third, we need to implement measures and fundamental actions, such as raising awareness, enhancing policies and governance, developing capacities and providing required resources.

### *Public awareness and education*

We need to raise awareness of communities (especially those living within critical habitats), policymakers, planners and managers, and the general public about the importance of habitats and biodiversity, their respective role and responsibilities concerning conservation, and the need for collaboration, knowledge sharing and networking. “Models for development must be re-examined and adjusted” to take into account the fact that there is only 1 finite earth. Ultimately, we must consider not only the institutional responses but also our personal roles in decreasing populations and consumption (*Gomez*).

### *Policies and governance*

A healthy ocean has many benefits — it increases food supply, preserves ecosystem resilience, and buffers against global climate change. To provide for healthy oceans, negative human impacts should be limited or regulated. This can be accomplished by ensuring that watersheds are managed vigilantly with sustainable land use practices that reduce the flow of sediments, nutrients, and pathogens into coastal waters; catch limits and gear restrictions for fisheries are implemented; and non-extraction zones are established to maximize the well-being of selected marine habitats and to allow them to provide valuable ecosystem services (*Roberts, et al., 2001*).

The choice of policy instruments is complex and depends on specific



institutional, economic and social needs. Policy options should be systematically analyzed to minimize the costs of public administration, monitoring and enforcement, as well as the private costs of implementation. It should be emphasized that the establishment of marine managed areas (MMAs) or marine protected areas (MPAs) is a long-term investment in secure and sustainable ecosystems and to secure the source of food, livelihood, and other benefits — to people, species and habitats — over time. There is also a need to work at the international level to enhance MPA networking and implement biodiversity management policies, for example to protect migratory species and aquatic resources. Moreover, biodiversity-related resources have non-use values to people everywhere that need to be reflected in local use decisions — without compromising local economic development.

There are many different forms of governance that affect coastal and ocean resources and services. These can range from traditional and local governance systems to national systems. We have to analyze roles and responsibilities, examine the legal system, and understand community perceptions regarding biodiversity conservation and management efforts. It also involves assessing the enforcement chain, including the phases of surveillance and detection, interception and arrest, prosecution, and sanctions.

### *Science to Action*

Applying scientific information into management is a complex process involving facilitation, translation, communication and capacity development. This process requires facilitating a partnership between scientists, decisionmakers, managers and communities; translating the scientific findings into accessible, understandable information; and communicating this

information to key stakeholders at the appropriate time. Integrated analysis of numerous, multidisciplinary studies and traditional knowledge is critical to maximize learning and ensure adaptive management.

Both social and ecological systems must be jointly considered: biological information and a sound scientific basis are needed and actions must be customized to the local situation (culture, religion, traditional knowledge, formal governance/management regimes) and management needs. Long-term cooperation mechanisms among local communities, scientists, private sector, and local government are necessary to ensure sustainable use of coastal and marine resources.

There is a need to explore diverse community-based approaches in protecting, restoring and managing key habitats that integrate traditional ecological knowledge, local wisdom and cultural beliefs. Drawing on the knowledge of traditional societies to develop new models of sustainability, which combine modern science and traditional ecological knowledge in coastal communities, was identified as critical. Sato-umi concepts and practices were recognized as providing an opportunity to assess human communities' relations with nature. Nonetheless, the speed of change is degrading the management systems that have been developed over time, we must revisit and adapt from past practices those that can work in our time.

### *Capacity development*

There is a need to help people and their institutions develop their capacity to perform better, sustain that performance over time, and remain resilient during change. It is essential to enhance the knowledge, skills, experience and capability of governments — both at local and national levels — to: (a) set in place necessary policies, laws and enabling

conditions; (b) develop plans (have long-term vision, develop strategies, operational plan, business and financial plan, integrated land- and sea-use plan, etc.); (c) effectively manage, implement the plan, monitor, and enforce laws and regulations; (d) resolve conflicts; (e) mobilize resources and financing; (f) conduct public awareness and social marketing activities and involve various stakeholders; and (g) collaborate with scientific community, civil society, private sector, and donors.

It is also essential to develop capacity of communities and other sectors on good practices, alternative/supplemental livelihood opportunities, and interagency and inter-sectoral coordination and cooperation to better manage coastal habitats and resources, and achieve both development and environmental objectives over time. Trained personnel and effective flow of information are also critical to ensure adaptive management.

Donors, international agencies, development partners as well as the private sector have a crucial role to play to support capacity development, knowledge management and sharing, and networking, and provide additional financing support.

Habitat and biodiversity conservation and MPAs can vary in governance structure. Most are run by government agencies, often at the local level. Some involve a certain form of cooperation between public (government), communities, private sector organizations (corporations, foundations), and NGOs, such as environmental groups), frequently called co-management.

### *The bottom line*

So why conserve biodiversity? Because biodiversity is the life of Gaia, all the plants, bacteria, protists, animals and humans, all of the habitats that they call home, all of the natural processes of which they are a part, the air we breathe,

the water we drink, and the food we eat, and all the essential basis of all goods and services on earth. Therefore, biodiversity conservation must be the natural thing to do.

## Acknowledgments:

### Co-convening Agencies:

#### Theme 3, Workshop 1 – Networking of Marine Protected Areas: Benefits, Good Practices, Standards and Next Steps:

ASEAN Centre for Biodiversity; Biosphere Connections/Ramsar Convention on Wetlands; and Department of Environment and Natural Resources

#### Theme 3, Workshop 2 – Indigenous Approaches to Habitat Protection and Restoration: Experiences in Sato-umi and other Community Initiatives: International EMECS Center of Japan

#### Theme 3, Workshop 3 – Innovation in Biodiversity and Habitat Conservation:

**Lessons Learned:** UNDP/GEF Yellow Sea Large Marine Ecosystem (YSLME) Project

## Presentations:

### Theme 3, Workshop 1 – Networking of Marine Protected Areas: Benefits, Good Practices, Standards and Next Steps

#### Workshop introduction

Fuentes, R.U., and T.M.S. Lim. "Introduction and Review of Recommendations from the Past EAS Congress."

#### Part 1: Benefits of Managing MPAs as a Network

Alino, P.M. "MPA Networking in the Philippines Finding Synergy Despite Adversity."

Claussen, J.D. and S.J. Green. "A Financial Management Framework for MPA Networks"

Pilcher, N. "Bio-physical Benefits of Managing MPAs as a Network."

#### Part 2. Good Practices in Developing Networks of MPAs

Chu Hoi, N. "A Review of Good Practices in Developing Networks of MPAs in the ASEAN."

Kasasiah, A. "The Management of MPA networks in Indonesia."

Kaur, C. "Management of National and Transboundary Marine Protected Areas in Malaysia."

Meepring, A. "Participatory Approach for Sustainable Natural Resource Management and Coastal Conservation."

## Box 5. Conclusions and Recommendations for Workshop 1. Networking of Marine Protected Areas: Benefits, Good Practices, Standards and Next Steps

Well-managed marine protected areas can deliver local financial, economic and social benefits to fisheries and other economic use sectors, especially to lower income groups, and to hazard management.

- There has been notable progress in managing some individual MPAs, but more MPAs and a much broader area still need to be protected and managed (including enforced and financed) effectively.
- MPA networks help improve good governance (e.g., transparency/communication, enforcement/accountability, use of information), management coverage and efficiency, and can help address transboundary issues.
- MPA networks must have very clear objectives, contributions to individual MPAs, and must be cost-effective.
- Biological information can help design an effective and efficient network of MPAs.
- Management and monitoring standards and guidelines can help improve management effectiveness.

### Recommendations:

- Economic sectors of local communities and governments should contribute resources to manage MPAs and not overly rely on external donors.
- Improve (individual) MPA management (including enforcement and financing) effectiveness along with increases in coverage and MPA networking.
- Networks should have a clear objective, value/contribution and should improve efficiency. Networks may be useful for pulling together political and financial commitment and contributions. Networks with similar activities can complement and streamline activities with each other. Develop a regional system (network) of MPAs (e.g., Regional Network of ASEAN MPAs).
- Strengthen collaboration across sectors and across geographic locations through ICM. Manage MPAs within a context of sustainable development (e.g., China's MPA system, which is embedded in its marine functional zoning system).
- Improve information and monitoring including gap analysis but act on available information. Strengthen the use of science and practical guidelines to drive management. Based on biological information, expand managed sites as needed to help secure critical habitats.
- Build upon existing available MPA network cases shared through existing channels (e.g., Sulu-Sulawesi cases published in Tropical Coasts magazine, peer reviewed publications and the Learning Partnership for MPA Networks, e.g., TNC, et al., 2008). Learning networks can later lead to the development of ecological networks as needed and possible.

### **Box 6. Conclusions and Recommendations for Workshop 2. Indigenous Approaches to Habitat Protection and Restoration: Experiences in Sato-umi and other Community Initiatives**

- The workshop recognized that long-term cooperation mechanisms among local communities, scientists, private sector, and local government are necessary to ensure sustainable use of coastal and marine resources.
- The sato-umi workshop stressed the need to explore diverse community-based approaches in protecting, restoring and managing key habitats which integrate traditional ecological knowledge, local wisdom and cultural beliefs. Drawing on the knowledge of traditional societies to develop new models of sustainability which combine modern science and traditional ecological knowledge in coastal communities was identified as critical.
- As coastal communities are faced with increasing habitat degradation and loss, sato-umi concepts and practices were recognized as providing an opportunity to assess human communities' relations with nature.
- The workshop highlighted that participatory and community-based activities to restore and rehabilitate an ecosystem, is an effective mechanism to encourage the community and other stakeholders to take part in the conservation and management to their own resources.

#### **Recommendations:**

From the lessons learned from the application of sato-umi concept in Japan, the workshop's recommendations highlighted the need for:

- Building on existing community-based partnerships aimed at empowering local communities and widening partnership participation to include multiple stakeholders from local to national levels;
- Exploring institutional frameworks to coastal management, which reflects local needs, circumstances and characteristics to ensure diversity in approaches;
- Integrating science into management decisions and managing habitats through application of biological information from all available data sources; and
- Recognizing the importance of ecological networks and interconnectivity of forest to sea, including human dimension, successful ICM needs to include a comprehensive management of the material flow from mountain-farm-river to the coastal sea.

On the indigenous knowledge and community-based approaches in protection, restoring and managing key habitat, the recommendations included:

- Developing potential models of sustainability that incorporate and build on the rich cultural histories and indigenous knowledge in Asia;
- Managing coastal habitats by increasing public awareness, adopting appropriate legislation and strengthening enforcement;
- Coordinating across sectors to improve governance and efficiency, and addressing transboundary issues; and
- Exploring institutional frameworks, such as sato-umi, for managing natural and human systems.

### Box 7. Conclusions and Recommendations for Workshop 3. Innovation in Biodiversity and Habitat Conservation: Lessons Learned

Generally, there is sufficient legislation, but country legislation and the obligations to international conventions (e.g., Ramsar, CBD) and treaties are not respected, therefore improving environmental awareness of central and local governments is essential.

- Local communities are the final defenders of the environment if other mechanisms don't function, therefore, providing accurate and understandable information to stakeholders can help empower, and allow informed decisions on selection of habitats for protection.
- Providing information of the economic value of the area is important but stakeholders should also be presented with an incentive package that involves them in protecting the environment.
- Involvement of the community in monitoring, decisionmaking and management gives a sense of ownership and user's rights should be respected.
- Management plans also need implementation plans.

Nateewathana, A. "Marine Protected Areas Networks: A Lesson Learned from Sea Turtle Conservation Projects in ASEAN Region"

Trinh, C.H. "Cooperation between Marine Protected Area and Integrated Coastal Zone Management in Quang Nam Province, Vietnam."

Wang Bin. "A MPA network approach in China: Status and Challenges."

#### Part 3. Common Goals, Targets and Standards for Partnership and Collaboration

Naoko Morimoto, M. Tupper and Kohei Hibino "Review and Potential MPA Management Effectiveness Standards for the Regional/National/Site level."

Pollisco, F. Jr. "Initiatives on Gap Analysis for MPAs in the ASEAN Region."

Young, L. "The Benefits of a Network of Wetlands of International Importance (Ramsar Sites) under the Convention on Wetlands."

#### Panel Discussion

Dr. Nguyen Chu Hoi, ASEAN Working Group on Coastal and Marine Environment; Dr. Somboon Siriraksophon, Southeast Asian Fisheries Development Center (SEAFDEC); Dr. Gabriel Antonius Wagey, Ministry of Marine Affairs and Fisheries, Indonesia, Dr. Alan T. White, The Nature Conservancy, USA

#### Theme 3, Workshop 2 – Indigenous Approaches to Habitat Protection and Restoration: Experiences in Sato-umi and other Community Initiatives

##### Part 1: The Sato-Umi Concept and its Application in Japan: Lessons and Application

Furukawa, K. "Potential of Urban Wetland as a Target of Habitat Restoration and Management."

Maegawa, M.\* and H. Uranaka. "The Ago Bay Management Initiatives in Japan."

Matsuda, O. "Community-based Sea Grass Bed Restoration and Management in Seto Inland Sea, Japan: Case of Akou Coast in Japan."

McDonald, A. "Concept and Practices of Satoyama Sato-umi Sub-Global Assessment in Japan."

Muroishi, Y., T. Yamada and N. Ogawa. "Supporting activities for the creation of Sato-umi in Japan."

Ukita, M.\*, M. Sekine and H. Yamano. "Case of Fushino River Estuary Initiatives in Japan."

Yanagi, T. "Concept and Practices of Sato-umi in Japan and Lessons Learned."

#### Part 2: Indigenous Knowledge and Community-based Approaches in Protecting, Restoring and Managing Key Habitats

Bina-de Guzman, A.. "When the Cradle Falls: A Case of Management Failure in a Community Marine Reserve in Southern Philippines."

Ferrer, E. "Indigenous Approaches to Access, Control and Protection of Coastal Resources: A review of some Philippine Experiences."

Hai, T. C. "Developing a Mechanism of Mobilization of Various Human and Material Resources in Planting, Taking Care and Protecting Urban Green Trees in Danang City."

Illisriyani Ismail\*, Kusairi Mohd Noh, Fatimah Mohamed Arshad, and Aswani Farhana Mohd. "Evaluation of Artificial Reefs in Peninsular Malaysia."

Jang, J. Y.\* and Y. R. Choi. "Community-Based Management Approach at Work in the Muan Wetland Protection Area: Changing Perception, Changing Practice and Changing Policy."

Savaris, J.P.,\* R. Joven, R. Golbeque and E. Advincula "Conceptual framework of organizing communities for effective mangrove management."

Soonthornnawaphat, S.\* and J. de Silva. "Implementing an Ecosystem Approach to Coastal Management through Community-based Organizations: An Example from the Andaman Coast of Thailand."

Suprpta, Dewa Ngurah. "Implementation of Tri Hita Karana, a Local Wisdom of Bali to Maintain Agricultural Resources."

Yeemin, Y.,\* Chaipichit Saenghaisuk, Sitiporn Pongsakun, and Makamas Sutthacheep. "Community Involvement in Coral Reef Restoration Projects in the Gulf of Thailand."

#### Theme 3, Workshop 3 – Innovation in Biodiversity and Habitat Conservation: Lessons Learned

Choi, Y.R. "Biodiversity Conservation Actions to Success: Lessons from the Small Grant Program of the WWF/KORDI Yellow Sea Ecoregion Support Project."

Han, D.-U. "Living with Black-Faced Spoonbill, the Symbol of Peace in the Yellow Sea: Developing a Programme of Cepa for Black-faced Spoonbill in Ganghwa Island, South Korea

Han, J. "Spotted Seals Protections in Liaodong Bay of Bohai Sea."

Oomura, T., K. Morohoshi, and Y. Hosokawa.. "Benthic Habitat Restoration along Seawall Under Co-benefit Strategy with Disaster Prevention - Pilot Work and its Restoration Monitoring in Tokyo Bay."

Moores, N. "Early Steps Towards the Conservation of the Avian Biodiversity of the Yellow Sea."

Na, J. "Yalu Estuary Reserve - Protection of Shorebird Habitat in China."

Park, G.S. "Biodiversity Loss on a Tidal Mudflat in Ro Korea and Management to Combat It"

Tobai, S. "The YSLME and WWF Partnership for Marine Biodiversity Conservation –Scientific, Policy, and Financial Benefits of an Ecosystem-scale Partnership."

Walton, M. "Introduction to the workshop, and ecosystem-based approach of the YSLME project."

- Zhang, X. "Protection and Rehabilitation of Seagrass Beds in Shandong Province, China."
- Zuo, P. "Heavy Metal Pollution in the Yancheng Biosphere Reserve, Jiangsu, China."

### Posters on Habitat Protection, Restoration and Management

- Khalid, S. "Role of Communication for Sustainable Management of Coastal Ecosystem."
- Manalo, J. "What is the best institutional arrangement for Marine Protected Areas in the Philippines?"
- Pan, M. "Thorns in Time: Acanthaster Planci Outbreaks as told by Mabini and Tingloy Batangueños."

## References:

- Agardy T, and Staub, F. 2006. Marine Protected Areas and MPA Networks. Educational Module. Network of Conservation Educators and Practitioners (NCEP). Available at: [http://ncep.amnh.org/index.php?globalnav=modules&secti onnav=module\\_files&module\\_id=221](http://ncep.amnh.org/index.php?globalnav=modules&secti onnav=module_files&module_id=221)
- Balmford, A., K.J. Gaston, A.S.L. Rodrigues and A. James. 2000. Integrating costs of conservation into international priority setting. *Conserv. Biol.* 14: 597-605.
- CCIF Analysis, Center for Applied Biodiversity Science 2003 PA Costs report, IFCA 2007 PA report.
- Christie, P., A.T. White and E. Deguit. 2002. Starting point or solution? Community-based marine protected areas in the Philippines. *Journal of Environmental Management* 66:441-454.
- Cicin-Sain, B. and Belfiore, S. 2005. Linking marine protected areas to integrated coastal and ocean management: A review of theory and practice. *Ocean and Coastal Management* 48(11-12): 847-868.
- Conservation International. 2007. "Japan." Available at: [www.biodiversityhotspots.org/xp/hotspots/japan/Pages/default.aspx](http://www.biodiversityhotspots.org/xp/hotspots/japan/Pages/default.aspx)
- FAO SOFIA. 2008. [www.fao.org/docrep/011/i0250e/i0250e00.htm](http://www.fao.org/docrep/011/i0250e/i0250e00.htm).
- Footprint Network . n.d. [www.footprintnetwork.org](http://www.footprintnetwork.org).
- GEO data portal. 2006. GEO Data Portal, compiled from UNFCCC-CDIAC. Available at: <http://maps.grida.no/go/graphic/co2-emissions-from-fossil-fuels-by-region>.
- Global Environment Facility. 2010. Defying Extinction: Partnerships to Safeguard Global Biodiversity. Available at: [www.thegef.org/gef/sites/thegef.org/files/publication/defying-extinction.pdf](http://www.thegef.org/gef/sites/thegef.org/files/publication/defying-extinction.pdf)
- Gomez, Edgardo. 2009. "Sustainable Adjustment/Retreat in the Coastal Zone during the Anthropocene." Theme Keynote for Habitat Protection, Restoration and Management, presented during the East Asian Seas Congress 2009, 23-26 November 2009, Manila, Philippines. Available at: [www.pemsea.org/eascongress](http://www.pemsea.org/eascongress).
- Hughes, T.P., D.R. Bellwood, C. Folke, R. S. Steneck and J. Wilson. 2005. "New paradigms for supporting the resilience of marine ecosystems," *TRENDS in Ecology and Evolution*, Vol.20, No.7, July 2005. Available at: [http://doc.nprb.org/web/emc/Hughes%20et%20al%202005\\_ecosystem%20resilience.pdf](http://doc.nprb.org/web/emc/Hughes%20et%20al%202005_ecosystem%20resilience.pdf).
- IUCN. 2008. Towards Networks of Marine Protected Areas. The MPA Plan of Action for IUCN's World Commission on Protected Areas. Laffoley, D. d'A., (ed.). IUCN WCPA, Gland, Switzerland. 28 pp.
- Japan Satoyama Satoumi Assessment 2010. Satoyama-Satoumi Ecosystems and Human Well-being: Socio-ecological Production Landscapes of Japan – Summary for Decision Makers. United Nations University, Tokyo, Japan.
- Japan sub-global assessment report (JSGA). 2009. "Governance structure, 2008." UNU-IAS Japan SGA Secretariat.
- Japan Ministry of the Environment. 2009.
- Kaufman L and Tschirky J. 2010. Living with the Sea. Science and Knowledge Division, Conservation International, Arlington, VA, USA. Available at: [www.conservation.org/Documents/CI\\_MMAS\\_Science-to-Action\\_Living\\_With\\_the\\_Sea.pdf](http://www.conservation.org/Documents/CI_MMAS_Science-to-Action_Living_With_the_Sea.pdf).
- Mongabay.com. 2006. Available at: <http://news.mongabay.com/2006/1213-wwf.html>.
- Mumby, P.J.\*, R. Iglesias-Prieto, A. J. Hooten, P.F. Sale, O. Hoegh-Guldberg, A. J. Edwards, C. Drew Harvell, E.D. Gomez, N. Knowlton, M. E. Hatzioles, M.S. Kyewalyanga, and N. Muthiga. 2011. "Revisiting climate thresholds and ecosystem collapse." *Frontiers in Ecology*, Vol. 9.
- Orbach, M. and L. Karrer. 2010. Marine Managed Areas: What, Why, and Where. Science and Knowledge Division, Conservation International, Arlington, Virginia, USA.
- PEMSEA. 2010. Papers presented during the EAS Congress 2009. International Conference on Sustainable Coastal and Ocean Development, Theme 3 Habitat Protection, Restoration and Management, 23-26 November 2009. Partnerships in Environmental Management for the Seas of East Asia. Available at: [www.pemsea.org/eascongress](http://www.pemsea.org/eascongress)
- Roberts, C.M., J.A. Bohnsack, F. Gell, J.P. Hawkins, and R. Goodridge. 2001. Effects of marine reserves on adjacent fisheries. *Science* 294: 1920–1923.
- Siriraksophon, S., C. Paterson and J. Pernetta. 2009. "Development and Operation of a Regional System of Fisheries Refugia for the South China Sea and Gulf of Thailand." Abstract submitted for the East Asian Seas Congress, Theme 3 Habitat Protection, Restoration and Management, WORKSHOP 1: Networking of Marine Protected Areas: Benefits, Good Practices, Standards and Next Steps.
- TNC (The Nature Conservancy), WWF (World Wildlife Fund), CI (Conservation International) and WCS (Wildlife Conservation Society). 2008. Marine protected area networks in the Coral Triangle: development and lessons. TNC, WWF, CI, WCS and the United States Agency for International Development, Cebu City, Philippines. 106 p.
- UNEP/GRID-Arendal. 2011. "Coastal population and shoreline degradation." Image Adapted from UNEP 2002b, based on Burke and others 2001, Harrison and Pearce 2001. *Global Environment Outlook 4 (GEO-4)*, 2009. Cartographer: Bounford. com and UNEP/GRID-Arendal - <http://geodata.grid.unep.ch>; [www.unep.org/geo/geo4/media](http://www.unep.org/geo/geo4/media); and <http://maps.grida.no/go/graphic/coastal-population-and-shoreline-degradation>
- UNEP GPA. 2011. "Blue Diamond." 4 May 2011. [www.gpa.unep.org/index.php?option=com\\_content&view=article&id=55&Itemid=41](http://www.gpa.unep.org/index.php?option=com_content&view=article&id=55&Itemid=41)
- USAID. n.d. "Biodiversity Conservation." Available at: [http://usaid.eco-asia.org/programs/bio\\_con/index.html](http://usaid.eco-asia.org/programs/bio_con/index.html)
- Wilkinson, C.R., ed. 2004. Status of the Coral Reefs of the World: 2004, Global Coral Reef Monitoring Network and Australian Institute of Marine Science .
- World Commission on Protected Areas (WCPA). 2008. Laffoley, D. d'A., (ed.) 2008. Towards Networks of Marine Protected Areas. The MPA Plan of Action for IUCN's World Commission on Protected Areas. IUCN WCPA, Gland, Switzerland. 28 pp.
- Wood, L. J., L. Fish, J. Laughren and D. Pauly. 2007. Assessing Progress towards global marine protection targets: Shortfalls in information and action. *Oryx*, 43(3), 1-12.
- World Summit on Sustainable Development (WSSD). 2009.. A/CONF.199/20 chapter 32(c) – IUCN (2009). Draft Bahrain Action Plan for Marine World Heritage.
- World Wide Fund for Nature (WWF). n.d. "WWF - Problems in the Coral Triangle ." Available at: [www.panda.org/what\\_we\\_do/where\\_we\\_work/coraltriangle/problems](http://www.panda.org/what_we_do/where_we_work/coraltriangle/problems).
- Young, L. 2009. The Benefits of a Network of Wetlands of International Importance (Ramsar Sites) under the Convention on Wetlands. Paper presented during the EAS Congress 2009, Manila.

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# FOOD SECURITY and LIVELIHOOD MANAGEMENT

## Introduction

A healthy food supply, livelihood and economic prosperity are at the very heart of the shared vision of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA). The maintenance of the Seas of East Asia as a major source of food and means of survival of its people is and will always be the overriding concern in management efforts.

Fish is so important to human survival and has long been used as an icon of food, and in perhaps the most famous example of such symbolic use of the fish as food, the act of fishing is further used as the representation of a human surviving with dignity, the most basic of human aspiration and expectation next to mere survival. Millennia after that Chinese proverb

was formulated, we learn that the human brain, the anatomical part that has elevated humans above other creatures, is dependent upon fish to maintain its intelligence aside from the body needing it to remain healthy. This also ties in with the theory that humans evolved and propagated through the world along the coasts, as the docosahexaenoic acid (DHA) provided by seafood facilitated the evolution of the human brain.

Fish and seafood provide DHA, an Omega-3 fatty acid that the brain needs to function efficiently. The general lack of DHA in the current human diet could lead to mental health problems. This underscores the urgency of efforts to manage the world's fisheries and maintain a healthy supply of this food (Crawford).

## The Role of Fisheries in an Urbanized World

In December 2009, participants of the workshop on The Future Role of Fisheries in an Urbanized World received a review of the development of fisheries over the last century or so. It was noted that fishing effort intensified twice in the twentieth century — the first after the Second World War, as a natural response to proscriptio during the war, and the second time during the 1970s, coinciding with motorization and invention of new gear (*Funge-Smith*). The use of satellites, fish finders and GPS to locate targets has since then further increased fish catches through the years. Fishing capacity and catches in the East Asian Seas are enormous, with close to two million fishing vessels recorded (*Funge-Smith*), reflecting the importance of fish to the people of the region (*Weeratunge*). Among these, the small-

scale fishing concerns involve at least 37.3 million people (including those in aquaculture), out of the total 43.5 million in the world; majority of them are in Southeast Asia (*Salayo and Perez*).

Due to the intensive fishing, demersal species were depleted in the 1970s, causing a change in target species over the years. Smaller pelagic fish comprise the bulk of current catches, but these are also declining and even smaller, trash fish are taking their place. These include juveniles of commercial species (*Funge-Smith*).

## Pressures

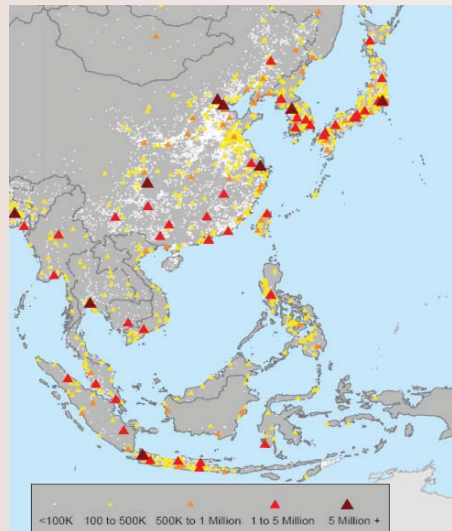
### Urbanization

The increasing global population by itself is a pressure on fisheries (**Box 1**), but the trend of urbanization presents yet another kind of pressure. In the Seas of East Asia region, there was a shift in the population from predominantly rural to predominantly urban (48 percent) within the span of 30 years, and this figure is expected to increase to 55 percent by 2020 (*Weeratunge*). As part of this pattern, fishing ports, towns and villages have merged into urban agglomerates; subsistence fishing has declined, and fish production is targeted for markets. Furthermore, there has been a depletion of capture fisheries resources due to overfishing, pollution, habitat destruction, land reclamation and coastal construction. Fishing communities have been marginalized by the growth of industrial and service sectors in coastal areas, and former fishworkers have shifted to other livelihoods or migrated elsewhere (*Weeratunge*).

Urbanization changes consumption patterns and preferences (**Figure 1**), thus (*Weeratunge*):

- Fish heterogeneous commodity and demand is subjected to variability in taste, income and price;

### Box 1. The urbanization sprawl in East Asia (*Weeratunge*).



The majority of countries and population of the region will be urban by 2020, and in all urbanized countries, except China, the extent of urbanization will be higher than 60 percent. Most of these urban areas are coastal areas and were already urbanized by 2000; coastal urbanization proceeded faster than average urbanization.

- Values and tastes (e.g., increased demand for high value species, sushi, live fish) can differ according to the consumer's class, ethnicity and gender; and
- There is increased consumer awareness of safety and hygiene (thus, the institution of certification, standards, among other things).

These aspects are not yet well-researched in many EAS countries.

It was also noted that the urbanizing and rural countries in the region are the top 4 exporters of fish (China, Thailand, Vietnam, Indonesia), and urbanized or urbanizing countries are the top 3 importers (Japan, China, RO Korea).

It was concluded that (*Weeratunge*):

- Most EAS countries and the region as a whole will be urban by 2020;

### Figure 1. Urbanization and demand for Fish.

#### Projections (%) for Fish Consumption, 2005-2020

Country	Urban share 2005	Urban share 2020	Growth rate/year in total consumption	Growth rate/year in rural consumption	Growth rate/year in urban consumption
China	70.53	87.19	2.58	-2.00	3.62
Indonesia	46.08	55.55	1.06	0.12	1.92
Malaysia	59.38	5.67	9.95	12.55	-1.85
Philippines	63.12	75.03	0.5	-1.56	1.38
Thailand	36.34	33.18	1.83	2.07	1.37
Vietnam	33.14	30.61	1.73	1.91	1.33

(*WorldFish, 2008: Asia Fish Model*)

- Urban share of fish consumption is higher in urbanizing (China) and urbanized countries (Philippines)
- Growth rate in urban fish consumption is higher than rural rate - except Malaysia and predominantly rural countries.

- Urbanization will contribute to reducing capture production, marginalizing fishing communities and reducing employment in fisheries;
- Urbanization will contribute to reduction in overall poverty, increases in incomes and demand for fish;
- New consumption patterns will increase demand for high-value fish among the well-off and could spur unsustainable fishing and aquaculture practices;
- Fish is sufficiently important in the diet that the demand for low-value fish will continue among the rich and poor;
- Aquaculture will fill the gap for this demand — through increased fish and increased incomes; and
- Conflict between fish for food and feed for aquaculture can decrease fish security for the poor.

In order to better prepare for an urbanizing region, a better understanding of the impact of urbanization on the fisheries sector and fishing communities is needed to manage capture fisheries sustainably. Likewise, fish consumption patterns of different groups should be better understood — with reference to tastes, preferences, substitutability, and safety — as well as how these are linked to regional and local markets.

### **Climate change**

The East Asian Seas regional fisheries could be severely affected by climate change (*Kim and Low*). The effects of climate change are being felt in the region in the form of severe and destructive storms and storm surges, changing precipitation patterns and rising sea temperature (and the warming rate is very steep). Sea level rise will eventually affect the region as well.

Storms impact on fisheries in the following way:

- coastal areas are destroyed;
- fishing patterns and seasons are disrupted;
- fishing vessels and aquaculture facilities will be harmed; and
- fish school formation and primary-secondary production are disrupted.

Intense rains have already affected aquaculture facilities, in addition to flooding homes and farmlands.

There is not enough science being applied in the region on “socioecological interaction” and climate change. More effort is needed for the development of innovative solutions and effective adaptation and mitigation strategies. Stakes are high for the Seas of East Asia, as, given its level of production, consumption and trade of fishery products, the region currently has the strongest influence on market, employment and economy of world fisheries (*Kim and Low*).

### **Threats to food safety**

Perhaps the best-known threat to the safety of fish and seafood is shellfish poisoning, and the red tide problem recurrent in the region (and other parts of the world). The toxins (primarily *Pyrodinium bahamense*) that may cause death or injury are naturally-occurring and widely distributed in tropical Asia. Their cysts live for more than 100 years in the sediment and are resistant to adverse conditions. They can be spread very easily by water movement, transport and other maritime and aquaculture activities. Although the most serious episodes of shellfish poisoning occurred in the 1990s, it continues to be a threat. Shellfish are the most inexpensive of seafood, are easily cultivated, and thus are popular among low-income groups (*Fukuyo and Dao*).

The red tide episodes have been found to coincide with the El Niño Southern Oscillation (ENSO) phenomenon due

to the shifting of high temperature waters causing upwelling and phytoplankton bloom. The only way to control cases of shellfish poisoning is to continuously monitor the products. On the prevention side, measures to minimize the spread of toxins, built into operational procedures, need to be instituted in aquaculture facilities (*Fukuyo and Dao*).

The International Atomic Energy Agency (IAEA) Marine Environment Laboratory (MEL) in Monaco assists countries in the region in the use of nuclear technologies for research into the transfer of shellfish toxins in the marine food chain, and related research to assure safe consumption, trade and export of seafood (*Jeffree*). It is interesting to note that MEL emphasizes the combination of scientific study with economics for more effective adaption.

In general, consumer information on fish products is largely unavailable in Asia (*Williams*). The AsiaPacific FishWatch project is trying to change this by providing accessible and reliable information on price, safety, sustainability, and food security of fish for the use of consumers, the general public, fish exporters and importers, fisheries managers and scientists. This includes the steps taken “from the water to the mouth”, including women’s roles, to bring the fish to the consumer.

There are different supply chains for different markets (*Williams*):

- fresh and processed local
- distant urban
- fresh and processed export
- re-processed

It was argued that reliable public information is an important step to assuring the consumer of fish safety along increasingly complex supply chains. This is also needed in creating greater demand for sustainable and fair fish production and trade. A project is



underway that will post comprehensive information, compiled through the cooperation of experts, networks and organizations, onto a website (Williams).

### Sustainability

Capture fisheries has suffered many reversals due to unsustainable fishing methods. The industry is in constant search for approaches that will keep fish stocks healthy.

The Code of Conduct for Responsible Fisheries, adopted in 1995, enshrines the ecosystems approach to fisheries, but has not been widely implemented, perhaps because it is very difficult to change from the mindset of optimizing fish harvests. It is also difficult to operationalize the ecosystems approach, even if it has been enshrined in many global agreements (such as Agenda 21, the Rio Declaration and the Biodiversity Convention. FAO only recently published the Ecosystem Approach to Fisheries (EAF) Guidelines.

The initiative of the World Wide Fund for Nature in sustainable tuna fisheries in the countries around the Coral Triangle (CT) focuses on that part of the supply

chain where there are fewer, more influential stakeholders who can provide the biggest impacts. (The tuna project is but one part of the whole Coral Triangle Program.) Transaction costs to accommodate large numbers of stakeholders with differing perspectives is proportionately huge. Faced with such a constraint, WWF focuses on canneries and processors and trading and retail companies as the primary agents of changing behavior toward more responsible practices. They envision a market pull by targeting these two groups with advocacies on best practices, promotion of fisheries certification, and sustainable sourcing policies (Figure 2); the impacts of which, could, at the same time, influence fishers' buy-in to sustainable fisheries practices and how tuna patrons could be helped to choose sustainably caught tuna.

Through this initiative, WWF is initiating the process of implementing an ecosystem-based approach to fisheries management, and addressing issues of excess capacity, bycatch, IUU fishing and destructive fishing practices.

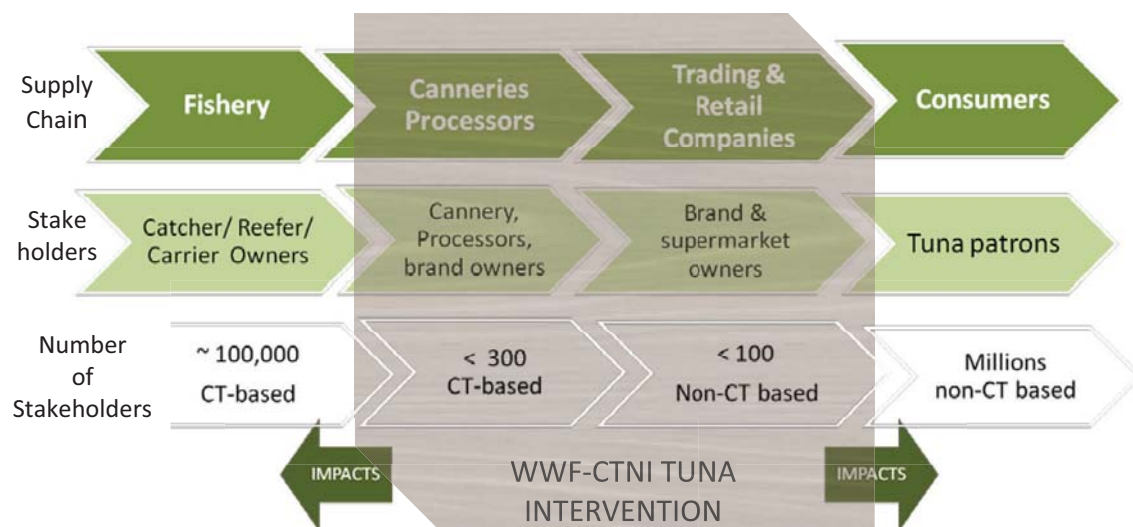
The mission of the FISH (Fisheries Improvement for Sustainable Harvests)



Photo source: New Straits Times, 6 July 2008

Project in the Philippines is to establish fisheries management systems that will catalyze change in fisheries exploitation in four ecologically important areas (and which can be sustained and replicated beyond the project lifespan) (Silvestre, et al.). The project applies the ecosystems approach at the local level, using science and employing an adaptive management style. The goal is to have a 10 percent increase in fish stocks within seven years (from 2004).

Figure 2. The tuna market pull approach (Muldoon).



The project addresses three linked aspects of management: growth mechanisms (MPA/refugia network, environment-friendly enterprises, species-specific management, and area/season closures), control mechanisms (gear restriction and size limit, registration and licensing, zoning of sea uses and fishing areas, law enforcement and policy development), and maintenance mechanisms (management planning, capacity-building and institutional development, inter-local government unit (LGU) management arrangements, constituency-building and private-public sector partnership). The issues and opportunities for addressing these are illustrated in **Figure 3**.

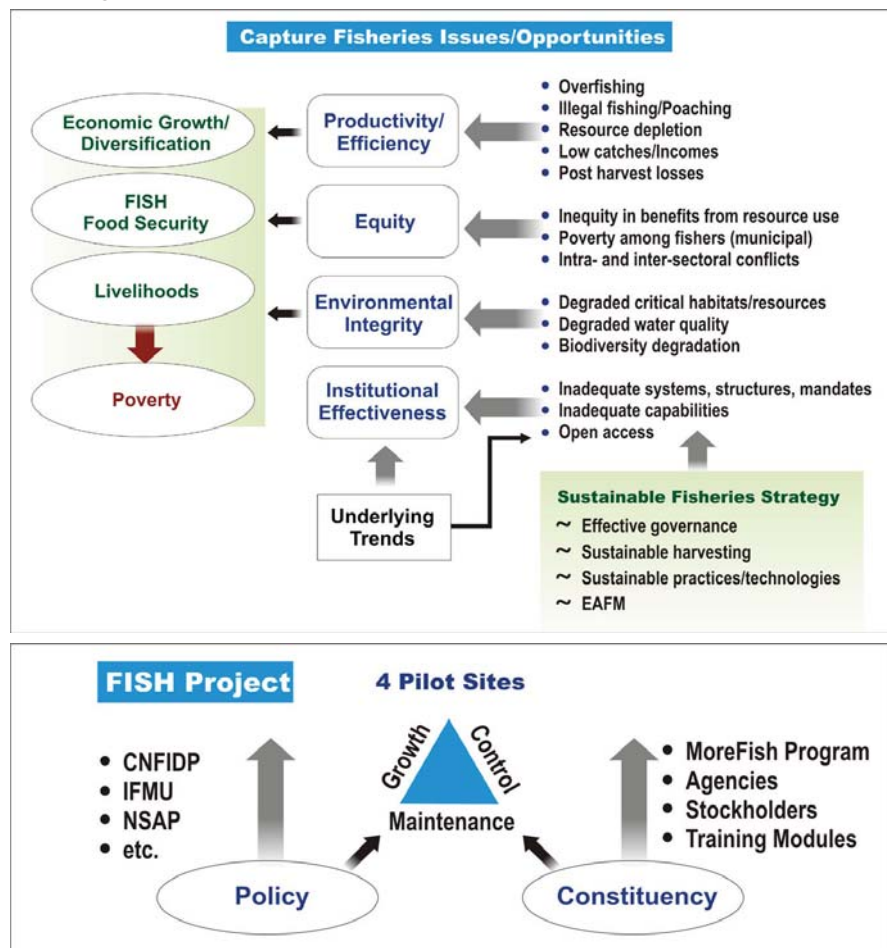
The project has already resulted in improved local constituencies, policies/ordinances, plans and action programs, and capacities collectively leading to, among others, increased catches and mitigation of local capture fisheries issues (PEMSEA, 2009c).

A WorldFish project also being undertaken in four study areas in the Philippines (Perez and Garces) assesses problems and issues in local fisheries utilizing a prioritization scheme (Participatory Systems Appraisal). Interventions are determined by analyzing problems according to whether they are:

- Symptom (elements greatly influenced by other elements)
- Critical (accelerator or catalyst)
- Buffer (development activities expected to have little impact)
- Motor/Lever (active element with predictable impacts)

For Motor/Lever problems, priority interventions should be applied. For critical problems, there should be intervention with caution. This system is designed to help prioritize management interventions and

**Figure 3. Capture Fisheries Issues/Opportunities** (Silvestre, et al.).



conserve limited management resources.

A basic need to establish sustainability in fisheries is competent fisheries personnel with a good fisheries education. Unfortunately for the Philippines, fisheries education in the country has become non-responsive and non-relevant (Juliano). Issues include a lack of trained faculty, irrelevant curriculums, poor laboratory facilities and field studies, and resulting stiff competition of fisheries graduates from graduates of other courses. It was recommended that the education agency of the country turn its attention to making fisheries education more relevant. One measure is to implement the Agriculture and Fisheries Modernization Act (Juliano).

In Japan, communities have become active participants in educating

people about fisheries and the environment (Seino).

One community decided against extending a conventional dike in order to keep alive a dynamic ecosystem (habitat of a number of endangered species) in the mouth of Maite River, keep it thriving and use it to educate children and other people. Local fisheries became the teachers, and fisheries cooperatives acted as research, study, education and proposal institutions. In such instances, what is crucial is that information is accumulated and transmitted by local people.

In another case, marine trash was accumulating on the coast of Fukue island. The community became a research team in a project to determine where the trash was coming from and what to do about it. They learned how to gather the trash and process

it. In this case, the knowledge of local inhabitants helped formulate the research hypothesis, whereas scientists provided the scientific methodology. This gave rise to a new scheme for waste disposal, where the national and prefectural governments provided technical advice and a policy proposal, the municipal government and community-based organization provided field studies and the community-based organization provided the manpower. NGOs and scientists provided scientific knowledge.

## Addressing Food Security and Sustainable Aquaculture

### Aquaculture

Population growth and consumption trends (or diet habit changes) (*Weimin*) together with stagnant capture fish production, led to the rapid development of the aquaculture sector in the last two decades. Environmental issues were also a key driver (*Philips and Beveridge*). It is foreseen that by

2030, fish supply from aquaculture will exceed that from capture fisheries (*Kim and Low*). As of now, it is the steadiest and fastest growing food production industry in the world (*Weimin*).

Some statistics are presented in **Box 2**.

East Asia is producing a hefty percentage of the world's aquaculture. In 2006, 80 percent of the world total aquaculture came from East Asia (*Kim and Low*).

This represents a "huge opportunity and responsibility" for aquaculture (*Philips and Beveridge*). Aquaculture contributes to MDG goals by providing food and livelihood to the global population. The responsibility is how to do this sustainably.

## Challenges

### Sustainability/Environmental awareness

Aquaculture will need to be seen as efficient resource user contributing

to food and better ecosystem management. This includes such things as better siting, better farming systems and management, focus on small-scale farmers, markets, and better institutions (including new ways of communicating) (*Philips*). Because aquaculture expanded very quickly, institutions and governance have had to catch up. More efforts are needed to harmonize regulations as well as promote sustainable aquaculture.

There are some very good cases of techniques for sustainable aquaculture. Integrated multi-trophic aquaculture (IMTA) has been used to address problems of eutrophication and waste nutrients from mariculture practices. Fish, seaweed, and shellfish were cultivated together in Sanggou (Sungou) Bay, China, to mutually benefit from their respective waste materials (*Fang, et al., Figure 4*). From Japan comes an example of scientific multi-species marine ranching (*Tanaka*). Lessons learned from the marine ranching project are presented in **Table 1**.

A project called EMMA or the Norad-Environmental Monitoring and Modelling Aquaculture in Risk Areas in the Philippines (2004-2006) was carried out to determine whether the number of fish cages in Taal Lake in the Philippines exceeded the water body's carrying capacity. The study recommended some measures to increase carrying capacity (such as combining cultivation of fish with certain plants and filter feeders, proper site selection and management practices) (*Hernandez-Palerud*).

The culture of seaweed in combination with other aquaculture products is also part of integrated multi-trophic aquaculture (IMTA) (**Figure 5**) (*Ik Kyu Chung*, Pusan National University, RO Korea). Because seaweeds are natural filters for excess nutrients and valuable products in themselves, the application of this system would be very useful to

### Box 2. Aquaculture and Food Production.

#### Aquaculture — Rapid developing industry (performance)

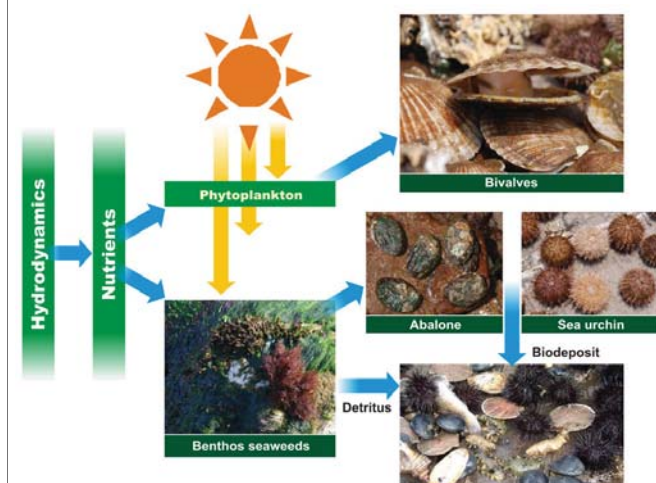
- Aquatic animals — a traditionally important source of animal food for human beings.
- Increasing demand (population growth and diet habit change) and stagnant capture fish production (up 6.78 percent during 1987-2007) have led to rapid development of the aquaculture sector during the last two decades:
  - o World aquaculture production has grown at an average annual rate of 8.18 percent during 1987-2007.
  - o The total world aquaculture production reached 65.19 million tonnes in 2007
- Aquaculture — the steadiest and fastest growing food production industry in the world.

#### Fastest Growing Animal Food Production Industry

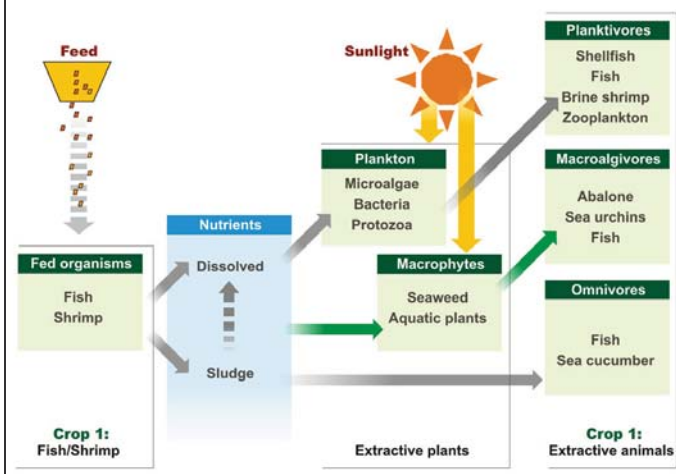
- In 1987, the aquaculture sector contributed 3.63 percent of world animal food production.
- In the next 20 years, cultured aquatic animal food production increased by nearly five times.
- In 2007, aquaculture contributed 10.78 percent of the world animal food production.
- In comparison, poultry production (fastest growing among animal food production sector) increased by 144.10 percent during 1987-2007.
- Contribution of capture fisheries dropped from 29.02 percent in 1987 to 19.29 percent in 2007.

Source: FAO.

**Figure 4. IMTA for Sea Ranching practiced in Sungo Bay, China (Fang, et al.).**



**Figure 5. Low Pollution Mariculture (IMTA) (Ik Kyu Chung).**



**Table 1. Lessons Learned from the Marine Ranching Project (Tanaka).**

Marine environment	Communities
1. Enhancing the whole ecosystem not just fish	1. Involving local fisher from the first stage
2. Appropriating the intrinsic ecological features of the area in the design	2. Value scientific knowledge and local knowledge
3. Maintain the biological niche	3. Not just fish stock measures but ecosystem measures!

sustainable aquaculture. Seaweeds can also be used for carbon sequestration.

In the Philippines, the government has adopted the mariculture park concept as a regulatory tool to ensure environmental soundness and overall sustainability of fishcage culture. This involves a process beginning with an initial environmental assessment of the proposed area. Having passed that, the local government declares the area a mariculture park and then enters into an agreement with the national fisheries bureau to develop and co-manage the park. Regular monitoring is conducted. The direct impact is the elimination of destructive, and illegal fishing methods and an increase in fish recruitment. The mariculture park approach also provides employment to thousands of workers and contributes to the national goals of food security and economic growth (Adora). The list of established mariculture parks are presented in **Figure 6**.

Aquaculture is very important to local concerns and local institutions are taking action to improve conditions. An analysis of fishkills in Bolinao, Philippines found that it was caused by overcapacity. A Marine Emergency Response System (MERSys) for mariculture areas was instituted to enable local governments to anticipate and respond to marine-related emergencies including such fishkills, and others like poisoning from shellfish, fish and seaweeds (McGlone, et al.). This included training, advocacy and public information, partnership agreements among stakeholders including the local governments, and institutionalization. The study recommended that the environmental impacts had to be addressed through mitigation measures to ensure sustainable mariculture.

Chonburi, Thailand adopted and implemented a Coastal Strategy for sustainable development of the province. The Strategy covered

tourism, promotion of environmental awareness, seafood production and livelihoods. Seafood is a major tourist attraction in the area, thus the importance of aquaculture. Activities important to sustainable development were awareness-building, participatory activities in beach clean up and habitat protection and restoration (mangroves, seagrass, coral reefs, including artificial reef establishment), a Youth Guide scheme, improving the governance mechanism, and the sharing of experiences for replication in other coastal areas (Khunplome). In Jakarta Bay, a study was undertaken on how to apply the ICM approach towards "eco-friendly" aquaculture. Aquaculture in Jakarta Bay is currently practiced in an unsustainable way, impacting on the tropical ecosystem and capture fisheries, although the proper implementation of Government Act No. 27, 2007 would result otherwise. The proposed strategy is to build and adopt a shared vision for integrated sustainable development

and institute ICM and implement the law (*Zamani*).

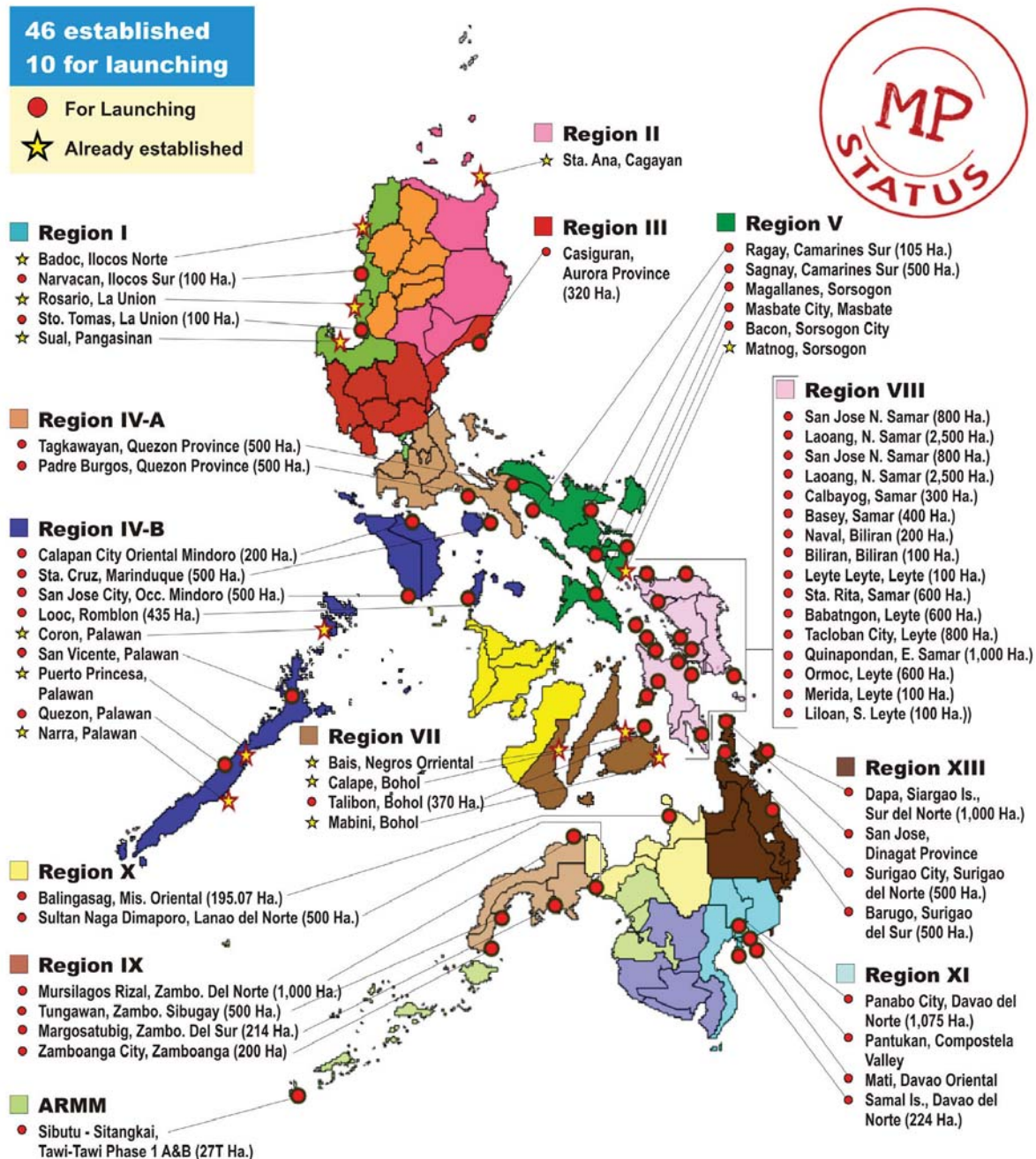
### Food Security

Fisheries play a big role in national food security in the region (**Box 3**). For example, China produces slightly more than it needs domestically, and the excess is exported (*Weimin*). We know

that fish provides a high proportion of protein in the East Asian diet, as it should, according to Prof. Crawford. In low-income and food deficit countries (LIFDCs), while consumption of fish by weight is lower, the percentage of fish to total animal protein is 18.5 percent, which is higher than the world average (*Weimin*).

However, the changing diet habits, globalization, trade in flux — all these could potentially change how much fish remains available to low-income countries and low-income groups in other countries. Even pet food is becoming a competitor for the supply of fish (*PEMSEA, 2009c*). These are some of the issues that need to be addressed.

Figure 6. Mariculture Parks in the Philippines (*McGlone, et al.*).



## Livelihood Management and Sustainable Coastal Tourism

### Fisheries as livelihood

The conditions of small-scale workers that depend on fisheries, capture and aquaculture, directly for food, and for livelihood is one major concern that needs to be highlighted. In Asia, 80 percent of aqua-farmers are small-scale (*Weimin*). *Salayo and Perez* describe this group as composed of large numbers and yet characterized by poverty, insecurity of food and livelihood, and marginalization. They are directly dependent on the resource (often depleted and overfished) for food and livelihood. And yet they play a large role in the provision of food not just locally or nationally but globally as well. If empowered, they could be an engine for development and social change, as well as conservation and management. This could be done by providing them with socially equitable access rights, equitable development between rural and urban communities, giving a political or governance character to poverty issues, mainstreamed into society and be allowed to participate in increased productivity and secured economic benefits. They need to be educated about sustainable fishing and aqua-farming and be involved in climate change adaptation and mitigation.

Taking these steps would contribute to meeting the Millennium Development Goals.

Aquaculture contributes to poverty alleviation by providing employment and income (*Weimin*). Aside from the aqua-farmers and workers, other people derive their livelihood from the aquaculture sector if inputs manufacturing, products processing and marketing are included. With respect to poor rural farmers and fishers, aquaculture can easily be adopted as an alternative livelihood, as it is easily integrates into other rural livelihood

### Box 3. Contribution to Food Security — Supply of Fish Products.

- Capture fisheries contributed over 90 percent of the total aquatic animal production globally before the 1980s.
- Aquaculture contributed 41.69 percent of the total world production of aquatic products in 2007.
- Capture fisheries and aquaculture supplied the world with about 110 million tonnes of food fish in 2006.
  - o Providing an apparent per capita food fish supply of 16.7 kg (live weight equivalent); and
  - o Aquaculture accounted for 47 percent.
- Since 1992, Aquaculture contributed to a modest annual growth rate of about 0.5 percent in per capita food fish supply outside China while offsetting the effects of stagnant capture fishery production and a rising population (about 1.4 percent annually).
- Aquaculture contributes to capture fisheries production through culture-based fisheries/ocean ranching.

Source: FAO

activities. It potentially has a much higher return than crop farming and other agricultural activities. The demand for aquaculture products will rise, as it is foreseen to play a huge role in feeding the world population (*Weimin*).

A project, run by the Spanish AECID (Agency of International Cooperation for Development) with the participation of the Food and Agriculture Organization (FAO) is a holistic regional fisheries livelihoods project targeting small-scale fishing communities in six major coastlines in Southeast Asia. The project identified problems as to fishing communities as follows (*Funge-Smith*):

- Limited mechanisms and capacity;
- High vulnerability of small-scale fishers and their families;
- Loss of fish and aquatic product value;
- Limited alternative livelihood options; and
- Poor access to microfinance to diversify income.

The project goals are in the form of:

- Co-management mechanisms for sustainable utilization of fishery resources;

- Measures to improve safety and reduce vulnerability for fisher communities;
- Measures for improved quality of fishery products and market chains;
- Diversified income opportunities for fisher families;
- Facilitated access to microfinance services for fishers, processors and vendors; and
- Regional sharing of knowledge in support of livelihood development and reduced vulnerability for fisher communities and of sustainable fisheries resource management.

### Sustainable Coastal Tourism

Despite a slower growth in global tourism, Asia-Pacific tourism continues to increase significantly in scale and scope (*Hampton*). Tourism is a major contributor to the GDP and employment of the Southeast Asian countries. In the Philippines alone, the tourism industry is projected to have a direct output exceeding US\$ 5 billion, generating an additional 200,000 jobs by the end of the decade (*Fortes*).

**Figure 7** presents the tourism direct employment in the Philippines (2002-2010).

In recent years, the scope of tourism has shifted from long haul inter-continental tourism to regional and domestic tourism. Such tourism trends have spatially concentrated on coastal areas and islands (*Hampton; Wong*).

In Malaysia, research has shown that the rise in small-scale coastal tourism is related to the increasing number of backpackers and domestic tourism. For instance, the Perhentian Islands, 20 km off the east coast of Peninsula Malaysia, were first frequented by backpackers in the early 1990s. Three years later, small businesses catering to the tourists were started on the island.

While the trend is towards upscale tourism and backpackers are often seen negatively, several studies showed growing evidence of positive economic impact of small-scale tourism (*Hampton, 1998; Scheyvens, 2002*). This is due to lower economic leakages and stronger linkages between goods and services provided by small-scale tourism as opposed to mass tourism. Local tourism also requires lower capital requirements, enabling the entry of small-scale businesses, as in the case of the Perhentian Islands. This creates

ownership among communities and small-scale business.

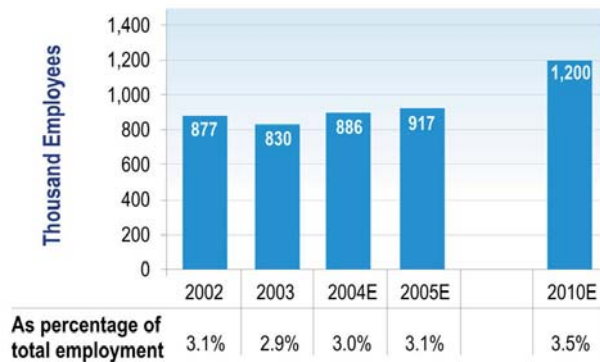
**Community-based tourism and conservation**

Community-based tourism in the case of the three Thai communities is an effective tool for the communities already possessing strong experiences in natural resources management. It can be promoted as a learning process for both the hosts and guests, rather than a mere economic activity for the communities (*Chotthong and Noipa*). This is further exemplified in

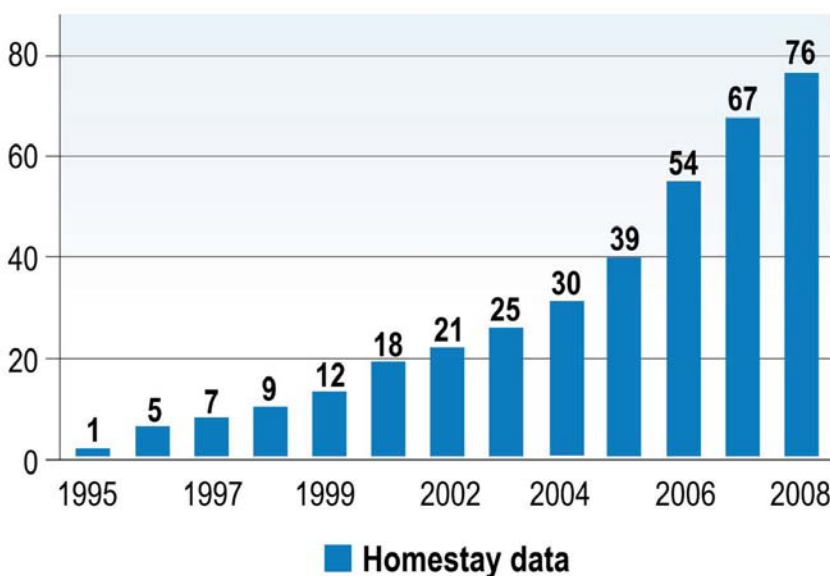
the experience in the Peam Krasaop Wildlife Sanctuary in Koh Kong Province, Cambodia, which has shown that there is a gradual process from which the basic organizing activities eventually lead to sustainable coastal ecotourism activities (*Nong*).

The homestay program implemented by the local government in Pagudpod, Ilocos Norte, Philippines, also linked sociocultural and environmental awareness while generating income for communities. The Municipal Government collaborated with various agencies, the academe and private sectors to provide comprehensive support to ecotourism development as the key to sustain tourist arrivals. For the homestay program, funds were allocated to improve the level of services through seminars on hosting, tourist reception services, and basic housekeeping. The local government unit (LGU) constantly monitored, visited, assessed and evaluated the facilities of those participating in the homestay program. Today, the homestay program is a signature initiative of Pagudpod and is a main source of income for many of the residents. Compared to only one taker in 1995 (**Figure 8**), Pagudpod now boasts 76 homestays as of 2008, most of which have facilities accredited by the Department of Tourism (DOT) (*Sales and Morata*).

**Figure 7. Tourism direct employment in the Philippines (2002-2010) (Fortes).**



**Figure 8. Number of Homestays in Pagudpod, Ilocos Norte (Sales and Morata).**



Local governments also play an important role in planning for development. The experience in Bali showed that spontaneous development generally relies on the market to provide for services that would normally be extended by the government or organized sectors (*Antara*). This leads to uncontrolled development, and eventually, the deterioration of coastal habitats upon which tourism is highly dependent.

Coastal tourism is also an important source of livelihood among the communities along the North Andaman coast of Thailand. This has been promoted by the private sector, nongovernmental organizations (NGOs), and government policy. The North Andaman Community Tourism Network (N-ACT) was formed to serve as an evolving platform to support local communities engaged in sustainable tourism (*Garrett and de Silva*). With the support of the International Union of Nature Conservation (IUCN), the N-ACT has increased the contribution of tourism to sustainable livelihoods and sound ecosystem management by providing communities with access to the best available knowledge and practices (*Garrett and de Silva*). In its first phase, N-ACT generated tangible benefit through cooperative engagement with stakeholders including community members, tour operators, media, and government officers. The first phase of N-ACT's work provided several useful lessons relating to three major areas in setting up community tourism networks, including:

- a. **Choosing the right partners** and engaging all possible stakeholders, developing and using ground assessment tools, careful selection of target communities and working towards setting standards are key factors that should be considered during the preparatory stages.

- b. **Setting up a successful network** entails local ownership and locally appropriate methods and knowledge products that cater to the need and use by a local audience, and help to leverage successful local examples, which can be used to build capacity in neighboring communities.
- c. **Linking conservation and tourism** can be achieved using a mixture of three approaches: (1) A passive approach where income is derived from non-extractive utilization of natural resources; (2) an active approach where conservation activities, such as a tourism product with saleable value, are promoted; and (3) a direct approach where tourism is used as a strategic tool to support existing conservation efforts.

#### **Public-private sector participation: Setting the criteria for responsible tourism**

A collaborative arrangement to promote sustainable tourism can also be seen in the experience of Green Fins (GFs) program. GFs promotes environmentally responsible diving and, through this, coral reef conservation and the promotion of the sustainable tourism industry. At the core of the GF program is a Code of Conduct (COC) designed to reduce the threats posed by SCUBA diving. Under the program, diving clubs commit to operate according to the Green Fins COC, while divers and snorkelers are trained to follow Guidelines for Environment-friendly Diving and Snorkeling (*Hunt, et al.*).

The Code of Conduct covers 15 items, ranging from dealing responsibly with garbage and other waste, to educational and awareness raising activities, such as beach and underwater clean ups and reef

monitoring. GFs specially-trained teams assess dive operators to see how well the Code of Conduct is being followed and guide them to protect marine life even more. The secure online database stores dive operators' assessments to allow the GF teams to identify the best ways of helping divers and dive operators to be more responsible and to share this with other GFs countries. It also works directly with dive operators' staff to help them understand more about coral reef ecology and how they can help to protect and conserve reefs.

Similar to the Green Fins Program, the *Buhay Dagat* (Coastal Life) is a collaborative project to promote community-based tourism in protected areas. This was done to monitor activities in the protected areas and at the same time, provide income opportunities for local communities by training them as divers (*Mencias*).

In identifying the protected areas where community-based tourism will be promoted (**Table 2**), the *Buhay Dagat* uses the following criteria:

1. Established MPA with effective management;
2. Presence of local communities or people's organizations (POs);
3. No threats to security or safety;
4. Strong potential for coastal tourism;
5. Receptive and supportive LGU;
6. Reef is suitable for snorkeling;
7. Community is ready to have tourism;
8. Diveable at least six months in a year;
9. No threats from environmental disturbance (pollution, sedimentation, mining or uncontrolled development); and
10. Absence of natural or human induced hazards.

Upon selection of the site, capacity development assistance is extended to communities to increase their



**Table 2. MSN Management Rating System for MPAs (Buhay Dagat).**

Rating	Phase	Management Performance	Description
Level 1	Initiated	Passing	MPA establishment activities are in progress.
Level 2	Established	Fair	MPA is legalized and management activities have started.
Level 3	Enforced	Good	MPA regulations are implemented and management activities are maintained for two years or more.
Level 4	Sustained	Very Good	MPA is well-enforced over the years; participation and support from the LGU and community is consistent.
Level 5	Institutionalized	Excellent	Management and enforcement is consistently maintained and is assured by additional legal support.

appreciation of the marine environment and at the same time, train them as guides for tourists, particularly in diving/snorkeling. After training, the participants can assist the tourists in snorkeling within the MPAs for a fee. This also ensures that diving and snorkeling among tourists will not cause damage to the coral reefs.

### Sustaining Coastal Tourism: Moving from Fragmented to a Holistic, Integrated Approach

The social-ecological systems (SES) approach is an emerging trend in coastal conservation in East Asia which arises, in part, from an increasing understanding of the human influence on the goods and services of the coastal ecosystems provided to the tourism sector and upon which the people themselves depend for survival. The SES underlines the emergence of a complex systems approach for sustaining coastal ecosystems, linking habitat resilience to economics, local institutional structures, and society (Fortes).

Ecotourism development through coastal ecosystems conservation strategies in East Asia, such as MPAs, World Heritage Sites, or Biosphere Reserves has had limited success due to inadequate attention to the social context of conserving marine resource systems (Fortes).

While some ecological concerns are imperative, socioeconomic factors are critical to the success of common-property institutions because they can influence decisions on how users adopt restraints on resource use. In contrast, where these factors are inadequately and poorly reflected by strategies and action plans, low compliance rates results and outcomes, such as free-riding and overexploitation, are likely.

The SES shares similar principles with the integrated approach employed in Munakata, Japan (*Kojima*). Similar to many coasts, the interplay of issues in the coastal area of Munakata contributes to the deterioration of coastal areas, ultimately affecting the tourism sector.

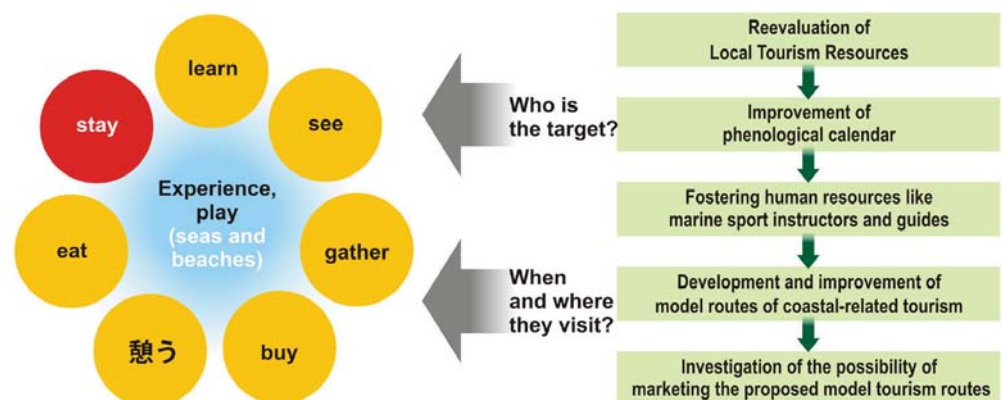
Munakata City enjoys about 5 million tourists a year because of its scenic beauty, fresh seafood and rich cultural

heritage, especially the Munakata Taisha Shrine. More than 90 percent of the tourists (about 30,000 to 40,000 visitors per month) visit this area for its fresh seafood, which is available all year round. During the summer season, about 20,000 visitors enjoy beach bathing and marine-based activities. However, one of the drawbacks is that most of the visitors come to this area for one-day trips and only one out of five people stay overnight. This means limited expenditure among tourists (*Kojima*).

A strategy has been developed to encourage tourists to stay longer in Munakata (Figure 9).

Aside from the challenge of encouraging tourists to stay longer, environmental issues are also another problem in Munakata. Recently, two-thirds of the beach have experienced serious beach erosion, which resulted in the destruction of coastal forests. The beach erosion also prevented a city marathon event during which participants run on the sandy beach.

The Munakata Coastal Strategy was developed as one of the efforts of the Munakata Integrated Coastal Management Working (MICMW)

**Figure 9. Creation of experience-oriented, overnight stay (Kojima).**

Committee to chart the courses of action for the sustainable development and the preservation of cultural and natural resources in the Munakata coastal zone. Since tourism is increasingly seen as a tool for development and revitalization of local communities, development of sustainable coastal-related tourism is the most important mission of the Munakata Coastal Strategy.

A re-evaluation of the tourism resources in the form of a phonological calendar was undertaken as a priority activity. A list of monthly festivals and events, seasonally-available fresh seafood, and seasonal recreational activities was developed. Tourists are often interested in what are essentially season-driven events, such as bird watching, spring wildflower displays, autumn tree color changes, seasonal fresh harvests and so forth. Being able to predict the timing of such events was thus important to the tourism industry in Munakata.

### *The impacts of climate change in sustaining coastal tourism*

Despite contributing 10 percent of total global GDP, and generating 230 million jobs worldwide, the social and environmental problems of coastal tourism is compounded with the impact of climate change (Wong; Libosada). Distinct socioeconomic impacts are indicated in **Table 3**.

Climate change directly affects coastal tourism (**Figure 10**) through:

- Loss of beaches, degradation of coastal ecosystems, saline intrusion, and damage to critical infrastructure.
- Reduction of appeal of tropical beach destinations as tourist destinations with increasingly

## Buhay Dagat Site

### 2nd site: Hundred Islands National Park, Alaminos City, Pangasinan

- The first protected area in the country established in 1940;
- 123 islands spread out in an area approximately 1,844 hectares; and
- Exceptional island formations.



projected milder winters in tourist market countries.

These impacts are most pronounced in Small Island Developing States (SIDS) where beaches and coral reefs are the basis of tourism. Being small states with relatively smaller economies, these countries are highly vulnerable when exposed to economic shocks. With limited physical size and generally limited natural resources, these states also have high susceptibility to natural hazards. Studies revealed that Maldives, Kiribati and Tuvalu would almost totally disappear with future sea-level rise (SLR). In addition, a 100-cm SLR would drown 70 percent of Seychelles.

### *Challenges in sustaining coastal tourism*

The concept of sustainability is widely used but interpreted differently. For the private sector, the main objective is to increase profits although corporate social responsibility (CSR) is now becoming more visible. Sustainable coastal tourism (SCT) discussed during the session is within the framework of poverty alleviation for local communities, which examines, in the process, the role of NGOs, LGUs, or the government.

As a livelihood, SCT in the form of ecotourism is suitable as a community-based approach to livelihood management but only on a small scale and based on local resources. Case studies point to the positive economic impact of coastal tourism at the community level and that community-based management and coastal tourism on a smaller scale generally provide economic benefits to impoverished coastal communities. However, this requires understanding of the environment, environmental impacts and some business management capacity, which is almost always a huge challenge at the local level. In which case, there is still the question as to whether local communities have the capacity to handle sustainable coastal tourism in the long run. In case such capacity development activities have to be provided, to what extent can these be done?

In the case of conservation and tourism, the case studies point to conservation as the primary objective among local communities prior to promoting sustainable coastal tourism. Coastal tourism only comes as a result of effective resource management and community organizing. There are several case

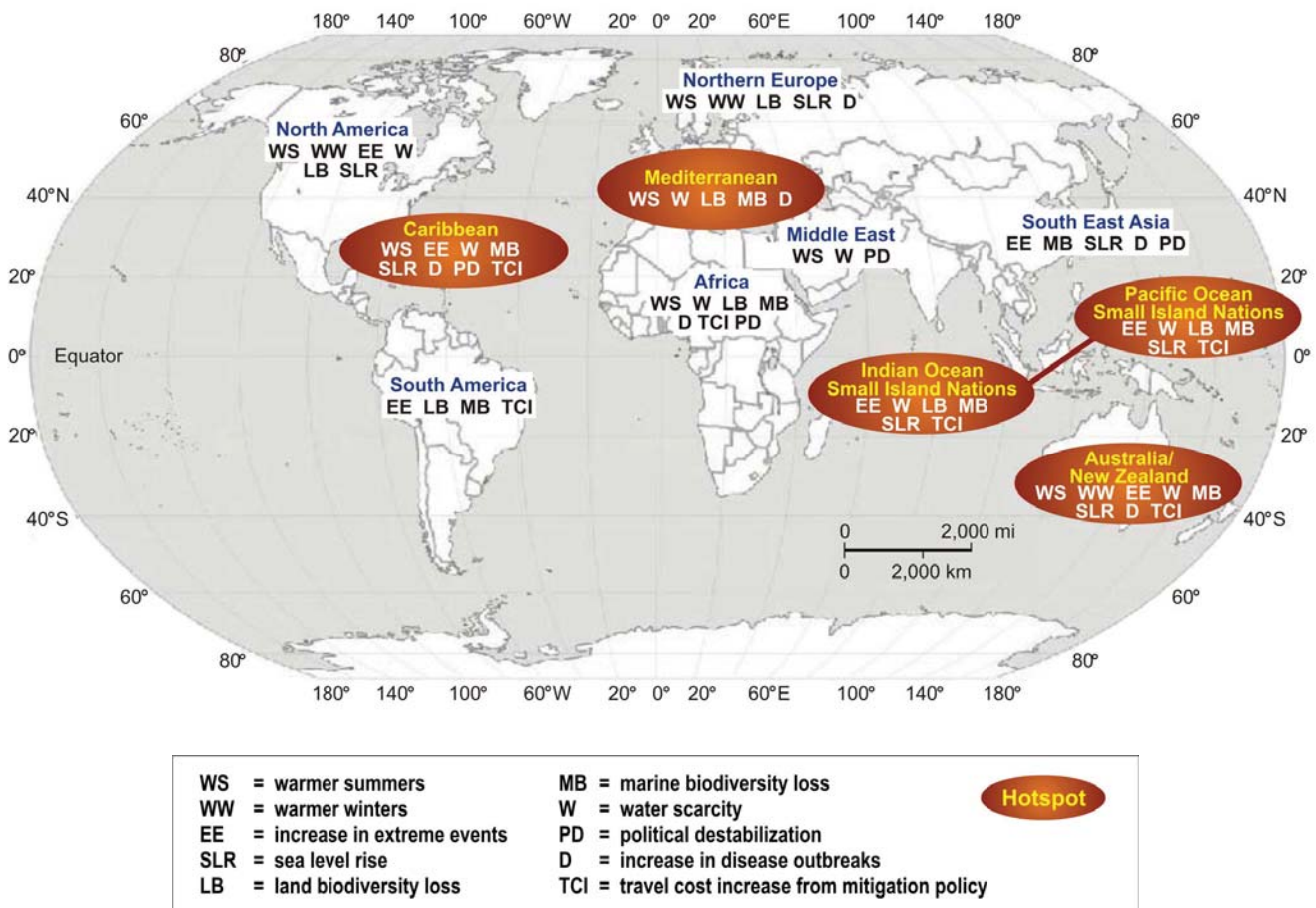
Table 3. Climate-related impacts.

Coastal socioeconomic sector	Climate-related impacts [and their climate drivers]						
	Temp. rise [air and seawater]	Extreme Events [storms, waves]	Floods [sea level, runoff]	Rising water tables [sea level]	Erosion [sea level, storms, waves]	Saltwater intrusion [sea level, runoff]	Biological effects [all climate drivers]
Freshwater resource	X	X	X	X	-	X	x
Agriculture and forestry	X	X	X	X	-	X	
Fisheries and aquaculture	X	X	x	-	x	X	X
Health	X	X	X	x	-	X	X
Recreation and tourism	X	X	x	-	X	-	X
Biodiversity	X	X	X	X	X	X	X
Settlements/infrastructure	X	X	X	X	X	X	-

Source: IPCC, 2007.

X strong    x weak    - negligible or not established

Figure 10. Climate change and global tourism (Wong).



Source: WTO, 2007.

#### Box 4. Conclusions and Recommendations for Theme 5: Food Security and Livelihood Management

##### Conclusions:

- Fishery products will remain the main source of protein of poor people and the rapidly expanding coastal populations.
- Aquaculture growth is essential to the East Asian Seas and can contribute to food security, poverty reduction and improved nutrition but sustainability concerns need to be addressed through improved practices and governance. Experience in better management practices is growing and the challenge is implementation and scaling up of these experiences.
- The highly sectoral approach to fisheries management cannot effectively resolve the complex problems.
- Current fisheries situation further complicated by 'cross-cutting' factors such as climate change, global warming and sea level rise. At least a decade lead-in is needed to achieve traction in actions.
- Evidence as to whether community-based coastal tourism are sustainable and economically viable is conflicting.
- Coastal tourism should be treated as a "business" endeavor for poverty alleviation to address basic needs and services.
- Coastal tourism needs to be considered holistically, e.g., tourist use of resources, environmental stress of wastes and social stresses.

##### Recommendations

- Fisheries, aquaculture and tourism sectors to be actively engaged in ICM.
  - Need to develop better understanding and awareness around : (i) improving social benefits of aquaculture and fisheries; (ii) nutritional quality of aquatic products; and (iii) ecosystem approaches in practice.
  - Fisheries and aquaculture education needs a revolution and new vision to prepare the industry and other professionals to function in the ICM context.
  - Aquaculture, fisheries and tourism need cost-benefit analyses to determine the best approaches for integration into ICM and to make its case to governments, e.g., for cleaning up land based pollution. justifying fisheries controls.
- Fisheries governance, institutions and managers need development
  - Use multiple management tools and actors, e.g., combining standard fisheries management measures (e.g., input controls, output controls, market-based incentives) + traditional/informal controls.
  - Sorting out roles and responsibilities of different government levels.
  - Sustain constituencies
- Local communities and governments need capacity development for coastal tourism
  - Strengthening entrepreneurial skills, conscious efforts to protect the integrity of biodiversity and cultural heritage and how to engage with the private sector in community tourism.
  - Other tourism operators should find ways to realistically involve/engage local communities in all aspects – from development to implementation – of coastal tourism.

studies to support that sustainability and negative social impacts of tourism can be avoided by integrating conservation and community activities as tourist activities. In many cases, homestay programs aim to promote better understanding of the local socioeconomic conditions among tourists while allowing local communities to be exposed to tourist behaviors and preferences.

In the same manner, integrating socioeconomic and political

considerations, in managing biospheres, reserves and protected areas, is more effective and is equally beneficial.

Communities may not have the necessary resources and skills to cater and to promote coastal tourism. Private sector participation, such as travel companies and dive shops, can assist in the process through marketing and promotion of sustainable tourist practices, as well as local capacity development.

There is an increasing involvement with private partnership through corporate social responsibility. Their involvement is usually 'brokered' or facilitated by local NGOs or community-based groups. Private sectors provide more approaches to train communities in running SCT.

The SCT case studies show that unlike private sector-driven tourism projects, local involvement in all phases of the project is a must and not an option. However, the challenge is

in determining the optimal level of involvement in decisionmaking and management.

An integrated approach to sustainable coastal tourism would definitely address coastal tourism issues. However, pursuing livelihood activities may entail different approaches from that of community-based coastal tourism. The tools for training in livelihoods management are not the same as the tools for sustainable coastal tourism management.

Despite the importance of coastal tourism to livelihoods and environmental management, there are various environmental and socioeconomic challenges that need to be addressed for these livelihood opportunities to be sustained. Climate change exacerbates tourism-related problems as in the case of developing countries in the East Asian Seas region.

Livelihoods and SCT need to have various protection or adaptation measures, e.g., corals, mangroves, seagrasses for measuring against coastal erosion, natural hazards (tsunamis) and climate change adaptation.

In summary:

- There is still conflicting evidence as to whether community-based coastal tourism is sustainable and economically viable.
- Ultimately, coastal tourism should be treated as a “business” endeavor for poverty alleviation to address basic needs and services in coastal communities.
- There is a need to pursue appropriate capacity development strategies for communities to strengthen entrepreneurial skills, with a conscious effort to protect the

integrity of biodiversity and cultural heritage.

- Coastal tourism is a much more complex issue that needs to be considered holistically (i.e., use of available resources needed to support tourism and the wastes generated/environmental stress, social impacts and the cultural implications to communities).
- There is a need to promote integrated/co-management approaches among sectors and institutions to address socioeconomic, political and environmental concerns associated with coastal tourism and livelihood.
- A combination of natural and social science is required to promote sound management at the local level, particularly in conservation activities and using these to inform stakeholders of the economic benefits.
- The private and public sectors need to link with the local communities to promote simple, sustainable tourism practices.
- Sustainable coastal tourism still faces a number of issues
  - a. Environmental – coastal erosion and degradation, coastal hazards (tsunamis) and climate change;
  - b. Socioeconomic issues, such as conflicting demands of coastal areas; and
  - c. Determining ways to realistically involve/engage local communities in all aspects — from development to implementation — of coastal tourism.
- In order to address the issues of climate change and livelihood,

there is a need for adaptation measures to be mainstreamed into national development plans, and downscaled to local plans.

## Conclusion

The initiatives mentioned implement many of the actions called for by the SDS-SEA with respect to the Sustain Strategy and especially the objective on equitable and sustainable fisheries, as well as other action items such as the application of science, the application of the ecosystem approach to management, ICM, participatory approach/community participation, and sustainable tourism. It is clear that efforts in this regard cannot falter and must proceed with more intensity than ever, given the existing and expected impacts of climate change.

## Acknowledgements:

### Co-conveners:

#### **Theme 5 Workshop 1: Addressing Food Security and Sustainable Aquaculture :**

Food and Agriculture Organization of the United Nations-Regional Office for Asia and the Pacific (FAO-RAP); Bureau of Fish and Aquatic Resources, Philippines (BFAR); and Southeast Asian Fisheries Development Center (SEAFDEC)

#### **Theme 5 Workshop 2: The Role of Fisheries in an Urbanized World:**

WorldFish Center and the Food and Agriculture Organization of the United Nations-Asia Pacific Fishery Commission (FAO-APFIC)

#### **Theme 5 Workshop 3: Livelihood Management and Sustainable Coastal Tourism:**

Department of Tourism (DOT), Philippines, and United Nations Development Programme (UNDP), Manila

## Presentations:

### **Workshop 1: Addressing Food Security through Sustainable Aquaculture**

#### **Part 1: The State of Aquaculture in the Region**

Miao, W. "Contributions of aquaculture industry to food security and poverty alleviation."

Phillips, M.\* and M. Beveridge. "Aquaculture and Ecosystems"

### Part 2: Innovative Technologies in Advancing Sustainable Aquaculture Practices.

Adora, G. "Food Security through Sustainable Mariculture Park Projects in the Philippines."

Ayson, E.G. DJ., R. Agbayani, and J. Toledo. "Institutional Capacity Development for Sustainable Aquaculture: Its Role in Integrated Coastal Zone Management"

Fang, J.-G.\*, J.-H. Zhang, Z.-J. Jiang, and Y.-Z. Mao. "Development of Integrated Multi-trophic Aquaculture in Sanggou Bay, China."

Hernandez-Palerud, J.. "Methodology for the Estimation of Safe Carrying Capacity for Small-Scale Aquaculture in Enclosed Lakes and Bays."

Tanaka, T.. "Introducing a successful Japanese Marine Ranching Project: Shiraishijima Island's Marine Ranching Project in Okayama."

### Part 3: Good Practices in Seaweed-based Aquaculture

Ik Kyo Chung. "Developing a Seaweed Species-selection Index for Successful Culture in a Seaweed-based Integrated Aquaculture System."

Largo, D.B. "Mighty Seaweeds in Integrated Multi-Trophic Aquaculture (IMTA): A Biofiltration System for Mitigating Inorganic Wastes and Carbon Dioxide in the Philippine Context."

### Part 4: Local Implementation of Good Practices: Successes and Challenges

Khunplome, V. "Sustainable Coastal Aquaculture to Improve Food Security and Livelihood of Communities in ICM Project, Chonburi Province, Thailand."

Macaraig, R. "An Approach for Integrated Aquaculture in Philippine Coastal Communities."

McGlone, M. "Bolinao Fish Kill: A Case Study on the Need for Sustainable Mariculture."

Zamani, N. "Mainstreaming Aquaculture in ICM Development."

### Poster Presentations

- Methods to implement the Ecosystem Approach to small scale aquaculture development to achieve sustainability,

maintain environmental integrity and enhance social well being by reducing inter and intra sectoral conflict through the participatory approach/consultation (AKVAPLAN-NIVA)

- Preliminary results for the study of the vulnerability of brackishwater pond farmers to the effect of climate change. (AKVAPLAN-NIVA)

- The Production and Culture of BEST in Saline Waters Towards Sustainable Aquaculture (BFAR: Melchor Tayamen)

- Culture of *Pangasius Hypophthalmus* in Ponds (BFAR: Adelaida Palma)

- Abalone (*Haliotis asinina*) Culture in Pens (BFAR:Jaime Salazar)

- Shrimp Biodiversity in Pristine and Disturbed Mangrove Areas along the West Coast of Peninsular Malaysia (Prof. Mohamed Shariff, Universiti Putra Malaysia)

### Part 5: Panel Discussion: Ways Forward: Mainstreaming Aquaculture in a Sustainable Development Context

#### Panelists:

Mr. Miao Weimin, FAO-RAP; Dr. Jobert Toledo, SEAFDEC; and Mr. Mike Philips, WorldFish Center

### Workshop 2: The Future Role of Fisheries in an Urbanized World

Fukuyo, Y. and Ha, D.V.. "Safety of Aquaculture Products."

Funge-Smith, S., Lentisco, A., Paruja, J. and D. Griffiths. "A Regional Fisheries Livelihood Programme for South and Southeast Asia – RFLP."

Funge-Smith, S. "Current Status of Coastal Fisheries in Asia."

Jeffrey, R. and F. Boisson. "Role of the IAEA-Marine Environment Laboratories in Supporting Regional Seafood Safety."

Juliano, R. "A Future Scenario for Fisheries Education in the Philippines."

Muldoo, G., Ingles, J. and K. Symington. "Compliance with the FAO Fisheries Code of Conduct within the Coral Triangle: Private Sector Engagement and a role for NGOs?"

Perez, M. and L. Garces. "Strengthening Governance and Sustainability of Small-scale Fisheries in the Philippines: Potential Directions for the Practical Implementation of Ecosystem-based Fisheries Management."

Salayo, N. and M. Perez. "Small Time, Big Numbers, Small Attention, Big Task: The Role of Small-scale Fisheries and Small-scale Aquaculture in Food Security and Livelihoods in Southeast Asia."

Seino, S. "The Japanese Schools and Universities: Responding to the Challenges (and opportunities) brought about by the Fishing Industry in Recent Years."

Silvestre, G., Adora, G., Tabios, B., Jatulan, W., Armada, N., Smith, R., Guidote, M., and A. Sia. "Sustainable Fisheries Development in the Philippines: Key Contributions and Lessons from the Fisheries Improvement for Sustainable Harvests (FISH) Project."

Weeratunge, N. 2009. "The Place of Fisheries in Markets and Food Security in an Urbanizing World: Outlook for EAS Countries." The WorldFish Center, Penang, Malaysia.

Williams, M. J. 2009. "What do I know about this Fish? Improving Asia-Pacific Fish Consumer Information." Asian Fisheries Society, Malaysia.

#### Panelists:

Consuelo Baltazar (Bureau of Food and Aquatic Resources or BFAR, Philippines)

Alex Madrigal (Department of Science and Technology or DOST, Philippines)

Luky Adrianto (Bogor University in Indonesia)

Cesar Pagdilao (Philippine Council for Aquatic and Marine Research and Development or PCAMRD)

Giselle Samonte-Tan (Conservation International)

Chul-Hwan Koh (Seoul National University)

Suam Kim (Pukyong National University)

### Workshop 3: Livelihood Management and Sustainable Coastal Tourism

Antara, M. Bali Experience in Sustainable Coastal Tourism."

Chotthong, B. and W. Noipa. "Coastal Resources and Livelihood Management through Ecotourism."

Fortes, M.D. "Social-Ecological Systems (SES) Approach in Sustainable Coastal Tourism in Biosphere Reserves in East Asia."

Garett, B. and J. De Silva "Lessons Learned – The North Andaman Community Tourism Network."

Hampton, M. "Small is beautiful but is it

- practical?' Small-scale coastal tourism and economic development in South-East Asia."
- Hunt, C.V., N. Phongsuwan, J.J. Harvey, K. Kosavisutte, and A. Miller. "Green Fins Program: A sustainable future for the diving tourism industry and the Impacts on the Local Communities."
- Kojima, H., T. Kubo, A. Kinoshita and H. Sato, "Integrated Coastal Management as a Tool for Enhancement of Local Community Coastal Resources and Tourism: A Case Study of Munakata Coastal Zone."
- Libosada, C. "Tourism in a Changing Climate."
- Mencias, L.F. "Buhay Dagat (Coastal Life)."
- Nong, K. "Mangrove Management and Eco-tourism Promotion in Cambodia." Participatory Management of Coastal Resources in Cambodia.
- Sales, M. and J. Morata, "Pagudpud Homestay: Building Partnerships to Harness the Strengths of Communities towards Sustainable Development."
- Wong, P.P. "Climate Change and Coastal Tourism."
- Workshop on Local Action, Global Contribution: Best Practices on Community-based Approaches to Sustainable Coastal and Marine Ecosystems Management**
- Part 1: Presentation of Case Models of Community-based Initiatives**
- Dwihastarini, C. and Mr. Budi Setiawan. "Effective Strategy on Community Approaches To Sustainable Coastal and Marine Ecosystems Management; based on case study of the Coral Reef Restoration Program in Belitung Island.
- Gadon, F. and R. Bagunas. "Multi-Partnership Building for Sustainable Coastal Resources Management in Balayan, Batangas (ANAK-Balayan, Philippines)."
- Navirak, N. and P. Visal. "From Survival to Sustainable Development: A community-based approach to coastal and marine management in Stung Hav, Preah Sihanouk, Cambodia."
- Nguyen Thi Kim Anh. "Vietnam Case Study."
- Poonsin Sreesangkom and Samarn Rungruang. "Income generation through Conserving and Sustainable Use of Coastal Resources – A Case Model from Thailand."
- Valdez, J. "Community-Based Marine Sanctuary Management and Livelihood Project: The Case of Maliliit na Mangingisda ng Caramay Multipurpose Cooperative (MMCMC), Roxas, Palawan."
- Seminar on Ecosystem Approach to Conservation and Fisheries Management**
- Marine Resources Conservation**
- Chu Manh Trinh. "Community Participation In the Establishment And Management of Cu Lao Cham Islands Marine Protected Area, Quang Nam Province, Vietnam."
- Garces, L.R., M. Tupper and M.D. Pido and G.T. Silvestre. "Evaluating the Management Effectiveness of the Marine Protected Areas Network in the Calamianes Islands, Palawan Province, Philippines: Key Results and their Implications."
- Ona, R.E.A., P.A. Regoniel, O.T. Alfonso, M.D. Pido, R.T. Fuentes, J. F.A. Pontillas and A. V. Regalo. "Community-based Biodiversity Threats Analysis and Mapping of the Balabac Strait Corridor, Palawan, Philippines."
- Petchrung Sukpong and Sathika Phaokanta. "Participatory seagrass monitoring using an integrated approach that combines scientific and local knowledge: An example from Southern Thailand."
- Samonte-Tan, G. PB., B.S. Francisco, W.P. Jatulan, N.B. Armada, K. Sylvano, E.T. Deguit, G. Sylvestre, A.T White. "Socioeconomic and Institutional Considerations for Marine Conservation: Lessons Learned from the Calamianes Islands, Philippines."
- Fisheries Management**
- Jumawan-Nanual, B., M. Cuevas and E.B. Metillo. "Successful Protection nd Indigenous Knowledge-Based Fishing Ban of Spinefoot Rabbit Fish, *Siganus Fuscescens* (Siganidae, Perciformes) Do Make Sense: Biological Evidence from Davao Oriental, Philippines."
- Lijie Duan, Shiyu Li, Yu Liu, Ying Wang, P. Failler, V. Christensen and J. Moreau. "Simulating the Effect of Seasonal Fishing Moratorium on the Fisheries in the Pearl River Estuary Coastal Ecosystem for Fisheries Strategies Exploration."
- Shimpei Iwasaki. "Fishers-Based Environmental Watershed Management in Lake Saroma, Japan."
- Tabeta, S., T. Kinoshita, H. Yoshimoto, Y. Shimizu, and Y. Matsuda. "Development of Tools to Assess Ecosystem and Economic Impacts Due to Ocean Fertilization Technologies."
- ICM/Co-Management**
- Endo, A. "Integrated Coastal Management and Small-Scale Coastal Fisheries."
- Klocker Larsen, R., J.M. Acebes and A. Belen. "Examining the Assumptions of Integrated Coastal Management: Diverging Stakeholder Agendas and Elite Cooption in Babuyan Islands, Philippines."
- Okubo, A. "Ecosystem Approach in Practice - A Comparative Analysis and Implications for Multilateral Cooperation."
- References:**
- PEMSEA. 2009a. Theme 5 Food Security and Livelihood Management. Workshop Reports, Proceedings and Presentations. Available at: <http://pemsea.org/eascongress/international-conference/food-security-and-livelihood-management>.
- PEMSEA. 2009b. Theme 5 Food Security and Livelihood Management, Workshop 1 Addressing Food Security through Sustainable Aquaculture Summary Report. Available at: <http://pemsea.org/eascongress/section-support-files/EAS-WP2010-16.pdf>
- PEMSEA. 2009c. "Food Security: of fish and men ...and cats and elephants." Theme 5 Food Security and Livelihood Management, Workshop 2: The Future Role of Fisheries in an Urbanized World. Available at: <http://pemsea.org/eascongress/section-support-files/EAS-WP2010-17.pdf>
- PEMSEA. 2009d. Theme 5 Food Security and Livelihood Management, Workshop 3 Livelihood Management and Sustainable Coastal Tourism. Available at: <http://pemsea.org/eascongress/section-support-files/EAS-WP2010-18.pdf>.
- PEMSEA. 2009e. Report on the Seminar on Ecosystem Approach to Conservation and Fisheries Management. Available at: <http://pemsea.org/eascongress/special-events/seminar-on-ecosystem-approach-to-conservation-and-fisheries-management>.
- PEMSEA, 2009f. Local Action, Global Contribution: Best Practices on Community-based Approaches to Sustainable Coastal and Marine Ecosystems Management. Available at: <http://pemsea.org/eascongress/section-support-files/EAS-WP2010-22.pdf>.



# The East Asian Seas Partnership Council

## Special Meeting

25 November 2009  
Mindanao Room  
Sofitel Philippine Plaza



**D**uring the East Asian Seas Congress 2009, PEMSEA Country and non-Country Partners gathered for a Special EAS Partnership Council Meeting. The important meeting, although brief, resulted in a number of decisions and recommendations, including the decision of hosting of the EAS Congress 2012 by the Republic of Korea, the inclusion of three new non-Country partners, the recognition of The World Bank as a sponsoring organization of PEMSEA, and signing of Memoranda of Understanding with various collaborators.

The members of Council approved, with appreciation, RO Korea's intention to host the EAS Congress 2012. The government of RO Korea informed the Meeting that budget for the 2012 Congress has already been approved by the Ministry of

Finance and assured its commitment to make the EAS Congress 2012 a success.

The Council approved the inclusion of three organizations as PEMSEA non-Country Partners, namely: the International Union for Conservation of Nature-Asia Regional Office (IUCN-ARO); the ASEAN Centre for Biodiversity (ACB); and the PEMSEA Network of Local Governments for Sustainable Coastal Development (PNLG).

IUCN-ARO has been actively working in coastal and marine areas of the region. There are a number of potential opportunities for developing on-the-ground cooperation between PEMSEA and IUCN-ARO. In December 2007, parties signed a Letter of Cooperation (LOC) on mutual collaboration.

ACB is an intergovernmental regional center established through agreement among the governments of ASEAN Member States. ACB and PEMSEA initially conducted collaborative activities in 2009, including the co-publishing a *Tropical Coasts* issue on food security. The Letter of Cooperation signed on 13 August also included collaborative activities on capacity development, policy and advocacy as well as information exchange.

PNLG has been playing a unique and valuable role to promote exchange of ideas and lessons learned in the ICM practices among local governments in the seas of East Asia region. The second EAS Partnership Council Meeting in July 2008 noted the important role of the PNLG in the Council, in order to convey the voice of local governments in the EAS region.





Along with the inclusion of three organizations as Partners, PEMSEA strengthened partnerships for SDS-SEA implementation by signing Memoranda of Understanding (MOUs) for mutual collaboration. The Philippine Environmental Governance Project (ECOGOV) and the Secretariat of the Convention on Biological Diversity (SCBD) signed MOUs with PEMSEA, while the ASEAN Foundation signed a Contract with PEMSEA for financial support to the EAS Congress 2009.

ECOGOV is a project of the United States Agency for International Development (USAID) being implemented in cooperation with the Philippine Department of Environment and Natural Resources (DENR). The MOU aims at sharing knowledge, information, tools, best practices and resources in

support of capacity development and the effective implementation of Executive Order 533 in the Philippines, which adopts integrated coastal management (ICM) approach for the whole country.

The Convention on Biological Diversity (CBD) is the international framework for the conservation and sustainable use of biodiversity and the equitable sharing of its benefits. The CBD was opened for signature at the Earth Summit in Rio de Janeiro in 1992 and seeks to address all threats to biodiversity and ecosystem services, including threats from climate change. The headquarters of the Secretariat of the Convention is located in Montreal, Canada. The MOU between SCBD and PEMSEA covers broad collaboration including information sharing, capacity development, policy and advocacy. A case study on

the assessments of the effects and consequences of the implementation of integrated coastal and marine area management to the sustainable development and conservation of marine and coastal biodiversity resources in the East Asian region is identified as one of the possible collaborative activities.

One major step towards the sustainability of PEMSEA is the inclusion of The World Bank as a PEMSEA sponsoring organization. The Council approved the inclusion, with the PEMSEA Resource Facility and The World Bank successfully agreeing to an MOU. The MOU stipulates four substantive areas for cooperation, including: (1) land-based pollution reduction; (2) integrated coastal and ocean management/governance; (3) climate change adaptation; and (4) public-private partnership.



**Congress 2011** Partnerships At Work:  
 Local Implementation And Good Practices  
 23 - 27 November • Philippine International Convention Center, Manila, Philippines



## Third Ministerial Forum of the East Asian Sea Congress 2009

# Strengthening the Implementation of ICM for Sustainable Development and Climate Change Adaptation in the Seas of East Asia

Manila, Philippines – The Third Ministerial Forum held on 26 November 2009 highlighted the need for the region to look into the serious impacts of climate change and the region's sustainable development. The event was graced by the attendance of Her Excellency President Gloria Macapagal Arroyo, President of the Philippines, who delivered the keynote speech for the Ministerial Forum. President Arroyo stressed the urgency of actions required to mitigate the adverse impacts of climate change, which already wrought havoc in the region. Stressing the importance of green growth, she concluded her speech by saying that "to create growth that is truly 'green', we must create seas that are truly 'blue'."

The culmination of the Forum was the signing of the *Manila Declaration on Strengthening the Implementation of Integrated Coastal Management (ICM) for Sustainable Development and Climate Change Adaptation in the Seas of the East Asia Region*. The Declaration confirmed the commitment of the 11 PEMSEA Country Partners to scale up ICM programs for sustainable development and climate change adaptation, targeting 20 percent ICM coverage of the region's coastline by 2015.

The Declaration is the region's response to the pressing issues of climate change through the implementation of ICM. Adding to the commitments of the countries

through the Haikou Partnership Agreement in 2006, it calls on actions of the countries and PEMSEA and encourages the involvement of non-Country Partners, international organizations, donors, the academe, local governments, communities and individuals to strengthen and accelerate the implementation of ICM for sustainable development and climate change adaptation.

The Chair of the East Asian Seas Partnership Council, Dr. Chua Thia-Eng, reported the progress of the implementation of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) to Ministers. The Chair reported that while the East Asian seas region is advancing in its economic development, environment and ecosystem health continues to deteriorate. Adding to this deteriorating trend is the threat of climate change.

The Reports of the Ministers provided up-to-date activities and progress at the national level on the implementation of the SDS-SEA.

The event also marked an historical event for PEMSEA as the representatives of East Asian countries, namely Cambodia, People's Republic of China, Democratic People's Republic of Korea, Indonesia, Lao People's Democratic Republic, Philippines, Republic of Korea



and Timor-Leste, signed the Agreement Recognizing the International Legal Personality of PEMSEA. The signing was witnessed by over 1,500 East Asian Seas Congress participants from within and outside the EAS region.

The Agreement re-affirms the commitment by member countries of PEMSEA to the Haikou Partnership Agreement on the Implementation of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) and the Partnership Operating Arrangements which were adopted by the Second Ministerial Forum at the EAS Congress in December 2006. This recognition highlights the countries' confidence in PEMSEA as the regional collaborative mechanism for the implementation of the SDS-SEA, and an important entity in building stakeholder partnerships to address the growing challenges in the Seas of East Asia.

With the recognition of its legal personality, PEMSEA is vested with the legal capacity to carry out its responsibilities, including entering into contractual agreements, as well as holding and disposing of property. In line with this Agreement, PEMSEA and the Government of the Philippines are currently concluding the negotiations for the Headquarters Agreement. The Headquarters Agreement, when

finalized and ratified through legal processes, will define the privileges and immunities granted by the Government of the Philippines to PEMSEA. These privileges and immunities will provide the international organization with the maximum use of its resources and with the ability to achieve full operational flexibility.

The Ministers from the region also visited the SEAnergies Exhibition, which featured a main exhibit focused on interconnectivity of East Asian Seas. It also featured exhibition booths of PEMSEA Partners and collaborators showcasing their major achievements with regard to the implementation of the SDS-SEA. The tour increased the interaction between Ministers and exhibitors and increased the understanding of high-rank policymakers on the status and progress of SDS-SEA implementation in the region.

The Ministerial Forum is the high-level policy forming mechanism of PEMSEA on the implementation of the SDS-SEA. The results of the 3rd Ministerial Forum will form a firm foundation for the next three years of work focusing on climate change as an urgent issue to be addressed. The next Ministerial Forum will be held in the Republic of Korea during the EAS Congress 2012.



## MANILA DECLARATION

ON

### STRENGTHENING THE IMPLEMENTATION OF INTEGRATED COASTAL MANAGEMENT FOR SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE ADAPTATION IN THE SEAS OF EAST ASIA REGION

Ministerial Forum  
Third East Asian Seas Congress  
Manila, Philippines  
26 November 2009

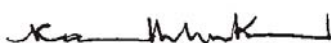
1. We, the representatives of the countries of the Seas of East Asia region, have gathered this day in Manila to discuss policies and actions for bringing into realization the shared vision of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) as adopted through the Putrajaya Declaration in 2003, and to review and evaluate progress towards priority targets for SDS-SEA implementation, as adopted through the Haikou Partnership Agreement in 2006.
2. We recognize the important role of coasts and oceans in providing valuable resources and services in the development of our economies and the achievement of the UN Millennium Development Goals across the region. We therefore acknowledge the need for continuing efforts to realize the SDS-SEA objectives, facilitating the fulfillment of global and regional commitments, as well as responding to common threats posed by uncontrolled development of coastal areas, poverty, resource degradation and marine pollution from land- and sea-based sources.
3. We acknowledge that our region is vulnerable to various impacts of climate change, which include frequent and extreme weather events, flooding, water shortage, acidification of the oceans and seas, salt water intrusion, sea level rise and other environmental emergencies that we all face. We stress that the impacts of climate change cut across various areas and issues including water resources, food security and livelihood, pollution, hazards and disaster, as well as biological diversity.
4. We recognize that our region needs to enhance its capacity building efforts in order to adequately reduce the risks posed by climate change to sustainable development.
5. We acknowledge that Integrated Coastal Management (ICM) is a valuable tool in achieving sustainable development and climate change adaptation, as affirmed in the Manado Ocean Declaration adopted by the World Ocean Conference held in Manado, Indonesia, in May 2009, and as an effective mechanism towards the broader goals of sustainable development in various other instruments such as the Bali Plan of Action of the APEC Ocean-Related Ministerial Meeting, the Agenda 21, the United Nations Framework Convention on Climate Change, the Convention on Biological Diversity, the Global Programme of Action for the Protection of Marine Environment from Land-based Activities and the Plan of Implementation of the World Summit on Sustainable Development.
6. We are encouraged by the progress made by the countries of the region over the past three years in SDS-SEA implementation, particularly with regard to the formulation and implementation of national policies and action plans for sustainable coastal and ocean development, and the initiation of national and subnational ICM programmes to achieve on-the-ground improvements in managing and sustaining marine and coastal resources. We acknowledge that ICM has been developed, demonstrated and applied at various locations across the region for the past 15 years as a systematic approach to achieving sustainable development of the coastal and marine environment and resources, specifically through on-the-ground implementation by local governments. We note that the Partnerships in

Environmental Management for the Seas of East Asia (PEMSEA) was instrumental in this effort.

7. We will continue to work together constructively to meet our regional targets, as set in the Haikou Partnership Agreement to implement ICM programmes in at least 20 percent of the Region's coasts and adopt national coastal and ocean policies in 70 percent of the countries by 2015. We see the urgency of addressing the pressing issues due to climate change as integral to these adopted targets.
8. We take note of the recent progress made in the transformation of PEMSEA into a self-sustained regional mechanism for the implementation of the SDS-SEA, and whose comparative advantage is the experience and knowledge gained from almost two decades of ICM practice.
9. We will strengthen and accelerate the implementation of ICM for sustainable development and climate change adaptation, where appropriate, in accordance with the following priorities:
  - a. Setting up sub-regional and national coordinating mechanisms for strengthening existing mechanisms to oversee and guide the implementation of ICM programmes;
  - b. Mainstreaming ICM into development plans and programmes at the sub-regional, national and local levels, including the conservation, rehabilitation and management of sub-regional seas and related watershed areas;
  - c. Delineating highly vulnerable coastal areas, coastal communities and resources and habitats, as well as vulnerable sectors of society, including the poor, women and the youth, and strengthening their capacity to respond and adapt to the impacts of climate change;
  - d. Developing and applying land- and sea-use zoning plans and schemes;
  - e. Implementing capacity building and technical assistance programmes to strengthen leadership capacities, skills and scientific and technical capabilities, including local governments' capacity to develop and implement ICM programmes;
  - f. Applying ICM good practices as guidance in developing and implementing ICM programmes;
  - g. Employing a range of new and alternative financing mechanisms to develop, implement and sustain ICM programmes and managing available funds in a cost-effective and cost-efficient manner;
  - h. Carrying out habitat restoration and management programmes, including coral reefs, seagrass beds, coastal wetlands and mangroves, and establishing marine protected areas, as appropriate, based on scientifically sound information, in order to improve the natural defenses of coastal and marine ecosystem to the impacts of climate change and to enhance carbon sequestration capacities of relevant habitats;
  - i. Formulating and implementing disaster risk management programmes including preparing for, responding to and recovering from natural and man-made disasters; and
  - j. Sharing information and knowledge on the development and application of innovative policies, legislation, technologies and practices in support of ICM programmes, as well as the social, economic and environmental benefits being derived.

10. We will report on the progress of ICM programmes every three years, including the measures taken for climate change adaptation.
11. We call on PEMSEA, as the regional mechanism for the implementation of the SDS-SEA, to undertake the development of the Implementation Plan for the SDS-SEA in 2010 for consideration by countries, to facilitate the scaling up of ICM programmes in countries across the region and to promote regional cooperation in education and training activities related to ICM and climate change adaptation, taking into account the Haikou Partnership Agreement.
12. We encourage Non-Country Partners, international organizations, donors, scientific and research organizations, the academe, local governments, communities, and individuals to play active roles in the development of the region's capacity in implementing ICM, protecting the environment and pursuing climate change adaptation measures.
13. We encourage the cooperation and support of relevant local governments and authorities in implementing ICM scaling up programmes and, where applicable, to mainstream such programmes into their local development plans.
14. We support the efforts of the global community to address the interrelationship between climate change and the coasts and oceans. We will contribute to these global efforts, through ICM implementation and the sustainable development of the Seas of East Asia.
- Adopted in Manila, Philippines this Twenty Sixth Day of November in the Year Two Thousand and Nine.

## The Kingdom of Cambodia



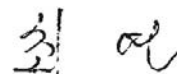
H.E. Dr. Mok Mareth  
Senior Minister  
Minister  
The Ministry of Environment

## The People's Republic of China



Hon. Sun Zhihui  
Administrator  
State Oceanic Administration

## The Democratic People's Republic of Korea



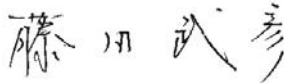
Hon. Choe Yon  
Vice Minister  
Ministry of Foreign Trade

## Republic of Indonesia



Hon. Masnellyarti Hillman  
Deputy Minister  
The Ministry of Environment

## Japan



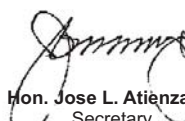
Hon. Takehiko Fujita  
Deputy Minister for Technical Affairs  
Ministry of Land, Infrastructure,  
Transport and Tourism

## Lao People's Democratic Republic



Hon. Sisavath Vithaxay  
Deputy Head  
Water Resource and Environmental  
Administration and Vice Chair of  
Lao National Mekong Committee

## Republic of the Philippines



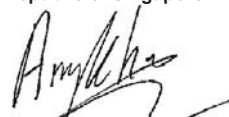
Hon. Jose L. Atienza Jr.  
Secretary  
Department of Environment and  
Natural Resources

## Republic of Korea



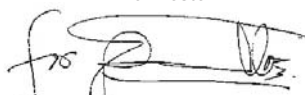
Hon. Choi, Jang-Hyun  
Vice Minister  
Ministry of Land, Transport and  
Maritime Affairs

## Republic of Singapore



Hon. Dr. Amy Khor  
Senior Parliamentary Secretary  
Ministry of the Environment and  
Water Resources

## The Democratic Republic of Timor-Leste



Hon. Mr. Mariano Assanami Sabino Lopes  
Minister  
Ministry of Agriculture and Fisheries

## The Socialist Republic of Vietnam



Hon. Dr. Nguyen Van Cu  
Administrator  
Vietnam Administration of Seas and Inlands  
Ministry of Natural Resources  
and Environment





## **AGREEMENT RECOGNIZING THE INTERNATIONAL LEGAL PERSONALITY OF THE PARTNERSHIPS IN ENVIRONMENTAL MANAGEMENT FOR THE SEAS OF EAST ASIA**

### **THE PARTIES TO THIS AGREEMENT,**

**RE-AFFIRMING** that the Haikou Partnership Agreement on the Implementation of the Sustainable Development Strategy for the Seas of East Asia (the Haikou Partnership Agreement) and the Partnership Operating Arrangements for the Implementation of the Sustainable Development Strategy for the Seas of East Asia (the Partnership Operating Arrangements), adopted and signed at the Ministerial Forum held in Haikou, China on 15 December 2006, transformed the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) from a project-based arrangement to the regional mechanism mandated for the implementation of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA);

**RECOGNIZING** that this mandate requires PEMSEA to carry out its responsibilities through contractual relations and collaborative arrangements and to manage and conserve its property and resources in accordance with best practices, as it provides technical advice and assistance and promotes bilateral and multilateral cooperation in the region;

**AWARE** that PEMSEA, supported by the Global Environment Facility, implemented through the United Nations Development Program and executed by the International Maritime Organization and United Nations Office for Project Services, has been playing a critical role in establishing stakeholder partnerships and building confidence to address the increasing environmental challenges in the Seas of East Asia Region since 1993;

**RECALLING** that the States of the Seas of East Asia Region, through the Putrajaya Declaration signed in Putrajaya, Malaysia on 12 December 2003 adopted the SDS-SEA as a common platform for regional cooperation and as a framework for policy and programme development and implementation;

**CONSCIOUS** that the signatory countries to the Haikou Partnership Agreement and the Partnership Operating Arrangements (Partner Countries) established the organizational structure of PEMSEA to ensure the effective implementation of the SDS-SEA;

**MINDFUL**, that the non-country signatories to the Partnership Operating Arrangements (Other Partners) act in synergetic and cooperative unity with the Partner Countries to carry out the broad-ranging functions set forth in the Haikou Partnership Agreement;

**ACKNOWLEDGING** that PEMSEA, represented by its Interim Executive Director, and the Department of Environment and Natural Resources of the Philippines (DENR), represented by its Secretary, entered into a Memorandum of Agreement in July 2007 under which the latter commits to host PEMSEA and provide office facilities for its use located within the DENR Compound, Visayas Avenue, Diliman, Quezon City;

**HEREBY AGREE AS FOLLOWS:****ARTICLE I  
RECOGNITION OF INTERNATIONAL LEGAL PERSONALITY**

1. The international legal personality of PEMSEA is hereby recognized. PEMSEA shall have the legal capacity to contract, hold and dispose of property, and such capacity as may be necessary for the exercise of its functions and the fulfillment of its purposes.
2. Other than recognition of the international legal personality of PEMSEA, this Agreement imposes no obligation on any of the Parties, and in particular, imposes no obligation to provide any form of financial contribution or support to PEMSEA or to guarantee any of the liabilities, debts and other financial obligation incurred by PEMSEA.
3. PEMSEA shall have its seat in Metro Manila, Philippines.

**ARTICLE II  
ORGANIZATIONAL STRUCTURE**

1. The EAS Partnership Council provides the policy and operational guidance for PEMSEA. The Council is composed of the Intergovernmental Session and the Technical Session.
  - a. The Intergovernmental Session, composed of the duly designated representatives of the Partner Countries, considers and decides on the recommendations of the Technical Session, and provides policy guidance, coordination and evaluation of the progress of the SDS-SEA implementation.
  - b. The Technical Session, composed of the duly designated representatives of the Partner Countries and Other Partners, discusses matters related to the scientific, technical and financial aspects of SDS-SEA implementation and makes appropriate recommendations to the Intergovernmental Session.
2. The Executive Committee, comprised of the Council Chair, the Session Chairs, and the Executive Director as its Secretary, ensures and oversees the implementation of the decisions of the Council. The Members of the Executive Committee shall be the officers of the Council.
3. The PEMSEA Resource Facility serves as the secretariat providing technical and secretariat services for the implementation of the SDS-SEA and is headed by its Executive Director. The PEMSEA Resource Facility is responsible to the Council through the Executive Committee.

**ARTICLE III  
DEPOSITARY**

The Executive Director of the PEMSEA Resource Facility shall be the depositary of this Agreement and of the instruments of notification and of accession.

**ARTICLE IV  
ENTRY INTO FORCE**

1. This Agreement shall enter into force on the date on which at least three Parties, including the Host Country, have expressed their consent to it.
2. Subject to the internal legal requirements of the Parties, consent to this Agreement may be expressed by signature, ratification or accession. With respect to ratifying or acceding Parties, this Agreement shall enter into force on the date of deposit of the instrument of ratification or of accession with the Depositary.

## ARTICLE V WITHDRAWAL

After this Agreement has entered into force, a Party may withdraw from it by giving written notice of withdrawal to the depositary. The withdrawal shall be effective one year from the date the notice is received by the Depositary.

## ARTICLE VI AMENDMENTS

Any Party may propose an amendment to this Agreement. The amendment shall take effect upon approval by all of the Parties.

## ARTICLE VII DISSOLUTION

This Agreement shall lapse once PEMSEA is dissolved or when, as a result of withdrawals and denunciations, less than three (3) Parties remain.

## ARTICLE VIII TEXT OF THE AGREEMENT

The authentic text of this Agreement shall be in English.

## ARTICLE IX TRANSITORY PROVISION

Pending the entry into force of this Agreement, the Executive Director of the PEMSEA Resource Facility, as currently existing, shall act as the depositary.

**IN WITNESS WHEREOF**, the undersigned have signed this Agreement in Manila, Philippines.

<p>The Kingdom of Cambodia</p>  <p>H.E. Dr. Mok Mareth Senior Minister Minister The Ministry of Environment</p>	<p>The People's Republic of China</p>  <p>Hon. Sun Zhihui Administrator State Oceanic Administration</p>	<p>The Democratic People's Republic of Korea</p>  <p>Hon. Choe Yon Vice Minister Ministry of foreign Trade</p>	<p>Republic of Indonesia</p>  <p>Hon. Masnellyarti Hillman Deputy Minister The Ministry of Environment</p>
<p>Lao People's Democratic Republic</p>  <p>Hon. Sisavath Vithaxay Deputy Head Water Resource and Environmental Administration and Vice Chair of Lao National Mekong Committee</p>	<p>Republic of the Philippines</p>  <p>Hon. Jose L. Atienza Jr. Secretary Department of Environment and Natural Resources</p>	<p>Republic of Korea</p>  <p>Hon. Choi, Jang-Hyun Vice Minister Ministry of Land, Transport and Maritime Affairs</p>	<p>The Democratic Republic of Timor-Leste</p>  <p>Hon. Mariano Sabino Lopes Minister Ministry of Agriculture and Fisheries</p>

Done this 26th day of November 2009



## East Asian Seas Congress

Ships At Work:  
Local Implementation And Good Practices

23 – 27 November • Philippine International Convention Center, Manila, Philippines



### Plenary Keynote on Coastal and Ocean Governance

by

**Professor Tommy Koh  
Ambassador-At-Large  
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(Delivered by Ambassador A. Selveraja, Singapore)  
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*Excellencies, Distinguished Guests, Ladies and Gentlemen,*

*I am very pleased to join you this morning for the third East Asian Seas Congress organized by PEMSEA and the Department of the Environment and Natural Resources, Philippines. I would like to thank the Government of the Philippines for hosting this conference and PEMSEA for inviting me to deliver the keynote address.*

#### **Challenges of Climate Change**

We live in challenging times. We are reminded every day of the impact of

climate change, through reports about the melting of the Polar ice caps and extreme weather phenomena such as floods, heat waves and tropical storms in different parts of the world. Earlier this year, several countries in our region were gravely affected by Typhoon Morakot with some communities still recovering from it.

Although the scientific community may be divided on the exact causes and the pace of climate change, few would question that global warming is a fact and has the potential to become the greatest security threat to humanity. Rising sea levels could wipe entire countries off the map and generate

millions of environmental refugees, while rising sea temperatures could destroy or disrupt marine ecosystems, which could in turn further devastate world fish stocks. It is estimated that almost 50 percent of the world's coasts are threatened by development related activities. With one billion of the world's population living in coastal urban areas, the potential socioeconomic disruption could reach catastrophic levels if the intense pressures being placed on coastal systems are not alleviated. The world is also faced by another crisis: the crisis of unsustainable fishery. Ocean governance in the field of fishery is one of the weak pillars of global governance. I think one of the solutions

is to strengthen ocean governance at the regional level.

It is therefore timely that PEMSEA has organized this conference to look at various aspects of sustainable coastal and ocean development.

## Role of UNCLOS

It has been 27 years since the adoption of the United Nations Convention on the Law of the Sea (UNCLOS) in 1982. Hailed as a “constitution for the oceans”, UNCLOS was a groundbreaking treaty. It was designed to be the international legal framework for the governance of the world’s oceans. As its preamble stated, it was intended to establish a legal order for the seas and oceans which will facilitate international communication, promote the peaceful uses of the oceans, the equitable and efficient utilization of their resources, the conservation of their living resources, and the study, protection and preservation of the marine environment.

For those of us who were involved with negotiating UNCLOS, it was an extremely challenging task. We had to balance a diverse array of interests, such as, the aspiration by coastal states to extend their territorial sea limits, safeguarding the freedom of navigation, protection of the marine environment, management of the oceans’ resources etc. It was therefore not surprising that the treaty took ten arduous years to conclude given its broad scope and the complexity of the challenges involved. The Convention which emerged from those negotiations is a finely balanced package. UNCLOS, which introduced the new legal concepts of *inter alia*: Exclusive Economic Zones (EEZs) and Straits Used For International Navigation, has played a crucial role by providing a stable legal framework for navigational rights, while respecting the rights of States to exercise lawful jurisdiction over their territorial waters

and exploit the resources in their exclusive economic zones. UNCLOS was also notable for establishing a compulsory dispute settlement system for States to resolve their disputes in a peaceful manner.

Today, UNCLOS has gained almost universal acceptance, with 159 State Parties, the latest being the Dominican Republic. The Obama Administration has declared the ratification of UNCLOS as a top priority.

UNCLOS is the only international legal framework in place which has provisions for the protection of the marine environment alongside provisions for the sovereign rights of States to exploit their marine resources and the rights of States to use the high seas for trade and transportation. For example, as stated in Article 193: “States have the sovereign right to exploit their natural resources pursuant to their environmental policies and in accordance with their duty to protect and preserve the marine environment.” Indeed, the range of environmental issues covered in UNCLOS has led some to declare that UNCLOS “probably contains the most comprehensive and progressive international environmental law of any modern international agreement.”

## Singapore’s Experience and ICM

As some of you may know, Singapore was first founded by the British as a free port in 1819. Today, maritime trade remains the vital lifeline of the global economy. Singapore continues to be one of the busiest ports in the world. At the same time, as a small island city state, we have also been keenly aware of the need to manage our coastal and marine environment in a sustainable and responsible manner, not only for the current population living and working in Singapore but also for future generations to come.

In recent years, we have also become more sensitive to the need to adopt a holistic approach towards managing coastal and marine pollution. According to the UN Environment Programme (UNEP), about 80 percent of the pollution load in the oceans originates from land-based sources and activities such as municipal, industrial and agricultural wastes and runoff as well as atmospheric deposition. It is therefore not sufficient to look only at ship-based sources of pollution, but also important to address land-based sources of pollution as well.



Singapore's advantage has been the fact that our small size has facilitated the close coordination between different agencies in government policymaking. Singapore's agencies have always maintained a high degree of coordination in the management of Singapore's marine environment, despite lacking a formal integrated framework for coastal management.

For example, from the project to clean up the Singapore River started in 1977 to the current Pasir Panjang port development, cooperation and consultation between agencies and stakeholders have been vital. Singapore implements Environmental Monitoring and Management Plans (EMMPs) for all coastal developments. Among other proactive measures, EMMPs provide real time monitoring of and immediate feedback response to sediment levels in the water that approach environmental tolerance limits. This has allowed Singapore to balance coastal development with environmental protection.

However, Singapore recognizes the need to further enhance the management of her coastal and marine environment. In view of this, Singapore has adopted an integrated coastal management (ICM) strategy this year. Our ICM strategy will not be developed from ground zero. We intend to stand on the shoulders of giants — the Sustainable Coastal Development Framework, developed by PEMSEA and implemented successfully in the region (including here in the Philippines), will be adapted and applied to Singapore. There are other advantages to adapting PEMSEA's framework for Singapore's ICM strategy. Although Singapore has made some strides in integrating our coastal policies and plans, we still have some way to go before achieving a full top-to-bottom integration. The application of a regionally accepted common framework will allow us to

better learn from other states and apply solutions based on common experiences. Demographic studies show that the world's population is predominantly found in cities, and most of these cities are coastal. As a coastal city, this common framework will also better allow Singapore to share our own successes and challenges in integrated urban coastal management with other similar coastal cities within and beyond the PEMSEA network of countries with ICM strategies. This will subsequently contribute to the knowledge-base of urban environmental management and biodiversity conservation.

With the increasing importance of coastal cities in supporting their growing populations, Singapore will be sensitive towards the changing needs of our domestic stakeholders and regional and global interests. We believe that Singapore's adoption of an integrated coastal management strategy will not only help us do this at the national level, but also bring us all closer to achieving the Sustainable Development Strategy of the Seas of East Asia (SDS-SEA) for the region.

Singapore's own experience has shown that it is possible to conserve our marine biodiversity and protect our coastal and marine environment while at the same time becoming the world's busiest transshipment port. We have achieved this by strictly controlling both land and sea-based sources of marine pollution.

Singapore's waters harbour some 250 species of hard corals, or about 32 percent of the world's 800 species. Of the 106 coral genera existing worldwide, 55 genera have been found in Singapore waters. Although the Great Barrier Reef is much larger in size than Singapore, there are likely to be more coral species and genera per hectare of reef in Singapore's waters than there are in an equivalent area of

the Great Barrier Reef. In July 2007, we initiated a Coral Nursery programme. Its objective is to enhance our coral reefs using fragments of corals that have already broken off from their parent colonies and are lying on the reef bottoms — these coral fragments, if left where they are, would most probably die. The Coral Nursery rehabilitates these fragments and transplants them back onto our coral reefs. Such active but sustainable methods make sense in an urban marine conservation scenario.

Singapore's experience, and indeed, the experience of our region, all show that protecting the marine environment, maintaining navigational freedoms as well as pursuing economic development are not mutually exclusive. Each of these activities needs not be pursued at the expense of the others as long as a careful balance is struck as has been done in the comprehensive framework which UNCLOS represents. I hope that over the next four days of this conference, more ideas can be exchanged and concrete strategies identified on improving coastal and ocean governance while preserving the integrity of UNCLOS.

## Conclusion

In conclusion, I wish to leave you with the following thoughts. First, I believe that UNCLOS has served us well and we should respect its provisions in our activities. Second, I see great value in the integrated coastal management approach for the sustainable development of our coastal regions. Third, I would urge PEMSEA to strengthen our regional governance in dealing with the challenges of land-based pollution, unsustainable fisheries and climate change.

Thank you very much.



Photo: Carlo Claudio

# *Pursuing* Sustainable Development *through* National Coastal *and* Ocean Governance

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## INTRODUCTION

National-level implementation of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA), primarily through integrated coastal and ocean management policies and programmes, is an essential component of coastal and ocean governance. Responsibility for sustainable development remains heaviest on national governments, although local governments have taken initiative and a large share of the burden in recent years. Approaches and strategies for meeting expectations with often inadequate resources and political support, and for building such resources and support, comprised the experiences, lessons and issues discussed in several workshops on governance at the 2009 East Asian Seas Congress (EAS) Congress in Manila, Philippines.

Three years earlier, at the 2006 East Asian Seas Congress held in Haikou, PR China, the International Conference concluded that integrated coastal management (ICM) is essential to sustainable development, and pushed for its scaling up to incorporate wider geographical, administrative and ecosystems areas and larger parts of a nation's coastal and related areas. The conference encouraged the adoption of ocean policy that supports local ICM implementation and integrates management of national ocean jurisdictions up to the 200-mile exclusive economic zone (EEZ).

At the close of the 2006 Congress, the Ministerial Forum adopted the

Haikou Partnership Agreement, including priority targets for the implementation of the SDS-SEA. One of these was the "formulation and implementation of national policies and action plans for sustainable coastal and ocean development in at least 70 percent of the participating countries by 2015, in order to develop and strengthen integrated coastal and ocean governance at the national level."

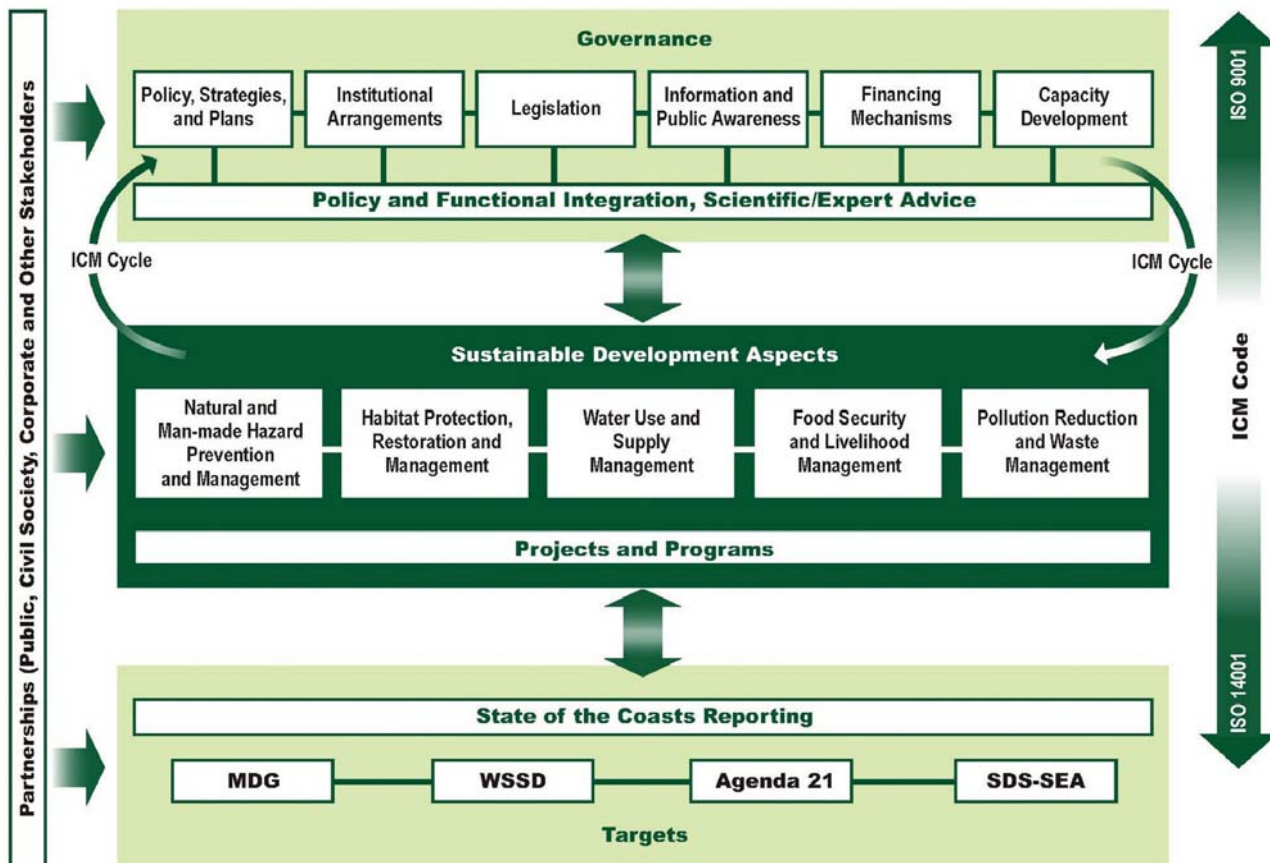
During the 2009 EAS Congress, participants from the East Asian Seas region and around the world brought updates on the development of their respective national integrated coastal and ocean management policies and actions.

### THE PROGRESS OF NATIONAL INTEGRATED COASTAL AND OCEAN MANAGEMENT

In the three years between the 2006 and 2009 Congresses, the process-oriented Framework for Sustainable Development of Coastal Areas through ICM Implementation (SDCA) was developed by PEMSEA based on the experiences in the region and elsewhere in the world. Applicable at all levels, including the national level, the SDCA ties elements of governance and management to address different aspects of sustainable development.

The experiences in policy development and implementation strategies applied at the local and

**Figure 1. Process-oriented Common Framework for Sustainable Development of Coastal Areas through ICM Implementation.**



Source: PEMSEA, 2009.



national levels that were presented at the different workshops under the Coastal and Ocean Governance theme of the EAS Congress 2009 provided excellent examples of the characteristics of ICM that make it an “operational definition of sustainable development” (PEMSEA, 2009), namely, broad-based approaches, operational strategies, operational tools, adaptive management, integration and coordination, and ecosystem-based management.

### *Broad-based approaches*

Broad-based approaches that support sustainable development and are attainable through ICM include environmental protection, sustainable livelihoods, and sustainable use of natural resources.

PEMSEA has developed a framework that can support these broad-based approaches and still provide for the specific components within an ICM programme. The Process-oriented Framework for Sustainable Development of Coastal Areas through ICM Implementation (SDCA), together with the ICM Cycle (**Figure 1**), serves as a guide for the management of the coastal and marine area in general or to address any issue concerning the area, at any level of governance. It brings together in an orderly fashion the broad and sometimes overwhelming array of issues, requirements, strategies, tools, processes and actions that need to be considered for effective management.

The SDCA may also be used as a framework for the integrated implementation of international and regional conventions (*Lotilla*). This is particularly important because of the highly technical nature of the obligations under different international and regional instruments, and their relationship

#### **Box 1. China Legislation and policies related to the Coast.**

PR China has passed Ocean Agenda 21 and other legal and policy reforms to promote sustainable coastal and marine development and coordination of marine affairs. The Sea Area Use Law covers China’s internal and territorial waters and adopts management schemes such as zoning, rights management, and user fee. The National Marine Functional Zonation (2002) divides water areas that include the contiguous zone, the Exclusive Economic Zone (EEZ) and the Continental Shelf into zones and ensures ecosystem health will be considered in development projects. China’s national five-year economic and social development programme of 2006 included a section on “marine resource protection and development.” In the same year, the State Ocean Development Programme 2010-2020 was launched. It adopted the watershed/catchment management principle, requiring upstream activities on land to consider their impacts on the downstream environmental carrying capacity in adjacent seas. Other features include the development and implementation of ‘water rights’-based management, market-based management and ecosystem-based management (PEMSEA, 2010c).

with one another and with overall coastal and ocean management. The SDCA facilitates the implementation of treaties and other instruments by placing them within the context of ICM.

Prof. Tommy Koh in his keynote speech at the start of the EAS Congress discussed the Convention on the Law of the Sea (UNCLOS) as one of the earliest international instruments providing consistently for the protection of the marine environment, and ICM which is the method by which the coastal environment may be managed and protected. The SDCA makes it clear that UNCLOS can be implemented through ICM.

For an archipelago like Indonesia, the challenge of coastal management is magnified by the special needs of long coasts and thousands of small islands, located in the Coral Triangle, with the consequent responsibility of protecting biodiversity in its territory. Aside from the various problems of environmental degradation and over-utilization of living resources, the threats posed by climate change

contribute to the urgency of adopting integrated policy. Indonesia has passed Law No. 27 (2007), which promotes the sustainable utilization of coastal and marine resources, and various other laws, and has made great efforts to address these problems. Indonesia has played a proactive role in international efforts in this regard. Nevertheless, Indonesia is still working on more comprehensive coordination of the different sectors and the integration of coastal management into the national planning system (*Djalal*).

PR China’s coast contributes to 62 percent of the country’s GDP, and the importance of this has brought about various pieces of national legislation (**Box 1**). These laws have gone a long way in alleviating the problems brought about by intensive growth of population and economic activities in the coastal provinces. At the local level, ICM has been implemented successfully in certain localities. ICM has reduced use conflicts and the national laws have improved the pollution situation (*Yu*). However, coastal reclamation has proceeded

practically unabated, with resulting loss of natural resources and habitats. At present, the two initiatives, from the national level and from the local level, need to meet in order to effectively achieve an integrated policy framework for land and sea use management.

Mauritius, composed of a main island and six groups of islands, has to deal with cyclones, tidal surges and the impact of climate change, as well as uncontrolled human activities and development. To address these problems, the country recently adopted key policy documents that enshrine principles of integrated coastal zone management (ICZM), environmental impact assessment (EIA), land plans and zoning, biotyping, water quality index and ballast water monitoring. Challenges to the implementation of these policies are prioritization, overlapping legislation and inadequate funding and skills (*Seewoobaduth*).

Kenya has very rich coastal resources that contribute 9.5 percent of the annual GDP, and on which several sectors are heavily dependent.

But these are under threat from overexploitation, environmental degradation and resource use conflicts. It is recognized that linking conservation and protection of coastal and marine ecosystems to socioeconomic development is essential. Strategies will reflect this and will include poverty reduction, social equity and the harmonization of national and district development plans. Kenya Vision 2030, the new long-term development blueprint with the vision of becoming a globally competitive and prosperous country with a high quality of life by 2030, integrates coastal and ocean management (*Wangwe*).

There have been several developments in the region in connection with the UNCLOS requirements for countries to establish the outer limits of their continental margin. These limits determine the sea areas over which countries exercise jurisdiction and consequently the obligation to manage.

The significance of the state's claim to the continental margin and its resolution to sustainable development

is that there is a concomitant obligation to protect the environment of the area. Politically, it has an impact on the national identity as a coastal state. These two considerations should result in a stronger political will to rationally utilize and conserve the resources under the jurisdiction afforded under the international law and to achieve more coherent national ocean policies and overall coastal and ocean governance.

### Operational Strategies

Operational strategies are those strategies that bring about the changes towards an effective governance framework.

An integrated ocean policy has great importance to Japan given that it has responsibility for the world's sixth largest Exclusive Economic Zone and Continental Shelf. After years of advocacy by policy groups, the adoption of the Basic Act on Ocean Policy in July 2007, was finally achieved as a consequence of:

- A research institution, the Ocean Policy Research Foundation, playing an important advocacy role;
- Institutional arrangements necessitating the reorganization of government agencies; and
- "Development and maintenance" of political will in order to consolidate sector-based initiatives into a comprehensive and integrated ocean and coastal policy, including local government programs of coastal development (*Terashima*).

**Figure 2. Key Elements of Executive Order 533 (*Custodio*).**

- multi-sectoral mechanism to coordinate efforts of different agencies, sectors and administrative levels;
- coastal strategies and action plans to address priority issues and concerns;
- public awareness and capacity building programs;
- integrated environmental monitoring;
- information sharing;
- mainstreaming of ICM program into national and local governments' planning and socioeconomic development programs; and
- investments and sustainable financing mechanisms for environmental improvement/protection and resource conservation.



In the Philippines, a country with a very long coastline

and some of the richest marine biodiversity in the world, the urgency for effective management to address the escalating pressures on the coastal and ocean resources and environment was recognized. The implementation of ICM was adopted as a national strategy in 2006 through Executive Order 533 (Figure 2). The national ministry, the Department of Environment and Natural Resources (DENR) has since been very active in implementing it, particularly in assisting local governments in adopting and implementing ICM with multisectoral participation, and in training and awareness building. There is widespread acceptance of ICM among local governments, but challenges remain. Some examples of these are conflicts in local priorities and non-allocation of funds for ICM implementation, lack of capacity to handle information resulting in loss of important data, and the need for alternative livelihoods (Custodio).

In the Philippines, there is a national lead agency responsible for ICM, but it is the local governments that actually implement ICM. To address the shortfall in funding, different mechanisms were established to finance the implementation of the national ICM program. Aside from national government budget and local government funds, environmental fees and public sector-private sector partnerships (PPP) were being applied (Custodio; Jara).

Singapore has been a participating country of PEMSEA from its inception. The academic sector of Singapore has provided key expertise in the development of PEMSEA programmes. and specific programmes utilizing ICM principles were implemented in the country. However, full political acceptance of ICM as an imperative national policy only occurred in 2008 (Figure 3). Having done so, Singapore

Figure 3. ICM Adoption in Singapore: Milestone (Goh).

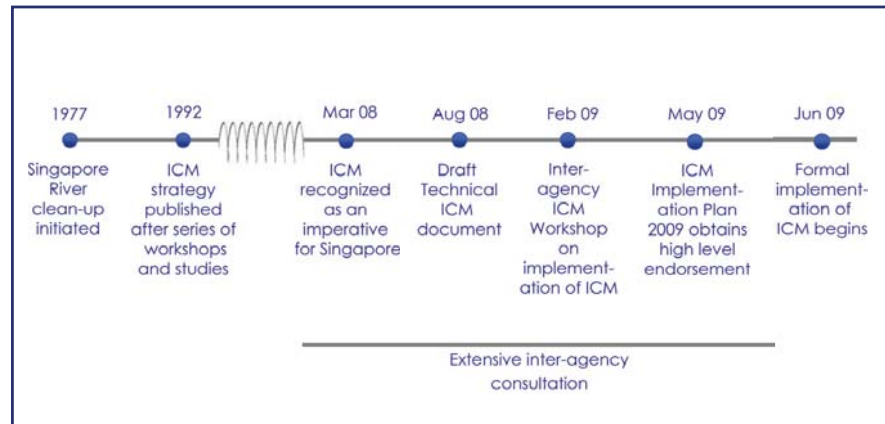
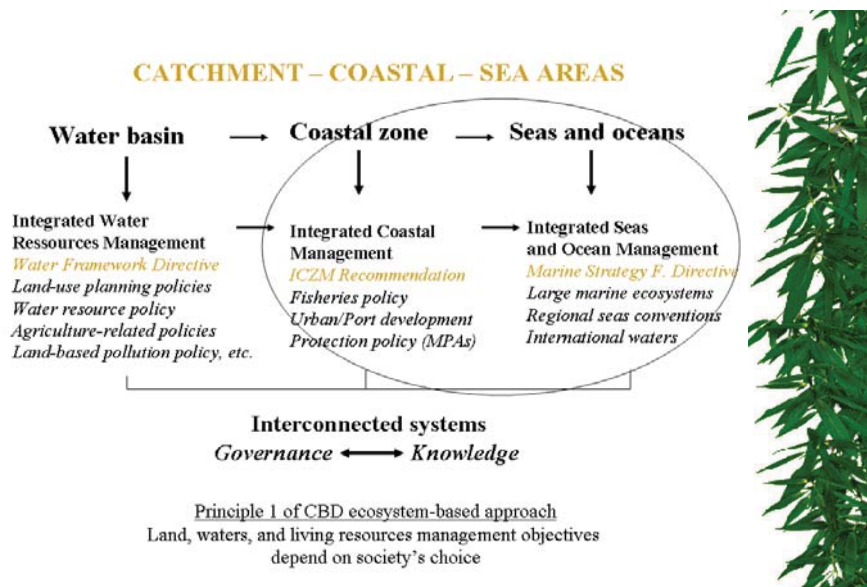


Figure 4. Interconnection: From Water Basin to Maritime Basin (Henocque).



will fully apply ICM as developed by PEMSEA as it applies to Singapore (Goh).

The adoption of ICM in Europe was a very logical progression from local initiatives in 1995 to becoming a part of the European Union's Marine Strategy Framework Directive in 2008 and adoption as part of national maritime policy among EU member states in 2009. Interconnections have been made between management of

the water basin, the coastal zone and seas and oceans through integrated water resources management (IWRM), ICM and integrated seas and ocean management. There is also the interconnection between territorial jurisdictions and between the components and the whole. ICM is local, and yet the regional sea conventions, including OSPAR (North Sea), HELCOM (Baltic Sea) and the Barcelona Convention (Mediterranean Sea), have important roles in coastal

and ocean management in Europe as well. It can be seen then that ICM is “nested” within the overall water-basin-to-maritime-basin local-to-national-to-regional policy (*Henocque*).

Saint Lucia, an island state in the Caribbean, is greatly dependent on its coastal resources. Although it is mountainous, coastal management means management of the entire island ecosystem. To do this, Saint Lucia adopted an ICZM Strategy and Action Plan with the objectives of developing a planning framework for managing coastal resource use, establishing appropriate decision-support systems and securing adequate financial resources. Other approaches utilized are having a champion, an interagency collaboration mechanism, promoting on-the-ground success and adaptive planning (*Walker*).

South Africa’s focus on management of marine protected areas (MPAs) is an example of integration of coastal and ocean management into national planning. Because of the strategic location of the country where two oceans meet, coastal goods and services are estimated to constitute 35 percent of the GDP. A legally-mandated system of MPAs covers 20 percent of the coastline, focusing on protection of marine biodiversity and socioeconomic development. In 2008, the National Protected Area Expansion Strategy was adopted to increase coverage of MPAs to include marine, wetland, terrestrial, estuarine and riverine ecosystems. Operational partnership contracts are in place for managing agencies for the MPAs. Various strategies for objectives such as species protection, resource conservation, and tourism development have been put in place. Expansion plans for the MPAs are to be developed.

### Box 2. Policy Changes in the Manila Bay Area (*Lotilla, et al.*).

- Coastal Strategy (MBCS) – embodies the shared vision of the Manila Bay Area stakeholders and the strategies needed to attain the vision;
- Operational plan of the Manila Bay Coastal Strategy (OPMB) – provides the specific targets, timeframe, budget and responsible entities;
- Executive No. 533 – ICM policy framework;
- Integration of land and sea as single planning unit – Bataan and Cavite;
- Oil spill preparedness not only the responders in case of oil spill but also the national and local government units;
- Manila Bay Area Advocacy plan – target various types of stakeholders using appropriate methods of sending messages, tag line – *Bahagi ka ng Obra* (You are part of the masterpiece); and
- Environmental monitoring of the Bay – integrated approach to determine changes in the condition of Manila Bay.

In the Philippines, private stakeholders employed the strategy of taking a case to court in 1999 to compel the Department of Environment and Natural Resources (DENR) and other relevant government agencies to adopt and implement a plan for the cleanup and management of Manila Bay. While the case was making its way through the judicial system, the DENR (with the support of PEMSEA) prepared the Manila Bay Coastal Strategy and the Manila Bay Operational Plan. The case reached the Supreme Court, which resolved it in 2009 by requiring government agencies to implement the Manila Bay Operational Plan and to report their actions every 90 days to an Advisory Committee, composed of eminent personages, established for the purpose (*Oposa*).

A strategy being put into effect by Japan concerns the steps taken by the Ministry of Education to incorporate awareness and education on the ocean into the elementary and middle school curricula as required by the Basic Plan on Ocean Policy. The Ministry has come up with a proposal for the incorporation of a “marine

education” in elementary school, which will be part of an overall design for “ocean education” in the 21st century (*Tamura*).

### Operational Tools

Operational tools are practices or activities that have been incorporated into the ICM Cycle.

The Integrated Information Management System for Coastal and Marine Environment (IIMS) was developed by PEMSEA to provide a decision-support system to supply necessary data needs. The database supports applications in ICM, bridges data gaps in ocean and coastal governance, and packages data/information into formats that are understood by the users. This has resulted in formerly invisible information becoming visible and facilitating adoption and implementation of policies (**Box 2** presents policy changes in the Manila Bay Area) (*Lotilla, et al.*).

Sri Lanka has a rich array of biodiversity, and its coastal areas

contribute significantly to the Sri Lankan economy. The National Environmental Policy is in place, supported by the National Environmental Act No. 47 of 1980 as amended and other environmental legislation. The Environmental Conservation Levy Act of 2008, applying a market-based instrument approach, provides for the imposition of a levy on specified items and services that are likely to have a harmful impact on the environment. These include motor vehicles (to be paid by the owners annually), non-CFL bulbs of over 40 watts (to be paid by the importer or local manufacturer), services supplied by cellular phone operators (to be paid each month by the user of the phone), and the use of television transmission towers, broadcasting towers and telephone transmitting towers (to be paid by the users). All funds so collected are remitted to the Environmental Conservation Levy Account.

The law was challenged in court for the infringement of fundamental

rights guaranteed under the Constitution. The Supreme Court nullified the law with respect to motor vehicles and non-CFL electric bulbs and transmission towers but upheld the levy on cellular phones. Since then, the government has established a waste mobile phone collection network with the participation of the private sector (*Batuwitage*).

The legislation on National Marine Functional Zonation (2002) is China's main tool in implementing integrated coastal and marine management throughout its coast. Finding that its application needs some adjustment to take the fate of habitat protection into more consideration, the use of ICM as "the mechanism to bridge the comprehensive land use plan with marine functional zonation on the local level as the first step" is being recommended (*Yu*).

#### *Adaptive Management*

Integrated coastal and marine management at any level is a relatively

new approach, and each country and site is different. It is therefore understandable that in the progress of implementation, adjustments have to be made through the iterative process of planning, implementing, assessing, modifying and/or redoing (*PEMSEA, 2009*).

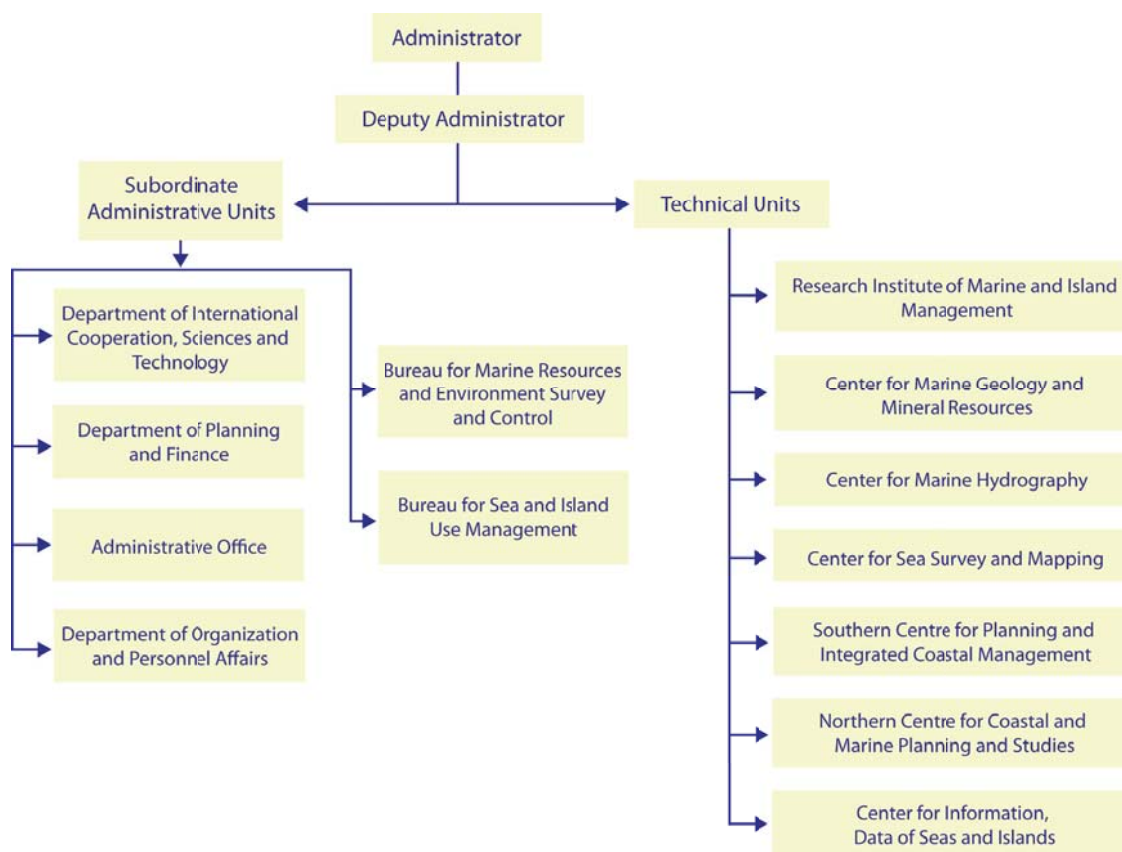
In the RO Korea, a national reorientation regarding the importance of the ocean to the country occurred in the late 1990s. Consequently, various national laws were passed and reorganizations took place, and continues to this day. RO Korea established the Ministry of Maritime Affairs and Fisheries (MOMAF) for integrated ocean management and passed the Coastal Zone Management Act (CZMA) and the Basic Act on Marine and Fishery Development (BAMFD). MOMAF was later integrated with the Ministry of Construction and Transportation to form the Ministry of Land, Transportation and Maritime Affairs. Fisheries functions were transferred to the Ministry of Food, Agriculture, Forestry and Fishery.



ICM activities in the Philippines.



Image Source: Custodio.

**Figure 5. VASI organizational chart (Chu Hoi).**

This necessitated some changes in legislation. A second Ocean Korea 21 (OK 21) for 2011-2020 reflects emerging environmental issues, including global climate change, and supports the goal of becoming an ocean G7 country by 2020. This demonstrates how the country continues to adapt in order to bring about effective integrated and coordinated ocean and coastal management (Kim).

Vietnam has implemented numerous coastal management projects in various localities along its long coastline. The country has integrated national offices into the Vietnam Administration of Seas and Islands (VASI) (Figure 5) under the Ministry of Natural Resources and Environment

(MONRE) and has enacted ICM-related policies and laws, including Governmental Decree No.25/2009/ND-CP on Integrated Marine Resources Management and Environmental Protection (which became effective in May 2009). However, sectoralism and fragmentation have not yet been overcome, and the country is still working towards an integrated policy and programmes. The need is rendered more urgent due to Vietnam's very high vulnerability to sea level rise due to climate change (Chu Hoi).

#### *Integration and Coordination*

A principle central to the ICM approach is integration and coordination between different

agencies and sectors and the streamlining of activities.

In Indonesia, the National Plan of Action (NPA) for the protection of the coastal and marine environment was developed and is being implemented through a multisectoral approach, with the participation of various sectoral agencies and nongovernmental groups. It emphasizes integration with river management. A task force for variability and climate change monitoring is to be organized under the Plan. The NPA addresses the creation of employment, livelihood opportunities and social support mechanisms. Continuous mainstreaming of the NPA is being pursued through strategic communication with planners and

### Box 3. Conclusions and Recommendations for some workshops under Theme 1: Coastal and Ocean Governance.

#### *Workshop 1: Coastal/Ocean Policy and Legislation: Implementation and New Initiatives*

##### **Conclusions**

Countries in the region are developing and/or implementing their respective national ocean/coastal policies based on UNCLOS, although there may be variations in terms of coverage. National ocean/coastal policy should address emerging issues, such as climate change, integrated management of land and sea, and economic development.

ICM is also an important part of an integrated ocean/coastal policy and coastal management programs, particularly of local governments. Sustainability of ICM programs must be addressed. Strong political will is important to be able to integrate sectoral initiatives into a national ocean/coastal policy. It should be materialized into institutional arrangements, and legislation.

While national ocean/coastal policies vary, they also have similar features and commonalities based on the international character of oceans. Thus, exchange of information and knowledge among countries is important. Communication and knowledge sharing between policymakers, stakeholders and scientists are important in ocean/coastal policy and ICM development and implementation. Marine education in schools and public outreach play an important role in raising awareness on ocean/coastal policy.

##### **Recommendations**

1. Facilitate, through the PEMSEA cooperative mechanism, exchange of information, knowledge and experience among countries on the development and implementing of national ocean/coastal policies;
2. Nest ICM in an integrated ocean/coastal policy;
3. Enhance political will, through the efforts of ocean society, in order to expand the circle of politicians who understand the importance of comprehensive and integrated ocean/coastal policy and to encourage materialization of this political will into institutional arrangements and legislation;
4. Incorporate in national ocean/coastal policy such measures that address emerging issues, such as climate change, integrated management of land and sea, and economic development;
5. Implement ICM within a framework for funding to be more accessible;
6. Enhance communication and knowledge sharing between policymakers, stakeholders and scientists;
7. Promote marine education at schools and public outreach; and
8. Harmonize ICM policy and implementation in national and local governments.

#### *Workshop 7: Making Mainstreaming Work: Driving National Action to Address Marine and Coastal Challenges*

##### **Conclusions**

Two major issues that the workshop sought to address relative to mainstreaming and implementation of coastal management were:

1. What is the relationship between coastal and marine environments and national development?
2. How do governments mainstream Integrated Coastal Management into national planning and budgetary processes?

The importance of coastal and marine ecosystems to national development is apparent in many countries given that the environment underpins the economy which in turn underpins the environment. Coastal and marine systems are central to national development in most countries and it is important to establish the economic value of ecosystem services at local scales in coastal and marine areas.

Mainstreaming is about solutions, not problems — it is about building wealth. In order to mainstream coastal management into national development there is a need to build on strengths and promote successes — success builds success. Mainstreaming is a process that takes time and one cannot do everything at once, but rather start with what is doable.

There is a need to encourage broad stakeholder participation and engage NGOs and private sector both in the development and implementation of national programs to increase transparency and ensure buy-in.

In generating funds to implement programs and projects under a national plan, one can make use of 'command and control', market-based instruments and voluntary approaches. Communication is critical and informal communication is as important as formal. An effective communication plan is essential.

One must live with conflicts as they will always be present between programs, planners and decisionmakers.

##### **Recommendations:**

To mainstream marine and coastal issues into national planning and budgetary processes, the workshop agreed that it is important to:

- Identify positive contributions of natural resource management to attainment of national development goals and the achievement of sustainable development;
- Identify the lead national agency;
- Form an inter-agency working group;
- Make use of good science;
- Identify goals and targets for marine and coastal sector in relation to national development goals;
- Scope out key strategic issues and entry points;
- Define a mainstreaming strategy; and
- Develop an accountability framework.

decisionmakers at different levels and the strengthening of collaboration with key persons from major political groups and research and educational institutions (*Indraningsih*).

RO Korea as described above is an example of how optimum integration and coordination was achieved through reorganization of government agencies. This is also the goal of Vietnam in its formation of VASI.

The presentation from Malaysia noted that as of that time, maritime affairs were “generally managed in a sectoral manner based on a tiered system structured around the federal and state government, ministries and agencies and to a lesser extent, the local authorities,” and therefore, while sectoral issues are adequately addressed, multiple use conflicts exist. It was recognized that in order to integrate ocean management, a comprehensive oceans policy addressing sectoral as well as inter-sectoral or cross-sectoral issues would be needed. Economic opportunities as well “could enhance the already significant contribution of the maritime sector to the national economy” (*Kaur*).

In Seychelles, the national economy is highly dependent on the coastal zone, with fishing and tourism as the main industries. For this reason, environmental management has always had a high priority to government. The National Environmental Plan of Seychelles (EMPS), implemented under a multisectoral National Steering Committee, is the national strategy and action plan in mainstreaming environmental management into the national development for the next ten years, thus serving as the blueprint for all development projects. The private sector participates in

EMPS implementation, as well as in education and awareness programmes together with nongovernmental organizations (NGOs) and the scientific community. What is needed is an incentive and disincentive plan for better and effective implementation of projects (*Gonzalves*).

In South Africa, the management of marine protected areas (MPAs) is integrated into national planning, as the system of MPAs covers 20 percent of the coastline, with expansion plans to be developed. The MPA plans include not only the protection of marine biodiversity but socioeconomic development as well (*Persad*).

### *Ecosystem-based Management*

ICM seamlessly aligns with ecosystem-based management, which emphasizes the maintenance of the integrity of ecosystems.

The National Plan of Action (NPA) of Indonesia for the protection of the coastal and marine environment is a good example, with its emphasis on integration of coastal and inland management.

While the presenters in the workshops on Coastal/Ocean Policy and Legislation and on Mainstreaming Marine and Coastal Issues did not specify ecosystem-based management, it was clear that it is the intent in their application of ICM and environmental management. The Science of Ecosystem-based Management workshop demonstrated the specific methods and processes developed, particularly in scientific monitoring, that operationalizes ecosystem-based management. These are all carried out in the context of ICM.

## **Acknowledgments:**

### **Co-Convening Agencies:**

**Theme 1, Workshop 1 – Coastal/Ocean Policy and Legislation: Implementation and New Initiatives:** Ocean Policy Research Foundation (OPRF) and Ocean Policy Institutes Network of the East Asian Region (OPINEAR)

**Theme 1, Workshop 7 – Mainstreaming Marine and Coastal Issues into National Planning and Budgetary Processes:** UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA).

### **Presentations:**

**Theme 1, Workshop 1 – Coastal/Ocean Policy and Legislation: Implementation and New Initiatives**

#### **Session 1: National Ocean Policy Implementation and New Initiatives**

Basiron, N. “Malaysia: National Ocean Policy Development.”

Chu Hoi, N. “National Policy of Vietnam on Coastal and Ocean Development.”

Djalal, H. “Experience and lessons learned from the implementation of the Coastal Zone and Small Island Management Act (2007) of Indonesia.”

Goh, N. “Adoption of the ICM Concept for Management of Coastal Areas in Singapore.”

Kim, S. G. “Implementation of the Ocean Korea 21, Korea Coastal Zone Management Act and Basic Law on Marine and Fishery Development.”

Terashima, H. “The New Initiative on Comprehensive Ocean Policy and The Basic Act on Ocean Policy of Japan.”

Yu, H. “China’s Sea Area Utilization Law and the Ocean White Paper of the People’s



Republic of China; Legal Framework, Practices and Achievements.”

## Session 2: Enabling Environment for ICM Implementation

Chua, T.E. “What is ICM?”

Custodio, C. “A Review of National and Local Initiatives in Promoting, Implementing and Scaling up ICM Practices in the Philippines in Implementation of EO 533.”

Henocque, Y. “Nested Approach in ICM Implementation.”

Lotilla, R.P.M. “Integrated Implementation of Relevant International Conventions Using ICM Planning and Management Framework.”

Lotilla, R.P.M., M.T. Lacerna\*, B. Gervacio, and D. Padayao. “Information Management for ICM Policy Planning and Decisionmaking.”

Oposa, A. “Involvement of the Judiciary in the Rehabilitation of Manila Bay.”

Tamura, M. “Primary Education in coasts and oceans in Japan.”

## Session 3: Legislators’ Dialogue

Facilitator: Hon. Pia Cayetano, Member, Philippine Senate

### Discussants:

Cambodia: HE Mrs. Mean Soman;

Japan: Goshi Hosono; Yasutoshi Nishimura;

Philippines: Sen. Miguel Zubiri; Rep. Belma Cabilao; Rep. Albert S. Garcia;

RO Korea: Dr. Je Jong-Geel;

Vietnam: Vice Minister Van Duc.

## Theme 1, Workshop 3 – The Continental Shelf: Post-May 2009 Perspectives

### Session 1: Submissions on the Limitations of the Continental Shelf

### Limits and Prospects for Cooperative Arrangements in the Shared Areas.

Carrera, G. “Implementation of Annex 1 on the Rules of Procedures.”

Indonesia: Dr. Hashim Djalal, Ministry of Maritime Affairs and Fisheries, Indonesia

Malaysia: Prof. H.M. Ibrahim, Maritime Institute of Malaysia

Philippines: Atty. Jay L. Batongbacal, Philippine Center for Marine Affairs

Vietnam: Mr. Nguyen Hong-Thao, University of Hanoi Law Faculty, Vietnam

## Theme 1, Workshop 7 – Mainstreaming Marine and Coastal Issues into National Planning and Budgetary Processes

### Session 1 - Theme: Policy and Institutional Development Processes

### Session 2 - Theme: Integrated Coastal Zone Management (ICZM) - A Framework and Tool for Planning and Supporting Sustainable Management of Coastal Resources

Batuwitage, P. “Establishing an Environment Conservation Levy: Sri Lanka’s Experience.”

Gonzalves, C.J.J. “Policy and Institutional Development Processes in the Seychelles.”

Indraningsih, W. “NPA on Protecting Coastal and Marine Environment from Land-based Activities.”

Jara, R. “Mainstreaming ICM Policy in Planning and Financing in National and Local Systems.”

Osborn, D. “Mainstreaming Marine and Coastal Issues.”

Persad, R.S. “Mainstreaming on Marine and Coastal Issues into National Planning Coastal and Budgetary Processes.”

Seewoobaduth, J. “ICZM: A Framework and Tool for Planning and Supporting Sustainable Management of Coastal Resources: The Mauritian Experience.”

Walker, LV. “ICZM: A Framework and Tool for Planning and Supporting Sustainable Management of Coastal Resources: The Saint Lucian Experience.”

Wangwe, B. “Mainstreaming of Marine and Coastal issues into Kenya’s National Planning and Budgetary Process.”

## References:

PEMSEA. 2009. “Achieving Sustainable Development Targets in a Changing Climate: How Can ICM Help?” PEMSEA Policy Brief. Quezon City, Philippines.

PEMSEA. 2010a. East Asian Seas Congress 2009 Conference Outcomes. Available at: <http://pemsea.org/eascongress/international-conference> and [http://pemsea.org/eascongress/section-support-files/report\\_overall.pdf](http://pemsea.org/eascongress/section-support-files/report_overall.pdf)

PEMSEA. 2010b. East Asian Seas Congress 2009, Theme 1 Coastal and Ocean Governance Workshop Summary Reports, Presentations and Proceedings. Available at: <http://pemsea.org/eascongress/international-conference/coastal-and-ocean-governance>.

PEMSEA. 2010c. East Asian Seas Congress 2009, Theme 1, Workshop 1 – Coastal/Ocean Policy and Legislation: Implementation and New Initiatives - Summary Report . Available at: <http://pemsea.org/eascongress/section-support-files/EAS-WP2010-01.pdf>.

PEMSEA. 2010d. East Asian Seas Congress 2009, Theme 1, Workshop 7 – Mainstreaming Marine and Coastal Issues into National Planning and Budgetary Processes - Summary Report. Available at <http://pemsea.org/eascongress/section-support-files/EAS-WP2010-07.pdf>

By Mr. Ivan Zavadsky, Senior Water Resources Management Specialist, Global Environment Facility  
Ms. Anna Tengberg, United Nations Development Programme  
Ms. Stella Regina Bernad, Consultant, PEMSEA

## Addressing Transboundary Issues Through Regional/Subregional Seas Cooperation:

# Initiatives in East Asia

In 2002, a group of experts of the Partnership in Environmental Management for the Seas of East Asia (PEMSEA) stated the understanding of coastal and ocean governance in the region as:

- The application of integrated management approaches to addressing coastal multiple use conflicts and their consequences at the local level;
- Development of national coastal strategies and policies to address cross-sectoral issues and their impacts; and
- Strengthening collaborative strategies and arrangements to address transboundary issues at the subregional and regional levels [PEMSEA, 2002].

With this perspective, the following year, the East Asian Seas participating countries adopted the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) through the Putrajaya Declaration as a framework for attaining better coastal and ocean governance of their seas (Figure 1). The reasoning was that the SDS-SEA would strengthen governance of the region's marine and coastal resources by providing a framework for cooperation and collaboration, as well as use an integrated approach for sustainable development.

In 2006, in order to make this pursuit sustainable, the participating countries agreed to forge a regional partnership by transforming PEMSEA into a regional coordinating mechanism

(Haikou Partnership Agreement on the Implementation of the SDS-SEA) (Figure 2 and Figure 3). Other partners, composed of governmental, nongovernmental and private organizations all dedicated to the ultimate goal of environmental management of the Seas of East Asia, also signed a Partnership Operating Arrangements Agreement with PEMSEA, signifying their commitment to working with the partner countries to achieve the SDS-SEA vision and objectives.

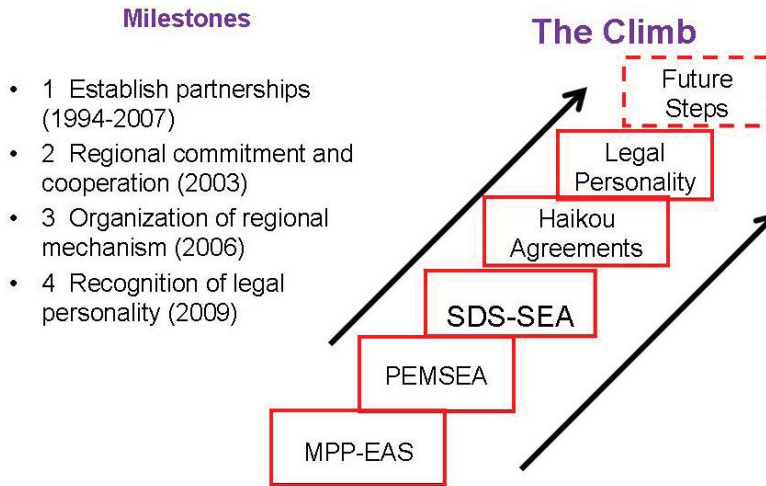
At the same time, the Partners adopted priority targets for the implementation of the SDS-SEA. These included some elements essential for governance: a regional partnership programme, adoption of national policies in at least 70 percent of the participating countries by 2015, and the implementation of ICM programmes in at least 20 percent of the region's coasts by 2015.

During the 2006 EAS Congress, coastal and ocean governance was discussed under the conference theme "Securing the Oceans," developing the new comprehensive understanding of ocean security as stated in the Tokyo Ocean Declaration (Cicin-Sain, 2006). The conclusions at that discussion concerned the advancement of nested ocean and coastal governance through cross-sectoral management at the national level, expansion of coastal

**Figure 1. Regional Commitment and Cooperation.**



Figure 2. Incremental Process.



and ocean management to the entire coastal zone and entire 200-mile zone, more effort to achieving regional transboundary cooperation, and more constant advocacy and widespread public education on oceans (*Tropical Coasts, 2006*).

During the recent EAS Congress, held in Manila on 23-27 November 2009, the discussions continued under the Coastal and Ocean Governance theme.

**UNCLOS Developments**

The Continental Shelf: Post-May 2009 Perspectives took up UNCLOS developments regarding the requirement of Article 76 of the Convention on the Law of the Sea for States to delineate their respective continental shelves, which has the potential to affect relations between neighboring States and thus, regional cooperation. While the formalization of conflicting claims could, in the extreme, destabilize relations in the region, on the other hand, their resolution could promote harmony. This has particular relevance to the region, as there is a high number of conflicting territorial claims among the countries of the Seas of East Asia.

The submissions and potential submissions by States of their

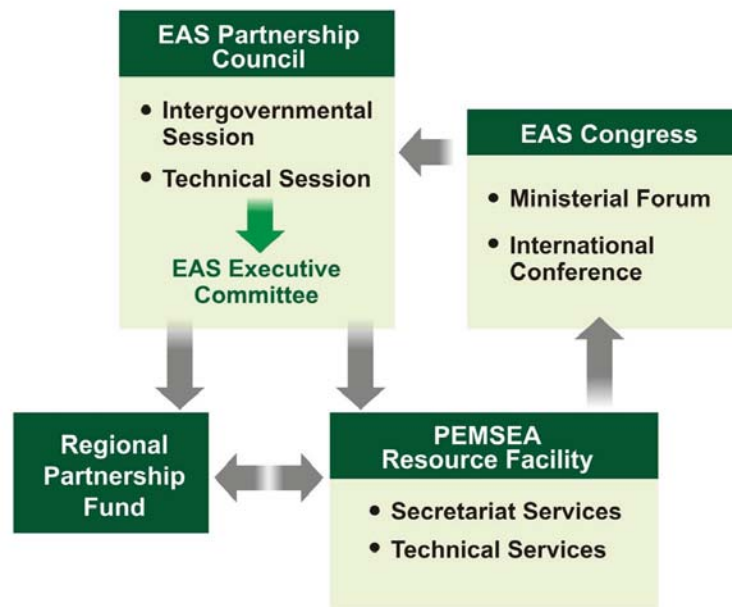
delineations and the resulting conflicts of claims between countries included the individual submissions of Japan and the Philippines, and the joint submission of Vietnam and Malaysia. While the Commission on the Outer Limits of the Continental Shelf (organized in accordance with the Convention) documents the conflicting claims and may help to clarify the issues between the States, only States can resolve disputes arising from the conflicting claims.

Submissions in the region have brought controversies to the front, but these should be seen as an opportunity for renewed dialogue between the States. Recommendations include the exploration of joint cooperation zones and other beneficial arrangements and greater cooperation for sustainable development of their shared marine areas (*PEMSEA, 2009b*), as allowed by the convention “without prejudice” to the jurisdictional claims (*Townsend-Gault*).

How do the conflicting claims brought under this UNCLOS mechanism, as well as those still to be made, affect the regional cooperation that is so necessary to effective regional coastal and ocean governance and to which PEMSEA is committed? It should be noted that UNCLOS itself requires States to cooperate for the purposes of conservation of natural resources, optimum exploitation and environmental protection (*Townsend-Gault, 2000*).

The Law of the Sea Convention is consistent in exhorting that States must take measures to protect the marine

Figure 3. Organization of PEMSEA Regional Mechanism.



environment in whatever actions they undertake as allowed by the Convention (Koh). For this reason, many consider UNCLOS as an early (signed in 1980 and entering into force in 1994) and comprehensive international environmental protection law.

The region has had years of regional cooperation towards coastal and ocean governance. The years of projects and programs to address issues transcending boundaries have built confidence and accustomed the countries to working together at problem-solving in the area of environmental management. Commitments made through PEMSEA and other agreements have established transboundary cooperation firmly in the region. If this does not resolve the conflicting jurisdictional claims, it at least brings about the willingness to set them aside while engaging in cooperative activities.

## Regional/Subregional Seas Cooperation

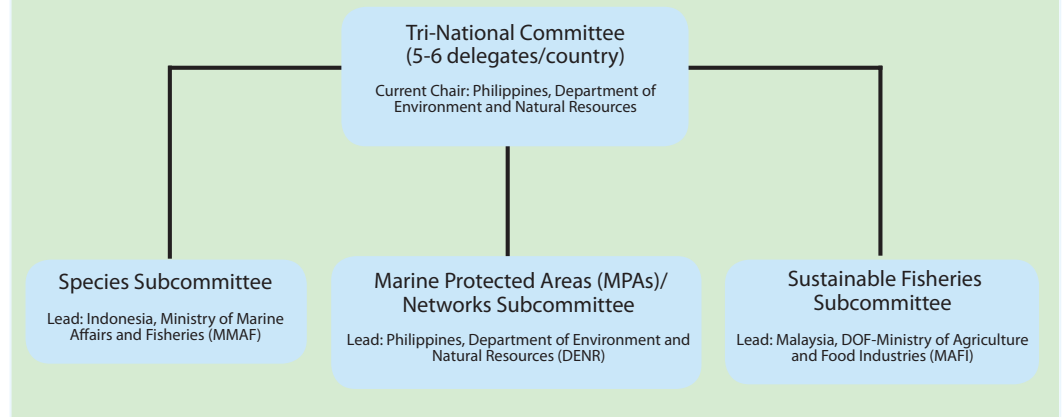
Case studies on specific regional and subregional efforts to manage transboundary issues include management of pollution, species, habitats, ecosystems and the coastal area as a whole, including their organizational aspects.

The Sulu-Sulawesi Marine Ecoregion (SSME) set up a Tri-National Committee (TNC) composed of the three participating countries. The TNC established three subcommittees on threatened, charismatic and migratory species; sustainable fisheries; and marine protected area and networks,

**Figure 4. Tri-National Committee for the Sulu-Sulawesi Marine Ecoregion (SSME): A functional governance** (Lim, et al., updated from Miciat and Trono, 2008).

### Country-level governance:

- **Indonesia:** Technical Working Group and National Committee for SSME [Ministry of Marine Affairs and Fisheries (MMAF) - Lead and Head of Delegation, Ministry of Environment, Ministry of Forestry, Ministry of Foreign Affairs, World Wide Fund for Nature]
- **Malaysia:** Technical Working Group for SSME [Department of Fisheries (DOF)-Sabah, Ministry of Agriculture and Food Industries (MAFI) - Lead and Head of Delegation, Ministry of Environment, Ministry of Tourism and Culture, Sabah Parks, Sabah Wildlife Department, Fisheries Department-Malaysia, University of Malaysia Sabah, Sabah Forestry Department, World Wide Fund for Nature]
- **Philippines:** Philippine Presidential Commission for the Integrated Conservation and Development of Sulu-Celebes Seas or PCSDCS [Department of Environment and Natural Resources (DENR) - Lead and Head of Delegation, Department of Agriculture-Bureau of Fisheries and Aquatic Resources, Autonomous Region of Muslim Mindanao, Philippine Council for Aquatic and Marine Research and Development (PCAMRD), Presidential Adviser on Mindanao Affairs, World Wide Fund for Nature, Conservation International, Department of Foreign Affairs]



each having its own Terms of Reference (TOR) and work plan (Figure 4).

The Yellow Sea Large Marine Ecosystem (YSLME) project focused on rebuilding fish stocks, a component of the Strategic Action Plan (SAP), through the development and implementation of Integrated Multi-Trophic Aquaculture (IMTA) (Figure 5).

The Coordinating Body on the Seas of East Asia (COBSEA) and the Northwest Pacific Action Plan (NOWPAP) cooperated on the implementation of projects addressing the problem of marine litter in the region through the organization of workshops, meetings and International Coastal Cleanup campaigns, establishing databases, developing monitoring guidelines and producing publications such as regional overviews on marine litter, posters and brochures (Figure 6).

The project united two regional programs with adjacent geographical areas in a cooperative effort.

The participating countries of the South China Sea (SCS) project promoted data-sharing through the development of a regional database, and established a long-term management framework for the marine environment of the SCS, founded on sound science, appropriate economic valuations, knowledge-based decisionmaking, and adaptive management, among others.

The Coral Triangle Initiative (CTI) developed subregional projects to address five primary goals including: (a) the designation and effective management of priority seascapes; (b) the full application of the ecosystem approach to management of fisheries and other marine resources; (c) the establishment and effective management of marine protected areas; (d) the achievement of climate change adaptation measures; and (e) the improvement of threatened species status. One of these subregional projects is the Arafura-Timor Seas Ecosystem Action (ATSEA) Project aimed at overcoming threats and problems in

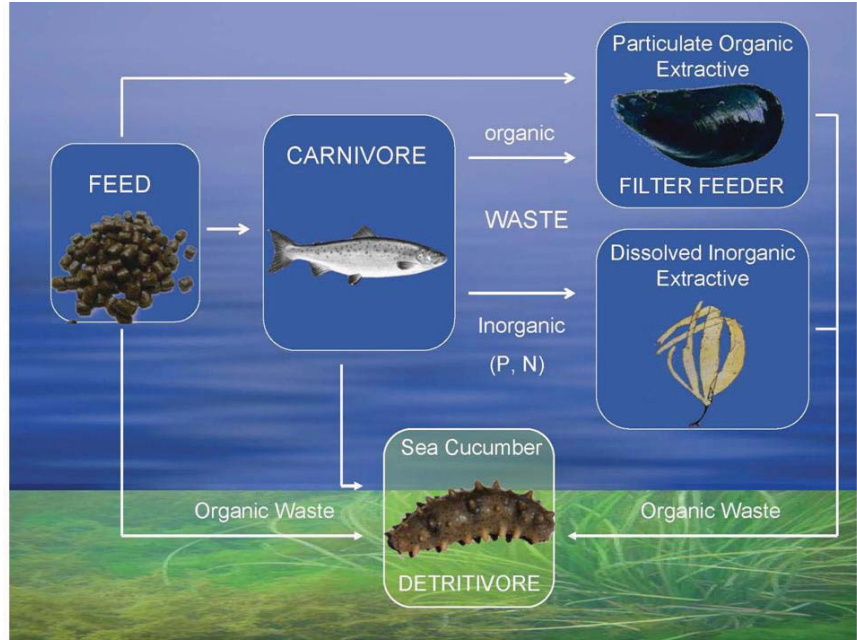
the area. A map of the Coral Triangle is presented in **Figure 7**; and the CTI organizational chart in **Figure 8**.

The UNEP/GEF South China Sea Project, with seven participating countries, addressed habitat loss and degradation, overexploitation of fisheries, and land-based pollution in 18 priority sites, and linked them through the development of a Fisheries Refugia network.

PEMSEA, in more than 15 years of its existence, developed integrated coastal management (ICM) as a management framework, established partnerships among the participating countries and evolved from a project into a self-sustaining regional mechanism with a legal personality, through which it can more effectively pursue sustainable development of the coastal and marine environment of the region.

It is clear that country participants of the different regional and subregional organizations have embraced inter-country cooperation. The transboundary nature of several issues affecting the marine environment is well-accepted in the East Asian region, and therefore, so is the need for cooperation to address them. The number of conduits that have been set up, the regional and subregional programs, seems justified by the magnitude and complexity of

**Figure 5. Integrated Multi-Tropic Aquaculture (IMTA) developed by YSLME.**



IMTA concept: The particulate waste in the water column is removed by filter feeding bivalves, while the portion that ends on the seafloor is utilized by sea cucumbers. The dissolved inorganic nutrients (N, P and CO<sub>2</sub>) are absorbed by the seaweed that also produces oxygen, which in turn is used by the other cultured organisms. Modified from Fang, et al., 2009) Source: Walton and Jiang, modified from Fang, et al., 2009.

such transboundary problems. However, it was noted that “there is a complex overlap of mandates and geographical coverage between different initiatives at the regional level in the region” (PEMSEA, 2009c). There is no doubt that the programs benefit the region. A common platform would maximize these impacts, avoid duplication of effort and optimize the available management and financial resources. There is obviously more to be done in this area.

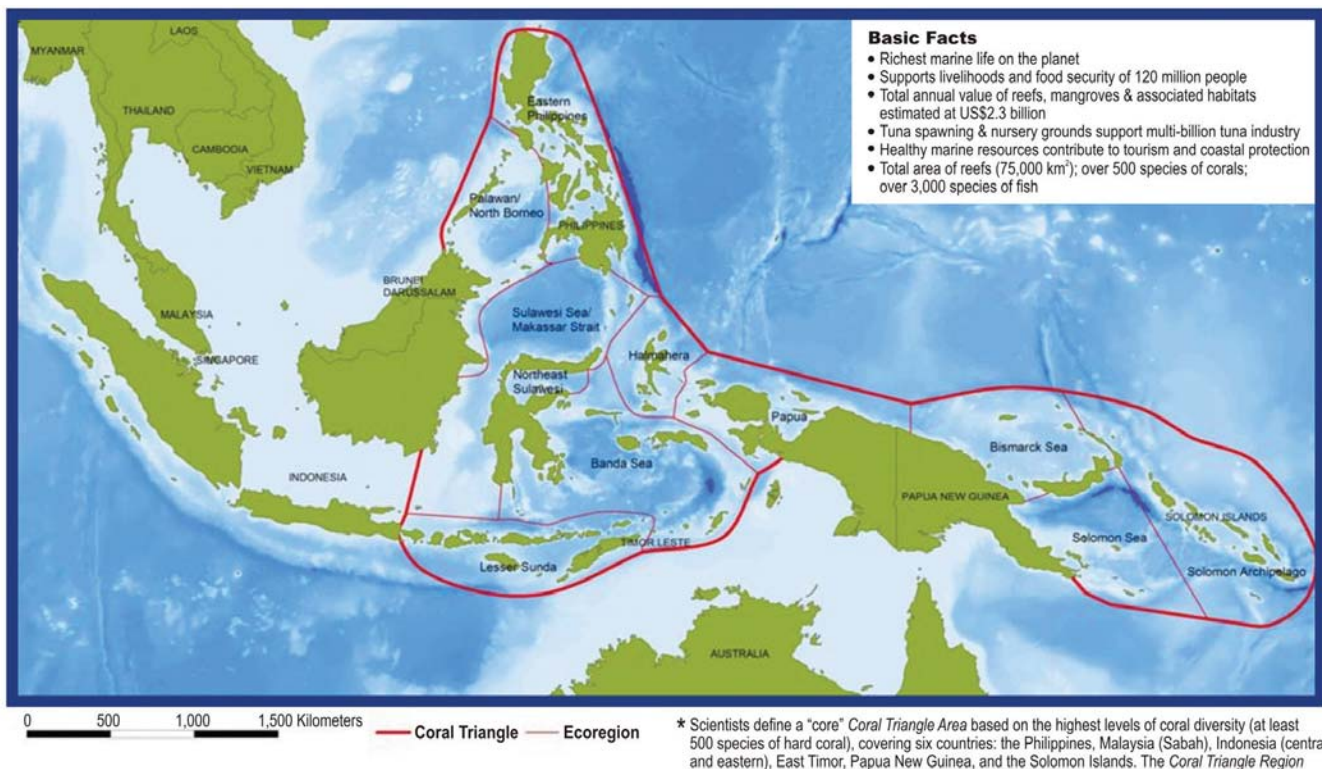
Improvements were suggested in the areas of imparting lessons learned from the different methodologies applied by the many programs, the translation of government commitments into clear goals, and the provision of a good platform for collaboration in a structured and coherent way. The SDS-SEA was reiterated as the “umbrella document” and platform for regional collaboration, which new programmes may revisit in order to identify new

**Figure 6. NOWPAP activities.**

Contents of RAP MALI		
Prevention of ML Input	Monitoring quantities and distribution of ML	Remove existing ML
<ul style="list-style-type: none"> <li>• Legal and Administrative Instruments</li> <li>• Wise Management</li> <li>• Information, Education and Outreach</li> <li>• Cooperation</li> <li>• Research Activities</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring of ML quantities and distribution</li> <li>• Maintenance of ML database</li> <li>• Compilation of data from national monitoring programmes</li> <li>• Regular assessment of current situation</li> </ul>	<ul style="list-style-type: none"> <li>• Beach Cleanups Campaigns</li> <li>• Removal of existing ML</li> <li>• Research Activities</li> </ul>

National Efforts	
<p><b>CHINA</b></p> <ul style="list-style-type: none"> <li>• Plastic bag ban since 2008</li> <li>• National MT action plan under preparation</li> </ul>	<p><b>JAPAN</b></p> <ul style="list-style-type: none"> <li>• Regular high-level inter-ministry meeting since 2006</li> <li>• Plastic bag charges</li> <li>• New ML disposal law (2009)</li> </ul>
<p><b>KOREA</b></p> <ul style="list-style-type: none"> <li>• Marine Environment Management Act came into force in 2008</li> <li>• ML management Plan since 2009</li> </ul>	<p><b>RUSSIA</b></p> <ul style="list-style-type: none"> <li>• Inter-department commission was established in 2005</li> <li>• A law on solid waste management is under development</li> </ul>

Figure 7. The Coral Triangle.



challenges and gaps and have them accounted therein.

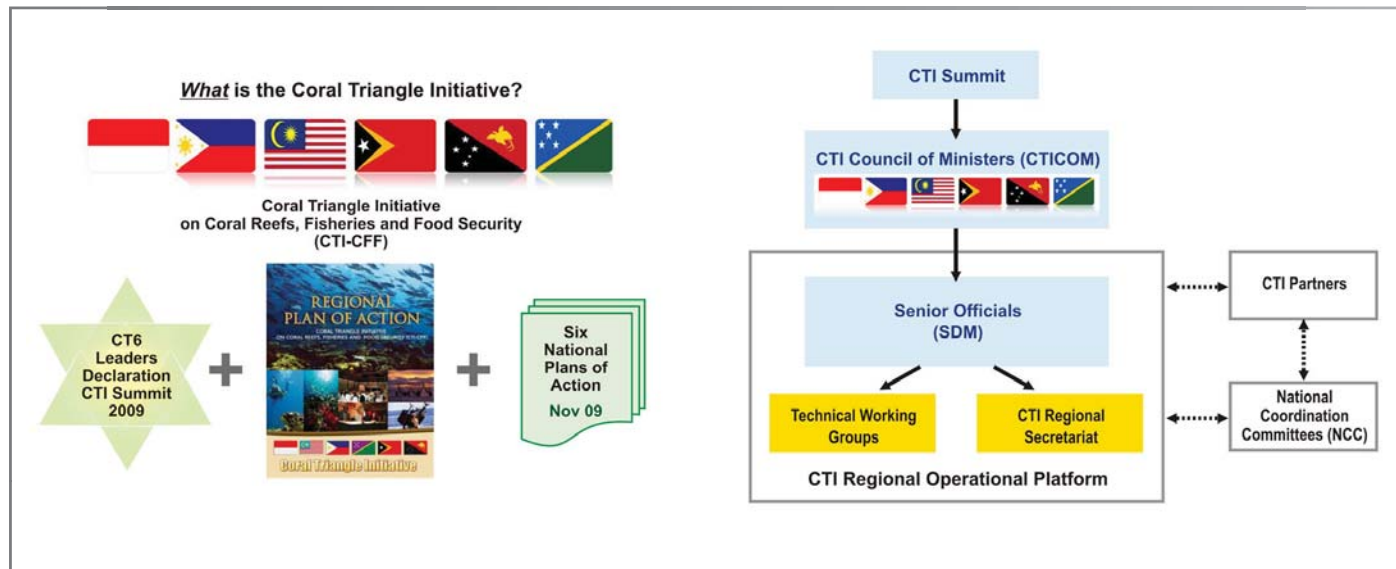
A set of practical measures, focusing on an information management mechanism, data exchange aimed at data harmonization, review of ongoing initiatives and programs, mechanisms for identifying and replicating best practices, promotion of ICM, and

stronger mobilization of government resources, were recommended to improve regional collaboration.

A Mangroves for the Future (MFF) study titled "Rapid Assessment of the Opportunities for a Sustainable Regional Mechanism for Governmental and Civil Society collaboration on Integrated Coastal Management in the

Indian Ocean Region, South Asian Seas, and Southeast Asian Seas" provided analysis of the inter-relatedness and possible collaborations among the different programmes in the region. The study assessed the existing institutions implementing ICM in the region, with the perspective of enhancing cooperation. The multiple demands on national governments to

Figure 8. The Coral Triangle Initiative and its Organizational Chart.



comply with international and regional commitments emphasizes the need for better coordination especially among the regional bodies and programmes (Figure 9). This need is evidenced by a number of factors, including language gaps, lack of communication and understanding, the continuing tendency to protect “turf”, and the need for more cross-sectoral integration.

Several areas for improvement of regional cooperation (MFF, 2009a) were cited:

- Overcoming sectoral barriers and creating cross-sectoral opportunities;
- Inter-organizational dialogue;
- Using tools to assist the understanding of obligations under international agreements;
- Building capacity through investment in education;
- Initiating cooperation at regional level by identifying common goals and agreeing on respective responsibilities;
- Creating cross-sectoral opportunities;
- Determining how to effectively share information;
- Determining the extent to which reports can be coordinated and cross-referenced; and
- The role of regional organizations in bridging the understanding gap between international obligations and national level programs and policies.

It was recommended that “a regional assessment of regional institutions and organizations such as the one undertaken by MFF should be conducted every two years” on a

**Figure 9. Multiple demands placed on national governments — a bottleneck for Governmental and Civil Society collaboration on ICM (MFF).**



rotational basis by the different organizations, institutions and programmes involved in ICM.

The exchange of information and knowledge among countries to learn from each other’s experiences in the development of national ocean and coastal policies was also recommended (PEMSEA, 2009a).

## Climate Change

Climate change is as an issue that is urgently being incorporated into plans and actions at the regional and subregional levels, and is certain to comprise a large portion of efforts hereafter.

The MFF Report (MFF, 2009a) identified it as “a very particular issue that cuts across almost every organization” for which capacity is still in the process of being

### Box 1. Workshop 3 - The Continental Shelf: Post-May 2009 Perspectives Conclusions and Recommendations.

#### Conclusions

- Peace and stability are prerequisites to any objectives of cooperation.
- Only the states can resolve their boundary disputes.
- Submissions brought to the front controversies in the Seas of East Asia region, particularly, the South China Sea.

#### Recommendations

- Resulting boundary disputes should be used as opportunity for renewed dialogue between neighboring states.
- Technical work on submissions may assist in clarifying various state positions that can be opportunity for step forward in the political process.
- Explore possibilities for joint cooperation zones for undisputed islands through inclusive dialogue.
- Promote continued dialogues and discussion and minimize the tone of discussion among states.

Source: PEMSEA, 2009b.

built. For this reason it is “a powerful reason for cooperation and sharing of individual institutions’ specific sectoral knowledge or capacity” at the regional level.

The Manila Declaration made by the Ministers at the end of the EAS Congress 2009 took particular note of this, stressing the particular vulnerability of the region to the impacts of climate change, to be addressed through the strengthening of the implementation of ICM. The transformation of PEMSEA into a self-sustained regional mechanism

for the implementation of the SDS-SEA, for which progress was noted in the Manila Declaration, will facilitate further development in regional coordination.

The regional and subregional organizations have their mandates and competencies to carry out and to contribute to sustainable development of the regional seas. As concluded by the workshops, they are also encouraged to contribute to better coordination. PEMSEA continues to pursue the regional partnership programme “building on the existing

relevant national and regional initiatives and programmes” as directed by the Haikou Partnership Agreement, with the SDS-SEA as platform.

## Conclusion

The ideal and ultimate goal of regional governance is common enforceable rules and standards in the region. In the Seas of East Asia, there is no illusion that this will be reached soon. PEMSEA has taken the Partnership approach and adopted the SDS-SEA as a part of a step-wise process to regional governance. In this way, incremental

### Box 2. Conclusions and Recommendations for Workshop 4: Initiatives in East Asia for Addressing Transboundary Issues through Regional and Subregional Seas Cooperation.

#### Conclusions

- Coordination is necessary for efficient use of available resources among initiatives; there is a need for a good platform for collaboration in a structured and coherent way, bearing in mind that countries are the key stakeholders;
- Methodological approaches vary: top down vs. bottom up: TDA/SAP, MPAs, Fish refugia, ICM/ecosystem-based management, demonstrations/pilot sites on ICM, etc. Information on these and lessons learned are not sufficiently organized for optimal cooperation and for ease of use by countries and other stakeholders;
- Commitments from the governments should be recognized and reflected in the regional and subregional programmes and initiatives — what countries want to do to address the transboundary issues, with clear goals to be transformed to national implementation plans of action;
- Adherence to ASEAN practices and utilization of its Working Group on environment and fisheries;
- SDS-SEA can serve as an umbrella document, ongoing and new programmes should revisit it in order to identify new challenges and gaps, and programmes could be accounted towards the SDS-SEA;
- Climate Change considerations and impacts need to be incorporated into plans, actions and activities;
- Inter-sectoral and inter-ministerial coordination within the countries (e.g., fisheries and environment departments) is critically important for coherence between ICM and sustainable fisheries management and habitat protection; and
- Ownership of the initiatives by the country is critically important.

#### Recommendations

- Sharing of information and experience through an organized, structured and cohesive information management mechanism for identifying the needs of countries and initiatives aiming at improving coordination and efficient use of resources should be developed and promoted;
- To start this process, a review of all ongoing initiatives and programs to be conducted as soon as possible, utilizing PEMSEA exercises, which is underway, and other similar exercises;
- Develop and promote better mechanisms for identification and replication of best practices from pilots and demonstration sites and for dissemination of lessons learned; consolidate and organize existing distribution channels of good practices and lessons learned such as through GEF IW:LEARN;
- Consider the use of SDS-SEA as a platform for collaboration within the region. Promote ICM including fisheries and habitat management at national and local levels as is the operational tool of the SDS-SEA; Mutual invitations and cross-participations in regional events could be used for coordination and information exchange;
- All partners are encouraged to strive for a better compatibility of data; standard methodologies for monitoring and assessment and common format for data exchange should be promoted aiming at data harmonization for better coordination of interventions.
- Stronger mobilization of governments’ resources is needed; countries are encouraged to increasingly provide resources for cooperating with each other.



steps are taken by the Partners that build trust and confidence in each other and muster and develop the resources, which allows them to work together at an increasing level to address common issues and challenges in cooperative ways (see *Bernad, et al, 2006*).

## Acknowledgements:

### Co-Convening Agencies:

#### Theme 1 Workshop 4: Addressing Transboundary Issues Through Regional/Subregional Seas

**Cooperation:** Conservation International - Philippines; Coordinating Body on the Seas of East Asia; United Nations Development Programme, Bangkok

#### Opportunities for a Sustainable Regional Mechanism for Governmental/Civil Society Collaboration on ICM in the Indian Ocean Region: Mangroves for the Future

### Presentations:

#### Theme 1 Workshop 4: Addressing Transboundary Issues Through Regional/Subregional Seas Cooperation

Adler, E. "Addressing the Transboundary Challenge of Marine Litter in East Asia by two UNEP Regional Seas Programmes."

La Viña, A. "PEMSEA: From a Regional Programme to a Sustainable Mechanism."

Lim, T.M.S, R. Trono and E.F.B. Miclat. "Sulu-Sulawesi: Regional governance and good practices."

Tengberg, A. "Overview on regional transboundary initiatives, projects, and programmes (status and funding opportunities)."

Tkalin, A. and E. Adler. "UNEP's Marine Litter Initiative Global Threat – Global Challenge and Regional Approach."

Tuan, V.S. and J. Pernetta. "The UNEP/GEF South China Sea Project: Initiatives for Regional Cooperation."

Wagey, T. "The Coral Triangle Initiative Summit and World Ocean Conference

with Highlights on the Arafura and Timor Seas Ecosystem Actions."

Walton, M. and Jiang, Y. "Successful Examples on Addressing Transboundary Marine Environmental Problems in the Yellow Sea."

Zhou, Q., L. Fengkui and W. Quan. "UNDP/GEF/SDA Project on Biodiversity Management in the Coastal Area of China's South Sea."

## References:

Bernad, S.R., K.R. Gallardo and T.E. Chua. 2006. "Regional Arrangement for the Implementation of the SDS-SEA: A Partnership Approach." *Tropical Coasts*, 13(1), July 2006.

Cicin-Sain, et al., 2006. "Securing the Oceans." *Tropical Coasts*, 13(2), December 2006. East Asian Seas Congress Special Issue 1.

Koh, T. 2009. Plenary Keynote on Coastal and Ocean Governance. East Asian Seas Congress 2009, 23 November 2009, Manila, Philippines.

Mangroves for the Future (MFF) Initiative. 2009a. "Opportunities for a Sustainable Regional Mechanism for Governmental/Civil Society Collaboration on ICM in the Indian Ocean – Workshop Summary Report. MFF Workshop at the East Asian Seas Congress, 25 November, 2009, Manila, Philippines. Available at: [mangrovesforthefuture.org](http://mangrovesforthefuture.org) and [pemsea.org/eascongress/special-events/workshop-on-government-and-civil-society-collaboration-on-integrated-coastal-management-in-the-indian-ocean-region/mff\\_summary\\_report.pdf](http://pemsea.org/eascongress/special-events/workshop-on-government-and-civil-society-collaboration-on-integrated-coastal-management-in-the-indian-ocean-region/mff_summary_report.pdf).

Mangroves for the Future (MFF) Initiative. 2009b. "Rapid Assessment of the Opportunities for a Sustainable Regional Mechanism for Governmental and Civil Society Collaboration on Integrated Coastal Management in the Indian Ocean Region, South Asian Seas, and South East Asian Seas." Original Assessment prepared by Kobkun Rayanakorn (19 March 2008), Updated Assessment prepared by Patricia Moore (30 December 2009). Edited by MFF Secretariat. Available at: [mangrovesforthefuture.org](http://mangrovesforthefuture.org) and [pemsea.org/eascongress/special-events/workshop-on-government-and-civil-](http://pemsea.org/eascongress/special-events/workshop-on-government-and-civil-society-collaboration-on-integrated-coastal-management-in-the-indian-ocean-region/mff_rapid_assessment.pdf)

[society-collaboration-on-integrated-coastal-management-in-the-indian-ocean-region/mff\\_rapid\\_assessment.pdf](http://pemsea.org/eascongress/special-events/workshop-on-government-and-civil-society-collaboration-on-integrated-coastal-management-in-the-indian-ocean-region/mff_rapid_assessment.pdf).

Miclat, E. F.B and R. B. Trono. 2008. "One Vision, One Plan, Common Resources, Joint Management." *Conserving the Sulu and Sulawesi Seas. Tropical Coasts*, 15(1), July 2008. Available at: [beta.pemsea.org/publications/conserving-sulu-and-sulawesi-seas](http://beta.pemsea.org/publications/conserving-sulu-and-sulawesi-seas).

PEMSEA. 2002. Proceedings of the Experts' Meeting on Strategies for Better Coastal and Ocean Governance, Kuala Lumpur, Malaysia, 18-20 November 2002. Partnerships in Environmental Management for the Seas of East Asia, Quezon City, Philippines.

PEMSEA. 2009a. Theme 1, Workshop 1 Summary Report: Coastal/Ocean Policy and Legislation: Implementation and New Initiatives Workshop Report. Available at: [pemsea.org/eascongress/section-support-files/EAS-WP2010-01.pdf](http://pemsea.org/eascongress/section-support-files/EAS-WP2010-01.pdf).

PEMSEA. 2009b. Theme 1, Workshop 3 Summary Report: The Continental Shelf: Post-May 2009 Perspective. Available at: [pemsea.org/eascongress/section-support-files/EAS-WP2010-03.pdf](http://pemsea.org/eascongress/section-support-files/EAS-WP2010-03.pdf)

PEMSEA. 2009c. Theme 1, Workshop 4 Summary Report: Addressing Transboundary Issues through Regional/Subregional Seas Cooperation: Initiatives in East Asia Workshop Report. Available at: [pemsea.org/eascongress/section-support-files/EAS-WP2010-04.pdf](http://pemsea.org/eascongress/section-support-files/EAS-WP2010-04.pdf)

Tropical Coasts. 2006. "One Vision, One Ocean." *Tropical Coasts*, 13(2), December 2006. East Asian Seas Congress Special Issue 1. Available at: [beta.pemsea.org/publications/one-vision-one-ocean](http://beta.pemsea.org/publications/one-vision-one-ocean).

Tropical Coasts. 2007. One Vision, One People. *Tropical Coasts*, 14(1), July 2007. East Asian Seas Congress Special Issue 2. Available at: [beta.pemsea.org/publications/one-vision-one-people](http://beta.pemsea.org/publications/one-vision-one-people).

Tropical Coasts. 2000. "A Challenging Journey: Coastal and Marine Policy Making in East Asia" *Tropical Coasts*, 7(2). Available at: [scribd.com/doc/35459440/Tropical-Coasts-Vol-7-No-2-A-Challenging-Journey-Coastal-and-Marine-Policy-Making-in-East-Asia](http://scribd.com/doc/35459440/Tropical-Coasts-Vol-7-No-2-A-Challenging-Journey-Coastal-and-Marine-Policy-Making-in-East-Asia).

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# Innovative Techniques Towards Reaching Sustainable Development Goals

Over the past 30 years, various integrated management approaches to coastal governance have been actively advocated, developed, demonstrated and practiced in many countries around the world. These initiatives were undertaken in various forms and at different geographical and functional scales. Much has been accomplished: programs have been established, stakeholders engaged, thousands of people trained, collaborations advanced, policies adopted, lessons learned and integrated into the process, and experiences shared. While there are successes in terms of impact and sustainability of management programs on the ground, there are also many failures in achieving identified objectives and sustainability. It is recognized that there is still so much

to do and so much to learn to reach sustainable development goals for coasts and oceans, including moving further afield, covering greater ground, and not just duplicating accomplishments but multiplying them exponentially.

During the East Asian Seas (EAS) Congress 2009, four workshops were held that discussed experiences and lessons in building and applying skills necessary for effective coastal and ocean governance, covering the following issues: (a) understanding of the marine economy; (b) facilitating an ecosystem approach to management; (c) implementing marine spatial planning; and (d) expanding capacity

building in the region through training and advanced education.

The workshops covered a wide range of learning and areas for expanded development, and emphasized that while ICM practice has matured, there is a need for a higher level of application tools. Furthermore, the challenges now at the forefront of coastal and ocean management demand new information and capabilities. These challenges include, among others, climate change and sea level rise, population pressure, persistent organic pollutants (POPs) and nuclear waste.

### Figure 1. The Bali Plan of Action

Ministers of all of the 21 APEC economies signed the Bali Plan Action in 2005. It prioritizes the value of the marine sector .

#### Bali Plan of Action

Towards Healthy Oceans and Coasts for the Sustainable Growth and Prosperity of the Asia-Pacific Community

#### Understanding the value of the marine sector.

*A better understanding of the short-term and long-term market and non-market value of the marine sector would better enable stakeholders and decision makers to achieve sustainable integrated marine management:*

- x. Study the market and non-market value of the marine environment and marine industries in the Asia-Pacific region including by undertaking research, communication and information exchange on marine activities.

Source: McIlgorm.

## Marine Economy

Advocacy for the protection and management of the coasts and oceans have made it clearer to more of the region's local and national governments of the economic importance of the coast and ocean. Evidence of this may be found in the Bali Plan of Action, which was signed by the Ministers of all 21 APEC economies in 2005 (**Figure 1**). It prioritized the value of the marine sector and called for a better understanding of the short-term and long-term market and non-market value of the sector.

The goal of measuring the ocean economy is to be able to answer such questions as "what do the oceans contribute to the national economy?" and "what is the economic value of the oceans as a resource?" The idea is simple, but difficult to put into practice. To answer questions such

as these requires thinking about the ocean as an input to the production of goods and services (**Box 1**). But almost all economic data are defined by what is made (the final product), not how it is made or where it is made. There are some types of economic activity where two ways of thinking overlap in marine-related activities: deep-sea freight transportation and commercial fishing are examples where the industry alone defines the connection to the ocean. But other industries have no such inherent connection. A beachfront hotel is classified in the same industry classification as a hotel at a ski resort. Thus, defining the ocean economy requires a combination of industrial and geographic perspectives. Certain industries will be included by definition since they directly use the ocean. For other industries, the choice of which establishments in that industry are selected for inclusion in the ocean economy will depend on their location in proximity to the oceans.

Another important consideration in defining the ocean economy is to use data that permit the ocean economy to be compared to other parts of the economy on a consistent basis across time and space. Knowing not only the size of the ocean economy, but how big it is compared with other parts of the economy, and how it has changed over time, provides useful information. These requirements mean

**"The major problem in marine economics is that the resources have small measured values but big uses."**

Dr. Charles Colgan, Keynote Speech, delivered by video message, as reported by IISD Reporting Services, EAS Congress Bulletin No. 1, 24 November 2009.

that the ocean economy should be defined using existing data to assure consistency. However, using government datasets that are not configured for these purposes means that the estimates, while exact as they can be with available tools, are not as accurate as might be if the government collected business data for an ocean account (*Colgan*).

National accounting systems currently being used in the region — and in the Pacific Rim area — are very much land-based. Activities and income reliant on the coastal and marine areas and the resources therein are in general not assessed separately from their sectors and in most countries, the data are not available separately from the sector in general. Some relevant data are unreported. Currently therefore, there is only a partial picture of the marine economy (See *Tropical Coasts*, July 2009, Vol. 16 No. 1.)

#### Box 1. Definitions of the marine economy.

"Ocean industries are defined as those industries that are based in Canada's maritime zones and coastal communities based in Canada's maritime zones and coastal communities adjoining these zones, or are dependent on activities in these adjoining these zones, or are dependent on activities in these areas for their income." (DFO, 1998) Canada

"The ocean economy consists of all economic activity which derives all or part of its inputs from the ocean" Kildow/Colgan, NOEP 2001, US\*

\* Ocean economy does not equal coastal economy.

### Box 2. National Plans and Policy on Marine Economy in China.

- **Outline of the National Marine Economic Development Plan, issued by the State Council in May 2003.**
  - The objective of national marine economic growth: By 2005, the added value of marine industries is to account for about 4 percent of GDP, and over 5 percent by 2010, and marine industries will gradually grow to be the pillar sector of national economy.
- **Outline of the National Marine Affairs Development Plan issued by the State Council in February 2008.**
  - The objective of national marine economic growth: By 2010, GDP of marine economy will be over 11 percent of national GDP, and annual increased ocean-related employment will be over 1 million.

Source: Rongzi.

The APEC large-scale categories can be used and adapted as an initial step, but lacking complete or consistent information, it was suggested that it would be beneficial to concentrate on good quality information from key sectors rather than get incomplete information in all categories. Five sectors: fisheries and aquaculture; marine transportation; marine tourism; offshore oil and gas; and government services (including national

being addressed. However, habitats were still being lost. This could perhaps be addressed through proper valuation and communication to the policymakers. Appropriate accounting could also pave the way for the application of market-based instruments. As an example, marine and coastal use zoning would work better as a management tool if user fees were based on the real value of the habitats that were being converted. Natural resources accounting, another methodology and strategy being employed in some countries, might be an effective application in this regard as well.

In order to accurately present just how big the coastal and marine economy is, three steps are needed: (1) finding usable data common across the region; (2) finding the right methodology that all can use; and (3) determining what uses the results may be applied.

Although countries of the region have different accounting systems, there are a few commonalities that may be developed guided by the APEC-developed framework (**Table 1**). This will allow for consistency and the start of an accounting system that will give policymakers and planners a clear picture of the marine economy.

defence) were identified as the key sectors, since they probably account for greater than 90 percent of the total value in most countries. (See **Table 2** on the economic impacts of marine-related activities in Canada.)

The lack of appreciation of the services provided by the coastal and marine resources skews priorities in planning. Proper attribution would allow the governments to act appropriately before the resources are irrevocably lost. The success of China's national sea use planning law (*Editor's note: See article on National Policy, this issue, page 7; see also Box 2.*) was established on the fact that use conflicts were

A very important consideration in favor of obtaining the information on the coastal and marine economy is that it will allow the governments to appraise economic vulnerability, plan strategies to address the financial crisis and the income gap, and plan accordingly in the face of the intensification of the effects of climate change, old and new types of pollution and the continued loss of habitat and overexploitation of resources. The information would provide basis for decisions to further develop the marine sectors or continue supporting them.

The usefulness of this marine economic framework also extends to site level

**Table 1. A comparison of APEC industry category data availability among Southeast Asian economies.**

Ocean economy- APEC Industry sectors	Indonesia	Japan	RO Korea	Malaysia	Philippines	Thailand	Vietnam
Oil and gas (minerals)	•	•	•	•	•	•	•
Fisheries/aquaculture (living resources)	•	•	•	•	•	•	•
Shipping (marine transportation and shipbuilding)	•	•	•	•	•	•	•
Defense/government	n/a	n/a	Some	n/a	Some	•	•
Marine construction	•	•	•	n/a	n/a	•	•
Marine tourism (leisure services)	•	•	•	•	•	•	•
Manufacturing equipment	•	n/a	•	•	•	n/a	•
Marine services (mapping, surveying, consulting)	•	n/a	Some	n/a	n/a	•	n/a
Marine research and education	n/a	n/a	n/a	n/a	•	•	n/a

Sources: National marine economy studies published in *Tropical Coasts*, 16(1), July 2009.

**Table 2. Economic Impacts of Marine-related Activities in Canada (2006).**

Primary Sub-Sectors	GDP Direct plus spin-off (\$000s)
1. Seafood	3,884,179
2. Offshore Oil and Gas	9,289,130
3. Marine Transportation	5,519,052
4. Marine Tourism	4,208,770
5. Marine Manufacturing and Construction	1,244,786
6. Federal Government	3,207,507
7. Provincial Government	128,400
8. Universities and Research	117,570
9. eNGOs	53,886
<b>Total</b>	<b>27,653,282</b>

Source: Baird.

to address site-specific environmental issues — that is, local governments and communities can use it at their level in the same way that national governments do.

In summary, it is apparent that changes in the economies of countries of the region over the past decades have, for the most part, increased the economic contributions of the oceans and coasts (*Tropical Coasts, 2009*). But major changes are occurring that affect the ocean and coastal economy, and even more profound changes are bound to occur as a consequence of historical problems like pollution, degradation

### Box 3. How can marine economy information aid decisionmakers at the national and local levels?

- Gives the marine economy a voice in national, regional and global forums;
- Provides government and industry with information on the size and importance of the sector (e.g., GDP; employment);
- Leads to more informed policymaking and decision-taking;
- Better understanding of the importance of good governance, management, protection and restoration of marine and coastal areas;
- Demonstrate the (potential) impact of climate change; and
- Demonstrate the outcomes of integrated coastal management.

and destruction of habitats, declining fisheries, uncontrolled development, poverty, and food security. Moreover, new pressures arising from a global economic downturn, energy issues, changes in the way in which coastal landscapes are used, and global forces such as climate change will increase historic pressures and create new ones. To begin to understand these changes, decisionmakers must appreciate what is likely to happen to ocean

and coastal economies under a business-as-usual scenario, as well as the long-term forces that will shape the ocean and coastal economies over the next several decades. The implication of the short- and long-term changes is that a focus on marine resource management and conservation is becoming more, not less, imperative. A better understanding of the tightly coupled socioecological systems of marine and coastal areas will lead to better decisions about what will take place and where, what areas to develop, and what areas to conserve. (Box 3).

### Science-based tools and methodologies for integrated, ecosystem-based management

The information and tools needed to understand and implement integrated, ecosystem-based management (EBM) can be derived from multiple disciplines and across varying spatial and temporal dimensions. EBM requires: (a) sound science supporting an adaptive management framework; (b) integrated assessments that facilitate management decisions for regulating multiple human pressures; and (c) coordinated and integrated national and

international monitoring programs.

As an innovative management approach, EBM acknowledges the connections, including linkages between ecosystems and human societies, economies and institutional systems.

### *Innovative Approaches to Monitor Ecosystem Changes*

EBM can be implemented strongly and effectively by capitalizing on the availability of scientific knowledge and technological advances from within and outside the East Asian Seas region, including experiences in engaging a wider participation of stakeholders in the scientific process.

It has been acknowledged that the operationalization of the goals of EBM needed to be systematized (*James, et al., 2007*). The need “to develop tools to characterize the accelerating changes and their effects on the ecosystems” is recognized. Tools or ecological indicators and innovative techniques should be pursued and developed, including modeling, remote sensing, and the use of biomarkers. For example, in Hong Kong, the effort consists of the identification of 13 biomarkers/bioindicators that can be applied for different management purposes (Box 4). It has been proposed that their application in the region be expanded to improve the cost-effectiveness of monitoring programs. Box 5 contains various case studies on innovative approaches to monitoring ecosystem changes.

### *ICM vs EBM*

The initial distinction between ICM and EBM and their eventual convergence is stated thus (*PEMSEA, 2009*):

*ICM and EBM complement each other in terms of operational modality where both adopt an integrated and ecosystem-based management*

*approach to managing the living resources and protecting ecosystem functions and services. They differ, on the other hand, in terms of priority, focus, outcome and area coverage. For instance, EBM focuses on ecosystem protection and management by taking the entire ecosystem such as the management of large marine ecosystems. ICM on the other hand may start with a small geographical scale within the administrative boundary of a local government and gradually scale up to cover a wider geographic area or ecosystems. Regardless of these differences, the application of these management approaches is necessary to ensure a comprehensive approach in addressing environmental (including ecosystem) concerns at the local level as well as in large bays, gulfs and coastal seas.*

ICM programs, for practicality, are initially geographically limited to correspond to the administrative jurisdiction of the participating local governments. This strategy eliminates complicated negotiations and institutional arrangements and allows energies to be concentrated on engaging stakeholders and setting up systems in a relatively straightforward manner. This strategy has paid off, as the initially modest successes have led to incremental expansion of geographic scope. In this way, the geographical expansion to cover the ecosystem develops organically.

One very good example is Xiamen, which in its implementation of ICM eventually moved into EBM through the inclusion of river and watershed management (**Box 6**).

In Danajon Bank in the Philippines, the development and implementation of an ecosystem-based fishery management (EBFM) approach which put in place control mechanisms to

bring about changes in the exploitation patterns among resource users is anticipated to result in an increased fish stocks by 10 percent in 2010 over the 2004 base period (**Figure 1**). The expansion of the project coverage from 4 municipalities to 17 municipalities suggested matching the spatial range of the ecosystem with the governance system to ensure the success of the initiative.

In Siak River (Indonesia), a study was conducted to determine the capacity of fisher communities in adapting to changes in the social and ecological systems occurring at various temporal

#### **Box 4. Application of biomarkers for different management purposes.**

- I. Identify exposure to certain chemicals
  - EROD, (Ethoxyresourufin-O-deethylase) in fish liver
- II. Monitor spatial and temporal changes in pollution
  - Body burden of metals and trace organics in barnacles and mussels
- III. Provide early warning to environmental deterioration
  - Fin erosion of fish
  - Epidermal hyperplasia/papilloma of fish
  - Condition Factor (CF) of fish
  - Hepatosomatic Index (HSI) of fish
  - Gonadosomatic Index (GSI) of fish
  - Lysosomal integrity of mussels
  - Imposex of gastropods
- IV. Indicate occurrence of adverse ecological consequences
  - Diversity indices
  - Log normal distribution
  - ABC (Abundance Biomass Comparison)
  - Multivariate statistics of species composition.

Source: Au.

#### **Box 5. Case studies on some innovative approaches to monitor ecosystem changes.**

Partnership for Observation of the Global Oceans (POGO) monitors the oceans using remote sensing. Remote sensing, which meets the requirements of speed, resolution, repeat frequency and cost-effectiveness was presented as an important tool to develop ecological indicators of the pelagic system that are useful for EBM. In contrast to ocean observations, which may be costly at the local level, a community-based monitoring was advocated as a low-cost alternative to monitor ecosystem changes. Through the Tsunami Impacts in Laem Son Project in Thailand, local scientists and communities were trained to monitor changes in intertidal biological assemblages in order to determine the extent of the damage caused by the 2004 tsunami.

Singapore has shifted from traditional monitoring of reef conditions to biocriteria monitoring, where the environment is examined whether it is improving or declining above or below acceptable levels. Considering the importance to Singapore of preserving the few remaining coastal habitats, which coexist with industrial activities, effort is directed towards improving biocriteria development and expanding it to other coastal habitats.

In Xiamen, PR China, the use of long-term monitoring data was found to be very effective in the conduct of an integrated analysis of nitrogen pollution and eutrophication to show the effect of human activities in the river-estuary-coastal system. The results of the study provided a basis for targeted management in specific areas and activities within the integrated river basin and coastal area management framework. In Xiamen Bay, numerical modeling to determine the changes in the hydrodynamic conditions of the bay for the period 1938-2007 provided information for optimizing restoration projects in the coastal areas. The data showed a decrease in average tidal velocity and tidal flow capacity attributable to the large-scale reclamation and dyke construction that took place beginning in the 1950s. The model predicts that these conditions could improve to 1972 conditions due to the current restoration projects.

Finding the right approaches to effectively communicate scientific findings to guide policy and management decisions remains essential. The Manila Bay Area Environmental Atlas in the Philippines has been a useful source of information for awareness building among stakeholders on the status of the Manila Bay Area. The map-based information, in combination with textual information was utilized for improved planning and policy formulation of various agencies and local governments including identification of programs and projects that support the implementation of the Operational Plan for the Manila Bay Coastal Strategy (OPMBCS). Moreover, the development of a cross-sectoral integrated environmental monitoring program for Manila Bay is expected to aid in measuring the progress and outcomes of implementing the OPMBCS.

**Box 6. ICM to EBM in Xiamen, China.**

1. First cycle: new legislation, strategic environmental management plan, pollution reduction.
2. Second cycle: sea use zoning, habitat restoration.
3. Third cycle: transboundary issues including upstream pollution.
4. Effective involvement of scientific expert group.
5. Demonstration site for 10 additional ICM sites in China.

and spatial scales. The ultimate goal of the initiative is to identify best policy options to achieve sustainability of the river basin, including understanding the need for integration in the context of ICM.

These and similar experiences have shown how EBM is becoming a reality in the region, as a natural progression in the development of integrated coastal and ocean management.

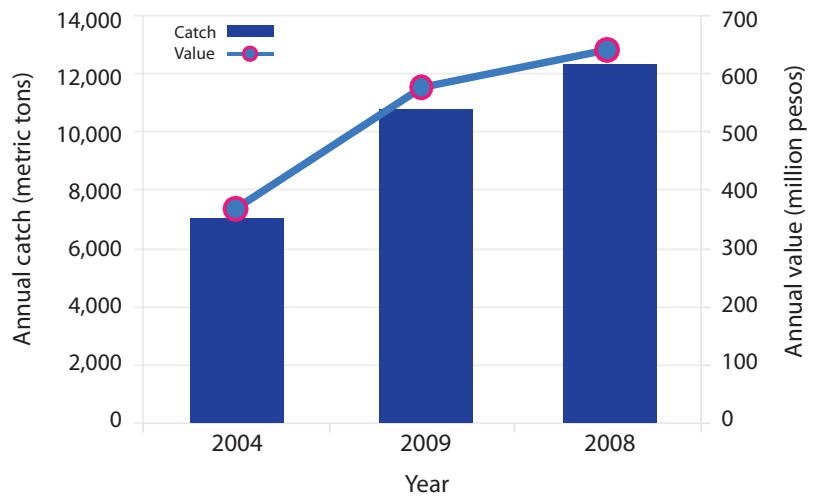
**Land and Sea Use Zoning: Challenges and Opportunities**

*Concepts and Practices of Zoning*

Zoning is commonly employed as a land and water use planning and regulatory tool to guide and direct the type of development most favorable or advantageous to the growth and development of an area considering its ecological constraints and socioeconomic objectives (Cabrido, 2009). In the Philippines, the zoning of land is a requirement by the government among local government units at the city and municipal levels to regulate the uses of their lands according to their most suitable and best uses from the perspectives of economics, social and environmental sustainability.

Aside from being a requirement, local governments, like Bataan (Philippines), are faced with multiple-use conflicts

**Figure 1. Volume and value of catch in Danajon Bank (Armada).**



(among them shipping, port zone, fishing and aquaculture, reclamation, resource protection, agriculture, land development, tourism and informal settlements), which give impetus to the development of a land and sea use zoning scheme (Baluyot). Such issues are common among national and local governments in the region.

Australia is one country that has successfully developed, implemented and monitored various protected area zoning schemes. For instance, the South Australian Government has established a carefully designed network of 19 multi-use marine protected areas (MPAs). A key

milestone in the process was the delineation and proclamation of the outer boundaries of this network of MPAs (Kirkman). Fourteen biophysical design principles were adopted by the South Australian Department for Environment and Heritage to guide the development of South Australia’s marine park boundaries (Figure 2).

After the designation of the boundaries, zoning within the MPAs was undertaken. The general zones included General Managed Use; Habitat Protection; Sanctuary Use; Restricted Access; and Special Purpose Areas.

**Figure 2. Biophysical design principles adopted by the South Australian Department for Environment and Heritage (Kirkman).**

- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1. Use of precautionary or anticipatory approach</li> <li>2. Ensure comprehensiveness</li> <li>3. Ensure adequacy</li> <li>4. Ensure representativeness</li> <li>5. Ensure connectivity and linkages</li> <li>6. Ensure resilience and vulnerability</li> <li>7. Account for ecological importance</li> <li>8. Complement and synergize with existing protected areas</li> <li>9. Accompany other conservation practices and agreements</li> <li>10. Consider all marine uses</li> <li>11. Consider indigenous interests and culture</li> <li>12. Consider cultural heritage</li> <li>13. Facilitate identification and compliance and enforcement</li> <li>14. Facilitate education, appreciation and recreation.</li> </ol> | <div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">}</div> <div> <p>overarching biophysical principles</p> </div> </div> <div style="display: flex; align-items: center; margin-top: 20px;"> <div style="font-size: 3em; margin-right: 10px;">}</div> <div> <p>socioeconomic principles</p> </div> </div> |
|--|---|

Another example of a successful protected area zoning was carried out and enforced in Moreton Bay Marine Park in Australia. With the expiration of an existing zoning scheme on 1 September 2008, a review was conducted to determine changes in patterns and levels of use over the past 10 years. The purpose of the review was to ensure the continuous, sustainable economic benefits being derived from the Bay (**Box 7**).

The review process (**Figure 3**) entailed data gathering and stakeholder consultation and negotiation processes, and culminated in a new zoning plan, which was adopted and initiated in 2008 (*Simmons*).

The new zoning plan included financing and monitoring commitments of the Queensland Government. The Queensland Government allocated US\$14 million in support of the commercial fishing sector for structural adjustments required under the new zoning plan, and another US\$1 million for the implementation of an artificial reef program. In addition, it was agreed that the zonation program would be reviewed in five years through a partnership approach in order to assess the ecological and socioeconomic effectiveness of the zoning.

The USAID-supported FISH project in the Philippines was guided by the experience of marine spatial planning (MSP) in the Great Barrier Reef, but adapted to take account of the smaller geographical scale, characteristics/ conditions at the site, technical capacity, and available financial resources (*Armada*). Project sites include: (1) Calamianes Islands, Northern Palawan; (2) Danajon Bank, Bohol; (3) Surigao del Sur, Pacific Seaboard; and (4) Tawi-Tawi, Sulu Archipelago.

The zoning was implemented with the objective of changing the

#### Box 7. Moreton Bay Marine Park's economic contribution.

- Tourism: ~\$500 million per annum (2006)
- Commercial fishing: ~\$24 million per annum (2006) value of landed catch
- Recreational fishing: ~\$194 million per annum (2000-2001) total associated expenditure
- Aquaculture: ~\$15 million per annum (2005-2006)

Figure 3. Timeline for the review of zoning in Moreton Bay Marine Park (*Simmons*).



management patterns of fisheries and, in effect, increasing fishcatch by 10 percent. The target of a 10 percent increase in fisheries catch was based on a simulation model, used to forecast outcomes under business-as-usual versus improved management scenarios.

The project was able to demonstrate how zoning for fisheries can be linked to fisheries resource management, resulting in improvements in mechanisms for registration and licensing of fishers, as well as management interventions concerning species and gear use that are spatial.

The process of zoning (**Figure 4**) involved stakeholder consultations, data gathering, information dissemination and public awareness in order to promote social acceptability and public support.

## Challenges to Zoning

### A. Climate Change

Existing and forecast impacts of climate change are emerging as important inputs to the zoning process. For example, in Hawaii, sea level is estimated to rise 0.24 m by 2050 and 1 m by 2100 (**Figure 5**). Erosion and retreat have already led to a loss of 4 miles of beaches over the last 50 years (*Lowry*). Twenty-five percent of sandy beaches on the island of Oahu have been lost or narrowed because of shoreline hardening. Several strategies undertaken to deal with coastal erosion in Hawaii are shown in **Box 8** (*Lowry*).

Some of the climate change adaptation initiatives being considered in Hawaii include: (a) stricter enforcement of illegal seawalls regulations; (b)



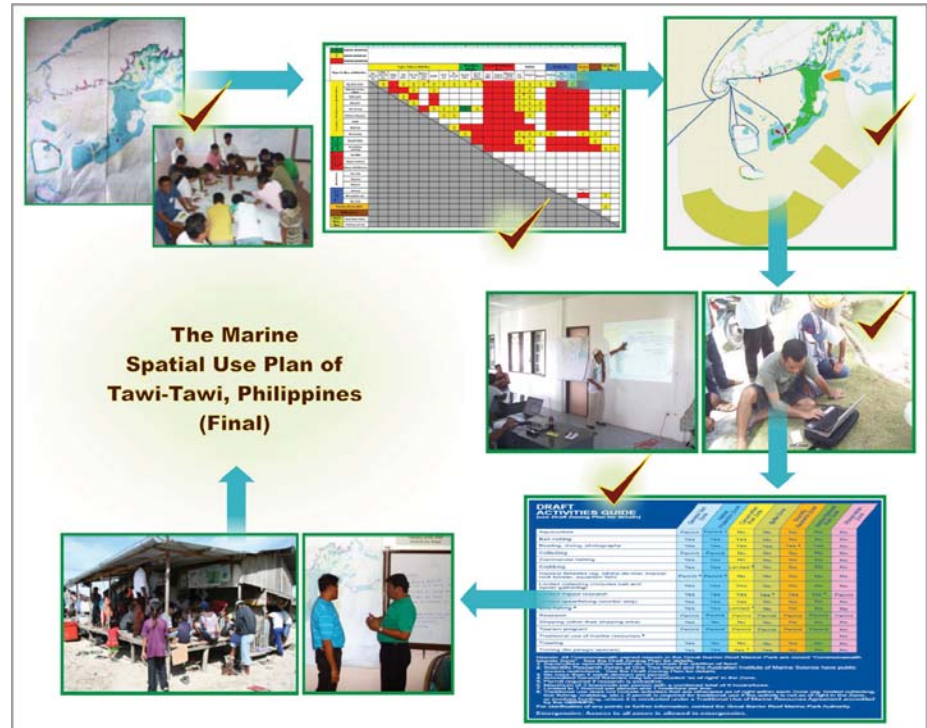
more beach protection plans with increased community involvement; (c) stricter building code requirements in flood-prone areas; (d) reduced insurance subsidies for new or re-built structures in most flood-prone areas; and (e) identification of potential 75 to 100 year sea level rise "impact zones" on each island.

Many of the questions associated with sea level rise and consequently longer term inundation scenarios are primarily technical. However, identifying some of the impacts of sea level rise and designing strategies to address them will create economic winners and losers — and is likely to be intensely political. Therefore, it is important that solutions be regarded as both effective and legitimate. This requires both technical analysis and transparent deliberative processes involving experts, managers, politicians and citizens. In selecting the best intervention, several socioeconomic and political criteria could be used (**Box 9**).

Aside from hard engineering employed in Hawaii, soft engineering and the proper zoning for mangroves can also be employed to cope with the challenges of climate change. Under the Sustainable Resource Management for Mangrove Biodiversity Conservation (SURMABIOCON), research is being undertaken on biobelting and biosheltering using mangroves in the typhoon-prone Province of Catanduanes, Philippines.

The study focuses on mangroves as buffers for storm surges and considers anthropogenic degradation and restoration following natural disturbances. Some of the methods being adopted in Catanduanes Island include structural manipulation (trees, land and water), planting trees and hydrological engineering; and compositional manipulation

Figure 4. Zoning Process facilitated under the FISH Project (Armada).



(species diversity and habitat recovery): seeding and planting multiple species to increase productivity. The results of the study will be used as a basis for biobelting and biosheltering initiatives in the province.

## B. Reclamation

One of the associated problems in zoning is the difficulty in dealing with coastal reclamation due to expansion of urban areas. While zoning regulates

### Box 8. Strategies for dealing with coastal erosion in Hawaii.

- **Beach nourishment.** Beach nourishment is a costly process. In the case of Waikiki, the cost has been more than US\$25 million over five years.
- **Shoreline setbacks.** The shoreline setback entails a minimum of 40' setback line required by state law in Hawaii. Variable setback lines were established on Maui and Kauai in consideration to the life expectancy of structures which is generally 70-100 years multiplied by the erosion rate (adjusted for sea level rise). Permanent structures are not allowed within setback area.
- **Special Management Area (ICM).** This is applied to coastal zone management area extending a minimum of 300 ft. landward from shoreline. Land use requires a special management area permit from the county which is subject to coastal policies. Coastal policies require adequate shoreline access, consistency with county land use plans, no substantial adverse environmental impacts, minimal alteration of landforms, no alteration of beach size etc.
- Urban zoning defines multiple categories of land use including residential, commercial, industrial, public facilities — and hazard and open space. It provides control over location, density, building height and lot siting. It also creates presumption of right to build.
- Tsunami zones have been designated on all islands.
- Flood zone designation establishes areas within which flood insurance is required.

the use and allocation of coastal areas, it can not deter reclamation due to urban spatial expansion and economic activities. With the increase in population over the years, coastal and river areas have become highly urbanized. Urban spatial expansion can be considered as a process of continually occupying the spatial resource suitable to urban development for social economic development (*Tao Lin*).

Nowhere is this more pronounced than in China. China's rapid urbanization led to the total sea reclamation of about 12,000 km<sup>2</sup> or an average of 200 km<sup>2</sup> per year since the 1950s (*Zhang*). Coastal reclamation projects in China were driven by various factors such as the salt industry in the 1950s, expansion of farm lands in the 1960s to the 1970s, the increased demand for aquaculture products in 1980s-1990s, and comprehensive uses in late 1990s to now.

Reclamation in China is permitted, with different government agencies

responsible for granting permits. However, reclamation has its impacts and ecosystem valuation indicates an estimated loss of US\$15.947 million/km<sup>2</sup> (*Zhang*).

An example of a developing area in China is Xiamen. Since its establishment in 1980s as a Special Economic Zone, Xiamen has undergone rapid urbanization with its urban population reaching 0.94 million in 2008. Land and coastal area utilization patterns in Xiamen are indicated in **Figure 6** which indicates the increasing trend in coastal reclamation for the past seven years.

Extensive reclamation and land conversion patterns in Xiamen have put pressure on the productivity of the island ecosystem. From 1955-2005, 122 km<sup>2</sup> of sea or 7.5 percent of Xiamen's current land area, were reclaimed primarily from the West Sea and Tong'an Bay, which are mostly within the reclamation zones of the Xiamen Marine Functional Zonation Scheme.

#### Box 9. Criteria for identifying strategies to address sea-level rise.

##### Economic

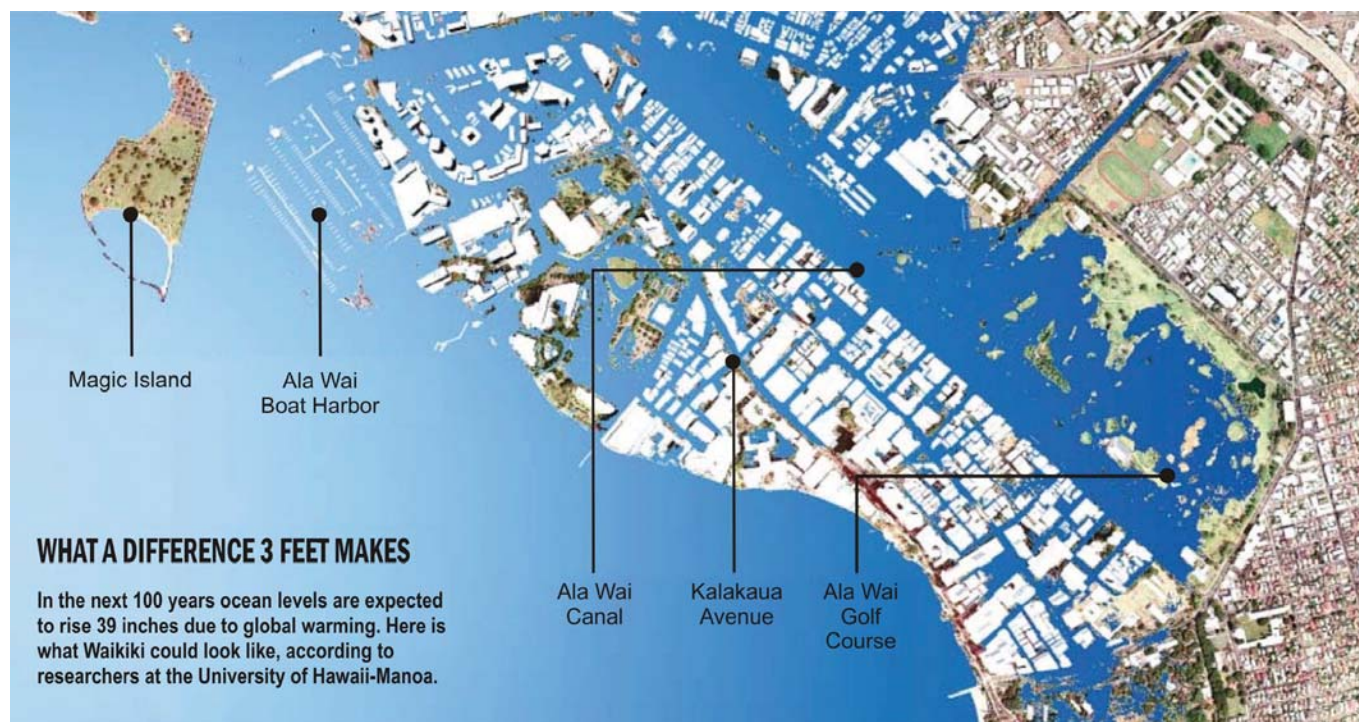
- Construction and maintenance costs
- Is the benefit greater than the resources applied to other approaches

##### Social/political

- Community risk – Is the strategy appropriate for anticipated sea level rise?
- Equity – who benefits and who pays in direct costs and dislocations?
- Institutional feasibility – Is it acceptable to the public? Does it require new institutions to implement?

To determine the impact of these pressures, several ecosystem valuation models were used to determine the impact of urbanization and reclamation to the ecosystem. However, many of the ecosystem valuation methods do not factor in

Figure 5. Varying impacts of sea level rise in selected coastal areas in Hawaii (*Lowry*).



the real 'value' of ecosystem services. This results in the underestimation of the true cost of ecosystem services, producing a lower 'price tag'. The actual ecosystem services being lost may be greater due to the limitations of methods and data. For example, user fees for sea reclamation in Tong'an Bay, Xiamen, are RMB 7.5/m<sup>2</sup> to RMB 22.5/m<sup>2</sup>, which is too low to reflect the external costs associated with reclamation. As a consequence, the low user fee does not deter excessive sea reclamation and protect the coastal environment (Wang, *et al.*).

Stricter measures are now being undertaken to review applications for reclamation permits to ensure that these are consistent with the zonation scheme and to ensure that ecosystem services are not compromised. The central government and Xiamen municipal government are also currently pilot testing eco-compensation schemes for broader application to better factor in the economic value of coastal ecosystem in determining user fees for reclamation and other sea use permits and licenses.

### Conclusions

Zoning is generally recognized as an important tool for sustainable

management of land and sea areas. The level of technical zoning done by countries and sites ranges from specific habitats to broader zoning for sea and coastal areas. Despite its importance in the sustainable allocation of uses and resources, countries in the EAS region have yet to fully implement land and sea-use zoning schemes due to various challenges in administrative and local capacity. Meanwhile, in some countries that developed comprehensive land and sea use zoning schemes, enforcement and policy support continue to be among the major issues.

A land and sea-use training workshop, which was conducted prior to the EAS Congress 2009, emphasized the need to distinguish zoning as a technical exercise and zonation as a legal instrument (*Serote*). Zonation can only be effective if governments are able to provide the necessary legal mechanisms at the national and local levels to enforce and implement zoning schemes. Developing and harmonizing national and local guidelines based on national and international standards should also be undertaken. However, the implementation of these guidelines also depends on the technical skills

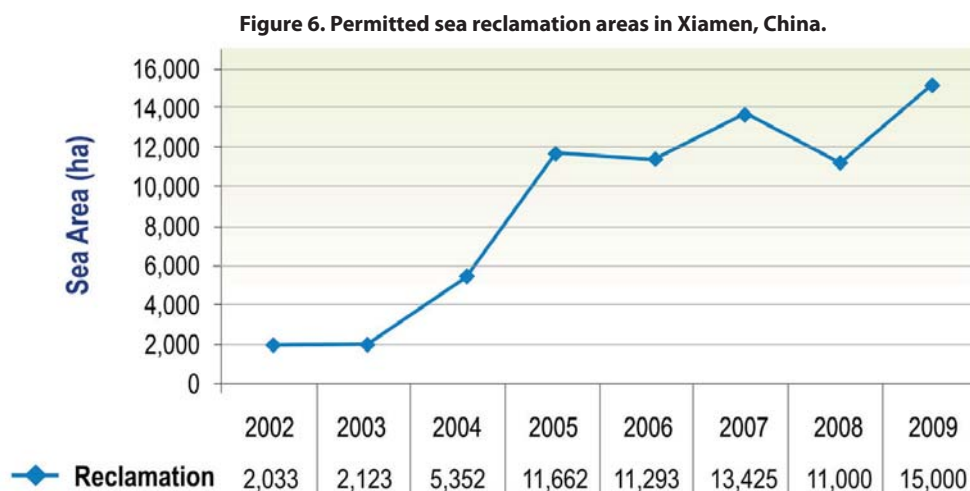
of local and national implementers. Capacity development for local institutions on technical and legal aspects of zonation, therefore, should be continually pursued in countries if zoning schemes are to be implemented effectively.

### Human Resources

Skills development, particularly through training, is a concern that needs to be addressed to meet human resources requirements in coastal and ocean governance.

Training is part and parcel of PEMSEA, and indeed in every project and programme, PEMSEA utilizes a comprehensive framework for sustainable development in the coastal area (SDCA) which in turn, is operationalized by ICM. In it, capacity development is one of the fundamental governance aspects.

Through the years, aside from the regular short-term trainings offered in the region, PEMSEA has contributed in establishing a network of learning centers and universities, standardized monitoring schemes, engaged areas of excellence, etc. PEMSEA and its partners have also begun to look into the development of a common



Sources: Sea Area Management Bulletin, 2002-2008; Expected 2009, taken from Zhang, 2009.

### Box 10. Capacity Development Activities presented during the Human Resource Workshop.

#### International Ocean Institute

The International Ocean Institute's OceanLearn is a system-wide programme for the coordination, delivery, quality assurance and development of global partnerships of the IOI's capacity building activities. OceanLearn is a global initiative which focuses on short training courses. It targets students and mid-level government, private sector and NGO employees. It is run by the IOI's network of Regional Operational Centers

From among OceanLearn's more than 300 participants in the last three years, about 80 from East Asia have completed IOI ocean governance courses. Their course deliveries in 2007-2009 include development, implementation and management of marine protected areas, ocean: governance (policy, law and management); responsible fisheries in the Pacific Islands; regional ocean governance for Mediterranean and Eastern European countries; and marine protected area management training.

#### Land-Ocean Interaction on the Coastal Zone (LOICZ) Project

The LOICZ Project is the core project of the International Geosphere-Biosphere Programme and the International Human Dimensions Programme on Global Environmental Change. Its aim is to provide science that contributes towards understanding the Earth system in order to inform, educate and contribute to the sustainability of the world's coastal zones. It is a collaboration which draws strength from thousands of researchers, a scientific steering committee (SSC) with 18 members; regional nodes in India, Singapore, China and Ghana, and an international project office (IPO) in Germany.

Its flagship capacity building strategy in long-term degree granting training is the Erasmus Mundus Joint Master Program in Water and Coastal Management. This program is participated in by 48 European and 15 non-European universities. Members of the LOICZ SSC and IPO teach different modules in this program.

#### ASEAN Foundation

The Foundation has so far supported some 100 projects worth US\$18 million. And over 18,000 ASEAN nationals have participated in capacity-building activities funded by the Foundation.

The Foundation has, to date, allotted about US\$8.5 million for projects which targeted developing human resources and capacity building. From this amount, about US\$3 million have been earmarked for ongoing capacity-building projects; roughly half are spent for scholarship programs. The Foundation's scholarships are coursed through the region's best universities and recently, partnerships with some private corporations have been started.

#### Asia-Pacific Network for Global Change Research (APN)

The APN is a network consisting of both policymakers and scientists to enhance research relevance for its stakeholders. Decisionmaking within the APN is always made after thorough discussion among and with its scientific members. In fact, the APN is unique in that it provides, once a year, a forum for its scientific and decisionmaking members to gather and make collective decisions on the research and capacity-building activities of the APN. Collective decisionmaking is made by all member countries, developed and developing. This unique gathering of within the APN family enables and encourages research and capacity-building/enhancement projects based on both policy needs and scientific gaps.

#### United Nations University (UNU)

Since 1996 up to the present, UNU — in collaboration with Shimadzu Japan and the National Project Coordinators (NPCs) from 11 Asian countries, namely, China, Japan, Indonesia, Republic of Korea, Malaysia, Singapore, Thailand, Vietnam, Philippines, India and Pakistan — has been active in capacity development for chemical analysis and monitoring of toxic organic compounds. This project's objective is to generate harmonized data on toxic organic compounds which can assist governments to manage pollution. And since 2002 these regional data serve as an input for the baseline data for the assessment of the effectivity of the Stockholm Convention in connection with the organochlorine pesticides (OCPs) in water, sediments and biota; and PCBs in water.

#### International Atomic Energy Agency (IAEA)'s Regional Cooperative Agreement

Asia is the only region in the world where electricity generating capacity and specifically, nuclear power is growing significantly. In East and South Asia, there are over 109 nuclear reactors in operation, 18 under construction and there are plans to build >110 within next 10 years. The greatest growth in nuclear generation is expected in China, RO Korea and India. Such condition and trend lend to an increasing cycling of radionuclides in the atmosphere and the marine environment.

Efforts to address challenges posed by nuclear generation are made through the International Atomic Energy Agency (IAEA)'s Regional Cooperative Agreement among 17 Asia/Pacific countries, constituting over 50 percent of the world's population and governed by IAEA's Technical Cooperation (TC) Programme. The TC Programme in 2007/2008 approved US\$2.8 million in projects. Since 1995, some of the major achievements of the marine programme, include: a marine radioactivity database; marine radio-analytical techniques in 14 RCA countries; new radioecology facilities in Indonesia, Malaysia, Pakistan and Thailand; novel nuclear technologies for marine environment applications; regional and national training in specific areas; expert assistance in national study programmes; regional communication/network development and data exchange; and quality assured and regionally standardized protocols.

curriculum in the region for a university degree programme for integrated coastal and ocean management. These initiatives provide an avenue in the continual improvement of ICM as a management tool, as well as re-tooling managers and mentors, instep with what is happening and in response to challenges in the region.

ICM's evolution into a management science as well as a management system is now being recognized. Operationally and technically, it can now be measured, such as through International Organization for Standardization (ISO), State of Coasts (SOC), etc., but politically, it has been instrumental in how local governments have likewise evolved. More recent local and national development processes are governed by integrative, collaborative planning and management, arguably as a result of the increase in lessons gained from integrated approaches, including ICM.

ICM is both a science and an art; a fact that necessitates a demand for a reformed training (short-term, degree granting, and other mechanisms). Questions such as the following are very relevant, which can be used to inform future strategies: Do we have enough training courses in this region? Do we have a supply of mentors, facilities, etc.? How do we reform ICM courses, instep with a requirement, that it should become a professional course? What do we want for the region? Where do we get funding for these new mechanisms? How do we address the lack in teaching materials? What is the profile of mentors/teachers conducting an ICM course? Likewise, what's the profile of students/trainees of ICM? What entry requirements should be imposed?

While a core of ICM practitioners has been developed in the region through the years, the gap between demand and supply is still wide. The sheer

extent of the coastal and ocean areas, and perhaps the fluid nature of personnel assignment, combined with the ever-growing list of issues and challenges, are a large part of the reason.

There are many providers of short-term and long-term trainings in the region (**Box 10**) who are open to participating in cooperative efforts. How to match these with the training needs is to be part of the solution in the coming months.

A survey of training needs has been undertaken among national governments, local governments, and research/academic institutions (with a focus on PEMSEA Partners). The respondents identified training needs that are focused on climate change, development planning and management, integrated coastal management, ocean governance, ecosystem-based management, resource valuation, risk assessment, information management, and ICM tools. It may be noted that even after all of the training conducted in ICM over the years, the respondents still picked ICM training as among the most important training needs, indicating the important role of ICM in their planning and management activities, a need to update skills needed for ICM and a need to have more people with knowledge about ICM. This ties up with the initiation of efforts — through policy reforms and country operations — to scale up ICM in the countries of the region.

In order to address the needs of countries with national ICM policies, short-term trainings are required at three levels: decisionmakers, technical staff, and ICM implementers.

A need for a higher level of professional capacity to address

#### **Box 11. Conclusions and Recommendations from the Workshop on Marine Economy.**

##### **Conclusions**

- We are underestimating the size of the marine economy due to several problems:
  - o Sourcing data, estimation approaches
  - o Home production and informal sector not accounted for
  - o Criteria for selection of sectors/categories
- There is a need to improve the understanding of the requirements of the final users of the economic information and data
  - o The purpose of the economic data is to inform and support marine-related policy and decision making by identifying the economic and environmental linkages, and thereby to improve quality of life
- The standardization of methodology may not be the required approach at the moment

##### **Recommendations**

- Encourage the completion of national marine economic profiles in each of the East Asian economies;
- Demonstrate how marine economic studies can improve marine related policy making; and
- Evaluate what marine economic information is required to address sustainable development of marine areas, and environmental management and climate change mitigation and adaptation measures.

the coastal and ocean management problems and solutions drives the quest for the establishment of a university degree program. This was substantiated by survey results and by other trends across the region: (1) the number of universities offering ICM/ Marine Affairs has increased; and (2) the numbers of donors advocating ICM have likewise increased. Donors, however, have brought with them a different "branding" or typologies (like integrated coastal zone management

or ICZM, coastal resource management or CRM, co-management, coastal area management (CAM), etc.), which made inroads to integrated management but, admittedly, brought confusion. This impetus has shown a need for a common ground on ICM practice and delivery in the region, through a “revitalized” post-graduate ICM program.

There are already at least 20 universities in the world with degree programs on marine affairs or ICM-related programs. A synthesis of experiences around the region and the world has been suggested, and this would include the body of policies and practices and their attendant “lessons learned.” This would necessitate a mechanism to keep information updated on state-of-the-art ICM practice in the region.

For example, Indonesia’s post-graduate ICM/Marine Affairs programs are usually a “sandwich” program that has sent an average of 20-30 students each year to China (Xiamen University), Japan (Ryukus University), Denmark (Aarhus University) and Germany (Bremen University). Afterwards, it is hoped that through synthesized experiences from different localities, a common program structure could emerge. Through this, and towards looking forward, the basis for ICM Program certification can be proposed.

Today, what limits the strengthening of an ICM program in Indonesia is that ICM is considered an academic degree. And based on a national law, an ICM program should have 55 percent courses in theory and 45 percent of its courses in practice (whereas a professional degree has 60 percent courses in practice and 40 percent courses in theory). Thus there is a clamor that the case for an ICM Program in Indonesia should change to differentiate it from an environmental program.

#### **Box 12. Conclusions and Recommendations for Workshop 5: The Science in Ecosystem-based Management.**

##### **Conclusions**

- Ecological indicators are an essential component for developing an EBM approach to environmental management.
- Community-based monitoring can be a useful, cost-effective means for collecting data, but needs to be scientifically validated, have statistically rigorous design and harmonized methodologies.
- Lack of long-term, systematically obtained data and scientific capacity hampers implementation of EBM in East Asia.
- Holistic monitoring programs should include biomonitoring (biomarkers, biocriteria), together with physical and chemical parameters.
- Measuring and communicating the gains from intervention projects needs to translate scientific information into financial and economic terms.
- Long-term data sets are essential in defining changes due to human activities and climate change.

##### **Recommendations**

- Advocate the universal adoption of environmental indicators readily derived from satellite-based earth observations.
- Promote community-based monitoring programs using harmonized methodologies in order to create national and regional networks.
- Request national governments to incorporate specific ecosystem-based goals and targets into ICM through national strategy and action programs to provide a basis for pragmatic policy implementation.
- Incorporate biological monitoring and, where appropriate, the use of biomarkers and biocriteria in environmental monitoring programs.
- Indicators should be adaptable and appropriate to changing climates.
- Recognize the need to integrate watershed and coastal monitoring programs and environmental management practices.
- A mechanism for regular inter-calibration and inter-comparison exercises needs to be considered at both national and regional scales.
- Include socioeconomic data in monitoring assessment procedure. Communicate outputs from scientific research (data, assessment reports, publications) to stakeholders (policymakers, civil society, educators, etc.) in appropriate user-friendly language and formats, including public access by Internet.

Xiamen University in China posited a need to have additional perspectives in such courses as climate change (to be in tune with the recent international agenda) and skills needed in zoning, planning, GIS, monitoring and communication.

Other programs in Marine Affairs/Coastal Management in the region are developed as interdisciplinary programs. In such a manner, an economics course is delivered by faculties from the economics school; marine policy course from faculties of law schools; etc. There is, thus, a tendency in

universities to mix courses and “dip” into other faculties (to create a so-called “interdisciplinary program”) and call it ICM. But this strategy has created a problem when students cannot get a job — as a coastal manager or planner — when they have finished their degrees. To counter this issue, the National University of Singapore, for instance, has created an Executive Committee that will see through the integration of interdisciplinary courses and faculties. This is a mechanism that allows courses to evolve and at the same time uses effectively the existing faculties who are streamlined or agree

**Box 13. Conclusions and Recommendations for the Workshop on Land and Sea-use Zoning: Challenges and Opportunities.**

Since zoning cuts across various sectors and geographic boundaries, there is a need to have an institutional mechanism for interagency decisionmaking regarding resources in shared jurisdictions.

There is also a need to determine management objectives and clearly define the dominant uses (both current and future) of land and sea areas. One of the major problems in zoning is the uncertainty of resource use and coastal area allocation over time, making it almost impossible to predict resource use patterns over time. Hence, effective land and sea-use plans need to carefully consider development plans, resource patterns in the site, particularly economic activities, and social preferences. Furthermore, there needs to be a clear reconciliation of the priority uses and the management objectives of the areas being zoned (e.g., zoning for conservation areas).

As a market-based instrument for managing coastal and marine areas and resources, creating the right incentives for the private sector to comply with the zoning schemes and regulations should also be considered.

**Recommendations:**

- a. Develop a set of criteria (e.g., elevation, spatial extent of resource) for designating boundaries of zones to guide the local planners in the process.
- b. Match governmental management activities with the degree of risks and uncertainty associated with climate change.
- c. Ensure that the designated size of marine protected areas reflects community management capacity and resource characteristics.
- d. Ensure that zoning schemes are implemented equitably.

Case studies on the implementation of zoning are needed by countries to guide them in the implementation process. However, such case studies would need to be contextualized or understood in specific political and social contexts.

**Box 14. Conclusions and Recommendations from the Workshop on Meeting Human Resources Requirements in Coastal and Ocean Governance.**

**Conclusions**

- Recent capacity building initiatives in ocean and coastal governance through short-term training and degree-granting education have increased the cohesion and interfacing of science and policy.
- The region has enough providers of skills and knowledge but they need to be integrated and networked. An effective interaction among them is not only practical but essential.
- ICM has evolved into a management science that needs to be complemented with a strategic short-term training strategies and a more formal post-graduate degree program.

**Recommendations**

- Documentation of best practices as case studies.
- Establishment of a network of ICM training centers. Necessarily, existing training programs of different training centers or institutions should be strengthened based on harmonized or standard concepts/activities. As well, a list of existing lecturers or trainers should be compiled in order to maximize their expertise. The workshop requested PEMSEA to take the lead in this effort.
- Strengthening of existing training institutions and examination of possibilities of complementation. Existing training courses available in the different participating countries needed to be compiled and reviewed in order to determine their strengths and weaknesses so that areas of improvement or complementation could be identified.
- Compare and eventually adopt a syllabus for ICM core course(s) among universities in the region through an e-group for comment and improvement.
- Develop mechanisms for a training-of-trainers (faculty) program for ICM core courses.
- Complete and update the information on universities offering ICM graduate programs.

on the multidisciplinary nature of a post-graduate degree.

A standard curriculum for the region is the ideal being sought, but given the structural differences of the institutions of higher learning in the region, may not be feasible at the moment. The continuation of studying and comparing existing programs

with the goal of eventually adopting a syllabus for ICM core courses has been recommended. Four ICM core courses have so far been identified:

- Principles and practice of integrated coastal management
- Theory and practice of planning as applied to coastal ecosystems

- Structure and function of coastal ecosystems
- Coastal (and Ocean) Governance

It may be easier to commit to a standardized program but an inherent problem by those attempting to create a new program always crops up: lack of qualified instructors/mentors/

teachers. These mentors are envisioned to have: (1) knowledge in ICM theory; (2) experience in ICM practice; and (3) should have the passion to teach ICM. Thus, as proposed, the objectives to re-tool and upgrade ICM teachers might include: (1) state-of-art of ICM in the region; (2) enhance teaching skills through mentoring by experienced practitioners; (3) provide discussions and sharing of experiences; and (4) develop common professional skills in ICM program delivery.

To attain these objectives several initial efforts are likewise needed: (1) confirming the needs assessment on strengthening competencies of ICM teachers; (2) detailing the objectives of the upgrading; and (3) detailing the scheme and mechanisms of the upgrading.

These measures should move the human resources in the region to a "new breed of professionals" in the practice of ICM.

The shared vision and mission as expressed in the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) continues to guide PEMSEA and its Partners as the region moves forward towards their realization. The third EAS Congress, while showing some steps backward, failures and doubts, more importantly synthesized so much more experience, enhanced awareness, wider influence, and more and mature expectations. In order to meet the priority targets under the 2006 Haikou Partnership Agreement and the Manila Declaration on Strengthening the Implementation of Integrated Coastal Management for Sustainable Development and Climate Change Adaptation in the Seas of East Asia Region that was adopted at the end of the EAS Congress 2009, PEMSEA needs to level up its activities. The momentum of 16 years of implementation, three Congresses and the sure cooperation of its Partners makes it ready to do so.

## Acknowledgements

### Co-Convening Agencies:

#### Theme 1, Workshop 5 – The Science in Ecosystem-based Management:

Coastal and Ocean Management Institute (COMI), Xiamen University, and Plymouth Marine Laboratory (PML)

#### Theme 1, Workshop 6: Land and Sea-Use Zoning: Challenges and Opportunities:

PEMSEA Network of Local Governments for Sustainable Coastal Development (PNLG)

#### Workshop on Meeting Human Resources Requirements in Coastal and Ocean Governance: Short-term Training and Degree-granting Education:

ASEAN Foundation and Japan-ASEAN Solidarity Fund

## Presentations:

### Theme 1 Workshop 2 – Contributions of Marine Economic Sectors to Regional and National GDP in an Uncertain Climate

Colgan, C. "The Challenges and Benefits of Measuring the Contribution of the Marine Economy in an Uncertain Climate."

### Session 1: Contribution of the Marine Sectors in East and Southeast Asian Economies

- Indonesia: Dr. Agus Heri Purnomo, Center of Marine and Fisheries Social Economic Research, Ministry of Maritime Affairs and Fisheries (MOMAF), Indonesia
- Japan: Dr. Hiroyuki Nakahara, Research Institute for Ocean Economics, Yokohama National University, Japan
- Malaysia: Dr. Nazery Khalid, Center for Marine Economics and Industry
- Philippines: Dr. Romulo A. Virola, Secretary General, National Statistical Coordination Board
- PR China: Prof. Liu Rongzi, China Institute of Marine Affairs, State Oceanic Administration
- RO Korea: Dr. Chul-Oh Shin, Korea Maritime Institute

- Thailand: Dr. Cherdchinda Chotiyaputta, Department of Marine and Coastal Resources, Ministry of Natural Resources and Environment (MONRE), Thailand

- Vietnam: Mr. Nguyen Khac Duc, Vietnam Administration of Seas and Islands

### Session 2: Towards a Common Framework for Measuring the Marine Economy

McIlgorm, A. "The APEC Framework for Measuring the Marine Economy."

### Session 3: How Can Marine Economic Valuation Contribute to National Policy?

Baird, S. "How has Measuring the Marine Economy Helped Canada?"

Ebarvia, M.C. "The Marine Economy and Environmental Values."

McIlgorm, A. "How can Valuing the Marine Economy Contribute to Policy and Managing National Wealth in Uncertain Times?"

### Theme 1 Workshop 5 - The Science in Ecosystem-based Management

#### Part 1: Integrating Science into Policy and Management Decisions

Adrianto, L.\* and A. Damar. "Linking Socioecological Adaptability in the Context of Integrated River Basin, Coastal and Ocean Management: The Case of Siak Riau Basin, Riau Province, Indonesia."

Kendall, M.A.\*, Aryuthaka, C., Jitanoon, and G.L.J. Paterson. "The Impact of Tsunami on Marine Ecosystems on the Coast of Thailand: Some Implications for Coastal Zone Management."

Platt, T. "Ecosystem-based Management and the Requirements for a Knowledge Base of Observations."

Vause, J., Xiongzi Xue\* and Xin Zhao. "Ecosystem-based Management (EBM) and Integrated Coastal Management (ICM): Divergence and Complementarity."

#### Part 2: Innovative Approaches and Methodologies

Au, D.W.T.\*, R.S.S. Wu, and P.K.S. Shin. "The Use of Biomarkers and Indicators for Marine Environmental Management."



Chen, N.\* and H. Hong. "Nitrogen Pollution and Eutrophication Problem in the Jiulong River Watershed Xiamen Bay: Management Implications."

Zhang, L.\*, J. Wang, and P.F. Ricci. "Baseline Determination in Marine Environmental Carrying Capacity."

Tun, K.\*, L.M. Chou; O. Larson, N. Goh, L. Goh, J. Low, and Shufen Yang. "Leveraging on Science to Manage and Monitor Singapore's Living Coastal Resources."

### Part 3: Knowledge Transfer and Communication

Armada, N.\*, G. Silvestre, W. Jatulan, R. Pestaño-Smith, M. Guidote and A. Gulayan. "Towards Ecosystem-based Fisheries Management: The Danajon Bank Story."

Hong, H.\*, J. Wang, Y. Jiang, L. Zhou, F. Zhang, Z. Wan and J. Hu. "Hydrodynamic Changes of Xiamen Bay (1983-Present) and Management Implications."

Narisma, H., and B. Gervacio\*. "Making Invisible Information Visible: Impacts of the Manila Bay Area Environmental Atlas."

Sombrito, E.Z.\*, and E.A. Gonzales. "Promoting Interdisciplinary Research: Integrated Environmental Monitoring Program of Manila Bay."

### Theme 1 Workshop 6 – Land and Sea-Use Zoning: Challenges and Opportunities

#### Part 1: Session Introduction and Review of Land and Sea-Use Zoning Plans and Implementation

Summary presentation: Progress in the Implementation of Land and Sea-Use Zoning Plans in Bataan, Philippines; Bali, Indonesia; Danang, Vietnam; and Sihanoukville, Cambodia

#### Part 2: Development, Implementation and Enforcement

Armada, N. R. Martinez and R. Bacalso. "Fisheries Use Zoning: A Fish Project Initiative to Enhance Fisheries Resource Management Interventions."

Baluyot, A.M. "Public-Private Partnership Sector Participation in the Development and Implementation of Coastal Land-

and Sea-Use Zoning Plan Bataan (CLSUZP), Bataan."

Cabrido, C.A. Jr. "Ecological Zoning as a Policy Tool for Sustainable Development."

Eko Rudianto, O.M. "Integrating Terrestrial Spatial Plan and Sea –Use Zoning Plan: Indonesia's Experience."

Lin Tao\*, Zhao Qianjun, Cui Shenghui, Shi Longyu and Gao Lijie. "Urban Spatial Expansion and its Effect on Island Ecosystem: A Case Study of the Island City of Xiamen, Southeast China."

Kirkman, H. "Choosing Boundaries to Marine Protected Areas and Zoning the MPAs For Restricted Use and Management."

Simmons, M. "Zoning in Moreton Bay Marine Park- Strategies and Lessons."

Wang, X., W. Chen\* and L. Zhang. "Monetary Evaluation on Depletion of Coastal Ecosystem Services Caused by Sea Reclamation: Concept, Methodology and Case Study."

Zhang, Z.\*, W. Su and Z. Wang. "Impacts of Sea Reclamation on the Coastal Ecosystem."

### Part 3: Zoning Considerations for Climate Change

Masagca, J.T. and M.T. Masagca. "Distributional Range of Mangroves in Catanduanes Island, Philippines: Inputs to Biobelting Programs for Tidal Surfers and Tsunamis."

Lowry, K. "Climate Change Adaptation and Zoning in Hawaii."

### Workshop on Meeting Human Resources Requirements in Coastal and Ocean Governance: Short-term Training and Degree-granting Education

#### Part 1: Capacity-building Experiences around the World

Otsuka, M. "IOI's capacity building program IOI-OceanLearn."

Uriarte, Jr., F. "Capacity-building activities of the ASEAN Foundation."

Weichselgartner, J. "Capacity-building activities: Experiences of a global project."

### Part 2: Capacity building in particular sector and issue

David, L. "CAPaBLE Scientific Capacity Building and Enhancement for Sustainable Development in Developing Countries: Climate Change."

Ino, F. and E. Santiago. "POPs analysis capacity development and monitoring in 10 Asian countries."

Szymczak, R. "Management of discharges to the marine environment from nuclear activities in the Asia-Pacific region – a coordinated regional approach."

### Part 3: PEMSEA strategies in building capacities in East Asia

Bonga, D. "Demand and Supply Survey (2009): Ocean and Coastal Governance."

Chua, T.-E. "Overall PEMSEA strategy in capacity development: Meeting the training needs of East Asia."

### Part 4: ICM Curriculum development in the East Asia

Adrianto, L. "Upgrading teacher competencies for an ICM program."

Jacinto, G. "Towards a common core courses in an ICM program."

## References:

- PEMSEA. 2009. Theme 1, Workshop 5 Summary Report: The Science in Ecosystem-based Management. Available at: [www.pemsea.org/eascongress/section-support-files/EAS-WP2010-05.pdf](http://www.pemsea.org/eascongress/section-support-files/EAS-WP2010-05.pdf)
- PEMSEA. 2010b. East Asian Seas Congress 2009, Theme 1 Coastal and Ocean Governance Workshop Summary Reports, Presentations and Proceedings. Available at: <http://pemsea.org/eascongress/international-conference/coastal-and-ocean-governance>.
- Tropical Coasts. 2009. The Marine Economy in Times of Change. Tropical Coasts, 16(1), July 2009. Available at: [beta.pemsea.org/publications/marine-economy-times-change](http://beta.pemsea.org/publications/marine-economy-times-change).

# A Night of Partnerships, Awards and Recognition

Creatures of the sea greeted participants of the East Asian Seas Congress 2009 during the Partnership Night held on 23 November 2009 at the Manila Ocean Park, Philippines. The colorful event was co-sponsored by the United Nations Environment Programme-Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (UNEP-GPA) and PEMSEA.

Hosted by Mr. David Celdran, the night featured costumed dancers from Thailand as well as local students performing street dances.

Awards and recognition were handed out to several organizations, local governments and ports by Mr. Raphael P.M. Lotilla, Executive Director of PEMSEA, and Mr. David Osborn, Coordinator of the GPA Coordination Unit of UNEP/GPA.

The awards and recognition were given out under two categories: The Integrated Coastal Management (ICM) Good Practices Recognition and the Port Safety, Health and Environmental Management System (PSHEMS).

The PEMSEA Award for Recognition of Local Government Good Practices/Achievements/ Excellence in Sustainable Development of Coastal Areas through ICM highlights continuing efforts in improved coastal governance, including the accomplishment of

measurable objectives for reducing social, economic and environmental stress through effective management programs, covering pollution reduction and waste management, reduction in vulnerability to natural and man-made hazards, habitat restoration and management, conservation of endangered species, and food security and alternative livelihoods. The awardees included: Bataan, Philippines; Batangas, Philippines; Chonburi, Thailand; Danang, Vietnam; Nampho City, DPR Korea; Preah Sihanouk, Cambodia; Sukabumi, Indonesia; and Xiamen, PR China.





The Municipality of Puerto Galera, Philippines, was awarded a certificate of recognition for dedication and commitment to the sustainable development of its marine and coastal resources through a public-private partnership (PPP). The PPP arrangement in Puerto Galera addresses pollution reduction and a sustainable water supply.

PEMSEA also recognized three ports in the region for demonstrating continued improvement in their commitment to port safety, health and environmental protection. The ports — Port of Tanjung Pelepas (PTP), Malaysia; Bangkok Port, Thailand; and Laem Chabang Port, Thailand — completed the implementation of their respective PSHEMS and underwent a recognition audit conducted by PEMSEA.



*Participants enjoying the Photo booth at the Manila Ocean Park.*

# Coastal Biodiversity in the East Asian Seas

The East Asian region is teeming with marine biodiversity. The greatest density of mangroves and corals are in the region (see figures), along with a multitude of species of seagrass, fish, and other plants and animals, some of which are endemic to the region.

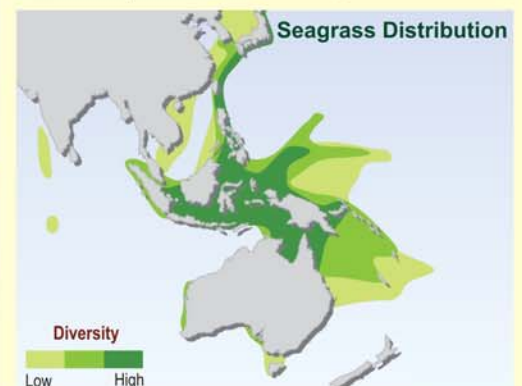
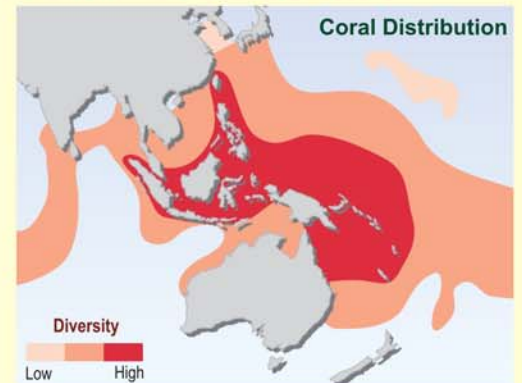
The important role of the region's rich biodiversity to economic prosperity, employment and food security is discussed in great detail in this issue of Tropical Coasts. The region's coastal and marine environments fill a substantial percentage of the world's demand for food, while economic opportunities afforded by coastal and marine environments provide livelihood to more than a billion people in the region living within 100 km of the coasts.

There exist, however, grave and immediate threats to coastal and marine environments, which are home to the diversity of plants and animals in the region. The ever ballooning global population and the corresponding increase in food production and consumption (see table), further aggravated by

rapid urbanization and development, are exerting tremendous pressure on coastal and marine environments. Countries and areas producing and consuming a disproportionately large amount of marine products, such as PR China, Indonesia, Japan and the Philippines, are also endowed with rich biodiversity, rendering a large percentage of the region's mangroves, corals and seagrass more prone to devastation. Overfishing in certain areas in the region has already depleted fish stocks, negatively affecting both the natural balance and possible economic opportunities. Rapid urbanization and human development in the coastal areas have already destroyed and are still laying waste to natural habitats.

Economic development, urbanization and development should not be ruthlessly made at the expense of the environment. Conscious and systematic efforts should be made to ensure that such development is approached from a sustainable viewpoint. These trends show that more than ever, the need to achieve sustainable development is becoming more crucial.

## Distribution of Coral, Mangrove and Seagrass Diversity in the East Asian Seas Region



Source: UNEP/GRID - Arendal, 2002 (From UNEP-WCMC, 2001).

## Distribution of Coral Reefs



Source: UNEP/GRID - Arendal, 2009.

Country	Production (tons in live weight) 2005	Production (tons in live weight) 2007	Total Food Supply (tons in live weight) 2005	Total Food Supply (tons in live weight) 2007
Cambodia	410,000	514,200	358,168	472,876
DPR Korea	268,700	268,700	195,232	275,828
Indonesia	5,578,369	6,329,533	946,260	5,460,533
Japan	4,819,116	4,977,047	7,829,911	7,221,335
Lao PDR	107,800	107,800	112,640	112,640
Philippines	2,803,603	3,209,349	2,758,201	3,138,560
PR China (including Hong Kong and Macau)	42,877,224	46,239,472	6,406,520	35,384,116
RO Korea	2,075,301	2,464,328	2,587,623	2,761,506
Singapore	7,837	8,025	169,085	219,462
Timor-Leste	350	350	350	350
Vietnam	3,367,200	4,277,900	2,246,742	2,636,522

Sources: Statistics and Information Service of the Fisheries and Aquaculture Department, 2010; FAO Fisheries and Aquaculture Information and Statistics Service, 2009; 2008.

### References:

- Statistics and Information Service of the Fisheries and Aquaculture Department. 2010. FAO Yearbook: Fishery and Aquaculture Statistics 2008. Rome, Food and Agriculture Organization (FAO). Available at: [www.fao.org/docrep/013/i1890t/i1890t.pdf](http://www.fao.org/docrep/013/i1890t/i1890t.pdf). 72p.
- FAO Fisheries and Aquaculture Information and Statistics Service. 2009. FAO Yearbook: Fishery and Aquaculture Statistics 2007. Rome, Food and Agriculture Organization (FAO). Available at: [ftp://ftp.fao.org/docrep/fao/012/i1013t/i1013t.pdf](http://ftp.fao.org/docrep/fao/012/i1013t/i1013t.pdf). 72p.
- FAO Fisheries and Aquaculture Information and Statistics Service. 2008. FAO Yearbook: Fishery and Aquaculture Statistics 2006. Rome, Food and Agriculture Organization (FAO). Available at: [ftp://ftp.fao.org/docrep/fao/011/i0400t/i0400t.pdf](http://ftp.fao.org/docrep/fao/011/i0400t/i0400t.pdf). 57p.
- UNEP/GRID-Arendal. 2009. Coral Reefs. From Blue Carbon - The Role of Healthy Oceans in Binding Carbon, UNEP-WCMC, 2009; Valiela et al., 2001. Riccardo Pravettoni, UNEP/GRID-Arendal, Cartographer/Designer. Available at: [maps.grida.no/go/collection/blue-carbon-the-role-of-healthy-oceans-in-binding-carbon](http://maps.grida.no/go/collection/blue-carbon-the-role-of-healthy-oceans-in-binding-carbon); and [maps.grida.no/go/graphic/coral-reefs](http://maps.grida.no/go/graphic/coral-reefs).
- UNEP/GRID-Arendal. 2002. Distribution of coral, mangrove and seagrass diversity. From UNEP-WCMC (World Conservation Monitoring Centre) 2001. 2002. Philippe Rekacewicz, UNEP/GRID-Arendal, Cartographer/Designer. Available at: [www.unep.org/dewa/assessments/ecosystems/water/vitalwater/33.htm](http://www.unep.org/dewa/assessments/ecosystems/water/vitalwater/33.htm); and [maps.grida.no/go/graphic/distribution-of-coral-mangrove-and-seagrass-diversity](http://maps.grida.no/go/graphic/distribution-of-coral-mangrove-and-seagrass-diversity).