Policy Brief
2011

Targeted Research and Monitoring Programs for Enhanced Management of the Seas of East and Southeast Asia


PEMSEA


Source: Philippine Department of Science and Technology, Region II


PEMSEA


PEMSEA

Palawan State University

Partnerships in Environmental Management for the Seas of East Asia

WorldFish
The WorldFish Center

CONSERVATION INTERNATIONAL

SCIENCE TO ACTION
Conservation International Science to Action

SOCMON
The Global Socioeconomic Monitoring Initiative for Coastal Management

A number of reports and studies have been undertaken relating to the status, issues and challenges to coastal and ocean management, protection and development. Very few of these initiatives, however, were focused on the socioeconomic aspects and socioeconomic values of the coastal and ocean environments and resources. The recent work of WorldFish Center, Partnerships in Environmental Management for the Seas of East Asia (PEMSEA), Conservation International (CI) and Global Socioeconomic Monitoring Initiative for Coastal Management (SocMon) provides some new insights into aspects relating to socioeconomics and governance of coastal and ocean resources that are relevant to policymakers and managers.

The monitoring reports, assessments and surveys presented herein — though varying in scope and methodology — provide information on the current socioeconomic and environmental status of specific areas in the region. Also included are possible actions to be considered by policymakers and managers in response to identified gaps and shortcomings in existing management programs, as well as changing political, socio-economic and ecological conditions in the concerned localities.

1.0 East and Southeast Asia

The significance of Southeast Asia, as a dynamic regional coast, cannot be overemphasized from various perspectives. It consists of countries from the Asian mainland (Cambodia, Lao PDR, Myanmar, Thailand and Vietnam) as well as countries of the Malay Archipelago (Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore and Timor-Leste). Southeast Asia covers 5 million km^2 of land area (FAO, 2000) and 105,592 km of coastline (Yuen and Kong, 2009). More than 250 million people live within 60 km of the coast (ICLARM, 1999) and this has continuously increased.

Collectively, the lands, coastal fringes and seas provide the natural resource base for economic growth of some 600 million people. These include economic activities related to agriculture, coastal industries, energy development, fisheries, maritime

Figure 1. Average Gross Domestic Product per capita Trend in Southeast Asia
(Source: ADB, 2009).

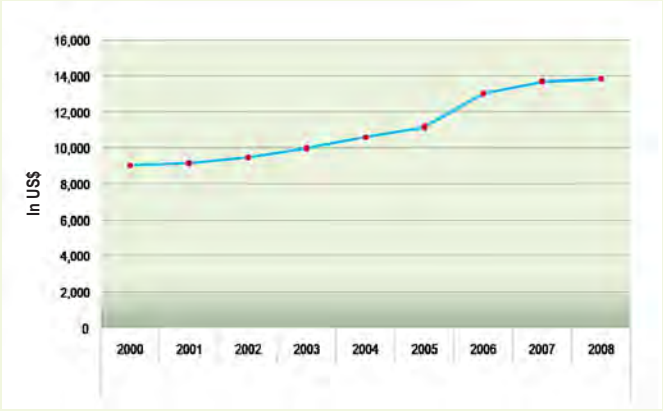


Figure 2. Average Literacy Rate of 15 years and older for Southeast Asia
(Source: ADB, 2009).

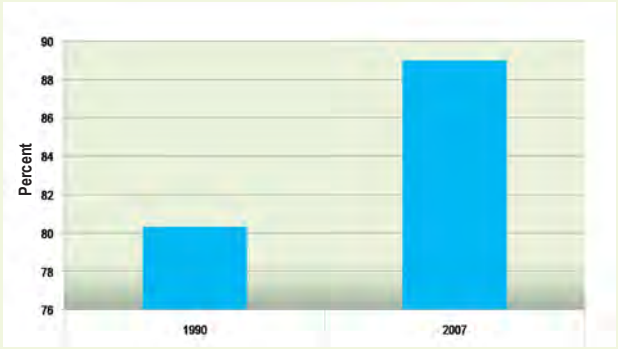


Figure 3. Average Energy Production for Southeast Asia
(Source: ADB, 2009).

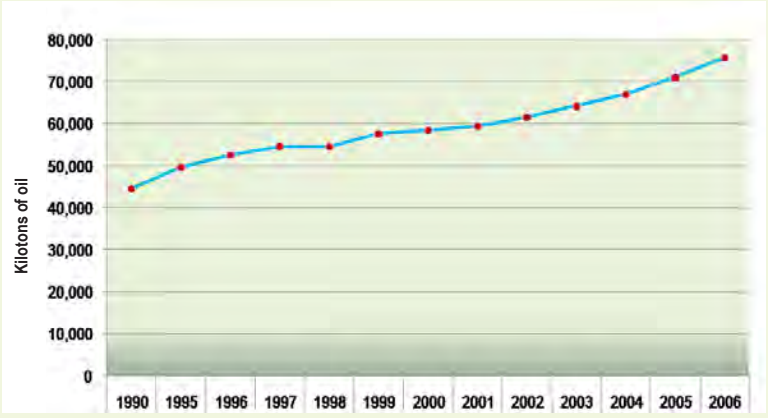
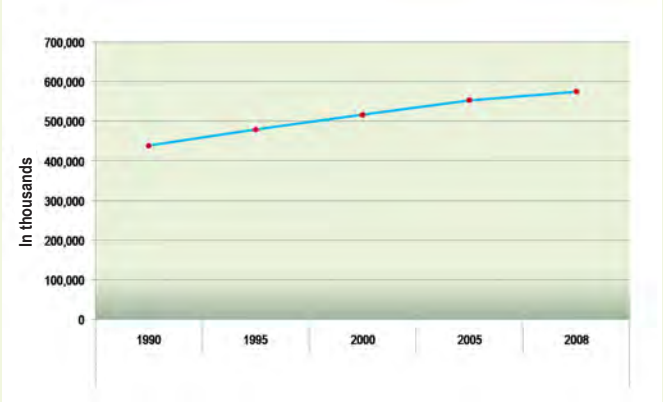


Figure 4. Total Population of Southeast Asia (Source: ESCAP, 2009).



trade and tourism. Rates of gross domestic product (Figure 1), adult literacy (Figure 2), and energy production (Figure 3) are increasing while rates of infant mortality, poverty level, and unemployment are decreasing.

The region is highly urbanized, with rapid population growth (Figure 4). Coastal settlements have developed into major cities, which are among the most populated in the world. In 2005, two megacities in Southeast Asia were within the Top 18 in terms of population, namely: Jakarta (Indonesia) and Metro Manila (Philippines) (UNEP/COBSEA, 2010, p. 10). Furthermore, one-fourth of the world's marine fish production is contributed by the Southeast and East Asia regions.

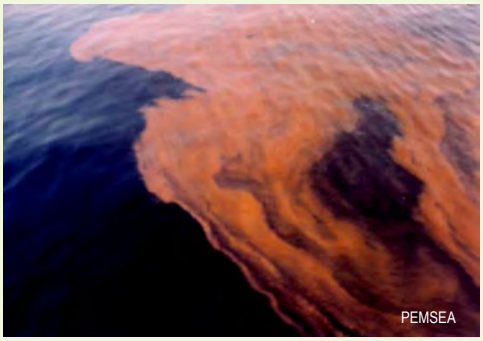
Aside from economic importance, the associated coastal habitats – coral reefs, mangroves and seagrass beds – help protect residential, agricultural and industrial areas against coastal erosion, flooding and natural calamities. The estimated annual economic net benefit of healthy coral reef areas for tourism and fisheries ranges from US$ 23,100 to US$ 270,000 per km^2 in Southeast Asia (Burke, et al., 2002). This region is also the epicenter of marine biodiversity and contains 30 percent of the world's coral reefs and mangroves (Chou, 1997; UNEP, 1998).

The Southeast and East Asia regions are quite important for maritime trade, being home to 12 of the world's 25 largest container ports. In East Asia ports, total volume of containers increased by 270 percent from 1985 to 1995 (PEMSEA, 2003 p. 34).

2.0 Marine Threats, Problems and Issues

There is an array of interlinked critical socioeconomic, governance, and environmental trends as well as transboundary issues/concerns in the region. Natural environmental hazards include: droughts, earthquakes, floods, forest fires, landslides, sea level rise, storm surges, tsunamis, typhoons and volcanic eruptions. Among the anthropogenic environmental issues that are land-based in origin are air pollution, deforestation, habitat degradation, sedimentation/soil erosion and water pollution from domestic and industrial sources. Current environmental issues that are largely marine-based include: destructive fishing practices, aquaculture development, dredging, energy development, shipping/maritime trade and tourism. There are also new/emerging problems such as climate change, ocean acidification, invasive species and marine litter.

On the economic front, widespread poverty and hunger remain key problems in most developing countries particularly in Southeast Asia.



Urban population has continued to grow but the coastal population density is increasing faster than non-coastal areas. Global demand for fish and fishery products has increased rapidly with rising population and higher fish consumption per capita (Dey, et al., 2008). Given resource depletion in the coastal areas, food security has become an emerging non-traditional security threat (Salayo, et al., 2006). Energy consumption likewise increased to 2.6 percent from 1990-2007 or 2.5 percent from 2000-2007 (ESCAP, 2009). On the social aspect, only southeast Asia has significant levels of child malnutrition: Cambodia, the Lao People's Democratic Republic and Timor-Leste all have levels of over 35 percent (ESCAP, 2009) while infant mortality rate has decreased from 1990-2007 (ADB, 2009).

3.0 Key Monitoring Initiatives in the Region and Country-specific Examples

In the past few years, a number of monitoring and assessment initiatives have been undertaken in the region. These initiatives have taken into consideration aspects and information relating to coastal and marine governance. Moreover, these research and monitoring programs have taken into account the socioeconomic values and benefits/impacts of the coastal and marine environment and resources.

3.1 Monitoring at the Regional Scale

Since 2004, extensive socioeconomic monitoring has occurred throughout SEA covering over 9,000 households and individuals representing over 40 coastal communities, including 21 in Indonesia, 27 in the Philippines, 2 in Thailand and 3 in Vietnam (Loper, et al., 2008). Of the seven most common coastal threats mentioned in SocMon studies, six are fisheries-related (Table 1). Such fisheries-related threats largely relate to overfishing and destructive fishing techniques, such as cyanide and dynamite fishing and the use of fine mesh nets. Another perceived threat is garbage/solid waste. This issue largely relates to marine litter. This Socioeconomic Monitoring (SocMon) forms part of the CI's 20 social science research projects under its Marine Management Area Science (MMAS) program.

Table 1. Major perceived threats to marine resources in SEA region (Loper, et al., 2008).

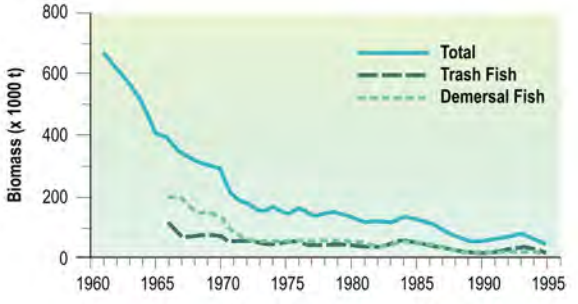
Threat	Number of studies listed (n=34)	Average percentage of respondents listing threat
Dynamite fishing	24	32%
Garbage/solid waste	23	12%
Use of fine mesh nets	22	14%
Cyanide fishing	15	27%
Commercial fishing	8	17%
Overfishing	5	75%
Use of compressors in fishing	3	14%
Water pollution	3	3%
Land-based pollution/tree removal	2	18%
Large scale fishing boats	1	81%
Coral mining	1	30%
Weather/climate	1	22%
Overpopulation	1	1%

The WorldFish Center has undertaken three research projects concerning the socioeconomics and governance of fisheries and aquaculture in the Southeast Asia region (Boxes 1 through 3). The studies have documented that fisheries and aquaculture contribute to employment, income and food security in many coastal communities. Sustainability of fish stocks have also been a concern due to overfishing and degradation of coastal habitats. Measures to reduce fishing effort or limitation of catch have not been successful as fishers felt that limiting catch would mean reduced incomes. Both the WorldFish Center and SocMon results provide the relevant baseline for monitoring of fisheries and other coastal resources in the region.

Box 1: Findings of the project titled "Assessment, Management and Future Directions for Coastal Fisheries in Asian Countries."

This project formed part of the Asian Development Bank, Regional Technical Assistance (ADB-RETA) from 1998 to 2002. The Southeast Asian countries covered were Indonesia, Malaysia, Philippines, Thailand and Vietnam. Key findings were: significant contribution of fisheries to employment mostly from the small-scale fisheries sector; distributional equity issues have great implications for the sustenance of livelihood of the coastal fishers and their families; and bioeconomic modeling suggests that the capture fisheries are suffering from overfishing and the need to rebuild stocks to sustain the fisheries.

The trends in estimated biomass from the scientific trawl surveys in the Gulf of Thailand (1960-1995) (Silvestre et al., 2003; Stobutzki, et al., 2006).



Box 2: Findings of the project titled "Strategies and Options for Increasing and Sustaining Fisheries and Aquaculture Production to Benefit Poorer Households in Asia."

Another ADB-RETA project, undertaken from 2001 to 2005, covered China and the following countries: Indonesia, Malaysia, Philippines, Thailand, and Vietnam. Key findings were: (1) household incomes of marine fishers are considerably higher as compared to freshwater fish farmers; (2) many fishers remain among the poorest of the poor; and (3) high dependence for fish as source of protein and livelihoods.

Contribution of fisheries in selected countries in Asia. (Dey et al., 2008)

Country	Total Production		Contribution to GDP (%)	Employment (000's)		Per Capita Fish Consumption (kg/yr)	Total Foreign Earnings (US $ million)
	Quantity (million t)	Value (US$ million)		Direct	Indirect		
Bangladesh	1.9	-	5.2	1,200	12,000	20.4	-
China	43.7	34,022	2.9	6,600	6,529	25.0	4,190
India	6.0	-	1.0	-	-	5.6	-
Indonesia (2000)	5.7	-	1.8	5,300	710,000	22.0	1,670
Malaysia (2000)	1.5	1,413	1.6	104	n/a	45.4	-
Philippines	3.4	1,775	2.2	1,000	-	27.0	507
Sri Lanka	0.3	378	2.3	150	100	17.0	-
Thailand (1999)	3.6	3,079	2.5	800	1,200	32.7	-
Vietnam	-	-	-	-	-	19.0	-

Source: ADB-RETA 5945 Country Reports. Figures are for 2001, unless noted otherwise.

Box 3: Findings of the project titled "Fish Fights over Fish Rights: Managing exit from the fisheries and security implications for Southeast Asia."

This GTZ-supported research project was implemented from 2003-2004, with geographical coverage including Cambodia, Philippines and Thailand. Many small-scale fishers are already classified as poor. Hence, catch limitation and limiting the number of fishers are generally not acceptable measures to manage the fishery. The fishers argued that limiting catch would mean reduced income, and thus, these measures are difficult to implement in many coastal fisheries.

Perceptions of respondents to fisheries management strategies in Cambodia, the Philippines and Thailand (Salayo, et al., 2008).

Strategies for Exit from the Fisheries	Cambodia	Philippines	Thailand
Effort Reduction			
Catch Limitation	Disagreed	Disagreed	-
Limiting the Number of Fishers	Disagreed	Disagreed	-
Gear/Area/Temporal Restrictions			
Banning the Use of Some Gears	Agreed	Agreed	Recommended
Closed Season/Non-fishing Seasons	Disagreed	Ambivalent	-
Establishment of Protected Areas	-	Agreed	Recommended
Sustainable Alternative Livelihoods	Agreed	Agreed	Recommended

3.2 Monitoring at a Local Scale

The Partnerships in Environmental Management for the Seas of East Asia (PEMSEA)* recently implemented a "State of the Coasts" reporting system, which is focused on measuring progress, changes and impacts of integrated coastal management (ICM) implementation at the local level. At present, approximately 10 percent of East Asia's 238,000-km coastline is being managed using the ICM process. The PEMSEA countries, through the Haikou Partnership Agreement in 2006, have targeted 20 percent ICM coverage by 2015.

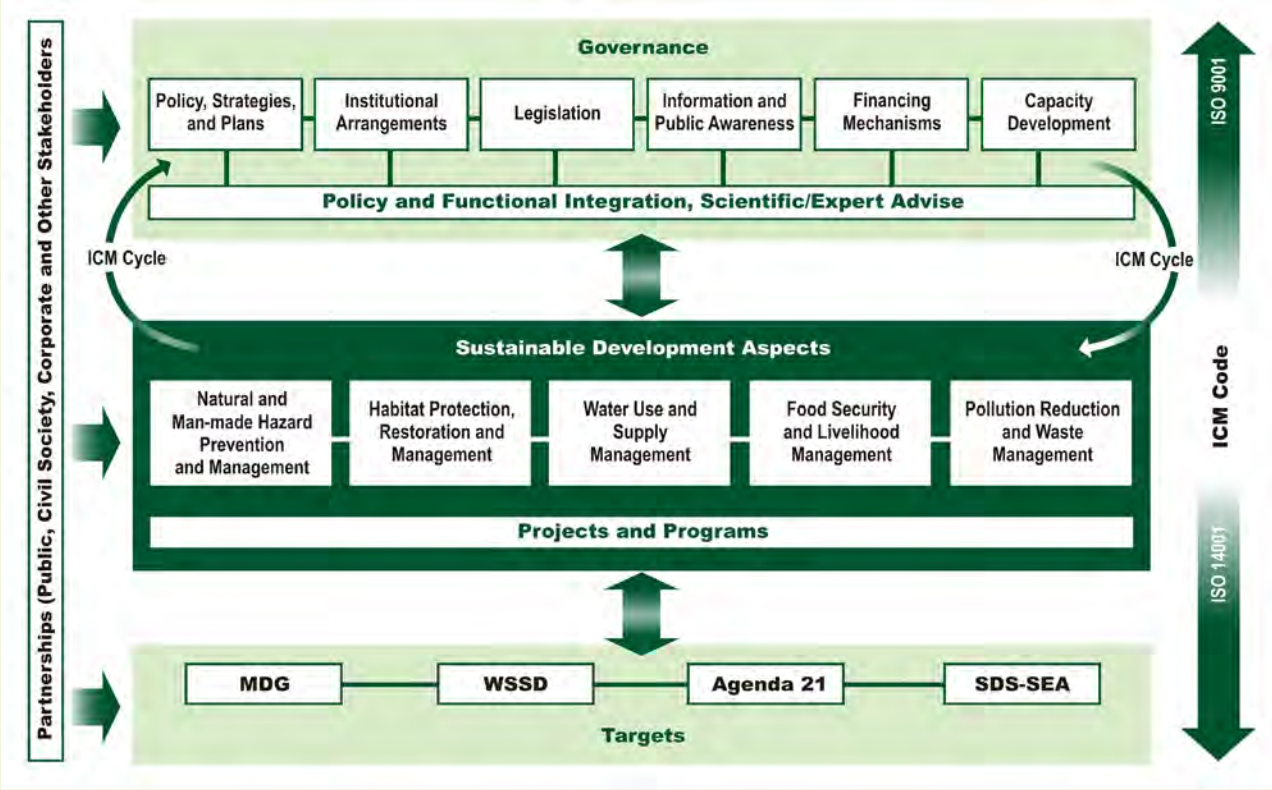
The State of the Coasts (SOC) reporting system has been developed primarily as a management tool in support of monitoring and evaluation, as well as policymaking and decisionmaking for ICM implementation at the local level. At the initiation of an ICM program, the SOC provides a framework for collecting and collating baseline information on the socioeconomic, biophysical and ecological situation within the ICM site, as well as legal and institutional mechanisms and ongoing programs. This baseline information provides managers with a good indication of the issues, challenges and gaps in coastal management, along with a sense of who the key players are and what they are doing. At regular intervals (between 1 to 3 year cycles), the SOC can be employed to determine the progress and impacts of ICM implementation and serve as a basis for the refinement of the ICM program, including priority issues that will be addressed in the future.

The SOC uses a series of process, social, economic and environmental indicators as basis to measure existing conditions at an ICM site as well as to determine changes that occur over time. In particular, the SOC reporting system uses key indicators for each of the six elements of governance and the five issue-specific aspects of sustainable development based on the Framework for Sustainable Development of Coastal Areas (SDCA) though ICM (Figure 5 and Box 4).

* PEMSEA serves as the regional mechanism for the implementation of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) and promotes the application of integrated coastal management (ICM) in support of SDS-SEA implementation. The SDS-SEA was adopted by 14 countries in the region (Brunei Darussalam, Cambodia, China, DPR Korea, Indonesia, Japan, Lao PDR, Malaysia, Philippines, RO Korea, Singapore, Thailand, Timor-Leste, and Vietnam).

The Haikou Partnership Agreement on the Implementation of SDS-SEA was signed by 11 PEMSEA Partner Countries (Cambodia, China, DPR Korea, Indonesia, Japan, Lao PDR, Philippines, RO Korea, Singapore, Timor-Leste, and Vietnam).

Figure 5. Framework for Sustainable Development of Coastal Areas (SDCA) through ICM.



Batangas Province, Philippines, one of the first PEMSEA ICM demonstration sites in the East Asian Seas region, published its first SOC report (Provincial Government of Batangas, Philippines and PEMSEA, 2008) while several other sites across the region are at various stages of preparing their initial SOC reports. The development of the SOC takes about six months and involves the collaborative effort of national government agencies, local governments, private sector, academe, nongovernmental organizations, civil society organizations and other relevant stakeholders.

Box 4: Relationship of SOC indicators to regional and international instruments.

As the SOC is directed towards tracking progress toward sustainable development targets, it uses simple, meaningful and measurable indicators that complement those of the World Summit on Sustainable Development (WSSD) Plan of Action, the Millennium Development Goals (MDG), Agenda 21, the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) and other relevant international/regional instruments.

State of the Coast

Process/Output
- [001] Coastal profile/Environmental risk assessment
- [002] Coastal strategy and action plans
- [003] Local government development plan, including coastal and marine areas

Social/Economic
- [017] Social and economic losses due to disasters
- [026] Fisheries production
- [027] Malnutrition rate
- [028] Poverty, education and employment
- [029] Livelihood programs

State/Environmental
- [015] Level of preparedness for disasters
- [016] Degree of vulnerability to disasters
- [019] Protected areas for coastal habitats and heritage
- [023] Access to improved water source
- [033] Sanitation and domestic sewerage
- [034] Municipal solid waste
- [035] Industrial, agricultural and hazardous wastes

SDS-SEA

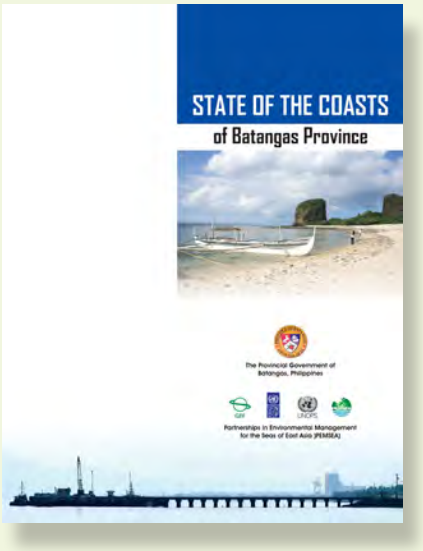
Process/Output
- Local governments empowered to manage marine and coastal resources
- Local coastal strategies
- Length of municipal coastlines under an integrated management program
- Disaster management plans and programs

State/Environmental
- Vulnerable coastlines to disasters
- Sewage treatment
- Drinking water
- Waste management

Agenda 21/WSSD/MDG

Social/Economic
- Proportion of population below national poverty lines
- Employment-to-population ratio
- Prevalence of underweight children under-five years of age
- Net enrolment ratio in primary education

State/Environmental
- Proportion of terrestrial and marine areas protected
- Proportion of population with improved drinking water source
- Proportion of population with improved sanitation



The SOC report of Batangas Province served as the first comprehensive assessment of the Province's progress in terms of the SDCA framework, and in relation to its implementation of the Batangas Province Strategic Environmental Management Plan (2005-2020).

In general, the Batangas SOC report noted positive developments in the province particularly in various governance aspects. Table 2 presents some of the key findings and recommendations of the Batangas SOC report.

The approach taken by the SOC and the focus on the local level provides important information on what is happening on the ground which is often not readily available. By building on strong data and monitoring system at the local level, the local SOC reports can eventually be rolled up into reliable national and regional SOC.

Table 2. Some key findings and recommendations from the SOC of Batangas Province about Governance of Marine and Coastal Resources (Source: Provincial Government of Batangas, Philippines and PEMSEA. 2008).

Aspects	Specifics	Key findings	Recommendations
Governance	Policies, strategies and plans	• ICM program covers entire coastline of the Province	• Integrate the Provincial Strategic Environmental Management Plan into local development plans
	Institutional arrangements	• Multisectoral coordinating mechanism (Batangas Bay Region Environmental Protection Council) and Secretariat (Provincial Government Environment and Natural Resources Office) for ICM implementation established	• Approval of the Batangas Environmental Protection Council as governing body for ICM implementation
	Legislation	• Sufficient legal instruments in place	• Strengthen enforcement of laws • Build capacity of enforcement officers • Establish systematic monitoring and surveillance arrangement
Sustainable Development	Habitat protection, restoration and management	• Number of MPAs increased • MPA Network established • Mangrove and terrestrial forest areas rehabilitated	• Consider institutionalization of coastal volunteers (*Bantay Dagat)* • Consider innovative approaches to manage and control development activities in the area (i.e., establish province-wide coastal use zoning scheme)
	Water use and supply management	• Access to water supply improved since 1990 • Decrease in incidence of waterborne diseases from 2000 to 2007	• Develop strategies on regulation and conservation of freshwater usage in the Province • Consider watershed reforestation, urban greening, and water use rationalization through regulation and market-based instruments • Ensure continued efforts to protect water supplies and provision of adequate water treatment and supply services to communities
	Food security and livelihood management	• Declining malnutrition rates since 1995 • Increased opportunities for employment • Increased access to elementary and secondary education since 2003 • Efforts made to improve fisheries management and fisheries management plan (2005-2020)	• Need to improve data collection and management to facilitate implementation and evaluation of fisheries management plan • Strengthen the linkage of all the municipalities efforts in sustaining fishery resources

4.0 Policy Recommendations and Strategic Directions

The above studies have identified many environmental and socioeconomic issues related to coastal and marine governance. These findings underscore the importance of monitoring in order to assess management interventions as well as to refine and improve approaches.

Regional assessments have the advantage of providing the broad picture, for use in development of policy and management programs, at the national and subregional levels. Most fisheries are fully or overexploited due to increasing conflicts and resource users, as well as continuing use of destructive fishing activities, as the SocMon and WorldFish studies have found. In the 1990s, some 16 million people in the Southeast Asian countries were directly involved in small-scale fisheries (Menasveta, 1998).

The fisheries sector (including aquaculture) is important as fish remains a major source of protein and livelihood. Aquaculture is an option to fill fish supply gap for food security, but it poses threats to the coastal habitats and may contribute to pollution. Reduction of effort or catch limitation are not politically acceptable options. Nonetheless, supplemental/alternative livelihoods through aquaculture and sea ranching need to be promoted. Most fisheries/aquaculture problems could be addressed by institutional/governance measures. Designation of Marine Protected Areas (MPAs) are encouraged to protect the coastal habitats and enhance natural stocks.

There is also a need for a local monitoring program to track the socioeconomic, governance and environmental/resource status as well as the progress through time. Local monitoring through the PEMSEA's SOC may then provide information on how these policies and programs are being mainstreamed into local action and, even more so, what socioeconomic and environmental benefits are being achieved. Specific for fisheries and coastal resources, the Batangas SOC highlights the accomplishments in terms of conserving the coral reefs and mangroves through MPAs and better coastal law enforcement. More broadly, the SOC also provides practical indicators and recommendations relevant to both governance and sustainable development aspects.

This policy brief highlights the importance of effective monitoring in improving the management of the Seas of Southeast and East Asia, and particularly in assessing the socioeconomic impact of management programs. Moreover, the complexity of the coastal and marine issues in the region need to be contextualized in the light of the global drivers that include evolving politics, economy, science and technology, and environment.

Authors:

Michael D. Pido[1], Kathrine Rose Gallardo[2], Len R. Garces[3], Daisy Padayao[2], Giselle Samonte[4], S. Adrian Ross[2], Maripaz L. Perez[3], and Teresita L .Salva[1]

[1] Palawan State University, Puerto Princesa City, Philippines
[2] PEMSEA Resource Facility, Quezon City, Philippines
[3] Philippine Country Office, WorldFish Center, Laguna, Philippines
[4] Conservation International, Arlington, Virginia, USA

References

ADB (Asian Development Bank). 2009. "Key Indicators for Asia and the Pacific." Available at http://www.adb.org/Documents/Books/Key_Indicators/2009/default.asp. Accessed 2010 June 6.

Burke, L., E. Selig and M. Spalding. 2002. *Reefs at risk in Southeast Asia*. World Resources Institute. 72 p.

Chou, L.M. 1997."Southeast Asia as the global center of marine biodiversity." *Tropical Coast*, 4(1):4-8.

Dey, M.M., R.M. Briones, Y.T. Garcia, A. Nissapa, U.P. Rodriguez, R.K. Talukder, A. Senaratne, I.H. Omar, S. Koeshendrajana, N.T. Khiem, T.S. Yew, M. Weimin, D.S. Jayakody, P. Kumar, R. Bhatta, M.S. Haque, M.A. Rab, O.L. Chen, L. Luping and F.J. Paraguas. 2008. *Strategies and options for increasing and sustaining fisheries and aquaculture production to benefi t poorer households in Asia*. WorldFish Center Studies and Reviews No. 1823. The WorldFish Center, Penang, Malaysia.

ESCAP (Economic and Social Commission for Asia and the Pacific). 2009. "Statistical Yearbook for Asia and the Pacific. "Available at http://www.unescap.org/stat/data/syb2009/index.asp. Accessed 2010 June 9.

FAO (Food and Agriculture Organization). 2000. "SouthEast Asia." Chapter 4 in *Global Forest Resources Assessment*. Available at http://www.fao.org/docrep/004/y1997e/y1997e0t.htm. Accessed 2010 June 9.

ICLARM (International Centre for Living Aquatic Resources Management). 1999. *ICLARM Strategic Plan 2000-2020*, Makati City, Metro Manila, Philippines. 27 p.

Loper, C., R. Pomeroy, V. Hoon, P. McCooney, Maria Pena, A. Sanders, G. Sriskanthan, S. Vergara, M. Pido, R. Vave, C. Vieux and I. Wanyonyi. 2008. *Socioeconomic conditions along the world's tropical coasts: 2008*. National Oceanic and Atmospheric Administration, Global Coral Reef Monitoring Network and Conservation International. Washington, D.C. 52 p.

Menasveta, D. 1998. *APFIC: Its evolution, achievements and future direction*. FAO Regional Office for Asia and the Pacific, Bangkok, Thailand. RAP Publication. 114 p.

PEMSEA (Partnerships in Environmental Management for the Seas of East Asia). 2003. Sustainable Development Strategy for the Seas of East Asia: Regional Implementation of the World Summit on Sustainable Development Requirements for the Coasts and Oceans. PEMSEA, Quezon City, Philippines.

Provincial Government of Batangas, Philippines and PEMSEA. 2008. State of the Coasts of Batangas Province Partnerships in Environmental Management for the Seas of East Asia (PEMSEA),Quezon City, Philippines, 119 p.

Salayo, N.D., L.G. Garces, K.K. Viswanathan, and M. Ahmed. 2006. "Fish fights over fish rights: Non-traditional security issues in fisheries in Southeast Asia." In Emmers R., M. Caballero-Anthony and A. Acharya. editors, *Studying Non Traditional Security in Asia: Trends and Issue*. Cavendish, Singapore. p. 210-241.

Salayo, N., L. Garces, M. Pido, K. Viswanathan, R. Pomeroy, M. Ahmed, I. Siason, K. Seng, and A. Masae. 2008. "Managing excess capacity in small-scale fisheries: Perspectives from stakeholders in three Southeast Asian countries." *Marine Policy*, 32: 692-700.

Silvestre, G., L. Garces, I. Stobutzki, C. Luna, M. Ahmed, R.A. Valmonte-Santos, L. Lachica-Aliño, P. Munro, V. Christensen and D. Pauly (eds.). 2003. Assessment, Management and Future Directions for Coastal Fisheries in Asian Countries. WorldFish Center Conference Proceedings 67; 1,120 p.

Stobutski, I.C., G.T. Silvestre, A. Abu Talib, A. Krongprom, M. Supongpan, P. Khemakorn, N. Armada, and L.R. Garces. 2006. Decline of demersal coastal fisheries resources in three developing asian countries. Fisheries Research, 78: 130-142.

UNEP (United Nations Environment Programme). 1998. Report of the thirteenth meeting of the Coordinating Body on the Seas of East Asia (COBSEA) on the East Asian Seas Action Plan. UNEP, Bangkok, Thailand, 69 p.

UNEP/COBSEA (United Nations Environment Programme/Coordinating Body on the Seas of East Asia). 2010. State of the Marine Environment Report for the East Asian Seas 2009. Chou, L.M., ed., COBSEA Secretariat, Bangkok, Thailand, 156 p.

Yuen, B. And L. Kong. 2009. "Climate Change and Urban Planning in Southeast Asia." *Cities and Climate Change*, 2(3). Available from: http://sapiens.revues.org/index881.html. Accessed 2010 June 3.

policy brief

For Comments and suggestion, please contact:

Dr. Michael D. Pido
Director, Center for Strategic Policy and Governance

Palawan State University (PSU)

G/F Medical Building, Tiniguiban Heights
5300 Puerto Princesa City, Palawan
Philippines
Tel.: (6348) 434 9524
Fax: (6348) 433 5303

The Executive Director

Partnerships in Environmental Management for the Seas of East Asia (PEMSEA)

PEMSEA Resource Facility
PEMSEA Office Building, Department of Environment and Natural Resources (DENR) Compound, Visayas Avenue, Quezon City 1165, Philippines
P.O. Box 2502, Quezon City 1165, Philippines
Tel.: (632) 929 2992
Fax: (632) 926 9712
info@pemsea.org
www.pemsea.org

Dr. Maripaz L. Perez
Regional Director for Asia and
Manager, Philippine Country Office

The WorldFish Center
Philippine Country Office

SEAMEO-SEARCA College
Laguna 4031, Philippines
Tel.: (6349) 536 0202
Fax: (6349) 536 0202

Dr. Giselle Samonte
Director, Social Science Research -
Marine Science Knowledge Division

Conservation International (CI)

2011 Crystal Drive
Suite 500, Arlington, Virginia, USA 22202
Tel.: 1 (703) 341 2400
Fax: 1 (703) 979 0953

Suggested Citation:

Pido, M.D., K.R. Gallardo, L.R. Garces, D. Padayao, G. Samonte, S.A. Ross, M.L. Perez and T.L. Salva. 2011. Policy Brief on Targeted Research and Monitoring Programs for Enhanced Management of the Seas of East and Southeast Asia. Palawan State University, Partnerships in Environmental Management for the Seas of East Asia, WorldFish Center and Conservation International. Quezon City, Philippines, 8 p.