

# Blue Economy

## Where are We Now?

## Where are We Headed?

### What is blue economy?

The Changwon Declaration 2012<sup>1</sup> provides the definition of blue economy. The *blue economy*, as discussed during the East Asian Seas (EAS) Congress 2012, refers to a sustainable ocean-based economic model; one that employs environmentally-sound and innovative infrastructure, technologies and practices, including institutional and financing arrangements, for meeting the goals of: (a) sustainable and inclusive development; (b) protecting our coasts and oceans, and reducing environmental risks and ecological scarcities; (c) addressing water, energy and food security; (d) protecting the health, livelihoods and welfare of the people in the coastal zone; and (e) fostering ecosystem-based climate change mitigation and adaptation measures. **Figure 1** illustrates the components being considered in blue economy assessment.

### What is the scope of the blue economy?

**First, the blue economy encompasses all economic activities with a direct relationship with the ocean and coastal and marine resources.** These include economic activities that are (a) ocean-based, and (b) ocean-related. However, these ocean economic activities must be **sustainable**.

*Ocean-based activities* include those that are undertaken in the ocean (e.g., fisheries and aquaculture, offshore oil and gas, mining, shipping/marine transportation, marine tourism, ocean energy, desalination, marine construction, communications – submarine cables).

*Ocean-related activities* use products from the ocean (e.g., seafood processing, marine biotechnology, salt, etc.); and produce products and services for the ocean and ocean-based activities (e.g., ship building and repair, ports, tourist resorts, communication, maritime insurance and law, maritime technical services, etc.).

**Second, the blue economy also includes marine education and research as well as activities of the public sector agencies with direct coastal and ocean responsibilities.** For example, national defence, coast guard, marine environmental protection, marine research and development, etc. contribute to protecting the ocean economy and maintaining the integrity of the coastal and marine resources.

**Third, new activities are also evolving over the recent years.** There are innovations in activities that aim to protect ocean health, such as ballast water and invasive species management, waste-to-energy, wastewater treatment systems with low footprint, etc. Ecotourism, eco-ports, and eco-ships aim to make tourism and marine transportation industries more environmentally sound, while ocean energy offers low carbon and renewable energy source. More countries are also spending in climate change resilient infrastructure to protect coastal communities and the ocean economy. These innovations and emerging markets advance opportunities for investments and business, further contributing to blue economy development.

Sustainable fisheries and aquaculture, desalination, and ocean energy help address food, water and energy security, respectively. Marine biotechnologies produce new medicines. Thus, the blue economy also contributes to achieving the sustainable development goals.

**Fourth, the ocean generates economic values and ecosystem services that are not usually quantified.** These include cultural services, carbon sequestration, shoreline protection, habitat for fish and marine life, waste recycling and storing, and ocean processes that influence climate and biodiversity (**Figure 2**). The net benefits from natural resources have to be measured to show how the oceans support human welfare. Likewise, the costs resulting from unsustainable economic activities, over-exploitation of natural resources, loss of habitats and biodiversity, and environmental degradation have to be analysed since these are not explicitly measured in the national income accounts.

<sup>1</sup> "We understand the Blue Economy to be a practical ocean-based economic model using green infrastructure and technologies, innovative financing mechanisms, and proactive institutional arrangements for meeting the twin goals of protecting our oceans and coasts and enhancing its potential contribution to sustainable development, including improving human well-being, and reducing environmental risks and ecological scarcities." (Changwon Declaration 2012)

**The blue economy and sustainable use of the ocean depends on understanding the role of the ocean and the economic activities affecting the ocean, integration of economic, environment, and social aspects, and coherent policies and management.**

## Assessment of Ocean Economy and Ocean Health

Having adopted the Changwon Declaration, countries in the EAS region have begun to assess their respective blue economy. The oceans provide the region with subsistence; source of food, energy, medicines and recreation; means of transportation and commerce, and source of income and jobs. The contribution of the ocean economy to the gross domestic product (GDP) shows that countries in the region depend on the ocean and coastal and marine resources in varying degrees: 3.3% in RO Korea, 4.5% in the Philippines, 9.4% in China, and 13% in Indonesia (Table 1).

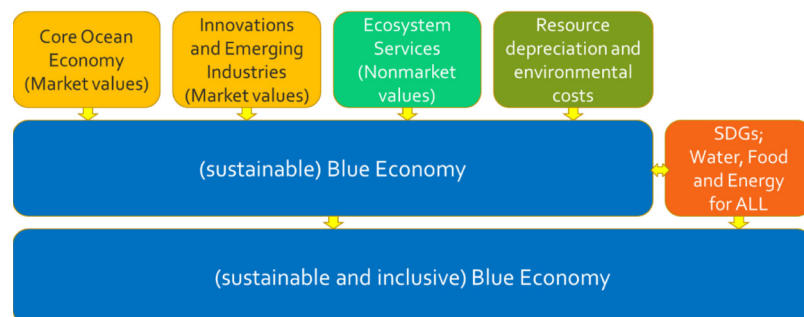
It is essential to recognize natural capital as a critical economic asset and as a source of public benefits. The oceans provide significant ecosystem services.

- The total economic value of coastal and marine resources in Thailand is around US\$27.67 billion.
- Tidal flats, beaches, natural parks, estuaries and coastal waters in RO Korea generate annual benefits amounting to US\$40.5–42.5 billion (Chang 2015).
- Coastal (mangroves, seagrass, coral reefs) and other marine ecosystem services in Indonesia are valued at US\$245 million (Fahrudin 2015). 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.
- Coral reef-related businesses in Malaysia are worth approximately US\$635 million annually in food, fisheries, tourism, and pharmaceuticals (Kaur 2015).
- The net benefits of coastal and marine resources in the Philippines amount to approximately US\$545.5 million (World Bank 2009). 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.

**Figure 3** shows the interplay between ocean economy and ocean health. Ocean economic sectors, such as fisheries, aquaculture, seafood processing, biotechnologies, and tourism, rely on healthy ecosystems. Ecosystem services, such as carbon sequestration and shoreline protection, also rely on keeping the integrity of ecosystems. However, economic growth over the past 50 years in the EAS region had been accompanied by decline in natural capital and the ability of ecosystems to sustain services (**Box 1**). Loss of habitats, pollution and other environmental pressures due to land- and sea-based activities impact human health and wellbeing as well as health of ecosystems. The ocean economy also affect the ocean environment: operational and accidental oil and chemical spills, pollution, sedimentation, conversion of habitats, overfishing, destructive fishing, and introduced invasive species to name a few.

**Figure 1. Sustainable and Inclusive Blue Economy**



**Figure 2. Ecosystem Services**

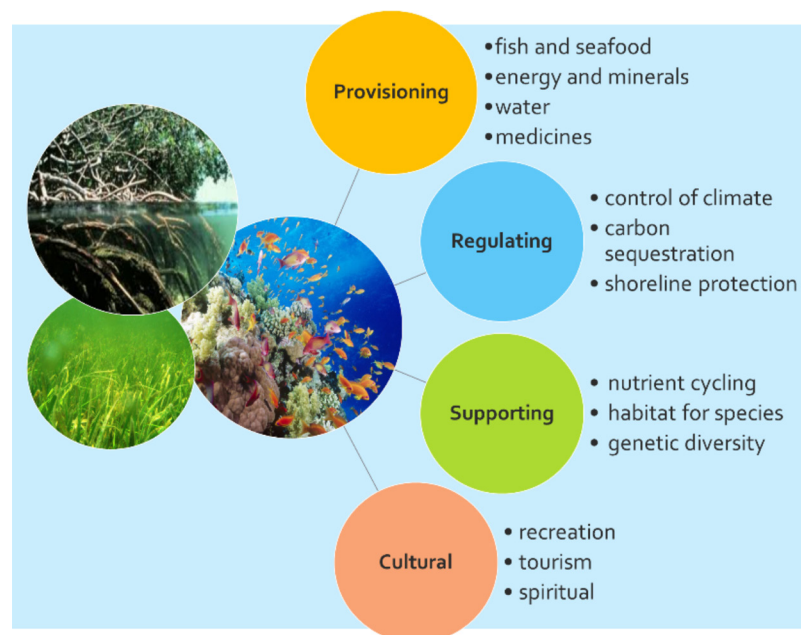


Figure 3. Ocean Economy and ocean health



Box 1

Resource degradation and environmental costs

- 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 (Wen Quan, 2015).
- Only 5.29% of the coral reefs in Indonesia are in very good condition, while 12.94% of mangroves are in good condition (Fahrudin, 2015).
- The environmental costs from unsustainable fishing, coastal development, pollution, and climate change impacts in the Philippines amount to PhP5.7 billion or around US\$129.5 million (World Bank, 2009).
- In Thailand, the total cost of coastal erosion, oil spills, and damage caused by tsunami amounted to US\$2.62 billion (Jarayabhand, et al., 2009). The cost from tsunami-related damages would have been lower if the habitats have not been degraded or destroyed by man-made activities.

Table 1. Ocean Economy and Ecosystem Services

	Indonesia	PR China	Philippines	RO Korea
1. OCEAN ECONOMIC ACTIVITIES	Year 2013 (in billion US\$, at current price)	Year 2014 (in billion US\$ at current price) <sup>c</sup>	Year 2012 (in billion US\$, at constant price)	Year 2010 (in billion US\$, at constant price)
<b>Fisheries and Aquaculture</b>	29.18	68.14	4.55	3.23
<b>Offshore Oil and Gas</b>	40.11	24.29	0.24	
<b>Mining (Minerals)</b>		0.84		
<b>Energy/electric supply (ocean energy; offshore wind, renewables)</b>		1.57	1.31 <sup>e</sup>	
<b>Water (seawater utilization; desalination)</b>		0.22		
<b>Manufacturing</b>	67.43		1.11 <sup>f</sup>	
• Seafood processing				2.31
• Ship building and repair		22.02		15.92
• Marine transport equipment				2.64
• Marine biotechnology, pharmaceuticals, chemicals		19.56 <sup>b</sup>		0.37 <sup>h</sup>
<b>Marine Construction</b>	90.73	33.38	1.13	1.27
<b>Shipping and Ports</b>	3.23	88.29	0.42	
• Marine transportation (shipping)				3.29
• Ports, storage and warehouses				1.75
<b>Marine tourism and recreation</b>	24.85	140.98	not estimated	2.9
<b>Defence/Government (navy, coast guard, etc.)</b>	1.02		0.46	2.81
<b>Marine research and education</b>			1.78	0.41
<b>Marine services (mapping, monitoring, consulting, maritime insurance, etc.)</b>	0.67 <sup>a</sup>		1.62 <sup>g</sup>	0.94
<b>TOTAL (billion USD)</b>	<b>256.55</b>	<b>399.29</b>	<b>12.39</b>	<b>37.82</b>
<b>2. CONTRIBUTION TO GDP (percent)</b>	13% <sup>a</sup>	9.4% <sup>d</sup>	4.49%	3.3%
<b>3. EMPLOYMENT IN OCEAN ECONOMY (million)</b>	5.3	35.5	1.6	
<b>4. ECOSYSTEM SERVICES (US\$)</b>	<b>244.8 M</b>		<b>545.5 M</b>	<b>40.46 to 42.54 B</b>

Notes:

<sup>a</sup> for year 2008

<sup>b</sup> sum of GVA of salt production (US\$1 B), chemicals (US\$14.46 B) and bio-medicals/biotechnology (US\$4.10 B)

<sup>c</sup> core ocean activities (does not include marine education, research and support services and ocean-related industries)

<sup>d</sup> share of gross ocean product (core ocean product plus marine education, research and support services, and ocean-related industries) to GDP

<sup>e</sup> does not include coastal wind power

<sup>f</sup> includes fish and seafood processing; ship and boat building; and manufacture of engines and turbines for marine propulsion, pulleys, etc.

<sup>g</sup> includes related maritime business activities and maritime insurance

<sup>h</sup> sum of GVA of marine chemicals and salt (US\$363.1 M) and pharmaceuticals and biotechnology (US\$3.1 M)

## Moving forward

Determining what constitutes the blue economy is a challenge in itself. This paper shows the initial attempt to estimate the ocean economy and ecosystem services. Note that this is a work in progress and not meant to be comparative analysis as countries measured their ocean economy in different years. There are still major gaps and concerns: economic activities and ecosystem services to be included in the assessment, data disaggregation, harmonization of statistical concepts and terms, price index and purchasing power parity, valuation methods, etc.

Ecosystem and environmental data are available from various studies, but the environmental and natural resource accounts still need to be developed in a systematic way.

Innovative technologies, new products and services, and demand for 'green' infrastructure and processes are also reshaping the traditional ocean economy. Emerging industries have to be included in the new ocean economy.

**Priority Area 1: It has become imperative to use a common framework and develop a system for ocean economy-environment accounting to properly assess the blue economy, starting with the ocean economy and its contribution to national wealth as well as ecosystem services that are not accounted for in the GDP. It is crucial to obtain policy support to institutionalize such accounts, including capacity development and provision of resources for implementation.**

The blue economy assessment should be incorporated in national economic measures. An evidence base is necessary to support sound policy- and decision-making aimed at protecting the coastal and marine environment and ecosystems, and

ensuring sustainable activities and livelihoods for coastal communities. Such accounts will provide indicators for strategic planning and policy analysis to identify more sustainable development paths.

Moreover, knowing the structure of the current ocean economy and status of the coastal and marine ecosystems would be helpful to see how external events, such as storms, climate change and environmental changes may impact the blue economy development.

**Priority Area 2: A regular regional reporting system on the State of Oceans and Coasts (SOC), with the ocean economy-environment accounts, is likewise essential to show governments, development partners, regional organizations, and various stakeholders the progress towards blue economy, including the benefits, gaps, and lessons learned.**

**Priority Area 3: Integrate and utilize the ocean economy-environment accounts and the SOC reports in national and local development plans, investment programs, land- and sea-use plans, and management decisions.**

The SOC reporting system with the blue economy assessment will provide a mechanism to:

- examine resource use and footprint
- monitor investment and net returns from ocean economic activities,
- promote growth potential in strategic industries,
- identify investment opportunities,
- provide direction in ocean stewardship and governance,
- contribute to multi-country response to address environmental threats and protect shared resources, and
- continually improve planning, monitoring and management of the implementation of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA).

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