



Global Targets Local Benefits

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

16-21 November 2015

Session 3

From Vision to Reality: Aligning the Global Agenda
with Local Benefits

Workshop 3

**Blue Economy Development:
Where Are We Now? Where Are We
Headed?**

Co-Chairs: Ms. Cary Anne Cadman

Environment Sector Coordinator
The World Bank

Dr. Marian delos Angeles

Senior Advisor, Resources,
Environment and Economics Center
for Studies, Inc. (REECs), Philippines



Hosted by the Government of Viet Nam

Organized by PEMSEA, Ministry of Natural Resources and Environment (MONRE), Viet Nam Administration of
Seas and Islands, and the City Government of Da Nang and supported by GEF and UNDP.

The East Asian Seas Congress 2015
Global Targets, Local Benefits: Setting the Sustainable Development Agenda for the
Seas of East Asia beyond 2015
Da Nang, Viet Nam, 16-12 November 2015

Session 3: From Vision to Reality: Aligning the Global Agenda with Local Benefits

**Workshop 3:
Blue Economy Development: Where are we now? Where are we headed?**

19 November 2015

Workshop co-chairs:
Ms. Cary Anne Cadman, The World Bank
Dr. Marian Delos Angeles, Resources, Environment and Economics Center for Studies, Inc.

Panel Discussion Moderator: Dr. Alistair McIlgorm, University of Wollongong, Australia
Workshop Coordinator: Maria Corazon Ebarvia, PEMSEA

1. INTRODUCTION

1.1 The workshop aimed to:

- a. create understanding of the blue economy through country presentations of ocean-based and ocean-related economic activities, and their contribution to national economies;
- b. examine the sustainability of such activities through valuation of ecosystem services and damages;
- c. identify on-going investments in innovative practices and technologies that contribute to blue economy development, address environmental and resource degradation and climate change impacts, and make economic activities more environmentally sound;
- d. discuss the development of a road map and policy recommendations for institutionalizing ocean economy and environment accounting, promoting blue economy investments and innovations, formulating a blue economy approach to sustainable development of coasts and oceans, and monitoring and reporting progress and gaps.

1.2 The concept of blue economy is evolving as the ocean space is changing dramatically, driven by innovations, new industries, shifting demands, and pressures from changing environment and climate.

1.3 In her keynote presentation, Ms. Cary Ann Cadman emphasized that policymakers need to know the value of coastal and marine resources to make informed decisions and support sustainable management. However, GDP is not enough indicator since it only shows economic growth. On the other hand, accounting of wealth – natural capital, human capital, social

capital – would show whether long-term economic growth and sustainable economic development is occurring or not. The wealth accounting and valuation of ecosystem services (WAVES) project can help countries develop and adopt economic-ecosystem accounts relevant for blue policies, and it provides a global platform for knowledge sharing.

- 1.4 We are still in a transitional phase to develop an ocean economy – environment accounting system, and design appropriate economic development plans, market-based instruments and incentives to effect transformational change in the blue economy. Challenges include data, leadership, science-policy linkages, capacity, and divergent interests.
- 1.5 Enabling conditions, clear regulations, strict enforcement, incentives and financing mechanisms are essential in coastal and ocean governance, and making industries ‘blue’.
- 1.6 Transboundary problems, rapid urbanization, loss of biodiversity, climate change, and other emerging issues affecting ocean health and sustainability of ocean economy pose new dimensions in economic and environmental management.

2. PART 1: WHERE ARE WE NOW?

- 2.1 The blue economy assessment aims to facilitate understanding of the role of the ocean and its contribution to the national economy; impacts of human activities on ocean health and sustainability; potential areas for investments in environmentally-sound technologies and infrastructure; and the interventions and innovative mechanisms needed to respond to changing environment and climate.
- 2.2 The blue economy assessment is based on the ocean economy-environment accounting and the UN System of Economic and Environment Accounts (SEEA) framework. This is in line with the indicators of the SDGs and Aichi Biodiversity Targets.
- 2.3 Seven countries presented their national ocean economic accounts, with some indicators for coastal and marine ecosystems. The ocean economy contributes to the GDP of the EAS countries in varying degrees: 3% in RO Korea, 4.5% in the Philippines, 9% in China, 13% in Indonesia, and 19% in Vietnam.
 - a. **China:** The gross ocean product consists of the core marine industry, support services (e.g., marine scientific research, education, management, and service), and marine-related industries. The core marine industry consists of: marine fisheries; offshore oil and gas; mining; salt; chemicals; biotechnology; electric power; seawater utilization; ship-building; construction; transportation (ports and shipping); and coastal tourism.
 - Marine GDP or gross ocean product (GOP) of China reached CNY6 trillion (US\$723 billion) in 2014, accounting for 9.4 percent of the China’s GDP in that year.
 - The core marine industry contributes a total value of US\$399 billion in 2014, at current prices. Coastal tourism, transportation, and marine fisheries provide the largest share in China’s ocean economy.
 - Ocean-related employment in 2010 was about 33.5 million, and increased to 35.5 million in 2014.
 - b. **Indonesia.** The ocean economy in Indonesia is calculated from seven (7) sectors, namely, fishery, marine tourism, marine transportation, maritime industry

(manufacturing), energy and mineral resources, marine facility (ports, warehouses, etc.), and marine services, plus government services.

- The contribution of the ocean economy to the total GDP of Indonesia in 2008 was US\$73 billion, and it increased to US\$256.5 billion in 2013, in current prices.
 - Marine manufacturing industries have the highest contribution to the Indonesian ocean economy in terms of output and GVA, followed by marine construction.
 - In 2008, more than five (5) million Indonesians work in ocean economic sectors, which is 5.11 percent of total employment. Of these, 1.85 million work in the marine construction sector while 1.69 million work in the fisheries and aquaculture sector.
- c. **Malaysia:** Traditionally, coastal and marine resources have supported industries, such as fishing, coastal transportation and communication, seafood processing and coastal and marine recreational activities. New ocean-based industries have developed over the years, which include oil and gas production, mariculture, and marine tourism. Ms. Cheryl Rita Kaur presented the classification scheme for the ocean economy, and sources of data.
- The ocean economy in Malaysia contributed 13.21 percent of the gross output of the national economy. Petroleum refineries have the highest contribution to Malaysia's ocean economy, followed by crude petroleum and natural gas production.
- d. **Philippines:** Mr. Romeo Recide explained in detail the scope and coverage of the ocean economy in the Philippines, and the sources of data, which include the national income accounts, Census of Philippine Business and Industry; fishing volume/value of production; Annual Financial Report from Commission on Audit; Department of Energy; Commission on Higher Education; Labor Force Survey; and Input-Output Table.
- Ocean GVA is valued at US\$11.2 billion in 2012, and contributed 4.5 percent to the GDP. This is an initial estimate, and is also underestimated because it does not include the GVA of marine tourism.
 - Fisheries sector has the highest contribution to the ocean economy.
 - Employment in the ocean sectors is estimated at 1.6 million in 2012, representing 4.3 percent of total employment in the Philippines.
- e. **RO Korea:** There are 14 sectors and 40 sub-sectors in the ocean economy of RO Korea as discussed by Dr. Chang Jeong-In.
- Ocean GVA is US\$37.82 billion in 2010. The contribution of ocean energy and electric power was not included yet in the current ocean economy assessment.
 - Ship building constitutes 42 percent of the ocean economy of RO Korea.
 - The average share of the ocean economy to the national GDP is 3.7 percent in 2008-2011.
- f. **Thailand:** Dr. Nawarat Krairapanond presented the value of the outputs of selected sectors of the ocean economy of Thailand. The estimation for the contribution of marine resources and marine activities was based on secondary data from published and unpublished government reports and research studies from various years.
- g. **Viet Nam:**

- The GVA of the ocean economy in Viet Nam is US\$ 28.94 million in 2015 (at constant prices). This is around 18.8 percent of the country's GDP.
- Offshore oil and gas has the contribution to Viet Nam's ocean economy, with a GVA of US\$12 million or 41.8 percent of the ocean economy.
- Employment in the ocean economy is around 3 million people.

2.4 Ecosystem services, such as cultural amenities, nutrient cycling, carbon sequestration and shoreline protection, are not fully captured in GDP, but could significantly alter the true GDP and wealth of nations.

- a. Dr. Fahrudin showed the initial valuation of coastal (mangroves, seagrass, coral reefs) and other marine ecosystem services in Indonesia, estimated to be around US\$245 million. However, the regulating services, such as carbon sequestration and shoreline protection, have not been estimated yet, and these services could be considerable given the large areas of mangroves and coral reefs in Indonesia.
- b. Ms. Kaur presented results of studies on coral reefs. The value Malaysia's reefs with a cover of about 4,000 km² is RM145 billion per year. Coral reef-related businesses in Malaysia are worth approximately US\$635 million annually in food, fisheries, tourism, and pharmaceuticals.
- c. The net benefits of coastal and marine resources in the Philippines amount to approximately US\$545.5 million according to World Bank 2009 study. Around 45 percent of this amount is from the provisioning services, and more than half of the net benefits are from the regulating, supporting and cultural services, which are not usually included in the GDP.
- d. Tidal flats, beaches, natural parks, estuaries and coastal waters in RO Korea generate annual benefits amounting to US\$40.5-42.5 billion as presented by Dr. Chang.
- e. The total economic value of coastal and marine resources in Thailand ranges from around US\$22 million to US\$27.67 billion according to various studies.

2.5 Most countries reported degradation of coastal and marine ecosystems, which affect the sustainability of ocean economic activities that rely on healthy ocean. Communities rely on food, livelihood, and shoreline protection provided by healthy ecosystems. Environmental costs, such as pollution and loss of biodiversity and ecosystem resiliency, are not clearly accounted for in the GDP.

- a. Mr. Wen Quan reported that the area of coastal wetland has decreased 57 percent in China in the past 60 years. Mangrove forest and coral reef decreased by 73 percent and 80 percent, respectively.
- b. According to Dr. Fahrudin, only 5.29 percent of the coral reefs in Indonesia are in very good condition, while 12.94 percent of mangroves are in good condition.
- c. Based on a World Bank study in 2009, the environmental costs from unsustainable fishing, coastal development, pollution, and climate change impacts in the Philippines amount to around US\$129.5 million.

2.6 There is a rich body of work already being made, and yet a long road is ahead towards a blue economy assessment that encompasses market values, as well as nonmarket ecosystem services, environmental damages, and equity aspects. The valuation of ecosystems services and environmental damages would be critical in: (a) evaluating tradeoffs and projects; (b) influencing policies on economic development, investment priorities, and environmental

management; and (c) designing appropriate regulations, economic instruments and incentives to change behavior.

- 2.7 Climate change impacting the blue economy, such as sea level rise, flooding, storms, ocean acidification affecting habitats and fisheries, and need for climate-proofing or climate-resilient infrastructure, etc., requires a knowledge base to be used for impact analysis and formulation of economic development plans and land and sea use plans that are responsive to these issues. The ocean economy-environment accounts would facilitate the climate change impact analysis, and corresponding mitigation and adaptation measures.

3. PART 2: WHERE ARE WE HEADED?

- 3.1 The ocean economy is dynamic, with new investments and emerging industries as well as innovative and environmentally-sound practices and technologies increasingly applied.

- 3.2 Different examples on how investments can be 'blue' were reported, such as eco-ports and shipping in Malaysia, climate smart aquaculture in Viet Nam, and ecotourism in Thailand.

- a. Ms. Cheryl Rita Kaur discussed Malaysia's maritime sector and its contribution to the nation's economy and well as future investment opportunities towards achieving environmental sustainability, especially in the ports and shipping sector. Examples of green practices applied in the sector include: monitoring air and water pollution levels; use of electric-powered cranes and port vehicles; use of waste and heat recovery system in port buildings; disposing of waste from ships and ports in an environment-friendly manner; recycling; use of low-sulphur fuel; use of energy-saving bulbs; reducing idle time of trucks/equipment; protecting/restoring sensitive areas/habitats; introducing green building features; rewarding port users which adopt environmentally-sound measures; establishing green port index; etc.

- b. For the last 20 years, aquaculture sector in Vietnam has developed rapidly, and made significant contribution through income and employment provision. Ms. Cao Le Quyen pointed out that there are environmental impacts from and on aquaculture activities that need to be addressed. Advanced science and technological application will be one of the key means to help the local aquaculture sector to reach targets for blue aquaculture development. Among the innovative practices being introduced in Viet Nam involve 'climate smart aquaculture'. In Thanh Hoa province, an integrated system is being piloted to cope with climate change through introduction of *tilapia* in brackish water shrimp ponds. In this integrated system, tilapia can utilize natural food and make use of feed residues from shrimp crop. This will result in clean shrimp ponds, reduction of feed conversion ratio (FCR) for farmed tilapia, and reduction of production costs. Brackish water shrimp-rice rotation and forest-shrimp systems are being applied in the Mekong delta to also reduce FCR, fertilizer use, and greenhouse gas emissions. The hard clam aquaculture in Ben Tre, which resulted in increasing both mangrove areas and local incomes, received certification from the Marine Stewardship Council.

- c. Tourism is recognized as one of the main economic sectors of Thailand. The coastal- and marine-based tourist attractions can continue to be a major revenue earner depending on how much attention is given to sustainability issues, and how much resources are spent on conservation and restoration. Dr. Nawarat Krairapanond mentioned several studies on financing mechanisms to fund conservation. The fundamental principle

emphasized in these studies is how to make the tourism sector pay more than the financial cost of visiting the sites. The studies demonstrated that there is willingness by the general public to contribute to conservation of iconic marine endangered species. The potential to introduce Payment for Ecosystems Services (PES) is being explored in one of the most popular island destination sites in the Gulf of Thailand.

3.3 Presentations on blue carbon initiatives in Indonesia and public environmental investments in the Philippines reflect comprehensive plans that would contribute to the protection of coastal and marine ecosystems, improvement of environmental conditions, and climate change mitigation and adaptation.

- a. Dr. Andreas Hutahaean discussed Indonesia's *National Priority for Blue Carbon Program*. Blue Carbon ecosystems, such as mangrove and seagrass, are often underrated ecosystems. They provide many essential ecosystem services, such as fisheries, shoreline protection, reduction of erosion, cultural services including tourism and recreation, and supporting services like cycling of nutrients. They are also significant for the global climate by storing and sequestering atmospheric carbon. Recently, it has been recognized that coastal ecosystems actually contain much more carbon per unit area than many terrestrial ecosystems. Several actions are being undertaken, such as assessment of fisheries and blue carbon value; community mangrove and seagrass restoration; capacity building in sustainable fisheries and alternative livelihoods; expanding the science program; integrating Blue Carbon into on-the-ground sustainable use, conservation and management; etc.
- b. Mr. Constante Llanes presented the strategic plans and programs of the Philippine Department of Public Works and Highways (DPWH). In addition to its basic responsibility to manage flood control works within major and principal river basins, DPWH has been tasked to implement other infrastructure projects in convergence with other national agencies and offices. DPWH has been directed to lead the preparation and implementation of the National Sewerage and Septage Management Program (NSSMP) through the Local Government Units (LGUs) as mandated by the Clean Water Act. This is part of the integrated framework for water quality management. DPWH also plays a very important role in the implementation of the Ecological Solid Waste Management Act. Furthermore, the DPWH is one of the government agencies tasked to carry out the Supreme Court decision through Manila Bay Mandamus (2009) to clear the shore of the bay and water tributaries from solid wastes, structures and informal settlers.

3.4 There are also new and innovative industries, such as marine biotechnologies in China and ocean energy in RO Korea. These industries started with the initiatives of the scientific community, but in response to emerging market demands.

- a. Dr. Xu Jinzhong showed the contribution of marine biotechnology in China. Marine natural products (MNPs) have been used in drug development, novel materials, pesticides, food and environmental protection. In coastal cities of China, institutes of marine natural product chemistry have been established to conduct research and develop new medicines.
- b. Ocean energy offers an alternative to fossil-fired power plants. It has considerable long-term potential for economic growth, energy security and job creation. Since 2000, the Korean government – Ministry of Oceans and Fisheries (MOF) and the Ministry of Trade,

Industry and Energy (MOTIE) – has operated the national R&D program for the development of ocean renewable energy technologies on tidal power (barrage), tidal current energy, wave energy and ocean thermal energy conversion (OTEC). Based on the R&D results, Uldolmok Tidal Current Power Pilot Plant (1MW), Sihwa Tidal Power Plant (254MW) and hybrid-OTEC power plant using multiple heat sources (200kW) had been built in 2009, 2011 and 2014, respectively. Jeju Wave Power Pilot Plant will be completed in 2015. Dr. Lee Kwang Soo emphasized that for the successful commercialization of ocean energy, some barriers should be overcome, such as financial risk, technological uncertainties, marine environmental impacts, grid-connection problems, etc.

- 3.5 More information is needed on demands, trends, innovations and standards as well as access to technologies, infrastructure, and financing. Government support in terms of policies, economic and environmental regulations, incentives, financial mechanisms, and institutional arrangements are also essential to promote 'blue' growth of ocean industries and sustainable development of oceans.

4. PART 3: MODERATED PANEL DISCUSSION: REALIZING A BLUE ECONOMY

- 4.1 The panelists were Dr. Vann Monyneath (Cambodia), Mr. Heru Waluyo Koesworo (Indonesia), Dr. Marian delos Angeles (Philippines), and Mr. Narciso Almeida de Carvalho (Timor-Leste), and the discussion was moderated by Dr. Alistair McIlgorm (Australia).
- 4.2 The panel discussion yielded key points that should be considered in formulating a roadmap for blue economy development:
- a. The blue economy assessment (using the ocean economy-environment accounting and SEEA framework) should be institutionalized and linked to policies and plans. A knowledge base on blue economy, including ocean income accounts, ecosystem services, investment opportunities, external costs and climate change impacts, is essential for sustainable management of the oceans.
 - b. The State of Oceans and Coasts should be regularly done by countries and partners in the EAS region to monitor the implementation of the SDS-SEA, and progress towards blue economy, and improved ocean health.
 - c. Awareness campaigns among the private sector as well as government and communities must be expanded to promote more investments in environmental improvement, climate resiliency, ecosystem conservation, and in innovative and environmentally sound production, technologies and infrastructure. Benefits generated by these investments versus the costs of doing nothing or costs of business-as-usual must be shown.
 - d. Work with international organizations in developing a blue carbon market as a mechanism to conserve coastal and marine ecosystems, and promote carbon offsets, including voluntary markets.
 - e. Blue bonds, payment for ecosystem services, environmental guarantee funds, pollution charges, tradable permits, carbon market, and other innovative financing mechanisms are available, but require further development to capture resource rent and pay for programs to reduce pollution, and protect ecosystems and biodiversity.

- f. Enabling conditions should include incentives and reward system to encourage industries to shift from the traditional ocean economy to blue economy.

5. WORKSHOP RECOMMENDATIONS

- 5.1 **Make ocean a priority** in medium- and long-term economic development plans. Align it with national policies and global commitments.
- 5.2 **Develop ocean economy-environmental accounts** to assess: contribution and trends of ocean economy; ecosystem services; impacts of ocean economic activities on the ocean environment; and progress towards blue economy. The SEEA provides a framework for this initiative and facilitates its institutionalization. However, capacity development and knowledge sharing are required as well as political support for implementation. It is important to initiate the assessment process, start with what is available, and do what is more important rather than doing everything at once.
- 5.3 **Quantify ocean wealth in metrics that are understandable and usable** by policy- and decision-makers. By measuring the ocean economy and showing its significance, a case can be made for higher budget allocation for protecting ocean health, supporting investments in key ocean economic industries, and pushing forward the blue economy agenda.
- 5.4 **Report using the State of Oceans and Coasts (SOCs)** as the platform to show the status of the ocean economy and the coastal and marine ecosystems, progress towards sustainability, gaps, solution options and best practices, and areas for potential growth and investments. Scale up the local SOCs to national and regional SOCs, with blue economy theme. Promote the results at the national and local levels, in social media, and in international summits to change mindsets, enhance collaboration, and get the blue economy as a global agenda.
- 5.5 **Apply the blue economy assessment and SOC reports** in: (a) formulating economic development plans and investment programs that incorporate sustainability and inclusivity objectives; (b) highlighting the investment opportunities for blue economy; (c) drawing up support for ecosystem protection for climate resilient communities; and (c) designing combined carrot-and-stick mechanisms to refine existing policies and laws and make them more implementable by the private sector.
- 5.6 **Leave room for learning by doing.** The blue economy development is a continuous improvement process.

ANNEX 1. Programme

Part 1: **Where are we now?: Assessment of ocean economy and ocean health**

Chair: Ms. Cary Anne Cadman, Environment Sector Coordinator, The World Bank, Indonesia

1030 – 1045 Keynote Presentation: What wealth accounting and valuation of ecosystems (WAVES) can do for blue economy

Ms. Cary Anne Cadman, Environment Sector Coordinator, The World Bank

1045 –1210 Ocean in the national income accounts: Country examples

Indonesia

Dr. Achmad Fahrudin

Faculty of Fisheries and Marine Sciences, Bogor Agricultural University (IPB), Indonesia

PR China

Prof. Wen Quan

Chief Scientist and Research Professor, National Marine Environmental Monitoring Centre, State Oceanic Administration (SOA), PR China

Philippines

Mr. Romeo S. Recide

Deputy National Statistician, Philippine Statistics Authority (PSA), Philippines

RO Korea

Dr. Jeong-In Chang

Senior Researcher, Marine Policy Research Department, Korea Maritime Institute (KMI), RO Korea

Thailand

Dr. Nawarat Krairapanond

Director of Natural Resources and Environmental Management Coordination Division, Office of Natural Resources and Environmental Policy and Planning (ONEP), Ministry of Natural Resources and Environment (MNRE), Thailand

Malaysia

Ms. Cheryl Rita Kaur

Senior Researcher, Centre for Coastal and Marine Environment, Maritime Institute of Malaysia (MIMA), Malaysia

Viet Nam

Nguyen Hoang Ha

Director, Department of Macroeconomy and Strategic Studies, Vietnam Institute for Development Strategies, Ministry of Planning and Investment, Viet Nam

1210 – 1230 Open forum/discussion

1230 – 1400 Lunch break

Part 2: Where are we headed? : Investment opportunities for blue economy

Co-Chair: Dr. Marian delos Angeles, Senior Advisor, Resources, Environment and Economics Center for Studies, Inc. (REECs), Philippines

1400 – 1405 Introduction

1405 –1540 Blue economy investment opportunities

Malaysia: Green Ports and Ships

Ms. Cheryl Rita Kaur

Senior Researcher, Centre for Coastal and Marine Environment,
Maritime Institute of Malaysia (MIMA), Malaysia

Vietnam: Sustainable Aquaculture

Ms. Cao Le Quyen

Deputy Director, Institute of Fisheries Economics and Planning,
Ministry of Agriculture and Rural Development, Viet Nam

Thailand: Ecotourism

Dr. Nawarat Krairapanond

Director, Natural Resources and Environmental Management Coordination Division, Office of Natural Resources and Environmental Policy and Planning (ONEP),
Ministry of Natural Resources and Environment (MNRE), Thailand

PR China: Marine Biotechnologies

Dr. Xu Jinzhong

Associate Professor, Ocean Institute of Zhejiang University, PR China

RO Korea: Ocean Energy

Dr. Lee Kwang Soo

Principal Research Scientist, Korea Institute of Ocean Science and Technology (KIOST),
RO Korea

Indonesia: Blue Carbon

Dr. Andreas Hutahaean

Blue Carbon Centre, Ministry of Marine Affairs and Fisheries (MoMAF), Indonesia

Philippines: Environmental Investments

Mr. Constante Llanes

Director, Planning Service, Department of Public Works and Highways (DPWH), Philippines

1540 – 1600 Open forum

1600 – 1615 Coffee break

Part 3: Moderated panel discussion: Realizing a Sustainable Blue Economy

Moderator: Dr. Alistair McIlgorm, Professor, University of Wollongong, Australia

1615 – 1630 Keynote presentation:
Breaking the Conundrum of Blue Economy: Practice and Prospects
Mr. Zhang Zhanhai
Director General, Department of Strategic Planning and Economy,
State Oceanic Administration (SOA), PR China

1630 – 1730 Moderated panel discussion

Panelists:

Dr. Marian delos Angeles

Senior Advisor, Resources, Environment and Economics Center for Studies, Inc. (REECs),
Philippines

Mr. Heru Waluyo Koesworo

Director, Marine and Coastal Degradation Control, Ministry of Environment and Forestry,
Indonesia

Mr. Narciso Almeida de Carvalho

Acting Director General, Directorate General of Fisheries, Ministry of Agriculture and
Fisheries, Timor-Leste

Dr. Vann Momyneath

Deputy Secretary General, National Council for Sustainable Development,
Ministry of Environment, Cambodia

1730 – 1745 Open Forum

1745 – 1800 Workshop conclusions and recommendations

Co-Chairs:

Ms. Cary Anne Cadman, Environment Sector Coordinator, The World Bank, and
Dr. Marian delos Angeles, Senior Advisor, REECs, Philippines

ANNEX 2.
Ocean Economy and Ecosystem Services

Table 1. Ocean Economy and Ecosystem Services

	Indonesia	PR China	Philippines	RO Korea	Viet Nam
1. OCEAN ECONOMIC ACTIVITIES (gross value added)	Year 2013 (in billion US\$, at current price)	Year 2014 (in billion US\$, at constant price) ^c	Year 2012 (in billion US\$, at constant price)	Year 2010 (in billion US\$, at constant price)	Year 2015ⁱ (in billion US\$, at constant price)
• Fisheries and Aquaculture	29.18	68.14	4.55	3.23	0.0037
• Offshore Oil and Gas	40.11	24.29	0.24		0.0121
• Mining (Minerals)		0.84			
• Energy/electric supply (ocean energy; offshore wind, renewables)		1.57	1.31 ^e		
• Water (seawater utilization; desalination)		0.22			
• Manufacturing	67.43		1.11 ^f		
• <i>Seafood processing</i>				2.31	0.0032
• <i>Ship building and repair</i>		22.02		15.92	0.0020
• <i>Marine transport equipment</i>				2.64	
• <i>Marine biotechnology, pharmaceuticals, chemicals</i>		19.56 ^b		0.37 ^h	
• Marine Construction	90.73	33.38	1.13	1.27	
• Shipping and Ports	3.23	88.29	0.42		0.0018
• <i>Marine transportation (shipping)</i>				3.29	
• <i>Ports, storage and warehouses</i>				1.75	
• Marine tourism and recreation	24.85	140.98	not estimated	2.9	0.0055
• Defence/Government (navy, coast guard, etc.)	1.02		0.46	2.81	0.00018
• Marine research and education			1.78	0.41	0.00001
• Marine services (mapping, monitoring, consulting, maritime insurance, etc.)	0.67 ^a		1.62 ^g	0.94	0.00046
TOTAL (billion US\$)	256.55	399.29	12.39	37.82	0.0289
2. CONTRIBUTION TO GDP (percent)	13% ^a	9.4% ^d	4.5%	3.3%	18.8%
3. EMPLOYMENT IN OCEAN ECONOMY (million)	5.3	35.5	1.6		3.0
4. ECOSYSTEM SERVICES (US\$)	244.8 M		545.5 M	40.46 to 42.54 B	

Notes:

^{a/} for year 2008

^{b/} sum of GVA of salt production (US\$1 B), chemicals (US\$14.46 B) and bio-medicals/biotechnology (US\$4.10 B)

^{c/} core ocean activities (does not include marine education, research and support services and ocean-related industries)

^{d/} share of gross ocean product (core ocean product plus marine education, research and support services, and ocean-related industries) to GDP

^{e/} does not include coastal wind power

^{f/} includes fish and seafood processing; ship and boat building; manufacture of engines and turbines for marine propulsion, pulleys, etc.

^{g/} includes related maritime business activities and maritime insurance

^{h/} sum of GVA of marine chemicals and salt (US\$363.1 M) and pharmaceuticals and biotechnology (US\$3.1 M)

^{i/} preliminary estimate