



PROCEEDINGS

Regional Planning Workshop:

Developing a State of Oceans and Coasts Report for the Seas of East Asia

31 March - 1 April 2016

PEMSEA Resource Facility, Quezon City, Philippines



REGIONAL PLANNING WORKSHOP: DEVELOPING A STATE OF OCEANS AND COASTS REPORT FOR THE SEAS OF EAST ASIA



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Executive Summary

The Regional Planning Workshop on the Development of a State of Oceans and Coasts (SOC) Report for the Seas of East Asia was held on 31 March – 1 April 2016 at the PEMSEA Building in the Department of Environment and Natural Resources (DENR) Compound in Quezon City, Philippines.

Representatives from 15 international organizations and regional programmes participated, and shared their views and perspectives on blue economy and the SOC report. They provided suggestions on key topics and indicators to be included in the SOC report, and pointed out the issues, challenges, solution options and examples of good practices. Available information and studies from their respective agencies and other sources of information were also discussed.

Agreement was reached on the outline of the SOC report. The participants will share information and their expertise to provide technical guidance and contribute to the development of the regional SOC report. The next steps include: (a) the development of the template, with Philippines as the pilot country; (b) organizing national teams for the development of National SOC reports; (c) organizing a regional Technical Working Group; (d) presentation of draft SOC reports at the Blue Economy Conference in November 2017 to get feedback; and (e) presentation and dissemination of SOC reports at the next East Asian Seas Congress in 2018.

1. Workshop Venue, Date and Program

Venue: PEMSEA Resource Facility
Department of Environment and Natural Resources (DENR) Compound
Visayas Avenue, Quezon City, Philippines

Date: 31 March – 1 April 2016

Agenda:

Introduction

- State of Oceans and Coasts report: Background, rationale
- Objectives and expected outputs of the workshop
- Workshop program
- Overview of activities undertaken on blue economy assessment and outputs

SOC Report

- Blue economy theme
- Content, topics, indicators

On-going and past initiatives of international organizations and regional programmes

- Available information from the development partners
- Other reports, studies and sources of information

Consensus on the scope and content of national and regional SOC reports

Next steps

- Work plan
- Regional TWG

Program: The complete program is shown in **Annex 1**.

2. Workshop Objectives and Expected Outputs

The workshop aims to:

- (a) discuss the blue economy theme of the SOC report
- (b) define the scope, key components and expected outcomes of the national and regional SOC reports
- (c) examine the topics and indicators for the SOC reports, and available information from related ongoing and past programs and projects
- (d) adopt a work schedule for the development of the SOC reports
- (e) discuss the role of a regional technical working group (TWG), and contribution of the participants/participating agencies

Given the above objectives, the expected outputs of the workshop are

- (a) outline and scope of the SOC report, with the key components, topics and indicators
- (b) list of available information
- (c) workplan
- (d) recommendations on the regional technical working group

3. Participants

The regional workshop was organized by Maria Corazon M. Ebarvia, with support from PRF Secretariat. There were 19 participants from 15 organizations and regional programs/projects. The World Bank and the Western and Central Pacific Fisheries Commission (WCPFC) signified interest, but were not able to join due to conflict of schedule. The list of participants is shown in **Annex 2**.

4. Facilitators

Three (3) facilitators moderated the discussions on the content of the SOC report, in particular on the topics, indicators and available information related to ocean economy, ecosystems and biodiversity, large marine ecosystems (LMEs), fisheries and food security, tourism, environmental damages, transboundary issues, climate change, and governance aspects.

Prof. Alistair McIlgorm, Ph.D.
Marine Economist and Capacity Development Coordinator
Australian National Centre for Ocean Resources and Security (ANCORS)
University of Wollongong, Australia

Dr. Marian S. delos Angeles, Ph.D.
Senior Advisor, Natural Resource and Environmental Economics and Policy
Resources, Environment and Economics Center for Studies, Inc. (REECs)
Quezon City, Philippines

Dr. Gil Jacinto, Ph.D.
UNESCO/IOC Regional Office for the Western Pacific
and
Executive Director, Coastal Management Center (CMC)

5. Summary of Presentations and Discussion Points

5.1 Introduction to the workshop

Mr. S. Adrian Ross, Executive Director of PEMSEA, gave the welcome and opening remarks. He gave the background of PEMSEA, its vision and mission, as well as the adoption of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA) in 2003, and the presentation of the updated SDS-SEA during the East Asian Seas (EAS) Congress 2015 in Danang, Vietnam in November 2015.

He pointed out the background and rationale for a reporting system to measure progress towards the achievement of the objectives of the SDS-SEA by the participating countries in the region. In particular, Target 2 of the Da Nang Compact on the SDS-SEA, which was adopted during the EAS Congress 2015, as well as the Post-2015 Targets commit PEMSEA Country and Non-country Partners to the development and utilization of a scientifically sound Blue Economy State

of Oceans and Coasts (SOC) reporting system, including agreed indicators and data requirements to monitor progress in SDS-SEA implementation.

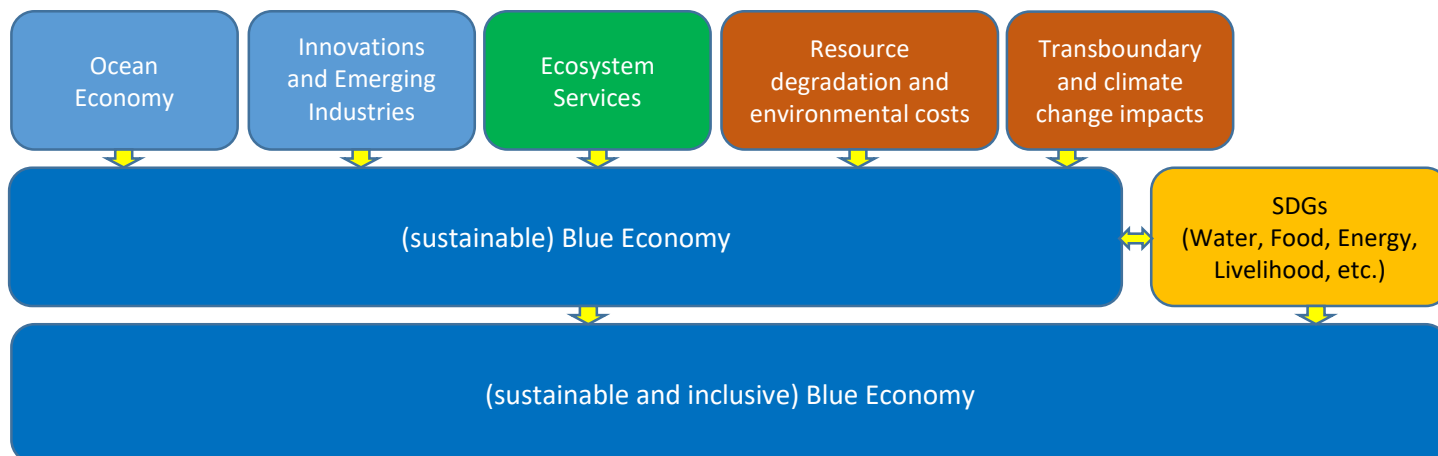
Mr. Ross showed the definition of blue economy as stated in the Changwon Declaration Toward an Ocean-based Blue Economy, which was adopted during the EAS Congress 2012, and the blue economy agenda of this declaration. The blue economy in the marine context is also in agreement with the following international agreements:

- Rio+20: ocean as natural capital; oceans as good business; oceans as integral to Pacific SIDS; and oceans as small-scale fisheries livelihoods
- UNDP: oceans as development spaces where MSP integrates conservation, sustainable use and ocean industries
- FAO: harnessing the potential of oceans, seas and coasts
- Xiamen Declaration of the Fourth APEC Ocean-related Ministerial Meeting Towards a New Partnership through Ocean Cooperation in the Asia Pacific Region (APEC 2014): fostering economic growth through conservation and sustainable development and management
- Aichi Biodiversity Targets: *Target 2* - By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Ms. Ebarvia gave an overview of the workshop, and explained the workshop objectives, expected outputs, program, and the activities that will be undertaken for the duration of the workshop.

To provide a background on blue economy, Ms. Ebarvia presented the activities that have been undertaken. She showed the definition and scope of blue economy as agreed upon during the Inception Workshop on Blue Economy Assessment held in July 2015. As indicated in **Figure 1**, the assessment of the blue economy consists of: (a) core ocean economy; (b) innovative and sustainable ocean economic activities and emerging industries; (c) ecosystem services (market and non-market values generated by coastal and marine ecosystems and biodiversity); (d) costs of resource degradation, biodiversity loss, environmental damages, and (e) transboundary issues and impacts of natural disasters and climate change. Items d and e aim to examine sustainability.

Figure 1. Components of Blue Economy Assessment



The blue economy also seeks to achieve the Sustainable Development Goals, particularly Goal 14. But it can also contribute to poverty reduction, economic growth and livelihood (SDG 8), innovation and infrastructure (SDG 9), the achievement food, water and energy security (SDGs 2, 6, 7), creating sustainable and climate resilient coastal cities and communities (SDGs 11, 13), and be a major factor in the other SDGs. Thus, the blue economy also aims to be inclusive, and contribute to poverty reduction.

Ms. Ebarvia also discussed the initial assessments done by seven countries on (a) their respective ocean economy, (b) innovative and sustainable economic activities for blue economy development, and (c) valuation of ecosystems services, and estimation of environmental costs. The major gaps and constraints were also pointed out. These initial assessments were presented at the workshop on blue economy development during the EAS Congress 2015. **Table 1** shows the ocean economic activities (their gross value added and contribution to gross national product), employment in the ocean economy; valuation of ecosystem services.

Key recommendations from this workshop include:

- developing ocean economy-environmental accounts, and quantifying ocean wealth in metrics that are understandable and usable by policy- and decision-makers;
- using SOC reporting system as the platform to show the status of the ocean economy and ocean health, gaps, solution options and best practices, and areas for potential growth and investments; and
- applying the blue economy assessment and SOC reports in: (i) formulating economic development plans and investment programs that incorporate sustainability and inclusivity objectives; (ii) drawing up support for ecosystem protection for climate resilient communities; and (iii) designing combined carrot-and-stick mechanisms to refine policies and laws and make them more implementable by the private sector.

As emphasized by Mr. Ross, the expectation is that the first SOC report will:

- show the critical role and contribution of ocean economic activities and coastal and marine ecosystems to national economies and welfare in the EAS region
- emphasize the values of ecosystem services, and the losses being incurred due to unsustainable practices
- assess the environmental damages and impacts of human activities
- show how natural hazards and climate change can affect blue economy development
- draw attention to investment and partnership opportunities on innovative and environment- and climate-friendly technologies and infrastructure
- provide an evidence base for region-wide ocean policy and decision-making

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 USD, at current price)	Year 2014 (in billion USD, at current price) ^c	Year 2012 (in billion USD, at constant price)	Year 2010 (in billion USD, at constant price)	Year 2015ⁱ (in billion USD, 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		
• Seafood processing				2.31	0.0032
• Ship building and repair		22.02		15.92	0.0020
• Marine transport equipment				2.64	
• Marine biotechnology, pharmaceuticals, chemicals		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
• Marine transportation (shipping)				3.29	
• Ports, storage and warehouses				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 USD)	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 (USD)	244.8 M		545.5 M	40.46 to 42.54 B	

Source: Various Powerpoint presentations. Workshop on Blue Economy Development: Where are we now? Where are we headed?. East Asian Seas Congress 2015, 19 November 2015, Da Nang, Viet Nam.

Notes:

^{a/} for year 2008

^{b/} sum of GVA of salt production (USD1 B), chemicals (USD14.46 B) and bio-medicals/biotechnology (USD4.10 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; and 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 (USD363.1 M) and pharmaceuticals and biotechnology (USD3.1 M)

^{i/} preliminary estimates

5.2 Review of outline and contents of SOC report

Ms. Ebarvia presented the draft outline of the SOC report. Participants were asked to give comments and suggestions (**Table 2**). The following were the key points for discussion:

- Who is the target audience?
- Does the proposed SOC report add value?
- Is the theme “blue economy” timely and consistent with global and regional strategies, targets and policies?

- How can it be improved? What topics/discussions need to be strengthened or added to the proposed outline?
- How can the SOC clearly distinguish and clarify ocean economy versus blue economy?
- What are the indicators/criteria for measuring/assessing the transition to blue economy?
- Are these indicators relevant and useful to target users (policymakers, planners, etc.)? What information is useful for the target users of the SOC report?
- What information is more relevant for the general public?

Table 2. Suggestions on the SOC Outline and Content

SOC Outline		Suggestions
Part 1. Ocean economy and ocean health	1. Role of oceans 1.1 Physical and biological features 1.2 The people of EAS region (demographic, economic and social features) 1.3 Ocean economy 1.4 Value of ecosystem services	Add: LMEs: location, brief description
	2. Coastal and marine ecosystems and biodiversity 2.1 Major habitats 2.2 Rare, threatened and endangered species 2.3 LMEs	• Follow RAMSAR classification of habitats. • Indicators ○ area (sq. km) ○ species distribution, species composition ○ stocks ○ resources ○ ecological values ○ threats
		• See IUCN Red List for the endangered species.
		• On LMEs: ○ Add Arafura and Timor Seas; ○ Progress of respective SAPs ○ Focus on shared resources and transboundary issues ○ Highlight need for co-management
	3. Risks and threats 3.1 Human activities and environmental damages	• Use DPSIR framework (drivers-pressures-state-impact-response) • On human activities, add: ○ Uncontrolled urbanization and development ○ Over-exploitation of resources, over fishing ○ Land reclamation ○ Oil and gas exploration • On impacts: ○ Add: Coastal erosion
	3.2 Natural hazards and climate change	• Use hazards, instead of disasters

		• Add: climate change vulnerability assessment
	3.3 Transboundary issues	• Transboundary pollution hotspots • Migratory fish, pelagic species • Marine turtles, migratory birds
		• Transfer the following sections from Part 2 (Blue Economy Development) to Part 1 (Ocean economy and ocean health) ○ Food security from coastal and marine resources ○ Tourism, heritage and cultural sites • Add: section on Navigation, Shipping and Ports ○ Navigational lanes ○ Contribution to trade: national, regional, global ○ Major ports and port performance indicators ○ Green ports ○ Impacts of ports and shipping ○ Note the contribution of Philippine seafarers
Part 2. Blue Economy Development	Blue economy development among key sectors	See country examples
	Drivers of future growth, innovations and sustainability	Link to the section on Innovations in Governance
	Best practices and innovations in ecosystem and biodiversity conservation	Add: MPA complexes
Part 3. Innovations in Blue Economy Governance and Investment Opportunities	Institutional arrangements and governance • Policies and regulatory framework (existing, gaps, options) • Incentives: combined carrot-and-stick mechanisms, reward system • Research and knowledge management • Capacity development • Stakeholder participation • Financing mechanisms	• Incentives: combined carrot-and-stick mechanisms, capturing resource rent, reward system • R&D: research linked to policy, planning and other applications • Innovative tools: Use of information technology and space technology in monitoring • Knowledge sharing, capacity development and technology transfer • Stakeholder participation: use of social media • Partnership mechanisms • Financing mechanisms: capital financing modalities, cost recovery mechanisms (user fees, tariffs, etc.), blue bonds, blue carbon market, capturing resource rent,

		payment for ecosystem services (PES), pollution damage charge, environmental guarantee fund, tradable permits, social finance
	Progress on SDS-SEA Progress of SAPs of LMEs	• Best practices • Gaps, constraints, challenges • Options • Benefits of shared management
	Blue economy investment opportunities • Potential projects • Enabling conditions (policies, laws and regulations, incentives, access to financing, access to new technologies and infrastructure)	• Support for project development and structuring – making projects bankable and attractive to investors

3.4 Review of past and on-going projects and available information

The participants examined the parts of the SOC report, and provided their perspectives on the topics and issues affecting the oceans, ecosystems, the people and economies in the East Asian Seas region as well as example of innovative and sustainable practices that would contribute to blue economy development. The three facilitators steered the discussion using the following guide questions:

- What data are available and accessible from your organization/programme? From other studies and reports?
- What data still need to be collected?
- What is the level of difficulty in getting such data? Provide suggestions on how to access the information.
- What information will be most useful for target users of the SOC report (e.g., policymakers, planners, managers, etc.)?

The available information, and suggestions on topics and data to be collected are shown in **Table 3**.

Table 3. Available Information, Suggested Topics and Additional Data to be Collected

Available data from the non-country partners	• ACB: biodiversity reports of 10 countries; State of Environment; The Economics of Ecosystems and Biodiversity (TEEB) • CCRES: toolkits (development ongoing); business analysis in El Nido, Palawan and in Indonesia (data gathering ongoing) • CI: seascapes (Sulu-Sulawesi; West Philippine Sea); on Sulu-Sulawesi (3 countries) - transboundary issues and governance; migratory species protection, e.g., marine turtles (3 countries); MPAs and networks; ecosystem-based adaptation (EbA) to climate change projects • CTI-CFF: fisheries; regional business forum – tourism • CTI-SEA: Regional State of the Coral Triangle; country reports; CTI Atlas website; Strategies and Action Plans of countries in Southeast Asia within the Coral Triangle
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	- DENR-BMB Secretariat of the National CTI Coordination Committee – State of the Coral Triangle Report - Philippines: MPA Support Network (MSN)/UP-MSI – State of the Coasts Report; Philippine MPA database - GIZ: Sulu-Sulawesi Marine Ecoregion – ecosystem-based management; climate change adaptation - IUCN: red book (endangered species), specific studies for selected species, - MFF: work in 11 countries; mangroves, seagrass, blue carbon estimation - USAID/ B+WISER: working in 7 protected areas; rehabilitation of 50,000 ha of mangroves in 10 regions; Siargao protected area - WorldFish: reef base, fish base; climate change adaptation; work in Oriental Mindoro
Other sources of information	- Ocean Health Index - UN World Ocean Assessment - World Bank: Wealth of Nations (WAVES), Country Environment Assessments - SEAFDEC, FAO: fisheries - FAO: IUU fishing, green aquaculture - MSC: list of certified fish - Living Coastal Resources (ASEAN-Australia) - ADB: economic cost of climate change - Climate change vulnerability assessment (IDRC/EEPSEA) - Vera Horigue's papers on governance and MPA networks (c/o Kubi)
Available data on LMEs	- IW Learn: transboundary diagnostic reports for LMEs - UNEP: South China Sea, Yellow Sea, Arafura and Timor Seas - CI: Sulu-Celebes (Sulawesi) LME – sustainable fisheries - WWF: Yellow Sea reports - World Ocean Assessment 2015 - NOAA: ocean chlorophyll, temperature
Additional topics and data needed	
Ocean economy/ Blue economy	- How to treat the following in the blue economy assessment - Economic activities in coastal areas: Which to include? Exclude? - Ocean economic activities that have negative impacts –(Examples: deep seabed mining, land reclamation, overfishing, destructive fishing, beach sand mining) - New industries where environmental impacts have yet to be fully studied (ocean energy, marine bioprospecting and biotechnology) - Include social impact analysis – social accounting matrix - Alternative livelihood - Policy reforms and management measures for blue economy
Ecosystem services	- Indicators / Data to be collected - Natural capital valuation - Valuation: market values/provisioning services; nonmarket values (regulating; supporting; cultural) - Productivity: Product per area, services per area - Value per beneficiary (households, fishing community) - Environmental costs; GPI - Compliance to laws/regulations
LMEs	In addition to national level or country data:

	• Shared resources • Transboundary issues • Hotspots • Economic growth areas • Strategies and Action Plans (SAPs): What is the status? What progress is being made at the regional or LME level? • What needs to be done? – improving inter-governmental collaboration and establishing co-management mechanisms
Fisheries	• Indicators / Data to be collected • Fisheries – Transboundary Waters Assessment • Ecological footprint • Stock • Catch plots • Stock enhancement innovations • Total allowable catch per species • Per capita consumption of fish; contribution to nutrition • Volume and value of high-valued species caught • Fish catch regulations – list • Certification • Use trade data – to capture some IUU fishing • MPAs and impact on fisheries • Issues: • How to treat interactions among sectors • Fishing down the food chain (fishing high-valued species at the expense of other species) • Fish and seafood supply chain • Co-management mechanisms among countries to address IUU fishing and transboundary issues • Pollutants: POPs, mercury, plastic, etc. – bioaccumulation, contaminated fish • HABs – paralytic shellfish poisoning • Climate change impacts • Winners and losers • Losses from: transport, storage, handling • Aquacultural practices – unregulated; excessive use of feeds; conversion of mangroves, use of groundwater • Improved fisheries investment framework
Tourism, heritage and cultural sites	• Indicators / Data to be collected • Tourist arrivals, patterns • Tourism revenues • Making tourism ‘blue’ (or sustainable) • Carrying capacity of tourist heritage sites, limitations on entrance to protect the site, user’s fees • MPAs • Treatment of wastewater: percentage of tourist establishments that have WWTF • Equity: town-based enterprises (ex. ROK), local employment • Marine cultural sites • Available data: • ACB: ecotourism, ASEAN heritage parks (marine), MPA complexes

	• CTI: Regional Business Forum on tourism (RBF4) • Issues: • delineation of marine tourism • carrying capacity of tourist heritage sites • wastewater management • multiple resource use conflicts
Shipping and ports	• Indicators / Data to be collected • Navigational lanes • Contribution to regional trade, global trade • Major Ports (port performance indicators): • location • merchant fleet types and ship capacity • berthing facilities; volume of passengers handled; cargo throughput; container throughput; • storage facilities; warehouses • value of goods passing through the ports • value-added of ports; investments in ports; • employment • Issues: • water pollution, antifouling paint and TBT, GHG emissions, • ballast water and invasive species, • coastal erosion, conversion of habitats • multiple resource use conflicts
Human activities and environmental damages	• Available information • Ocean health index • Platform, data contributed by countries • Coastal erosion (causes and effects): Siringan (Phl), COBSEA (other countries) • Scenario analysis • ASEAN TEEB report (mangroves, coral reefs, MPA) • WRI: hypoxia and fisheries • YSLME • Transboundary diagnostic analysis • Environmental impacts • Nutrient loading – regional seas; site-specific studies • Approach government agencies with mandates on the related activities • Response • Scenario building exercise (with experts) • Technological changes, innovations • Pollution reduction • Institutional changes, policy reforms, consistent enforcement
Natural hazards and climate change	• Available information • Scenario building • Climate change vulnerability assessment (IDRC/EEPSEA) • Economic cost of climate change (ADB) • Impact assessment of natural hazards • Responses: Climate change mitigation and adaptation • IUCN: protection of coastal and marine ecosystems; mangrove restoration in Thailand and Myanmar • ROK: transplant seagrass, pollution reduction

	- Indonesia: coral transplantation, UNCC obligations - PHL: mangrove planting, dikes and flood control projects - ADB projects on green cities; climate proofing housing and infrastructure - Sustainable cities – World Bank, ICLEI, WRI
Governance	Management of LMEs - Benefits of shared management - Causal chain analysis: Sulu-Sulawesi, South China Sea - YSLME: pollution control and biodiversity changes, benthic community (transboundary diagnostic assessment) - Philippines: MPA networks, analysis of bays (c/o Kubi/CCRES) - ADB RETA on CTI-SEA: SAPs - Fisheries management: CTI, SSME - Ports and shipping: - Ballast water management - Waste reception facilities in ports
	International agreements - Issue: How the implementation of international agreements contribute to blue economy development - Review actions taken and progress made on the following: (monitoring) - SDGs - UNFCCC, Aichi biodiversity targets - CITES, Basel convention, IMO conventions: MARPOL, London Convention (ocean dumping), anti-fouling system (AFS), etc. - LMEs: progress on SAPs
	Research: linking science to policy, planning, other applications - Research to be undertaken by - Academe - Policy, planning and research groups within government agencies - International organizations - Private sector - Knowledge product development - Targeted research on blue economy needs - Developing tools: marine spatial planning (CCRES, KMI), fishbe (UP-MSI), systems analysis tools (CCRES-Univ. of Queensland) - Packaging information to make them understandable and meet the needs of policy-makers and decision-makers - KPs for general public – to increase public awareness - Knowledge sharing and technology transfer - Private sector: new discoveries and innovative technologies for blue economy
	Going beyond research and policy - Implementation (good examples, gaps, challenges, options) - Application of research - Cost-benefit analysis (MPAs; closed season for fishing; mining vs. tourism and fishing; real estate development vs. habitat protection; hard infrastructure (dikes) vs. mangrove rehabilitation) - Designing economic or market-based instruments (user fees, PES) and incentives - Marine spatial planning, sea use zoning

	• Support for enforcement of policies and laws • Environmental monitoring (inter-agency, inter-government) • Use of new technologies, IT, social media • Intergovernmental coordination • IPBES – intergovernmental platform for biodiversity and ecosystem services: bridging science and policy
	Capacity development for blue economy • Strategy to tap key persons in government agencies to be the focal points for blue economy • Available programs/mechanisms • CTI: training on ecosystem-based management for fisheries for executives and middle managers • UP-MSI: mentoring program • ROK: KOEM (focus on applications), KMI (focus on policies) • KMI: marine spatial planning • CTI, PEMSEA: local government networks – use these networks for knowledge sharing, capacity building, and developing blue economy projects. • Philippines: Involve the League of Municipalities, League of Cities • Scaling up ICM: identify potential investment projects in ICM sites • Issues: • Capacity to imbed sustainable development in plans and projects and implement projects to achieve the SDGs • Capacity of local governments to develop investible and bankable blue economy projects (tap AIM, AIT for project development)
	Stakeholder participation / Participation mechanisms • What is different in blue economy • Relating stakeholders to governance • Co-management, joint management • More participatory decision-making • Stakeholder participation in monitoring and reporting • Government allocates budget for stakeholder consultations and participation • Embed blue economy in existing mechanisms • CTI: women's leadership forum, regional business forum, CSR forum • Tap private sector CEOs, and film/TV personalities to be champions for blue economy • Tools: Social marketing, social media
	Innovative financing • Available/possible 'new' financing mechanisms: • Blue carbon market • Blue bonds • Payment for ecosystem services (PES), environmental user fees • Social finance: microfinancing, social enterprise lending • Issue: for local governments – how to access capital financing, implementing/enforcing cost recovery mechanisms
Private sector	• Ways to involve private sector (investors, companies) in blue economy businesses and/or make them partners in blue economy development • <i>Improving business practices</i> – to improve bottom line, image

	• applying innovative and green technologies and infrastructure • green practices • more efficient use of resources • solid waste and wastewater management • CSR (nonprofit) • Habitat restoration, MPAs, alternative livelihood, social investment and finance • <i>Investing in blue economy</i> (direct investment, impact investment, equity investment in SMEs and social enterprises, etc.) • Blue economy investment opportunities in ICM sites • sustainable fisheries, sustainable and climate smart aquaculture • ecotourism • renewable energy • wastewater management, including reuse • eco-ports • climate proofing infrastructure • Issues: • how to attract private sector investments • finding and developing investible and bankable projects • setting in place enabling conditions
	• Blue economy investments • CTI: regional business forum – examples of best practices • Environmental investments: water, sanitation, wastewater management, solid waste management, stormwater management, etc. - Examples: Japan, ROK, China, Malaysia, Philippines • Coastal management, coastal and marine habitat protection and resource conservation (well-functioning MPA, MPA networks, MPA complexes) - Sabah: privately-managed MPA, coral reefs and fish population have recovered; - Malaysia: turtle islands - private sector supporting the management of MPAs; - Indonesia: Wakatobi - Nasugbu: SM support and gaps; - Thailand: PT&T supporting mangrove restoration; - Sarawak: state gov't subcontracts a managing agency; - Sabah: concession agreement for managing a marine park) • Sustainable and climate-smart fisheries and aquaculture (Viet Nam) • Climate change mitigation and adaptation, climate resilient infrastructure - CI: green initiatives; soft structures; getting investors to invest in green-grey structures or hybrid engineering - Green coastal cities: ROK; Viet Nam (ADB green cities project) • Ocean energy - Phil: additional tariff on power to increase demand and use of renewable energy; OTEC plant in Zambales; gaps: criteria to get ECC for ocean energy and renewable energy projects - ROK: Shihwa tidal energy; OTEC; pilot-scale projects
	• Enabling conditions

	• policies, regulations, incentives, support for R&D, access to technologies and financing, rights framework, etc. - Phil: tax incentives for equipment for renewable energy - BIMP-EAGA • Blue carbon potential - CI: blue carbon assessment in Indonesia, policy considerations - CI-Phil: blue carbon assessment with scientists (UP-MSI, Mike Fortes) and Climate Change Commission
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6. Consensus on the scope and content of national and regional SOC reports

The first SOC report will have a blue economy theme. Prior to the workshop, the draft outline was sent to the participants for their review. Additional topics and indicators suggested by the participants were incorporated in the revised outline (**Annex 3**).

The first part will focus on (a) current status and condition of the oceans and coastal and marine ecosystems, (b) ocean economy, (c) ecosystem services and contribution of oceans to the economy and social welfare, and (d) risks and threats. The Regional SOC report will also highlight the shared resources in LMEs, transboundary issues, benefits from shared or co-management among countries.

Transforming the traditional ocean economy to blue economy, and addressing the sustainability and resiliency of ecosystems through innovative and sustainable economic activities, and environmental and resource management will be the focus of the second part. Some examples are: (a) sustainable and climate smart aquaculture and sustainable and certified fisheries that contribute to food security and ocean health; (b) ocean energy as alternative to fossil-fired power plants; (c) ecotourism that is both environmentally and socially responsible, and financially viable; (d) eco-ports that also reduce GHG emissions and wastewater discharges, and protect habitats; (e) environmental improvement infrastructure (e.g., innovative wastewater management).

The third part will focus on innovations in ocean stewardship and governance, multi-stakeholder participation, partnership mechanisms, and management of LMEs, as well as opportunities for investment in blue economy.

The following is the outline that was agreed upon by the participants:

Introduction

- Blue economy theme
- Objectives, rationale, expected outcomes
- Scope, methodologies, caveats

Part 1. Ocean economy and ocean health

- Role of oceans and LMEs
 - The Seas of East Asia (physical and biological features)
 - The people and the economy (demographic and socioeconomic features)
 - Ocean economy (ocean economic activities – gross value added, outputs, contribution to national income and gross domestic product, employment)
 - Ecosystems services (market and nonmarket values)

- Coastal and marine ecosystems and biodiversity (major habitats and indicators; rare, threatened and endangered species; LMEs)
- Fisheries and food security from coastal and marine resources
- Tourism, heritage and cultural sites
- Navigation, shipping and ports
- Other key ocean economic activities
- Risks and threats:
 - Human activities and environmental damages
 - Transboundary issues
 - Natural hazards and climate change

Part 2. Blue economy development

- Transforming the ocean economy towards blue economy
 - Drivers of future growth, innovations and sustainability
- Innovative and sustainable economic activities
- Best practices and innovations in environmental and resource management
- Emerging industries: benefits; environmental, economic and social impacts

Part 3. Innovations in blue economy governance and investments

- Governance:
 - Instruments and mechanisms
 - Policies, legal and regulatory framework (existing/in place, gaps, options)
 - Research and development (R&D) linked to policy, planning, and other applications
 - Capacity development, technology transfer and learning products
 - Transformational engagement of stakeholders and participation mechanisms (more effective IEC, use of social media, relating stakeholders to governance for blue economy development)
 - Alternative mechanisms that create incentives
 - Novel financing mechanisms and modalities
 - Innovative tools for monitoring and enforcement
 - Meeting international commitments (SDGs, Aichi biodiversity targets, UNFCCC, Ramsar Convention, CITES, London Convention, Basel Convention, etc.)
 - Partnerships in ocean stewardship
 - Management of LMEs (benefits from shared management, assessment of progress of Strategies and Action Plans and recommendations)
 - Sustainable development strategies and action plans (progress, gaps, options)
- Business and investment opportunities in blue economy
 - Investment, business and partnership opportunities
 - Enabling conditions (policies, laws and regulations, institutional arrangements, access to financing, access to information and technologies, incentives)
 - Blue carbon potential

Summary and conclusion

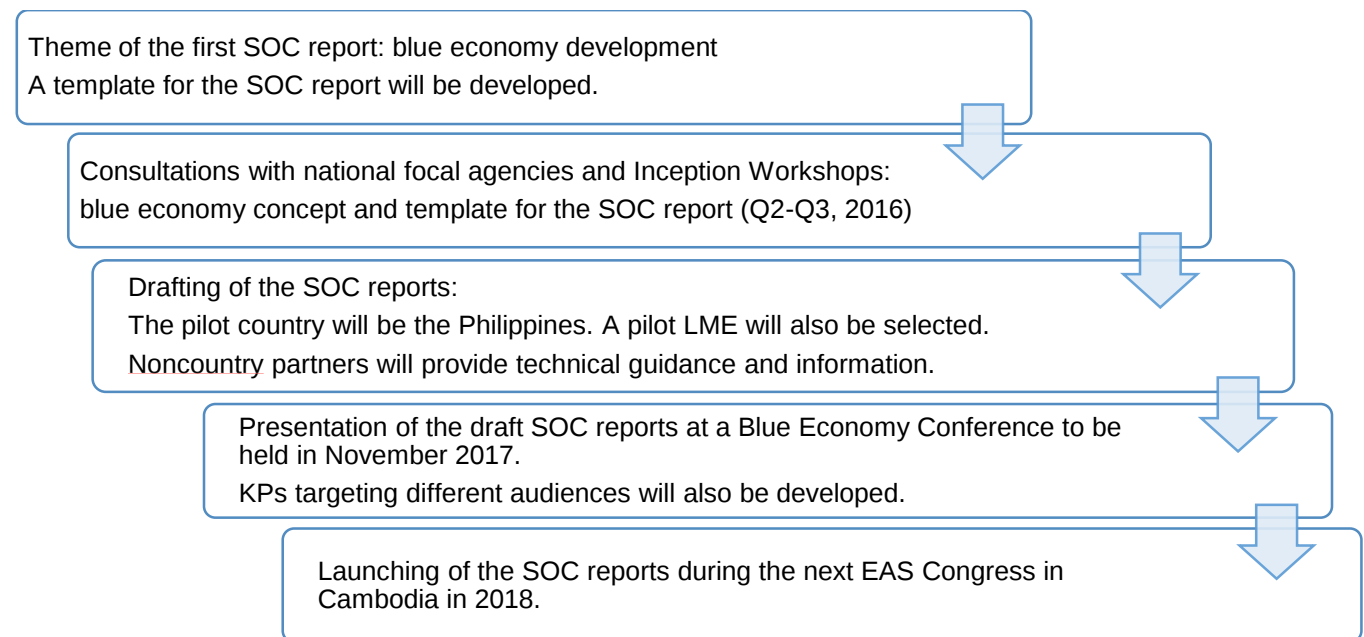
- Overall assessment and recommendations
- The ocean ahead

7. Next steps

7.1 Workplan

Using the outline of the SOC report and the sources of information that had just been discussed, the regional SOC report will be developed with country and non-country partners. To have a comprehensive picture of blue economy development in the region, work on the national SOC reports will also be undertaken. The SOC report will be piloted in the Philippines to develop a template that will guide the other countries. A pilot LME will also be selected for the regional SOC report. The regional SOC report will be an analysis and synthesis of information on the East Asian Seas region, LMEs, and transboundary aspects, and from the national SOC reports of partner countries.

The concept, outline, rationale, and expected outcomes of the SOC report, and workplan will be presented to the Executive Committee on 6 April 2016 for endorsement to the Partnership Council for approval. Country partners will also be consulted on the development of national SOC reports, and organizing of national teams that will work on these reports. The work initiated in 2015 on the ocean economy and ecosystem services will be continued. In parallel, knowledge products on blue economy will also be developed. The draft SOC reports will be presented at a Blue Economy Forum, which will be held in November 2017. Comments and suggestions received will be used to finalize the SOC reports. The target is to have a launching of the SOC reports during the next EAS Congress in Cambodia in 2018.



7.2 Regional Technical Working Group

The non-country partners and the participants agreed to provide expert advice and technical guidance, and contribute to the development of the regional SOC report. The regional TWG will also help in reviewing the national SOC reports. It was suggested to have agreements signed with the partners, including Terms of Reference (TOR) for the regional technical working group (TWG).

**Regional Planning Workshop:
Developing a State of Oceans and Coasts Report for the Seas of East Asia**

31 March – 1 April 2016

Program

Date/Time	Agenda Item	Speaker/Facilitator
31 March 2016		
9:00 – 9:15	1.0 Introduction • Opening remarks • State of Oceans and Coasts report: Background, rationale	S. Adrian Ross (PEMSEA)
9:15 – 9:30	• Introduction of participants	
9:30 – 10:00	• Objectives and Expected Outputs of the Workshop • Overview of activities undertaken on blue economy assessment and outputs - Inception Workshop - Blue Economy Workshop during the EAS Congress 2015	Maricor Ebarvia
10:00 – 10:20	<i>Coffee/tea break</i>	
10:20 – 12:00	2.0 Proposed Content of the SOC Report Key points for discussion: • Who is the target audience? Does the proposed SOC report add value? Is the theme “blue economy” timely and consistent with global and regional strategies, targets and policies? • How can it be improved? What topics/discussions need to be strengthened or added to the proposed outline? • How can the SOC clearly distinguish/clarify ocean economy versus blue economy? What are the indicators/criteria for measuring/assessing the transition to blue economy? • Are these indicators relevant and useful to: governments of the region; international/regional organizations; industry/business; potential investors in blue economy; scientific community; general public? • For the sections on ocean economy and blue economy development, how do we treat sectors like deep seabed mining, beach sand mining, IUU fish production, etc.? • For the sections on coastal and marine ecosystems and biodiversity, and fisheries and food security: What indicators are most relevant and should be included? – for national SOC; for regional SOC	Maricor Ebarvia
12:00 – 1:00	<i>Lunch break</i>	
1:00 – 5:00	3.0 On-going and past initiatives of international organizations and regional programmes	

	Key points for discussion: • What data are available and accessible from your organization/programme? From other studies and reports? • What data still need to be collected? • What is the level of difficulty in getting such data? Provide suggestions on how to access the information. • What information will be most useful for target users of the SOC report (e.g., policymakers, planners, managers, etc.)? • For the sections on ocean economy and blue economy development, how do we treat sectors like deep seabed mining, beach sand mining, IUU fish production, etc.? • For the sections on coastal and marine ecosystems and biodiversity, and fisheries and food security: What indicators are most relevant and should be included? – for national SOC; for regional SOC	
1:00 – 2:00	3.1 Blue economy assessment • Transforming the ocean economy; innovations and sustainability; new sectors	Facilitator: Alistair McIlgorm
2:00 – 3:30	3.2 Coastal and marine ecosystems and biodiversity • Habitats – indicators • Valuation of ecosystem services • Large marine ecosystems and transboundary issues	Facilitator: Marian delos Angeles
3:30 – 3:50	<i>Coffee/tea break</i>	
3:50 – 4:20	3.3 Sustainable fisheries and food security from coastal and marine resources	Facilitator: Marian delos Angeles
4:20 – 4:50	3.4 Sustainable marine tourism, recreational and heritage sites	Facilitator: Alistair McIlgorm
4:50 – 5:00	Wrap up	Maricor Ebarvia
6:00 – 7:30	<i>Welcome dinner</i>	
1 April 2016		
8:30 – 8:40	Recap	Maricor Ebarvia
8:40 – 9:20	3.5 Human activities and environmental damages	Facilitator: Gil Jacinto
9:20 – 10:00	3.6 Natural hazards and climate change	Facilitator: Gil Jacinto
10:00 – 10:20	<i>Coffee/tea break</i>	
10:20 – 12:00	3.7 Policies, institutional arrangements and governance	Facilitator: Marian delos Angeles
12:00 – 1:00	<i>Lunch break</i>	
1:00 – 2:00	4.0 Consensus on the scope and content of national and regional SOC reports Key points for discussion • What are the indicators/criteria for measuring/assessing the transition to blue economy? What indicators are most	Facilitator: Alistair McIlgorm

	relevant and should be included? – for national SOC; for regional SOC • Are these indicators relevant and useful to: governments of the region; international/regional organizations; industry/business; potential investors in blue economy; scientific community; general public? • For the sections on ocean economy and blue economy development, how do we treat new or emerging sectors like deep seabed mining, ocean energy and marine biotechnology wherein impacts are not yet fully evaluated?	
2:00 – 3:00	5.0 Work planning Key points: • Activities and milestones • Interface between national and regional SOC reports • Regional TWG: scope of work	Facilitator: Maricor Ebarvia
3:00 – 3:30	6.0 Summary	Maricor Ebarvia
	7.0 Closing remarks	S. Adrian Ross
3:30	<i>Snacks</i>	

**Regional Planning Workshop:
Developing a State of Oceans and Coasts Report for the Seas of East Asia**

**31 March – 1 April 2016
PEMSEA Conference Room**

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**State of Oceans and Coasts Report for the Seas of East Asia:
Blue Economy – Where are We Now? Where are We Heading?
DETAILED OUTLINE (DRAFT)**

Part 1. Introduction

- 1.1 Coverage and theme of the regional SOC report
- 1.2 Context and rationale of SOC report and the blue economy theme
- 1.3 Concept and framework of the regional SOC report
- 1.4 Methodology, scope, and timeframe
- 1.5 Caveats

There is a need for a reporting system to measure progress towards the achievement of the objectives of the SDS-SEA by the participating countries in the region. In particular, the Da Nang Compact on the Sustainable Development Strategy for the Seas of East Asia signed in 2015 commit PEMSEA Country and Non-Country Partners to the development and utilization of a scientifically sound Blue Economy State of Oceans and Coasts (SOC) reporting system, including agreed indicators and data requirements to monitor progress in SDS-SEA implementation.

The SOC with a Blue Economy theme will:

- a. show the critical role and contribution of ocean economic activities and coastal and marine ecosystems to national economies and welfare of the people in the EAS region;
- b. examine the benefits, costs and impacts at the regional and national levels;
- c. emphasize the values of ecosystem services, and the losses being incurred due to unsustainable practices;
- d. assess the environmental damages and impacts of human activities;
- e. show how natural hazards and climate change can affect blue economy development
- f. draw attention to investment and partnership opportunities on innovative and environment- and climate-friendly technologies and infrastructure
- g. provide evidence base for region-wide ocean policy and decisionmaking.

The SOC report will highlight the enormous economic potential and development needs of countries in the EAS region, at the same time, point out the growing natural and anthropogenic pressure imposed on the coastal and marine environment, and the opportunities to avoid them. Actions are being taken at different levels nationally and regionally, and examples of good practices to sustainably manage the coastal and marine environment will be featured in the report. However, a lot more needs to be done given the enormous pressures and environmental changes going on.

The blue economy in the marine context is also in agreement with the following international agreements:

- **United Nations Conference on Sustainable Development (Rio+20):** ocean as natural capital; oceans as good business; oceans as integral to Pacific SIDS; and oceans as small-scale fisheries livelihoods
- **Transforming our world: The 2030 Agenda for Sustainable Development** – Sustainable Development Goals (SDGs): *SDG 14* – Conserve and sustainably use the oceans, seas and marine resources for sustainable development
- **Aichi Biodiversity Targets:** *Target 2* - By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting

systems. *Target 6* - By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches.

- **UNDP:** oceans as development spaces where marine spatial planning (MSP) integrates conservation, sustainable use and ocean industries
- **FAO:** harnessing the potential of oceans, seas and coasts
- **APEC (2014): Xiamen Declaration** of the Fourth APEC Ocean-related Ministerial Meeting Towards a New Partnership through Ocean Cooperation in the Asia Pacific Region: fostering economic growth through conservation and sustainable development and management
- **Other international conventions and agreements:** Ramsar Convention on Wetlands; United Nations Framework Convention on Climate Change (UNFCCC); Convention on International Trade in Endangered Species (CITES); Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal; Regional Plan of Action (RPOA) for Responsible Fishing; Asia-Pacific Partnership on Clean Development and Climate; London Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter; International Convention for the Prevention of Pollution from Ships; International Convention for the Control and Management of Ships' Ballast Water and Sediments; etc.

Part 2. Ocean economy and ocean health

2 The role of oceans in the economy of the East Asian Seas region

2.1 The Seas of East Asia: Physical and biological features

- geography
- oceanography, hydrography, bathymetry, geomorphology
- meteorology (weather, rainfall, etc.)
- coastal and offshore geology, geohazards
- hydrology, water quality (temperature, pH, salinity, dissolved oxygen, BOD, turbidity, total dissolved solids, chlorophyll, nutrients, heavy metals, etc.)
- ecological and coastal characteristics
- etc.

2.1 The people and the economy of the Seas of East Asia

- *Demographic features* (total and coastal population, population density, population growth, urban-rural population, age-sex structure, gender ratio)
- *Economic characteristics* of the region (GDP, GNI, contribution of the region to world economy and international trade; transportation hub; economic growth and urbanization trends; coastal livelihood)
- *Social characteristics* (literacy and education, health, gender, ethnic composition, languages, religions)

2.2 The ocean economy

- Key ocean economic sectors in the Seas of East Asia
- Country indicators: gross outputs, gross-value added, percentage contribution to GDP, growth trends, employment

The ocean 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 to be considered in the blue economy. *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.). The ocean economy also includes marine education and research as well as activities of the public sector agencies with direct coastal and ocean responsibilities.

Ocean Economic Activity
Fisheries and Aquaculture
Offshore Oil and Gas
Mining (e.g., minerals)
Energy/electric supply (ocean energy; coastal and offshore wind energy; etc.)
Water (desalination; seawater utilization)
Manufacturing: ○ Fish and seafood processing ○ Ship building and repair ○ Marine transport equipment ○ Marine biotechnology, pharmaceuticals, chemicals ○ Salt
Marine construction
Shipping and ports (marine transportation, ports, warehouses)
Marine tourism and recreation
Marine communications (submarine cables)
Defence/Government (navy, coast guard, search and rescue, marine environmental protection, etc.)
Marine education and research
Marine services (mapping, monitoring, maritime insurance and finance, etc.)

2.3 Coastal and marine ecosystem services (Valuation of ecosystem services; socioeconomic benefits; contribution to the ocean economy)

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. 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, and the net benefits have to

be measured to show how the oceans and coastal and marine ecosystems support human welfare. There is a need to move towards properly accounting the worth of our ecosystems, including the intangible and nonmarket values, so as to deliberate the full benefits and costs and tradeoffs in political and economic decision-making.

- The total economic value of coastal and marine resources in Thailand is around USD27.67 billion.
- Tidal flats, beaches, natural parks, estuaries and coastal waters in RO Korea generate annual benefits amounting to USD40.5-42.5 billion (Chang 2015).
- Coastal (mangroves, seagrass, coral reefs) and other marine ecosystem services in Indonesia are valued at USD245 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 USD635 million annually in food, fisheries, tourism, and pharmaceuticals (Kaur 2015).
- The net benefits of coastal and marine resources in the Philippines amount to approximately USD545.5 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.

3 Coastal and marine ecosystems and biodiversity in the Seas of East Asia

3.1 Oceanographic features and role of ocean

This will include the unique geological features and oceanographic features and processes in the East Asian seas. Ocean currents and oceanographic processes have a substantial impact on the ecology of the region, influencing the availability of nutrients and driving the productivity, distribution and abundance of phytoplankton and fisheries. The processes thus affect the health and productivity of the marine ecosystems, including biodiversity.

3.2 Key habitats (indicators: area, coverage, species distribution, species composition, condition, biodiversity indicators, etc.)

- Mangroves / wetland forests
- Coral reefs
- Seagrass
- Beaches
- Estuaries, salt marshes, tidal flats
- Deep sea and offshore/pelagic habitats
- Coastal waters / permanent shallow waters

This will include description of key ecosystems and their current status, including coverage, areal extent, species composition and species distribution. Biodiversity indicators are also included, giving consideration to their condition, and associated threats, and highlighting those that require special attention. There are studies using the Drivers-Pressures-State-Impact-Response (DPSIR) framework, which provide an assessment of the ecosystems.

3.3 Large marine ecosystems (location, area, LME indicators, biodiversity, ecological value, socioeconomic value, etc.)

This section will highlight the LMEs in the EAS region, and will include description of distinct bathymetry, hydrography, productivity, and biodiversity. The shared resources, and the current transboundary environmental state, ecosystem status, stress, indicators of anthropogenic drivers

of ecosystem change and socio-economic impacts of these changes, hotspots with transboundary significance, and emerging issues should be identified. The benefits of joint or co-management, in addition to the Strategies and Action Plans (SAPs) of each country, should be given emphasis to effectively address transboundary issues.

LMEs

- Sulu-Sulawesi Sea
- Yellow Sea
- South China Sea and Gulf of Thailand
- Arafura and Timor Sea
- Indonesian Seas
- Sea of Japan/East Sea
- others (Bay of Bengal)

3.4 Rare, threatened and endangered species

Populations of many species are decreasing at an unsustainable rate, and the number of species listed as endangered, such as whales, dolphins, dugongs, marine turtles, seabirds, and sharks, to name a few, are on the rise. The threats to marine species are difficult to perceive because marine animals are not as visible as animals on land. However, marine creatures are equally, if not more, vulnerable to problems, such as habitat destruction and overexploitation. Loss of habitats, the spread of disease, pollution, and unsustainable fishing practices are directly related to the actions of humans, and recovery from these problems is rarely straightforward. Whales, dolphins, and shallow water animals that breathe air, like turtles, manatees, and dugongs are often hit by boats and caught in fishing gear. Species, such as turtles that lay their eggs on land often lose their nurseries due to coastal development. Many marine species live in small, specific habitats while others require protection across their migration routes that cover vast areas and include breeding and feeding grounds.

The Total Economic Value of the majority of these species consists of both recreational use and nonuse (existence and bequest) values, which can be measured by eliciting willingness-to-pay (WTP) for the preservation of a particular species. However, it is important to note that some species have non-use values only. Currently, one of the most accepted methods used to estimate the Total Economic Value provided by species is the Contingent Valuation Method (CVM). It has been found that people are willing to pay a small portion of their income towards the protection of endangered or rare species for a variety of reasons. While numerous CVM studies valuing threatened and endangered species have been conducted, especially over the last 30 years, performing an original study to value every single species would be costly and time-consuming.

4 Fisheries and food security from coastal and marine resources

- 4.1 Fishery resources, stock assessment
- 4.2 Fisheries (major species, volume and value of fish catch)
- 4.3 Aquaculture and mariculture (major species, volume and value of production)
- 4.4 Demand for fish and exports/trade
- 4.5 Contribution to food security (availability, affordability, quality, and safety of fish)
- 4.6 Contribution to income and livelihood
- 4.7 Sustainable fisheries (fishing effort, sustainable and efficiency yields, technologies)
- 4.8 Pressures and threats
- 4.9 Examples of good practices

This section will discuss the role of fisheries and aquaculture in ensuring food security and nutrition, and providing livelihood in coastal communities. This section will describe the longer term trends in the abundance of key species groups important for food security, and the social and economic aspects of fisheries, aquaculture and mariculture practices. Technological opportunities and good practices, such as climate smart aquaculture, will be highlighted.

Fish contribute a significant amount of animal protein to the diets of people worldwide. It is estimated that between 15 and 20 percent of all animal proteins come from aquatic animals.¹ Not only is fish a vital food, it is also a source of work and income. At the macroeconomic level, the contribution of fisheries and aquaculture to national economies, in terms of their share to gross domestic product (GDP), exports, and employment, varies across the EAS countries. Fisheries and aquaculture employ at least 4.6 million persons in the Coral Triangle; assuming an average household size of four, 18.4 million people representing 5% of the aggregate population in the Coral Triangle in 2009 were directly dependent on fisheries for livelihood.²

A key issue is to manage fish stocks and ecosystems, within a dynamic environment subject to climate fluctuations and change, in such a way as to maximize harvests without compromising future yields. Illegal, unreported and unregulated (IUU) fishing is a regional and global problem that threatens ocean ecosystems and sustainable fisheries. IUU fishing depletes *fish* stocks, destroys marine habitats, distorts competition, and weakens coastal communities. Lack of awareness, strong and effective conservation and management contribute to unsustainable fishing practices. In addition, proper fish stock assessment still hampers analysis of sustainable fishing levels and efforts that would contribute to forging appropriate policies and regulations.

5 Tourism, recreational and heritage sites

- 5.1 Major tourism sites
- 5.2 National parks, historical and heritage sites in coastal and marine areas
- 5.3 Tourism revenues and employment generation
- 5.4 Ecotourism / sustainable tourism
- 5.5 Major issues
- 5.6 Examples of good practices

Tourism is a vital tool for economic development and poverty reduction (UNWTO 2002). The coastal area, a source of biodiversity and ecosystem services, provides numerous opportunities for tourism and recreational activities, such as swimming, sun bathing, pleasure boating, snorkelling, etc. The open ocean also offers many opportunities for tourism and recreational activities that include SCUBA diving, sport fishing, whale and dolphin watching and cruise tourism. However, the assessment of coastal and marine tourism – separate from the whole tourism sector – is not always available.

The tourism and recreation sector plays a major role in promoting economic growth and alleviating poverty, with direct economic as well as significant indirect and induced impacts. It promotes infrastructure development, such as road networks, airport and seaport facilities, and amenities in the coastal and beach zones, which have the potential to benefit the whole country and its local population. The tourism industry is an important source of direct and indirect employment. It creates opportunities for the development of small and medium scale industries.

¹ FAO.

² ADB. 2014. Regional State of the Coral Triangle.

Tourism can also support conservation through private and public reserves, communal conservancies, and contributions to marine protected areas. Ecotourism is becoming popular among environmentally-conscious tourists.

Although tourism has immense potential to enhance socioeconomic development and contribute to environmental rehabilitation, it also has a wide range of negative social and environmental impacts. New approaches in shoreline management, marine spatial planning, and coastal resource management are needed to address environmental factors, as well as policy and regulatory frameworks to manage beaches and coastal and marine ecosystems in a sustainable way for tourism development.

6 Navigation, shipping and ports

- 6.1 Navigational lanes
- 6.2 Contribution to regional trade, global trade
- 6.3 Major Ports (and port performance indicators)
 - location
 - merchant fleet types and ship capacity
 - berthing facilities; volume of passengers handled; cargo throughput; container throughput;
 - storage facilities; warehouses
 - value of goods passing through the ports
 - value-added of ports; investments in ports; employment
- 6.4 Impacts and actions being taken

7 Other ocean economic activities

- 7.1 Fishing ports
- 7.2 Ship-building
- 7.3 Offshore oil and gas
- 7.4 Energy (e.g., ocean energy, coastal wind power, etc.)

8 Risk and threats to the Ocean Economy of the region

- 8.1 Human activities and environmental damages
 - Drivers/Pressures
 - Urbanization and development in coastal and marine areas
 - Conversion and destruction of habitats and ecosystems
 - Illegal, unreported and unregulated (IUU) fishing
 - Over-exploitation of resources; overfishing
 - Land reclamation
 - Deep seabed mining and beach sand mining
 - Oil and gas exploration
 - Impacts
 - Pollution
 - Major land-based sources of pollution and impacts
 - Sea-based sources of pollution and impacts
 - Loss of ecosystems and biodiversity
 - Declining fisheries; contaminated fish and seafood

- Introduced, alien, invasive species
- Coastal erosion
- Transboundary issues
- Environmental costs; valuation of environmental damages

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, the ocean economy also affects the ocean environment. Pressures and threats result from various causes and the confluence of various drivers, such as population growth, poverty, increasing demand and unsustainable resource use, coastal development, conversion of habitats, destructive fishing, and dumping of waste into the oceans. Moreover, pollution, oil spills, sedimentation, eutrophication, and other environmental pressures due to land- and sea-based activities impact human health and wellbeing as well as health of ecosystems. Water quality has been most affected by nutrient loads and contaminants originating from domestic sewage and industrial and agricultural chemicals.

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. 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.

- Southeast Asia is expected to lose one third of mangroves between 2000 and 2050 under a 'business as usual' scenario, with the value of loss estimated at US\$2 billion (annual value in 2050).³ For the coral reefs, the value of lost reef-related fisheries in Southeast Asia is US\$5.6 billion (annual value in 2050), with the highest loss in Indonesia and the Philippines.⁴
- 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 USD129.5 million (World Bank, 2009).
- In Thailand, the total cost of coastal erosion, oil spills, and damage caused by tsunami amounted to USD2.62 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.

8.2 Climate change, storm and flooding events, sea level rise, etc.

- Meteorological and climatic processes
- Role of coastal and marine ecosystems
- Effects of disasters on coastal communities and coastal and marine ecosystems
- Effects of climate change on coastal and marine ecosystems (e.g., coral bleaching)
- Effects of climate change on blue economy development

³ ASEAN-TEEB Scoping Study

⁴ ASEAN-TEEB Scoping Study

- Economic cost of climate change

Climate and natural processes influence the flow of rivers, turbidity and sediment transport. Climatic changes have largely been linked to extreme events, such as floods and droughts. Floods are linked to such impacts as soil erosion and sedimentation, while droughts lead to increased pollution concentration and reduce water volumes to the coast which then affects the essential river-coast interaction.

Key long-term impacts of climate change in the EAS region will be sea level rise, together with increasingly severe and possibly more frequent storms and storm surges. Most coastal cities in the region are situated at low elevation, often next to lagoons and estuaries.

Vulnerability to environmental change is increased where ecosystem goods and services are declining, e.g., conversion of mangroves and loss of integrity of coral reef systems because of changing ocean pH, which in turn may reduce natural protection levels provided by mangroves and coral reefs from storm surges and tsunamis. Socio-economic vulnerability is expected to increase over the next decades. The extent to which this vulnerability will increase with increased exposure to hazards depends on the adaptive capacity of countries in the EAS region. The Southeast Asian region is the most vulnerable to climate. Keeping "business-as-usual" could leave the region to suffer damages equivalent to more than 6% of GDP by 2100, more than two times higher than the global average⁵

One part of the research needed is to get evidence of physical and social impacts, including climate-sensitive health risks, effects on food and water security, livelihood and infrastructure, and psychosocial concerns due to displacement. The other part entails finding effective policy interventions, and innovative solutions – both structural and non-structural measures.

Part 3: Blue Economy Development across the Seas of East Asia

Introduction: Why do we need a new model for ocean economy development? Where? Which sectors are critical? What innovations in technologies, infrastructure, and practices can drive the shift from traditional ocean economy to blue economy?

9 Blue economy development among key ocean economic sectors

9.1 Transforming the ocean economy towards blue economy

The following are key drivers of future growth, innovations and sustainability:

- regulations and competition;
- new patterns of global demand and trade;
- increasing pressure on water, energy and natural resources; climate change;
- public awareness and consumption growth and patterns;
- supply chain trends and new technologies;
- standards and labels;
- capacity development – ensuring the right skills;
- role of governments, businesses and civil society;
- young entrepreneurs

9.2 Innovative and sustainable ocean economic activities

⁵ ADB. 2009. The Economics of Climate Change in Southeast Asia: A Regional Review.

Indicators:

- Outputs/revenues; investments; contribution to economy; projected demand and growth; employment generation
- processes, enabling conditions, technologies, environmentally-sound practices to make these industries 'blue'
- environmental, economic and social impacts

Climate smart aquaculture and food security (Viet Nam). 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. 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.

Ocean energy, energy security and climate change (RO Korea). This 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 has operated the national R&D program for the development of technologies on tidal power (barrage), tidal current energy, wave energy, and ocean thermal energy conversion (OTEC). 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.

Desalination and water security (Singapore). Across the globe, desalination is increasingly being considered as a new water supply source. Satisfying demands for freshwater is expected to become increasingly difficult in the context of a changing climate, with many regions facing more variable precipitation patterns and decreased water availability. Over the last 50 years, through strategic planning and investment in research and technology, Singapore has built a diversified water supply system, which allows the country to be more resilient to weather variability. The water supply is comprised of: (a) local catchment water; (b) imported water (from Malaysia); (c) highly-treated and purified reclaimed water (called NEWater); and (d) desalinated water.

Marine biotechnology and new medicines (PR 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 MNP chemistry have been established to conduct research and develop new medicines.

Eco-ports and eco-ships (Malaysia). Examples of green practices applied in the ports and shipping sector in Malaysia include: monitoring air and water pollution levels; introducing green building features; rewarding port users which adopt environmentally-sound measures; establishing green port index; 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; etc.

Innovative wastewater treatment and recycling. The field of wastewater management provides a good example of a holistic and integrated approach in dealing with the water and energy dependencies. Previously, wastewater management was conducted on a straightforward procedure – collecting and treating wastewater according to government-imposed regulations, and ultimately discharging the treated effluent into receiving bodies of water. However, technologies have evolved, enabling wastewater to be treated and reused extensively for irrigation (in Viet Nam),

and other domestic and industrial purposes (in India), which significantly contributed to reducing freshwater usage. To further enhance the resource recovery loop, technologies were further refined to allow usage of wastewater treatment by-products (e.g., sludge and biogas). Sludge is further treated for use as organic fertilizers and soil conditioners (in the Philippines, China, and Japan). Biogas from methane recovery has various uses, such as for (a) lighting, cooking and heating purposes (in Cambodia, Viet Nam, Lao PDR); (b) generation of electricity, which can sometimes be directed or sold back to the power grid (in Nakhorn Ratchasima, Thailand, and Kobe, Japan); (c) generation of alternative fuel to power buses, trains and garbage trucks (in Kobe, Japan). As alternative energy and fuel source, biogas has resulted in reduction of carbon emissions, and generation of carbon credits.

Climate-resilient infrastructure. The climate resiliency of public and private infrastructures is a multidimensional issue that requires convergence between the need to develop the economic and social infrastructure of the country and the necessity to protect the country's ecosystems. The restoration of ecosystems and their capacity to regulate the impacts of climate change will reduce risks and slow down the deterioration of infrastructure as well as increase the possibility of new investments. Adapting infrastructure to the risks of climate change within a broader green strategy not only helps to reduce the loss of lives, physical damages and interruptions in critical socio-economic services, but it also yields additional benefits from greater energy security, reduction of greenhouse gas (GHG) emissions, and biodiversity conservation. Structural measures include any physical construction to reduce or avoid possible impacts of hazards, such as flood levees, ocean wave barriers, etc. To complement and support these, non-structural measures are also important, such as building codes, land-use planning laws and their enforcement, and public awareness programs.

9.3 Best practices in ecosystem and biodiversity conservation

- Marine protected areas
 - role; importance; impacts
 - MPA complexes
 - MPA networks
 - social and economic aspects of ecosystem and biodiversity conservation
- PPP in integrated coastal management
- Community-managed marine sanctuaries
- Others

Marine protected areas. Marine heritage sites and protected areas are important for many reasons. They provide the most significant, front-line response to the global extinction crisis, and ensure conservation of biodiversity, continued flow of ecosystem services, and significant economic benefits to surrounding communities. Marine protected areas (MPAs) have been designated in many places in the East Asian Seas region, which can help protect and restore threatened and endangered species, but MPAs are limited in size and therefore, limited to the marine life that inhabits those areas.

Part 4. Innovations in Blue Economy Governance and Investments

10 Institutional arrangements and governance

10.1 Policies, legal and regulatory framework (existing, gaps, options)

10.2 Supporting mechanisms

- Research and knowledge management

- Research and development (R&D) linked to policy, planning, and other applications
 - Capacity development, technology transfer, learning products
 - Transformational engagement of stakeholders (governments, communities, civil society, businesses/private sector, etc.) and participation mechanisms
 - effective IEC, social media
 - Relating stakeholders to governance for blue economy development
 - Alternative mechanisms that create incentives
 - Novel financing mechanisms and modalities (users fee, payment for ecosystems services, pollution charge, environmental guarantee fund, blue bonds, tradable permits, blue carbon, etc.)
 - Innovative tools for monitoring and enforcement
- 10.3 Meeting international commitments (SDGs, Aichi biodiversity targets, UNFCCC, Ramsar Convention, CITES, London Convention, Basel Convention, etc.)
- Actions taken and progress being made
 - How implementation of international agreements contribute to blue economy development
- 10.4 Partnerships in ocean stewardship
- Management of LMEs (assessment of progress of Strategies and Action Plans and recommendations; assessment of joint management)
- 10.5 Sustainable development strategies and action plans (existing, progress, gaps, options)
- SDS-SEA
 - SAPs: CTI, SSME, YSLME, SCS
 - Coastal and ocean management
 - Fisheries management
 - Ecosystem and biodiversity protection
 - Pollution reduction; nutrient management; waste management
 - Disaster risk management
 - Response to climate change

11 Opportunities for blue economy investments and business

- 11.1 Investment, business and partnership opportunities
- Environmental investments: water, sanitation, wastewater management, solid waste management, stormwater management, etc.
 - Coastal management, coastal and marine habitat protection and resource conservation
 - Sustainable and climate-smart fisheries and aquaculture
 - Climate change mitigation and adaptation, climate resilient infrastructure
 - Green coastal cities
 - Innovative and environment- and climate-friendly technologies and infrastructure
- 11.2 Enabling conditions (policies, regulations, incentives, support for R&D, access to technologies and financing, etc.)
- 11.3 Issues

The international recognition of business as a 'stakeholder' in global development partly reflects the recognition of governments that they alone cannot solve global and local developmental problems, and should harness the expertise and resources of business. However, the business sector must acknowledge that 'sustainability' is not just a matter of legislative compliance or good corporate citizenship. Such realization in the ambit of a blue economy would compel business to rethink sustainability as a key strategic business driver, and to incorporate it into all aspects of the business processes and corporate philosophy. Sustainability has moved from having mainly environmental and energy efficiency issues, especially around carbon emissions and other forms of pollution or ecological footprint, to being a much broader concept encompassing a firm's impact on overall environmental and social issues, as well as how it addresses questions of governance – not just within its own direct operations, but throughout its supply chain. It goes beyond the minimum standards expected of a firm by its customers, financiers and employees, irrespective of and in addition to its regulatory obligations. Businesses are now expected to match the size of their influence with a corresponding degree of responsibility for addressing public goods. Corporations have to be more proactive about the sustainable development agenda for reasons that have little to do with their public image, but instead are driven by their own strategic long-term interest. In this case, innovations and sustainability are within their long term interest.

Part 5. Summary and Conclusion

12.1 Where are we now?

- Overall assessment of state of ocean economy and ocean health
- Gaps in policies, plans, and implementation

12.2 Where are we headed?

- Assessment of blue economy development
- Blue economy opportunities for investments and partnerships

12.3 Recommendations