



Global Targets Local Benefits

Setting the Sustainable Development Agenda for
the Seas of East Asia beyond 2015

16-21 November 2015

Session 2

Accelerating Actions for Sustainable Development
and Climate Change

Workshop 3

**Valuation of Coastal Ecosystem
Services and Benefits and Coastal Use
Zoning: Tools for Better Planning and
Implementation**

CO-CONVENING AGENCY:



Chair: **Dr. Jungho Nam**
Research Fellow
Korea Maritime Institute



Hosted by the Government of Viet Nam

Organized by PEMSEA, Ministry of Natural Resources and Environment (MONRE), Viet Nam Administration of
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East Asian Seas Congress 2015
“Global Targets, Local Benefits: Setting the Sustainable Development Agenda for the Seas of East Asia
beyond 2015
Da Nang City, Viet Nam

Session 2:
Accelerating Actions for Sustainable Development and Climate Change

Workshop 3:
Valuation of Coastal Ecosystem Services and Benefits and Coastal Use Zoning

19 November 2015

Co-Convening Agency:
Korea Maritime Institute
Partnerships in Environmental Management for the Seas of East Asia (PEMSEA)

Workshop Chair:
Dr. Jungho Nam
Research Fellow,
Korea Maritime Institute

1. INTRODUCTION, WORKSHOP OVERVIEW AND KEYNOTE

- 1.1. The Fifth East Asian Seas (EAS) Congress, co-organized by the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) and the Government of Viet Nam through the Ministry of Natural Resources and Environment and the Da Nang City Government, was held at the Furama Resort in Da Nang City, Viet Nam from 16 to 21 November 2015.
- 1.2. Carrying the theme “Global Targets, Local Benefits: Setting the Sustainable Development Agenda for the Seas of East Asia beyond 2015”, the EAS Congress 2015 took stock of achievements made in the East Asian Seas region in ocean and coastal governance, actions that need to be accelerated to realize the Sustainable Development Goals and to confront various challenges besetting sustainable development of the region including those posed by climate change, and new opportunities for collaboration and cooperation in order to move the vision of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) 2015 to concrete realities locally by aligning with the global agenda, with particular focus on suitable governance arrangements.
- 1.3. The EAS Congress 2015 featured the Fifth Ministerial Forum, an International Conference, the annual meeting of the PEMSEA Network of Local Governments (PNLG), an Exhibition, the Fourth EAS Youth Forum, and other activities. More than 800 participants from national and local governments, the academe, UN agencies, regional organizations, business professionals, local and international nongovernmental organization (NGOs), youth and community representatives,

and other members of civil society from within and outside the East Asian Seas region participated in the Congress.

- 1.4. Three major sessions focusing on various aspects of sustainable coastal and ocean governance and development comprised the International Conference as follows:
 - Session 1: A Decade of Partnerships in Sustainable Development of the Seas of East Asia: Synergies and Achievements
 - Session 2: Accelerating Actions for Sustainable Development and Climate Change
 - Session 3: From Vision to Reality: Aligning the Global Agenda with Local Benefits

Background of the Workshop

- 1.5. The workshop on ***Valuation of Coastal Ecosystem Services and Benefits and Coastal Use Zoning: Tools for Better Planning and Implementation*** looked into the different ecosystem valuation and coastal use zoning frameworks and methodologies, as well as their linkages and applications at the local level. The workshop brought together more than 100 practitioners, researchers, policymakers, local stakeholders and communities. The program for the workshop and the list of participants are provided in Annexes 1 & 2 respectively.
- 1.6. A total of 12 case studies from China, Indonesia, RO Korea, Malaysia, Philippines, Thailand and Viet Nam, as well as regional and international organizations and projects, were presented. The case studies outlined the experiences in the use of tools and methodologies on valuation and zoning and their application to management of specific habitats and resources, such as seagrass, coral reefs, mangroves, fisheries and tourism, as well as their application in addressing various problems including coastal reclamation and habitat exploitation. Three panel discussants from the PEMSEA ICM Learning Centers and university partners identified areas where such tools and experiences can be scaled up in their respective sites/countries, as part of the GEF/UNDP/PEMSEA regional initiative on *Scaling up the Implementation of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA)*.

Session 1: Opening of the Workshop and Keynote

- 1.7. Dr. Sung Gwi-Kim, President of the Korea Maritime Institute, and Dr. Jinsook Yoon, former Minister of the Ministry of Oceans and Fisheries delivered the Opening and Welcoming Remarks respectively at the workshop.

Dr. Kim and Dr Yoon expressed their gratitude to the organizers and participants of the EAS Congress and encouraged the participants to actively join in the discussion. They emphasized the importance of the workshop, citing KMI's support through the annual capacity development initiatives on valuation and marine spatial planning as well as its application in the region.

Dr. Kim also emphasized the challenge of limited informative documents on valuation and spatial planning in the region, which hinders application on-the- ground in many countries.

- 1.8. Dr. Jungho Nam, Chair of the Workshop and KMI Research Fellow, introduced the workshop by providing background on KMI's efforts on valuation and marine spatial planning. He emphasized

the role of networking in Asia for ecosystem valuation and management. He cited the objectives of the workshops as follows:

- Assessing the usefulness of the valuation and spatial planning tools;
- Determining the gaps and challenges in the application of the tools and methodologies;
- Identifying ways to effectively utilize these for coastal and marine planning and decisionmaking, particularly at the local level;
- Building consensus on the wider use of ecosystem valuation and coastal use zoning and methodologies, taking into consideration the participation of local stakeholders in the process; and
- Exploring the possibility of organizing a network of researchers, practitioners and service providers.

- 1.9. Dr. Tundi Agardy of Marine Ecosystem Services (MARES Program) provided the keynote presentation for the workshop on *Assessing and Valuing Ecosystem Services for Ocean Zoning*. Dr. Agardy is the author of the book *Ocean Zoning: Making Marine Management More Effective*, which was first published in 2010. She discussed the importance of ecosystem services (illustrated in Figure 1) assessment and valuation and its links to marine spatial planning. She cited experiences from Mexico, Abu Dhabi, and St. Kitts/Nevis, Caribbean. She provided some background on the valuation and zoning that was completed in these sites and identified some of the success factors. While these areas are outside the EAS region, they share the same experiences as those in Asia, including some challenges with implementation.
- 1.10 Dr. Agardy stressed that there is no single model or formula for conducting valuation and spatial planning. These are done differently in various areas, as objectives and conditions will be different.
- 1.11 Valuation, she said, should also be done carefully, as “value” of ecosystem services may vary for different people/sectors. For instance, the non-provisioning services are usually the most difficult to value. The values of the regulating and cultural services are also difficult to capture, despite the reality that these may be more important than provisioning services.
- 1.12 There are several tools used for valuation of ecosystem services but emphasis should be made on the *process* of valuation and *use* of information being gathered. She cited, for instance, that there are about 934 marine ecosystem services valuations listed on the Marine Ecosystem Services Partnership (MESP) database, which is a virtual center of information based at Duke University. The database contains information on the economic value of ecosystems for their ecological value and provides links on the specific case study locations.
- 1.13 Despite numerous case studies, Dr. Agardy stressed the importance of making these data and information accessible to planners and decisionmakers. She pointed out that an ocean zoning based on an understanding of how ecosystems support human well-being helps orient policies towards both sustainability and equity. If done properly, ocean zoning allows the control of impacts from the delivery of ecosystem services. It is a natural extension of integrated coastal zone management (ICZM). It can be done at any scale but most commonly used for marine protected areas, designing network of MPAs within state and national waters, or in transboundary regions and semi/enclosed area, and in best cases, it is dynamic, rather than fixed, leading to adaptive management.

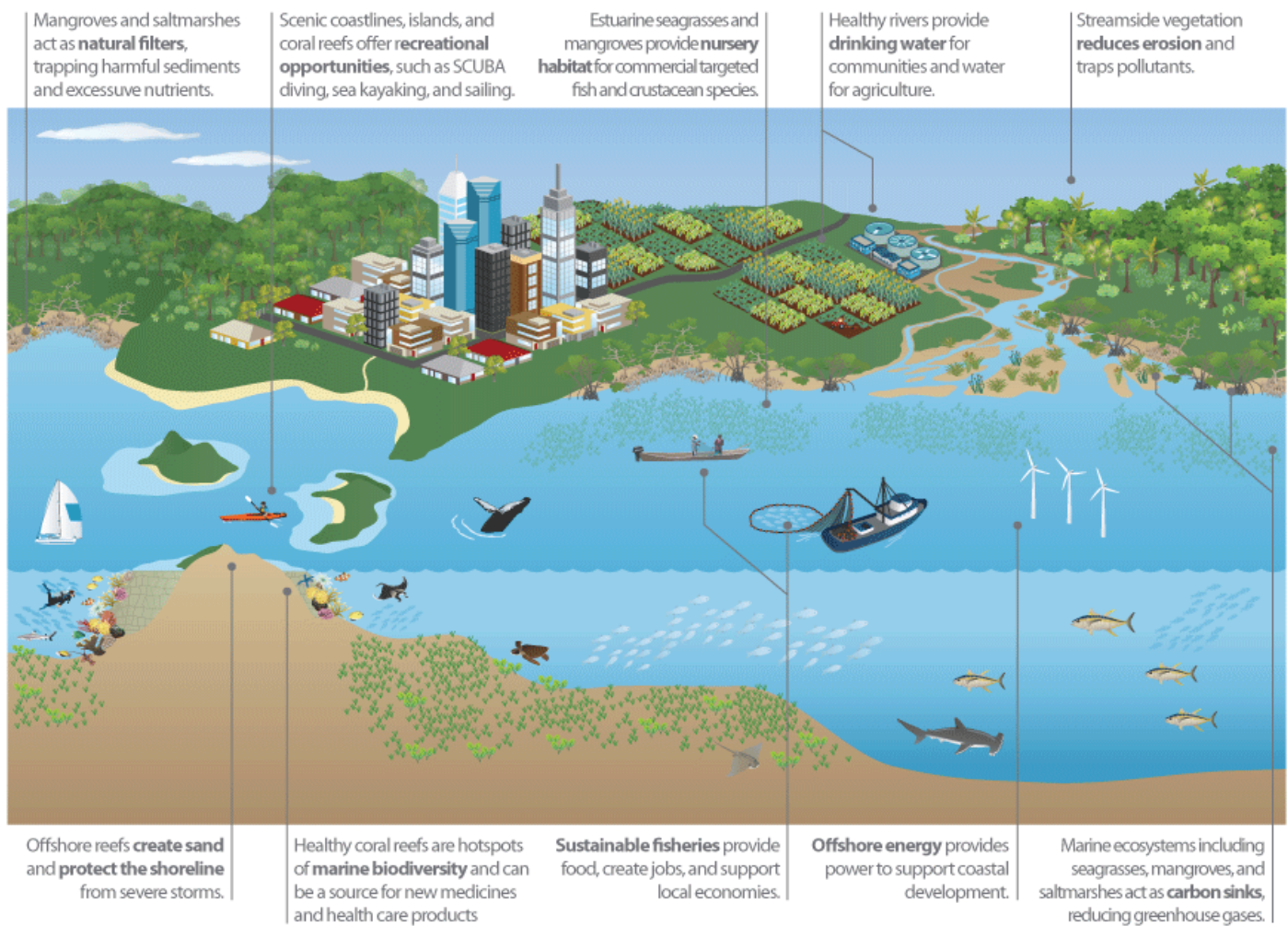


Figure 1. Marine ecosystem services (Agardy, 2015).

- 1.14 In order to effectively conduct assessment and implement them, science should look into the interconnectedness of factors and a careful analysis of the situation where the valuation and planning is being done. The following were identified as areas where science is needed:
- Ecology: understanding functioning, productivity, balances, thresholds, connectivity
 - Stressors: identifying how ecosystems are affected
 - Resilience: predicting how ecosystems will fare in the future
 - Values: economic and non-monetary
 - Spatial dimension: what/where are the most important areas
 - Situational analysis of enabling conditions: existing policies and regulations, governance frameworks, information flows
- 1.15 Dr. Agardy cited the different experiences in valuation and zoning, and how valuation information is being incorporated into planning and zoning:

- Marismas Nacionales in Mexico, which has the largest mangrove complex on the Pacific coast of Mexico. Mangroves, however, are disappearing at a rapid rate due to man-made changes on the fresh and salt water balance in the coastal zones. This can be linked to the expanding agriculture upstream and large infrastructure projects, which alter the freshwater and sediment flows into Marismas Nacionales. An important implication for decisionmaking involved planning to encompass the source of threats that need to be managed. In this case, initial planning in the Gulf of California had to be extended high into watersheds. (Further information can be accessed at http://forest-trends.org/documents/files/Project_Profile_Mexico.pdf).
 - Under the Abu Dhabi Blue Carbon Demonstration Project, an appraisal of all ecosystem services coming from Blue Carbon habitats (mangrove, seagrass, salt marsh, and others) was conducted to stress the comprehensive value of functional natural habitats. While the estimation provided the potential collective value of these ecosystems for their services as part of blue carbon co-benefits, the group warned against the maximization of one service alone at the expense of the other services. Other ecosystem services have been assessed as co-benefits and areas of high ecosystem service value/multiple benefits have been mapped out. Such information on high ecosystem service values can be used in creating new MPAs, directing land reclamation away from these areas and developing marine based eco-tourism for more sustainable blue growth. (More information on the project can be found at http://bluecarbonportal.org/dt_video/tundi-agardy-ecosystem-services-component-lead-the-abu-dhabi-blue-carbon-demonstration-project).
- 1.16 Dr. Agardy expressed hope for the East Asian region to be able to integrate land and sea use zoning. Zoning needs to take into account the land-and area-based sources of pollution, eutrophication and the compounding effects of climate change. Zoning, she said, should also be dynamic enough to anticipate changes and promote adaptive management. Based on these experiences, she identified some success factors in the conduct of marine spatial planning and valuation:
- **Consideration of all benefits that flow from ecosystems including the non-monetary values.** In cases when there is focus on one service only, the tendency is to come up with a zoning plan not supported by uses, which does not guarantee the delivery of all services. Identifying a single service of high value, and having all management attention and investment then focused on maximizing that commodity usually brings a lot of problems, including overexploitation of that resource, and in some cases, may result to land grabbing.
 - **Fully addressing issues of equity.** This includes maintaining access to resources, anticipating the needs of people using the system and ensuring the availability of widest array of services for people.
 - **Using science to pinpoint the areas of greatest ecological and social importance,** the protection of which can serve as foundations for blue growth.

2. SESSION 2: CASE STUDY PRESENTATIONS ON ECOSYSTEM SERVICE VALUATION AND CUZ: AVAILABILITY, APPLICABILITY AND TRANSFERABILITY OF TOOLS AT THE LOCAL LEVEL

The case study presentations highlighted the different experiences and lessons learned in the use of valuation and marine spatial planning tools.

- 2.1 Mr. Norman Emmanuel C. Ramirez, Programme Specialist for Capacity Development and Coordinator for the ASEAN Heritage Parks Programme of the ASEAN Center for Biodiversity (ACB), related their initiatives in conducting the scoping study on The Economics of Ecosystems and Biodiversity for Southeast Asia (ASEAN TEEB) focusing on mangroves, coral reefs, forests, and marine protected areas. The study is part of the broader ASEAN TEEB initiative (Figure 2), which aimed to mainstream the process of the economics of ecosystems and biodiversity through the conduct of assessment and valuation of key ecosystems and ecosystem services in Southeast Asia.

ASEAN TEEB Framework

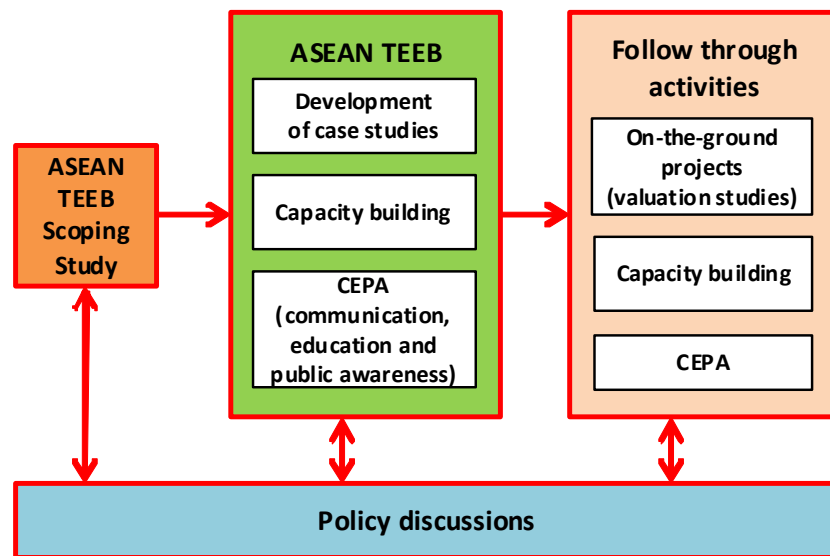


Figure 2. ASEAN TEEB Initiative framework (Ramirez, 2015).

- 2.2 As part of the initiative, an initial set of case studies were prepared highlighting the value of ecosystem services. The case studies were at different scales/levels from regional, provincial to local level and highlighted the values of various habitats and resources in different sites in the region:
- **Case study 1 on mangroves.** Southeast Asia is expected to lose one third of mangroves between 2000-2050 with a loss of US\$ 2 billion annually by 2050.
 - **Coral reefs.** Lost reef-related fisheries are expected to reach about US\$ 5.6 billion (annual value in 2050).
 - **Case study 3 on Leuser Forest Ecosystem** over a 30-year period showed that short-term gains do not compensate for long-term losses.
 - **Case study 4** on Hon Mun Marine Protected Area in Viet Nam, which illustrates the effective use of information on the economic values of ecosystem. A recommendation to introduce a user-fee that is earmarked for MPA has been adopted. Under this scheme, visitor fees have been introduced, generating a total revenue of US\$ 66,000 in 2011, or 40% of the annual MPA budget.
- 2.3 Dr. Tobias Borger of the Plymouth Marine Laboratory (PML) shared experience in incorporating ecosystem service valuation in marine planning in Europe. He shared the legal drivers of valuation for marine and some examples of the ecosystem service valuation including the Dogger-Bank, which

used the mixed method approach including ecological assessment, discrete choice experiment and citizen's jury. Under the ecological assessment, the future trends in ecosystem service provision or the qualitative assessment of change was determined. The stated preference valuation study or the choice experiment was conducted to determine the willingness to pay among households in the United Kingdom for species protection. The citizen's jury approach involved getting 19 representatives of the public into a focus group discussion, with the help of four experts.

- 2.4 From these processes/methods, the results pointed to preference on fishing activities over the development of wind farms.
- 2.5 Several examples were provided including the Marine Ecosystems Research Programme (2014-2019), which linked the EU Marine Strategy Framework Directive (MSFD) Descriptors to the ecosystem service categories. Examples on valuing MSFD Descriptors in Ireland and the triage approach. Based on these experiences, several challenges were encountered including the scarcity, establishing the linkage between ecosystem functions, services and benefits for valuation, the differences on spatial and temporal scales on data and concepts, stakeholder engagement, limited databases for valuation which hinders the use of value transfer.
- 2.6 Dr. Peter Mumby of the World Bank/GEF/UQ Capturing Coral Reef Ecosystem Services Project (CCRES) discussed the integration of coral reef ecosystem services into marine spatial planning based upon his experience in the project sites in Indonesia and the Philippines. Dr. Mumby emphasized the importance of ensuring stakeholder participation in the process, particularly in understanding local stakeholder aspirations for their communities. He emphasized the importance of promoting greater transparency in the decisionmaking process.
- 2.7 Dr. Mumby identified five (5) key aspects/steps in developing and implementation of valuation and marine spatial planning:
 1. Promoting a system-level understanding of issues, which considers the major threats and concerns of the site, the anticipated changes and developments, as well as new opportunities for livelihoods and peoples' aspirations.
 2. Assessing the "profitability" of businesses, which may not necessarily about an environmental benefit. Some require sound business model design, which can provide opportunities for government and donor agency collaboration. For instance, the switch from slash/burn agriculture to agro-forestry or looking at both the economic and environmental benefits derived to watershed.
 3. Defining the MSP objectives through a stakeholder analysis that will incorporate business needs and government policy (e.g., Aichi targets).
 4. Applying an iterative approach to evaluating the outcomes.
 5. Analyzing the feasibility of meeting the aspirations of communities/stakeholders and assessing the trade-offs that need to be made.
- 2.8 Dr. Mumby also discussed some of the challenges and opportunities in operationalizing ecosystem service value within a planning context including the following:
 1. Tractability vs sophistication. Approach can vary in sophistication over time as new information are generated and capacities improve.
 2. Necessitates a critical review of the data requirements for marine spatial planning.

3. Importance of networking to allow sharing of expertise and experience as well as available data and information.
- 2.9 Dr. Luky Adrianto's presentation on Mapping and Valuing Pelagic Ecosystem Services in Lesser Sunda Ecoregion provided information on the preliminary results of a research on manta rays and their contribution to tourism in the area. The work also included a policy recommendation to integrate the ecosystem approach for fisheries management into integrated coastal management (ICM).
 - 2.10 Dr. Adrianto's presentation emphasized the use of ICM for ocean-based blue economy and the process of mapping ocean wealth in Lesser Sunda Ecoregion. The study revealed the economic value of manta rays in several sites including Komodo and Bali. Manta rays in the Lesser Sunda Ecoregion have contributed to regional income amounting to US\$1 million to US\$15 million per year. While this is a result of rapid value estimation and despite the uncertainties, it should be considered a minimum estimation. However, manta rays are faced with challenges from local fishers, who are hunting them for daily production. Estimated benefit from this activity is only US\$ 200 per tail.
 - 2.11 In relation to these values, it was noted that the preservation and rehabilitation of particular ecosystems including seagrass is important to the flow of goods and services. A systematic thinking on protecting fisheries, and consequently the value of the manta rays, is therefore necessary. ICM was proposed as a mechanism to ensure the flow of goods and services from fisheries management including manta rays in the Lesser Sunda Eco-region.
 - 2.12 Ms. Regina Bacalso shared Ecofish's initiative to test the application of a method to attribute values per unit area of sea space. This was done by computing for the respective net annual values of the various activities within the specific area by calculating the net revenues generated from direct uses and estimating non-use values. The approach focuses initially on the major activities in municipal capture fisheries settings, including artisanal and small-scale fisheries, mariculture operations, marine tourism, and marine biodiversity conservation through fish sanctuaries or marine protected area establishment.
 - 2.13 The estimated values of sea space-use are included as an additional map layer over the existing sea use maps. This enables the stakeholders to compare the *size* of the benefits derived from their sea space. This can provide a powerful decisionmaking tool, particularly in prioritizing particular activities over others where sea use conflicts exist. The Ecofish project aims to use this approach in making fair and comprehensive estimates of the value of a delineated marine space at various scales — from a specific habitat to a fishing ground shared by two or more districts. In the future, this can also be used in determining use and entry fees, in information, education and communication campaigns, and in inculcating the value/worth of a site/resources among the stakeholders.

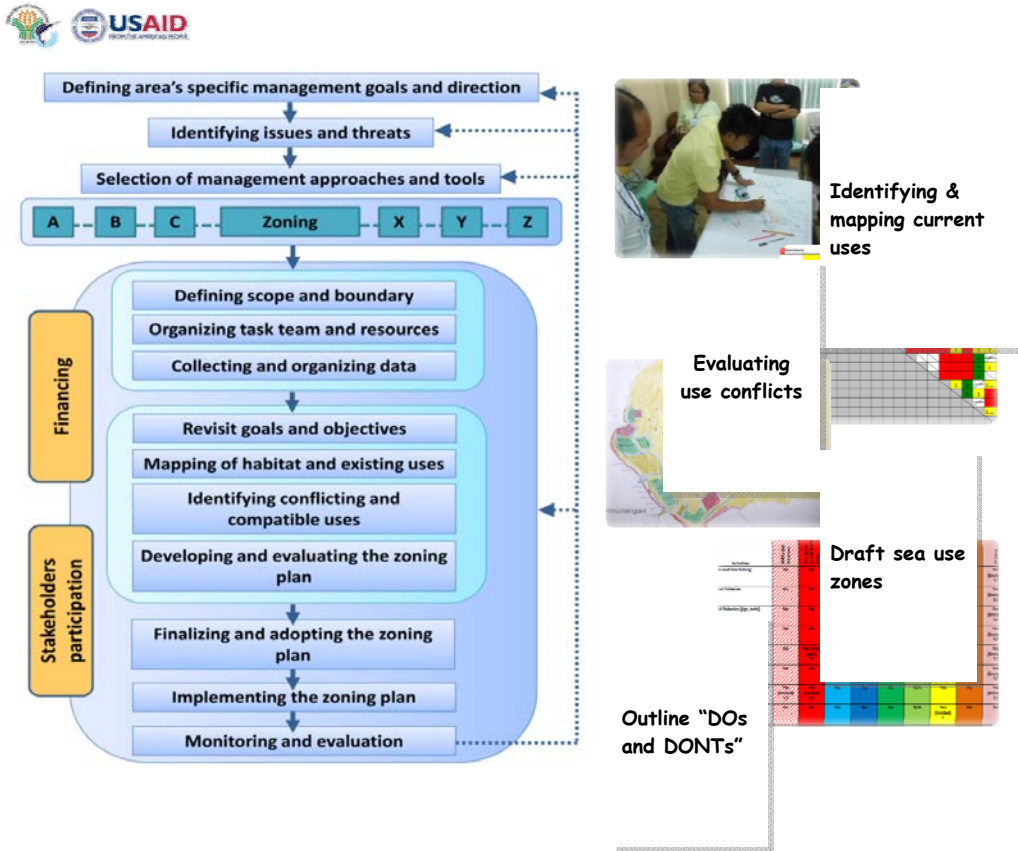


Figure 3. Zoning process of Ecofish where the valuation will be incorporated (Bacalso, 2015).

2.14 Dr. Orapan Nabangchang's presentation focused on the *Understanding Economic Values of Seagrass Ecosystems and its Implications for Decisionmaking: A Case Study of Trang Province, Southern Thailand*. Dr. Nabangchang explained the various importance of seagrass as follows:

- One square meter of seagrass produces 10 liters of oxygen each day
- Seagrass are also food source of dugongs and green sea turtles. A dugong can eat up to 40 kg of seagrass daily while a green turtle can eat 2 kg of seagrass per day.
- 61 rai or 0.25 hectares of seagrass can sequester 48 tonnes of carbon/year or the equivalent of greenhouse gas emitted in driving a car for 3,350 km.
- Filtering pollutant such as nutrients, chemicals and sediments

2.15 Given these values, several measures have been identified to protect the value of the seagrass including restoration and replanting seagrass beds, reducing and controlling pollution at source and dugong conservation. In assessing the value of the seagrass area in Trang, replacement cost was calculated at US\$1,168/hectare. The preliminary estimates provide an indication of the economic value of seagrass ecosystems and in encouraging local communities and government to protect the seagrass in the area.

2.16 Ms. Monique Sumampouw's presentation related their experience on the Contribution of Valuation Economy Study to the Zoning Process for Proposed Tun Mustapha Marine Park (TMP) and

Semporna Marine Spatial Planning. The TMP is the largest MPA in Malaysia with 1 million hectare coverage. In valuing the TMP, 3 scenarios were valued as follows:

Table 1: Total Economic Values for three scenarios:	
TMP with no proposed extractive projects	RM 1.47 billion
TMP with proposed extractive projects	RM 1.56 billion
TMP with no proposed extractive projects but with ecotourism	RM1.81 billion

- 2.17 These scenarios were identified to provide an idea to stakeholders on the value of the TMP under different conditions. The gazetting of the TMP as an MPA, was seen as an important step in ensuring food security, particularly in managing commercial fisheries, promoting local community use and establishing no-take zones. The gazetting will create the legal platform for a concerted and collaborative effort to sustain and improve livelihoods and conserve biodiversity.
- 2.18 The presenter expressed one of the challenges in the valuation and zoning process is the subjective interpretation of economic potentials of resources and the implications of the marine spatial planning. This is important as it will determine the support or non-support of the policymakers to the zoning plan. It is therefore important that the objective and the process of zoning be transparent at the start of the process in order to build a stronger understanding among stakeholders on the implications of zoning and to build trust in the negotiation process. It is also important that different institutions such as the environment department be engaged with institutions that manage water pollution and other related concerns in the coastal area so that the zoning process can consider the different dimensions and implications of planning a specific sea space.
- 2.19 Dr. Choong-Ki Kim of the Korea Environment Institute (KEI) presented a study on the *Use of big data to quantify nature-based tourism and recreation*. In this study, the InVEST (Integrated Valuation of Ecosystem Services and Tradeoffs) – Recreation Model was applied to value nature-based tourism in Jeju Island, RO Korea.
- 2.20 The study aimed to measure and map the value of recreation and tourism and to understand the characteristics of what attracts or deters tourists by using several methods, such as information from flicker photos, twitter user-days, mobile phone, as well as credit card use. The model predicts the visitation days of tourism based on the locations of natural habitats and other features. In the absence of empirical data on visitation, the study used proxy data for visitation days based on geo-tagged photographs and mobile phone usage. The “big data” showed statistically significant relationships between visitation with natural features such as scenery, vegetation, wildlife, geological features, national parks, etc.
- 2.21 Such information can be used in valuing nature-based tourism that will take into account pressures from economic development, increase in visitors, habitat destruction and climate change under alternative scenarios. These can then help in establishing management strategies for sustainable nature-based tourism. The application of big data provides new opportunities for the valuation of

ecosystem services including nature-based tourism for the countries and regions where field data are limited.

- 2.22 Reclamation is seen as a major challenge and opportunity on the use of coastal areas. Dr. Peng Benrong’s presentation on *Linking Valuation of Ocean Space and Marine Ecosystem to Coastal Reclamation Planning in Xiamen* focused on an analytical framework, which links the value of ocean space and marine ecosystems, to estimate the Total Allowable Area for Coastal Reclamation (TAACR) and its spatial distribution. The objective was to provide scientific support for spatial planning of coastal reclamation and to maximize the net benefits of coastal reclamation, with consideration to a set of constraints. Various benefits and costs, including the ecological and environmental costs of coastal reclamation, were systematically quantified in the framework. Using data from the Tongan Bay of Xiamen, model simulations were developed. The results suggest that the TAACR in Tongan Bay is 5.67 km², and the area of the Bay should be maintained at least at 87.52 km² in order to maximize the benefits derived from the use of the Bay.
- 2.23 Dr. Kim Thi Thuy Ngoc of the Institute of Strategy and Policy on Natural Resources and Environment (ISPONRE) discussed the Mainstreaming of ecosystem services into the decisionmaking process. She discussed the different drivers on the loss of ecosystem services, particularly on mangroves in Ca Mau Province. As part of the process, mapping, valuation and trade-off analysis were conducted. The InVEST model was used in generating scenarios as part of the mapping process. The results of the valuation are indicated in Figure 4 below.

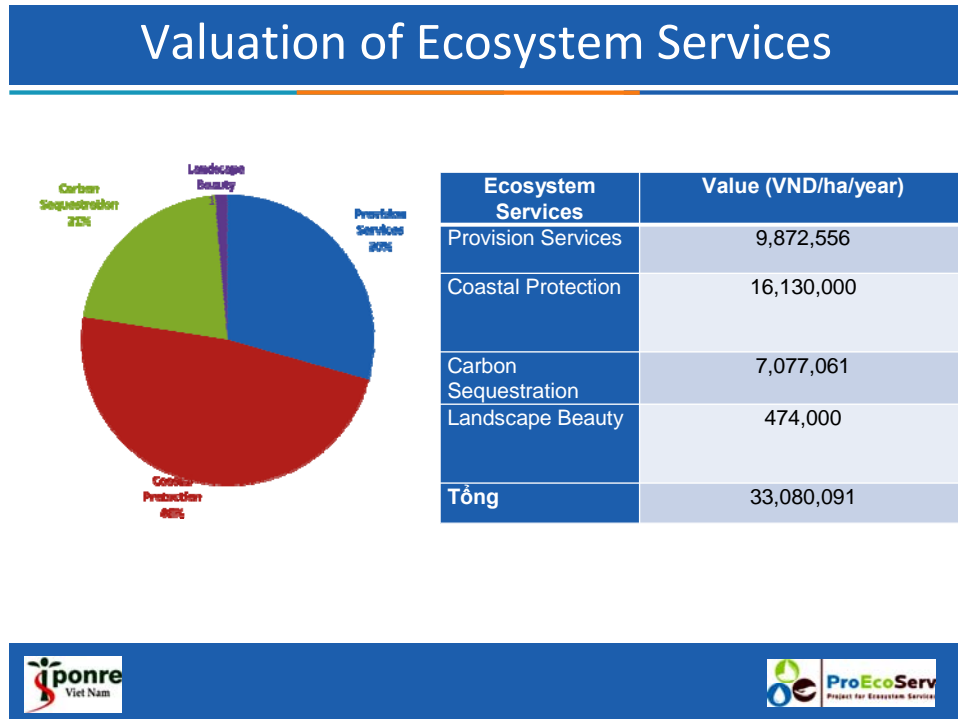


Figure 4. Results of valuation of ecosystem services in Ca Mau Province.

- 2.24 The results of the valuation process were taken into consideration in the land use planning of Ca Mau National Park and in fulfilling specific policies such as Party Resolution No. 24-NQ/TW on Responding to Climate Change, Natural Resources Management and Environmental Protection, the National Strategy for Green Growth and the National Strategy for Environmental Protection to 2020, Vision to 2030.
- 2.25 Dr. Daesok Kang's presentation was on the preliminary application of spatial ecosystem service valuation in Gyeonggi Bay. The Bay is located on the western coast of RO Korea and has been subjected to competing uses over the past decades, resulting on the deterioration of the bay ecosystem. The EMERGY methodology, which is a biophysical approach in the valuation of ecosystem services, was used to construct value maps for selected ecosystem services of the bay. The approach uses available energy as the common currency to compare different components and processes of ecosystems. Environmental characteristics and management needs of the bay were used to select spatial resolution, the spatial energy mapping procedure, and data and information required for the valuation. Emergy maps for environmental inputs to the Gyeonggi Bay ecosystem were constructed to understand the characteristics of environmental conditions for the bay.
- 2.26 A value map for stored resources in the bay was constructed using biomass data of benthic invertebrates as an example. Fishery production and marine sand extraction, two conflicting uses of the bay ecosystem, were selected to construct value maps of ecosystem services to illustrate how spatial value maps could be used in spatial decisionmaking in marine ecosystems (Figure 5).

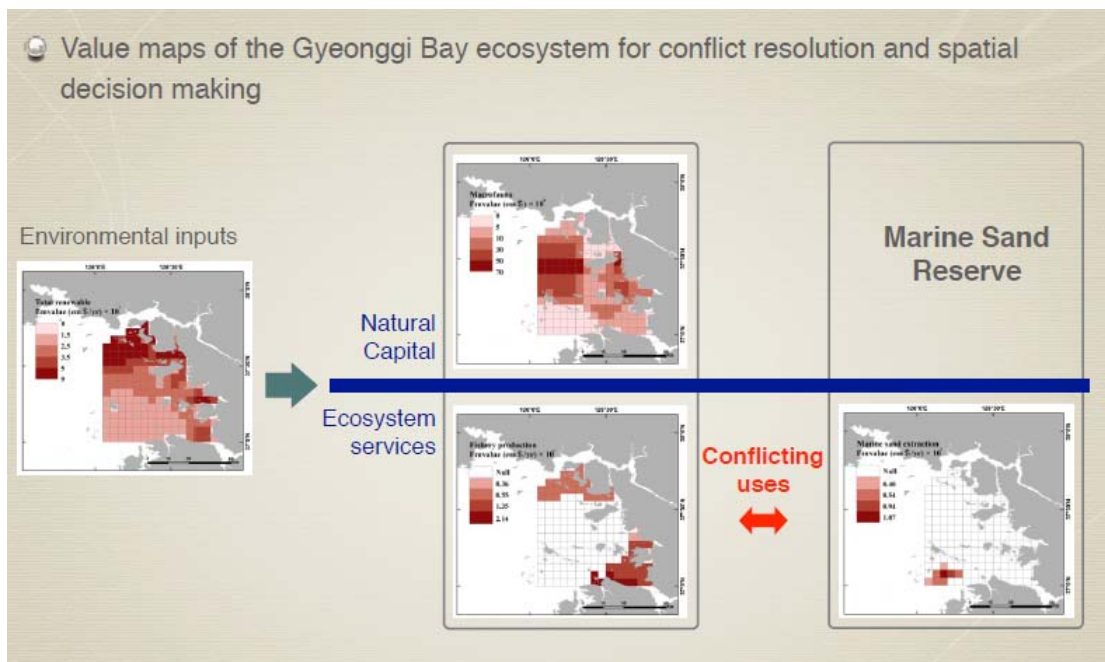


Figure 5. Value maps of the Geonggi Bay Ecosystem for conflict resolution and spatial decisionmaking.

3. SESSION 3: PANEL AND PLENARY DISCUSSION ON THE APPLICATION OF ECOSYSTEM SERVICE ASSESSMENT, VALUATION AND COASTAL USE ZONING: SCALING UP TOOLS AND METHODOLOGIES

- 3.1 Given the different case studies presented, Dr. Natalie Degger shared that PEMSEA will be focusing on several sites where valuation will be used for specific habitats and locations. Dr. Degger presented an overview of the ICM priority sites where valuation and zoning tools will be applied as part of the GEF/UNDP/PEMSEA regional project on Scaling up the Implementation of the SDS-SEA. This will be done to generate buy-in among local policymakers and communities in protecting these resources. Similarly, coastal use zoning (CUZ) is being conducted to delineate marine protected areas and habitats in order to protect ecosystem integrity by reducing multiple use conflicts and unsustainable exploitation of marine and coastal resources through better enforcement. PEMSEA will be working with ICM Learning Centers across the region (i.e., local universities and research institutions) to build local capacities and promote adoption of tools, methodologies and processes, including those for ecosystem valuation and CUZ. Through the support provided by academic and research partners, the technical tools can be localized to suit site conditions thereby enabling local governments to better appreciate the process and eventually, create greater understanding and appreciation of the results.
- 3.2 As an introduction to the panel discussion, Dr. Degger’s presentation provided an overview of the tools that are expected to be applied at the local level, the priority sites where these will be implemented, and the proposed steps to mobilize ICM Learning Centers and other PEMSEA Partners in their implementation. The following key questions were raised by Dr. Degger as part of the introduction to the panel and plenary discussions:
- What are the priority/preferred tools and methodologies for valuation and coastal use zoning/marine spatial planning that can be used at the local level?
 - What kind of training activities should be conducted to strengthen the skills of partners (i.e., University or research institutions) on the use of these tools?
 - What kind of information/case studies/manuals should be made available to support the application of these tools?
 - What kind of researches should be done to support the use of these tools/methodologies?
 - Can we set up a network/use an existing network to assist local sites on valuation and zoning?
- 3.3 Plenary Chair, Prof. Chul Hwan Koh of the Seoul National University and Technical session Chair of the East Asian Seas Partnership Council, reiterated the importance of using the results of ecosystem valuation in the process of zoning or decisionmaking. However, this remains a challenge in actual implementation. Incorporating social aspects of valuation, such as preferences, needs to be incorporated into the process.
- 3.4 Mr. Sakanan Plathong expressed that valuation and zoning, in the case of Thailand has been used in the management of national parks with the objective balancing development with conservation. Marine spatial planning is not a simple process as boundaries of marine and coastal resources cannot be easily defined. A lot of the zoning plans/schemes are the result of a negotiation process rather than based strictly on scientific information or decision-support system.
- 3.5 For Thailand, and in the specific case of Prince of Songkhla University, there is a need for capacity building on techniques for ecosystem service valuation, integrating information and creating better cooperation between technical staff and managers. A training of trainers for Learning Centers

should be done, with actual application of techniques including the effective communication of results and what it means to management process and the livelihood of communities.

- 3.6 Dr. Hilly Roa Quiaoit of Xavier University, Philippines, shared the university's experiences related to ecosystem service valuation and coastal use zoning, most of which are based on their reef-to-ridge program and on the R3/riverbasin management. Dr. Quiaoit informed the workshop that they have done valuation in support of Payment for Ecosystem Service (PES) for water supply and flooding control. Valuation data was needed to improve the PES. She also indicated that there is need to provide some guidance on resource valuation for local implementers and the academe, which is involved in extending support for implementation. In the same manner, experts usually have a limited understanding of the local nuances or context with which valuation is conducted and the decision on which method to use is left to the experts' judgment.
- 3.7 Dr. Quiaoit stressed the importance of policy response to valuation and zoning data. A strategy on how these will be packaged to come up with appropriate policy measures should also be included in guidance documents. For instance, she cited that of the 14 coastal use zoning schemes around Macajalar Bay, only 2 have been adopted. There is a need to learn to talk like a diplomat and lobby for the adoption of these CUZs. Stakeholder analysis is also important, particularly on those who are dependent on the resources and those that will be highly affected by the zoning. In the case of Xavier University, they needed to convince Del Monte (a plantation owner) that the PES is different from the usual corporate social responsibility (CSR), in order to generate acceptance of the fee system for water use.
- 3.8 A guide on valuation and spatial planning will be useful, particularly in identifying several scenarios including that of the business-as-usual scenario. It was also expressed that a COP network to bridge communication and understanding among the NGOs/CSOs and scientists would be beneficial. Researches along the lines of social audits to identify stakeholders, as well as water flow/retention studies to identify impacts on coastal ecosystems are needed.
- 3.9 Dr. Ario Damar of the Bogor Agricultural University expressed that there are a lot of valuation and MSP tools available. He echoed most of the speakers' concern that the use of these tools in actual implementation remains a major challenge. The linkage of science, policy and implementation needs to be established/strengthened so that results of research initiatives can be translated into policy and decisionmaking processes. In order to do this, a multidisciplinary approach to implementation has to be established involving various expertise and cross-cutting fields of expertise and integrating decisionmakers as part of the process. Bridging information into something that can be used into decisionmaking can be done through this approach.
- 3.10 In terms of capacity development, training has to be done at different levels — from local leaders, technical staff and communities. The ICM Learning Centers should be trained on these tools first so that guidance can be extended to local implementers. Dr. Damar emphasized the importance of sharing expertise through existing networks. For instance, the PEMSEA Network of Local Governments should be linked with the PEMSEA Network of Learning Centers, which can provide the necessary guidance in the application of tools and methodologies at the local level. In Indonesia, for example, there is also a need to get CUZ schemes legally adopted by either the local or national government for these to be implemented properly.

3.11 During the plenary discussions, the presenters and participants of the workshops also raised the following points:

- The availability of environmental economists who are eager to share expertise and organizing a 2-3 day training to promote appreciation of EV tools can be done to promote the use of these tools.
- MSP is an important policy instrument and policy and decision-makers need to understand and appreciate the linkage between ecological structure with its value and function. Having a network of experts can help in promoting the link and understanding of the ecological values and how communities benefit from these. Training on how these are assessed and communicated to policy- and decision-makers should be done.
- There is always a tension between the use of standardized methods and the need to adapt methods to local conditions. There is therefore a need to increase the involvement of stakeholders in the process/study so that methods can take into consideration the varying conditions/preferences of stakeholders.
- The need to communicate or “sell” the results of the researches should also be a part of the training and education. Technical experts should also be conscious on the quality of data and information and the possible proxy parameters in the absence of these data.
 - In valuation, values calculated are usually determined by researchers/NGOs. Local people/stakeholders should be heard in valuing their ecosystems. There is a need to engage them as early as possible in generating data that will be used as input to tools and to instill a sense of ownership/buy-in of the results.

3.12 Towards the end of the session, Prof. Koh called on Dr. Agardy to summarize the results. Dr. Agardy was impressed by the diversity of tools and experiences presented during the workshop. The diversity, she said, allows for collaboration across different players. Rather than standardization, she encouraged participants to look into guidance on what kind of approach is needed for what kind of scale and help users with the tools or metrics as needed. Considering the diversity of approaches, the East Asian seas region can be a world leader in applying valuation and zoning.

3.13 Dr. Agardy also cited the importance of anticipatory valuation — of thinking what might exist in the future with various management interventions or scenarios. This can help identify targeted investment, for instance, in trying to restore areas that are degraded but can deliver ecosystem services. The keynote speaker also encouraged everyone to start with the existing data/information to create actions on the ground and “...not let perfect be the enemy of the good.” She stressed that science is imperfect and waiting for perfect data and information will not create change.

4. CONCLUSIONS

4.1. There is no single tool or methodology that can accommodate the varying objectives of zoning in different sites. Stakeholder engagement is important in identifying the objectives of valuation and zoning and getting their perspectives on the right balance between environmental protection and pursuing development objectives. Policy- and decision-makers should be engaged in the process to create the support needed to legislate.

- 4.2. There is a wide array of experiences on ecosystem service valuation and its linkage to coastal use zoning/marine spatial planning within and outside the region. However, guidelines on the application of these tools at the local level are still limited and a challenge due to the varying conditions and objectives of sites on their valuation and zoning initiatives.
- 4.3. There is a general recognition that ecosystem service valuation plays a critical role in lobbying and decisionmaking, but efforts to link results of valuation to policy- and decision-making is challenged by limited/poor communication to policy- and decision-makers
- 4.4. Some elements of success in valuation and zoning include:
 - Consideration of all benefits that flow from ecosystems including those not traded in markets;
 - Assessment of values in monetary and non-monetary values;
 - Fully addressing issues of equity, that is, maintaining access to resources, anticipating the needs of people and ensuring the availability of the widest array of services for people; and
 - Using science to pinpoint the areas of greatest ecological and social importance, the protection of which can serve as foundation for blue growth.
- 4.5. The linkage between policy and science have not been established in many cases. The results of valuation are sometimes not made available to policy- and decision-makers, or are not effectively communicated, resulting in poor uptake of results and recommendations.
- 4.6. Valuation and zoning can be used to assess societal priorities and understand trade-offs and benefits, and if done properly and communicated well to policy- and decision-makers, it can lead to effective management of coastal, marine as well as watershed resources.
- 4.7. There is a need to have a system-level understanding of issues by looking at the linkages of socioeconomic issues including major threats and concerns on the environment, anticipated changes and developments, new opportunities for livelihoods, and peoples' aspirations. Stakeholders must therefore be engaged in the process.
- 4.8. Effective ecosystem service valuation and coastal use zoning are those that consider all benefits derived from the resources and a zoning that addresses the issues of equity by allowing availability of widest array of services for people.
- 4.9. Valuation and zoning can be used not only to look at areas that can be protected but to identify the areas that need to be restored.

5. RECOMMENDATIONS

- 5.1. Convince the unconvinced. There is a need to communicate the results of valuation studies to convince the "unconvinced" and to create actions on the ground. This is particularly important in the case of local officials who will need to use the results of the valuation in their policy- and decision-making processes

- 5.2. Promote ownership of the process and strengthen the participation of local stakeholders in the process of valuation and zoning to take into consideration community preferences and create buy-in/support for the zoning.
- 5.3. Link the science into policy- and decision-making. The science behind valuation must be connected with policy- and decision making.
- 5.4. Immediate action using the best available data. It is usually difficult to generate a complete set of information in conducting valuation and zoning but implementers must use the best available data and information to conduct the valuation and zoning.
- 5.5. Review of zoning plans. Zoning should be seen as an iterative process and that zoning plans can be adjusted as new information comes in and based on new priorities of communities or local governments.
- 5.6. Promoting transparency on the objectives of zoning and valuation so that stakeholders will be guided properly on the decisions/choices on the trade-offs that need to be made in the process of negotiation.
- 5.7. Broader/holistic approach to zoning. There is a need to consider the interaction between land-based activities and sea uses in order to come up with better and a more holistic approach to zoning.
- 5.8. Conduct anticipatory valuation. There is a need to think about what might exist in the future — the potential ecosystems values as a way to plan for areas for targeted investment for degraded areas and the type of values that might be enhanced in the future.
- 5.9. Strengthen capacity for valuation and zoning by encouraging training (by KMI) and providing opportunities for application at the local level (in PEMSEA sites) of the tools learned from the training.
- 5.10. Strengthening the capacity of the members of the PNLC on valuation and zoning so that they can be mobilized in providing support to local governments on the use of tools and methodologies on valuation and zoning.

Annex 1.
Workshop Program

Session 2

Workshop 3

Valuation of Coastal Ecosystem Services and Benefits and Coastal Use Zoning: Tools for Better Planning and Implementation

CO-CONVENING AGENCY:



Schedule: 19 November
1030 – 1800

Venue: Furama Gallery 1 and 2

Chair: **Dr. Jungho Nam**
Research Fellow
Korea Maritime Institute

Previous valuation was done independent of coastal use zoning and other tools. This workshop aims to emphasize the linkage between the two and how they are used to support better planning and management of coastal and marine areas and resources, to provide social and economic benefits for coastal communities.

It will look into the different ecosystem valuation and coastal use zoning frameworks and methodologies as well as their linkage and their application at the local level. It will bring together practitioners, researchers, policy maker, local stakeholders and communities to:

1. assess the usefulness of these tools;
2. determine the gaps and challenges in the application of these tools and methodologies;
3. identify ways to effectively utilize these for coastal and marine planning and decision-making, particularly at the local level; and
4. build consensus on the wider use of ecosystem valuation and coastal use zoning and methodologies, taking into consideration the participation of local stakeholders in the process.

The workshop will also explore the value of organizing and/or strengthening a network of researchers, practitioners and service providers, which can provide support to local governments in continually developing, improving and promoting ecosystem valuation and marine spatial planning knowledge products and services among policy-makers, planners and managers at the local level.

| P R O G R A M M E

Session 1: Opening of the Workshop and Keynote

- 1030 – 1040** **Chair's Introduction of the Session**
Dr. Jungho Nam, Korea Maritime Institute (KMI)
- 1040 – 1050** **Opening Remarks**
Dr. Sung-Gwi Kim, Korea Maritime Institute
- 1050 – 1100** **Welcoming Remarks**
Dr. Jinsook Yoon, Ministry of Oceans and Fisheries, RO Korea
- 1100 – 1130** **Keynote Presentation**
Assessing and Valuing Ecosystem Services for Ocean Zoning
Dr. Tundi Agardy, Marine Ecosystem Services (MARES) Program

Session 2: Case Study Presentations on Ecosystem Service Valuation and CUZ: Availability, Applicability and Transferability of Tools at the Local Level

- 1130 – 1150** **The Economics of Ecosystems and Biodiversity for Southeast Asia (ASEAN TEEB) Initiative**
Mr. Norman Emmanuel Ramirez, ASEAN Centre for Biodiversity (ACB)
- 1150 – 1210** **Opportunities and Barriers on Incorporating Ecosystem Service Valuation in Marine Planning: A European Perspective**
Dr. Tobias Borger, Plymouth Marine Laboratory (PML), United Kingdom
- 1210 – 1230** **Integrating Coral Reef Ecosystem Services into Marine Spatial Planning**
Dr. Peter Mumby, World Bank/GEF/UQ Capturing Coral Reef Ecosystem Services Project
- 1400 – 1420** **Contribution of Valuation Economy to the Zoning of Proposed Tun Mustapha Marine Parks (TMP) and Semporna Marine Spatial Planning**
Ms. Monique Sumampouw, WWF-Malaysia Marine Program

- 1420 – 1440** **Mapping and Valuing Pelagic Fisheries for Tourism in the Lesser Sunda Ecoregion: Preliminary Results on Manta Rays**
Dr. Luky Adrianto, Yudi Wahyudin and Benny Osta Nababan, Centre for Coastal and Marine Resource Studies Bogor Agricultural University, Indonesia
- 1440 – 1500** **Accounting for Sea Space Use in ECOFISH MKBAs – A Preliminary Approach**
Ms. Regina Therese M. Bacalso, Ecosystems Improved for Sustainable Fisheries (ECOFISH) Program and **Ms. Rina Maria Rosales**, Resources, Environment and Economics Center for Studies (REECS)
- 1500 – 1520** **Understanding Economic Values of Seagrass Ecosystem and Implications for Decision Making: A Case Study of Trang Province, Southern Thailand**
Dr. Orapan Nabangchang, School of Economics, Sukothai Thammatirat Open University
- 1520 – 1540** **Quantifying Nature-based Tourism in the Era of Big Data: A Case Study for Jeju Island, RO Korea**
Dr. Choong-Ki Kim, Korean Environment Institute/Environmental Policy Research Group
- 1540 – 1600** **Panel Discussion (Application of the tools at the local level)**
- What are the challenges on the use of these tools?
 - How can the different stakeholders be effectively engaged on the use of the tools and processes?
 - How can these tools and processes be mainstreamed into planning and implementation at the local level?
- Panelists:**
Mr. Norman Emmanuel Ramirez, ACB
Dr. Tobias Borger, PML
Dr. Peter Mumby, University of Queensland
Ms. Monique Sumampouw, WWF-Malaysia Marine Program
Dr. Luky Adrianto, Centre for Coastal and Marine Resource Studies Bogor Agricultural University
Ms. Regina Therese M. Bacalso, Ecosystems Improved for Sustainable Fisheries (ECOFISH) Program
Dr. Orapan Nabangchang, School of Economics, Sukothai Thammatirat Open University
Dr. Choong-Ki Kim, Korean Environment Institute/Environmental Policy Research Group
- 1615 – 1635** **Linking the Value of Ocean Space and Marine Ecosystem to Coastal Reclamation Planning: A Case Study of Xiamen**
Dr. Peng Benrong, College of Environment and Ecology (CEE)/Coastal and Ocean Management Institute (COMI), Xiamen University

- 1635 – 1655** **Mainstreaming of Ecosystem Services in to Decision Making Process through Ecosystem Services Mapping and Valuation – A Case Study of Coastal Area in Ca Mau Province, Viet Nam**
Dr. Kim Thi Thuy Ngoc, Division of Science and International Cooperation, Institute of Strategy and Policy on Natural Resources and Environment, MONRE, Viet Nam
- 1655 – 1715** **Biophysical Approach in Ecosystem Service Valuation: Spatial Energy Valuation**
Prof. Daeseok Kang, Pukyong National University in Busan, RO Korea
- 1715 – 1730** **Ecosystem Services are Jargons? Challenging Issues in Translating Them into Marine Spatial Policy**
Dr. Jungho Nam, Korea Maritime Institute

Session 3: Plenary: Application of Ecosystem Services Assessment, Valuation and Coastal Use Zoning: Scaling up Tools and Methodologies

- 1730 – 1740** **Valuation Tools and Coastal Use Zoning: A Step towards Application in PEMSEA Sites**
Dr. Natalie Degger, PEMSEA
- 1740 – 1755**
- What are the priority/preferred tools and methodologies for valuation and coastal use zoning/ marine spatial planning that can be used at the local level?
 - What kind of training activities should be conducted to strengthen the skills of partners (i.e., University or research institutions) on the use of these tools?
 - What kind of information/case studies/manuals should be made available to support the application of these tools?
 - What kind of researches should be done to support the use of these tools/methodologies?
 - Can we set up a network/use an existing network to assist local sites on valuation and zoning?

Plenary Chair: Prof. Chul Hwan Koh, Seoul National University and East Asian Seas Partnership Council, PEMSEA

Panelists:

- **Mr. Sakanan Plathong**, Prince of Songkhla University, Thailand
- **Dr. Hilly Roa-Quiaoit**, Xavier University, Philippines
- **Dr. Ario Damar**, Bogor Agricultural University, Indonesia

- 1755 – 1815** **Workshop Conclusions and Recommendations**
Workshop Chair

Annex 2.
List of participants (Presenters, speakers and panelists)

Name	Organization
Dr. Sung-Gwi Kim	Korea Maritime Institute
Dr. Jinsook Yoon	Ministry of Oceans and Fisheries, RO Korea
Dr. Jungho Nam	Korea Maritime Institute
Dr. Tundi Agardy	Marine Ecosystem Services (MARES) Program
Mr. Norman Emmanuel Ramirez	ASEAN Centre for Biodiversity (ACB)
Dr. Tobias Borger	Plymouth Marine Laboratory (PML), United Kingdom
Dr. Peter Mumby	World Bank/GEF/UQ Capturing Coral Reef Ecosystem Services Project
Ms. Monique Sumampouw,	WWF-Malaysia Marine Program
Dr. Luky Adrianto	Centre for Coastal and Marine Resource Studies Bogor Agricultural University, Indonesia
Yudi Wahyudin	Centre for Coastal and Marine Resource Studies Bogor Agricultural University, Indonesia
Benny Osta Nababan,	Centre for Coastal and Marine Resource Studies Bogor Agricultural University, Indonesia
Ms. Regina Therese M. Bacalso	Ecosystems Improved for Sustainable Fisheries (ECOFISH) Program
Dr. Orapan Nabangchang,	School of Economics, Sukothai Thammatirat Open University
Dr. Choong-Ki Kim	Korean Environment Institute/Environmental Policy Research Group
Dr. Peng Benrong,	College of Environment and Ecology (CEE)/Coastal and Ocean Management Institute (COMI), Xiamen University
Dr. Kim Thi Thuy Ngoc	Division of Science and International Cooperation, Institute of Strategy and Policy on Natural Resources and Environment, MONRE, Viet Nam
Prof. Daeseok Kang	Pukyong National University in Busan, RO Korea
Dr. Natalie Degger	PEMSEA
Prof. Chul Hwan Koh	EAS Partnership Council, Technical Session
Mr. Sakanan Plathong	Prince of Songkhla University, Thailand
Dr. Hilly Roa-Quiaoit	Xavier University, Philippines
Dr. Ario Damar	Bogor Agricultural University, Indonesia