



## The Rise of Blue Carbon Credits: A learning exchange on blue carbon initiatives in East Asian Seas

June 27, 2023 | 9:00 AM to 12:00 PM (GMT +8) via ZOOM

### 1. Introduction

In line with the commemoration of World Ocean Day this June 2023, PEMSEA organized and held the Blue Carbon Regional Forum on June 27, 2023. Over 130 participants attended the online forum through ZOOM and Facebook Livestream. The learning exchange aimed to provide an avenue for PEMSEA partners and other development stakeholders in East Asia to share their on-going initiatives on blue carbon, and underscore the importance of having a standard accounting method for blue carbon.

The PEMSEA Resource Facility served as the Secretariat to and organizer of the forum.



The following documents are attached as Annexes:

1. Copy of the program;
2. List of secretariat; and
3. List of speakers (presenters and panel reactors).

The following are downloadable links for:

1. [Presentations](#);
2. [Recording via Facebook](#); and
3. [Recording via YouTube](#).

### 2. Opening Message and Rationale of the Forum

**2.1** Ms. Aimee Gonzales, Executive Director of PEMSEA Resource Facility, provided the rationale on the conduct of the forum.

- The annual dialogue and learning exchange aims to deep dive on specific topics with the view to helping unpack challenges and opportunities for the EAS region, bringing to light new science-based information, and identify key players in the region to foster more collaborative actions.

- The past annual dialogues paved the way for the development of the second volume of the Regional State of the Oceans and Coasts Report and regional responses to multilateral environmental agreements.
- This learning event on blue carbon is timely, given the increasing interest in its potential to provide both mitigation and adaptation co-benefits in the context of climate change, and its relevance in achieving countries' climate mitigation targets.
- Blue carbon ecosystems possess a huge potential in addressing several key issues that threaten the world today, such as the climate crisis and biodiversity loss:
  - It has a greater capacity to remove carbon emissions in the atmosphere compared to land-based carbon and has a crucial role in achieving global emissions targets.
  - It provides co-benefits in terms of increasing biodiversity, providing ecosystem services such as food security, coastal protection, and alternative livelihood.
  - Blue carbon likewise promotes the complementary roles of science and policy, where early blue carbon science has been crucial to integrating these ecosystems in national and international policies on climate change. Simultaneously, national and international policy processes play a key role in creating the enabling conditions for science to advance and be able to respond to societal needs.
- Despite the many benefits that blue carbon ecosystems raise, they experience high rates of loss due to human activities and unsustainable practices. Thus, awareness on its potential should be discussed to promote the conservation and restoration of blue carbon ecosystems.
- Understanding the details of the carbon cycle in these ecosystems is crucial to maximize the economic potential of blue carbon ecosystems, which is becoming increasingly recognized in global carbon market mechanisms.
- Countries in the East Asian Seas region have conducted extensive research on the blue carbon potential of mangroves, coral reefs, seagrass, seaweeds, tidal flats and eelgrass. However, no country in ASEAN has formally established a carbon market. Countries such as the Republic of Korea and China have established trading schemes for carbon markets and emissions in 2015 and 2021, respectively. Japan has also begun piloting its own voluntary blue carbon market.
- Blue carbon remains crucially understudied from local perspectives, despite its prominence in the global arena. The potential of blue carbon can be maximized by addressing the following questions:
  - How local communities can be effectively integrated into national or regional carbon markets? and;
  - How future blue carbon-centric markets can support local coastal communities with blue carbon ecosystems?

### 3. The BlueCARES Project

2.2 Dr. Maria Lourdes McGlone presented the BlueCARES Project and the salient points of their findings on the blue carbon assessments in selected areas in the Philippines.

- The BlueCARES Project is Comprehensive Assessment and Conservation of Blue Carbon Ecosystems and their Services in the Coral Triangle. It is a trilateral project between Japan, Philippines, Japan and it ran for 6 years from April 2017 to March 2023. The goal of the project is to establish a blue carbon strategy as an effective scheme for enhancing local efforts to conserve blue carbon ecosystems and improve the resilience and thereby for contributing to mitigation of global warming.
- One of the project sites is Eastern Samar. For Eastern Samar, the project focuses on realizing sustainable and resilient social ecological systems despite the increasing risk of super typhoons.
  - There is a rapidly declining coastal ecosystem in the Philippines for blue carbon, which poses a considerable risk to meeting national emission targets as it releases the stored carbon back to the atmosphere.
  - After Super Typhoon Yolanda in 2013, a lot of the mangrove areas were heavily damaged in Eastern Samar. It was projected that over time, there will be a 14% increase in typhoon peak intensity and super typhoons will surely come again with much bigger intensity. The data from the Project shows that the occurrence of strong typhoons resulted in the decrease of status of the blue carbon ecosystems.
  - Typhoon Yolanda also devastated the below-ground blue carbon ecosystem of the impact areas. There was a sudden big loss of carbon stock in sediments in Eastern Samar. There was a correlation observed between the sudden carbon stock loss and the increase with future typhoons and its intensity.
  - The BlueCARES project also conducted remote sensing of the blue carbon ecosystem, mapping the current mangrove cover from 2010 to 2020 as well as the cover gain and cover loss. Among the regions with high mangrove cover lost is Region VIII, the provinces facing the Pacific and experiencing frequent typhoons.
  - The result of the mapping is done through a ground-based nationwide monitoring network, which is the Core-and-Network System. It is a platform for sustainable periodical nationwide monitoring of blue carbon ecosystems including the below-ground blue carbon. The result of monitoring is essential in updating the blue carbon strategy and policies as adaptive management.
- Another project site is the Aklan Province. The project focuses on the role of watershed management in coastal management. The project attempts to come up with a green carbon and blue carbon link or the G-B link to devise or develop a management system that would address issues that affect blue and green carbon ecosystems.
  - In Aklan, there was a declining trend in upland forest cover, hence, there was a relative increase in sediment discharge, both fine and coarse sediments, going to the river. This resulted in the shallowing of the Kalibo area and becoming flood prone. While the built-up of sediment discharge has enhanced the growth and expansion of Bakhawan Ecopark, the trapping of sediments resulted in erosion on the coastline.

- The Typhoon Frank in 2018 has also caused erosion from the Aklan River to Bakhawan Eco-park. Every time there's a big typhoon, Aklan experiences a major flooding problem. The other problem is the Batan Bay with high pollutant discharge. The mangrove areas were converted to fishponds. Currently, almost the entire mangrove cover is gone. It caused degradation of water quality, decrease in fish catch, loss of blue carbon function.
  - The G-B link approach was used for Aklan to consider the green carbon and blue carbon link as a holistic and effective approach for conservation and rehabilitating the integrated watershed and coastal zones.
  - For the G-B link, using the hydrology, hydrodynamics, and water quality components, the project did model developments and field surveys to understand the system and create scenarios. This can determine carrying capacity and other factors such as natural mangrove vegetation. These are critical to communicate with the stakeholders including the national government, local government, academic institutions, and communities through workshops and citizen science. These are necessary to design a blue carbon strategy for Aklan.
- The last project is Busuanga, Palawan. The project focuses on sustainable tourism development and island scale resource coastal management.
  - The BlueCARES Project developed a citizen science toolkit, which featured select case studies in the Philippines including Bolinao, Boracay, and Busuanga. They also developed a field survey method to monitor blue carbon ecosystems, obtain data, and understand the long term changes, which are essential for decision-making in sustainable use of carbon.
  - At the end of the project, they developed site specific blue carbon strategy. The intention is to scale up the strategy up to the national level. The copy of the strategy can be requested from the project management unit.

#### **4. Blue Carbon Strategy in Indonesia: Highlighting Climate Actions Agenda Post Presidential Decree No. 98/2021 (The Economic Value of Carbon-NEK)**

4.1 Dr. Andreas Hutahean, Indonesia's National Focal Point on Blue Economy in the Indian Ocean Rim Association and the Deputy Director of the Coordinating Ministry for Maritime and Investment Affairs, presented the blue carbon strategy of Indonesia.

- The current Nationally Determined Contributions (NDC) of Indonesia were recently revised to include more information on the ocean sector, i.e., mitigating measures, and wetland issues, i.e., carbon storage. Indonesia aims to reduce greenhouse gas emission by 29% through national effort, and 41% with international support.
- Indonesia passed the Presidential Decree No. 98/2021 that emphasized on The Economic Value of Carbon (NEK). The support and result from this policy can be used to achieve Indonesia's NDC target:
  - For instance, there is a price on GHG emissions (e.g., from combusting fossil fuels) to capture external costs;
  - Incentivizing changes investment, production, and consumption patterns (e.g., fossil fuel subsidy removal or energy taxes; and

- Plans and guidelines on carbon trading, carbon offsetting, and carbon market.
- A Ministerial Regulation on the basis for carbon trading in the forestry and other land use (FOLU) sectors including mangroves also exists.
- Indonesia has conducted a study and project, together with Australia, focusing on the North Sulawesi, East and West Nusa Tenggara. The study entitled “Seagrass Blue Carbon and Livelihood 2020” aimed to enhance the capacity of young scientists through lectures on integrated blue-carbon livelihood and the development of artificial intelligence for seagrass mapping.
- The Government aims to have a zero-emission target by 2070 (Net Zero Emission 2070). By 2030, all sectors are required to have considerable decrease in GHG. For example, the energy sector is set at 1.164 million tonnes of carbon dioxide emission by 2030, and then down to 766 million tonnes by 2050.
- Mapping of the seagrass is not as easy as mangroves. The use of remote sensing as a tool for scaling up the mapping efforts may include data bias. Hence, there is a need to develop a more rigid tool something that can be used for monitoring or mapping of the seagrass meadows, e.g., the use of advanced analogy like developing the artificial intelligence for seagrass in Indonesia.
- Indonesia's Mangrove Rehabilitation Program in 2021-2024 aims to address the 9.330 hectares per year deforestation. A three-year target is over 620,000 hectares of replanted mangrove forest cover in selected sites.
- Indonesia has an existing effort in linking carbon pricing and non-carbon benefits. They are currently using three standards:
  - Climate, Community and Biodiversity Benefits (CCB) - used to demonstrate broad social and environmental benefits. They issue labels of Verified Carbon Units or VCU to certified projects (VCU in 1 ton CO<sub>2</sub> emission);
  - Sustainable Development Verified Impact Standard (SD Vista) - they also issue labels for VCU as well as sustainable development assets to account for contributions to SDGs; and
  - Verified Carbon Standard - they also issue labels for VCU; account GHG emission reduction or removals.
- In Asia Pacific Region, there is no current standard mechanism to account blue carbon. There is a pressing need to develop a methodology in order to achieve a better market price.

## 5. Improving Blue Carbon Sink Capacity in China

5.1 Dr. Guangcheng Chen of the Third Institute of Oceanography of the Ministry of Natural Resources of China shared the on-going practice and policies of China on blue carbon.

- The existing biological carbon pool and carbon sequestration remain one of the solutions considered by China to reduce GHG emissions.

- Based on the systematic investigation into the distribution of national marine carbon sink ecosystems, China proposed to protect and restore the existing blue carbon ecosystems by means of various blue carbon pilot projects and marine ecological protection and restoration projects, giving full play to the role of blue carbon in mitigating climate change.
- Incentives such as financial support and social capital participation have been continuously developed, and the regulations of marine protection and restoration have been continuously improved, which effectively promote the protection.
- The central governments promised to address the 2030 and 2050 targets for the carbon peak and carbon neutralization in the future. The state council released the Action Plan for Carbon Dioxide Peaking Before 2030 last October 2021. It seeks to consolidate the carbon sequestration capacity of ecosystems; the protection of oceans, which will stabilize ecosystem carbon sequestration and to protect the marine ecosystems, so that carbon sink capacity is improved. The baseline survey and carbon registration related to the restoration efforts will be also monitored and promoted.
- In 2021, the Master Plan for the National Key Ecosystem Protection and Restoration major projects were developed. This included nine major ecological protection and protection projects to be implemented in the next 15 years including the protection and the restoration of coastal zones.
- In the same year, a National Special Action Plan for Mangrove Protection and Restoration was passed by the Ministry of Natural Resources and National Forestry and Grassland Administration, which aims to restore the country's 18,800 hectares of mangrove forests, including plantation of 9,050 hectares of mangroves.
- The Verra Standard remains to be the mechanism used in China for carbon offsetting projects. But on February 4, 2023, the development of a unified national registration system and trading system was completed for the establishment of the national Chinese Certified Emissions Reduction (CCER) trading center.
- On March 30, 2023, the Ministry of Ecology and Environment (MEE) called for the public proposal for the CCER Project methodology for 15 categories including forestry and agriculture. Methodology is quite likely to be improved in the CCER mechanism.
- In 2018, the State Council issued a circular on strengthening the protection of coastal wetlands, and strictly regulating sea enclosure and recreation. According to this circular, new recreation of the sea has been regulated, and only the low national strategy projects are allowed, which meant that the coastal wetlands are strictly protected in China.
- The number of marine ecological restorations projects has been implemented to improve the ecosystems health of the coastal zones. They carry out 143 protection and restoration projects in the coastal areas. A total of 1,500 kilometers of coastline and 30,000 hectares of the coastal wetlands were restored in the past seven years.

And around three million hectares of marine protected areas have been established for better conservation of the coastal wetlands.

- In China, two series of national standards have been worked out for coastal restoration such as the technical guidelines for marine ecological restoration and technical guidelines for monitoring and effectiveness and reason of ecological restorations. These two series of guidelines also helped improve the coastal wetlands. The government also provided guidance of ecological restorations by releasing the industry standard and other normative documents.
- The guidebook for mangrove ecological restorations was also released by the Ministry of Natural Resources to provide comprehensive guidance for the whole process of the ecological restoration of mangroves.
- Marine industry standards on blue carbon stock survey are under development. Prior to this, the technical specifications for ecosystem carbon stock investigation and assessment, carbon sink monitoring, and calculation of the three blue carbon ecosystems were developed. Early warning and monitoring for pilot investigations of blue carbon stocks and more than 20 pilot investigations have been conducted around throughout the coastlines of China for the past two years.

5.2 Dr. Chen also summarized the progress of the mangrove protection and restorations in China.

- According to the latest report of the Ministry of Natural Resources, in 2019, the mangroves in mainland China is approximately 27,000 hectares. Mangroves mainly occur in Guangdong, Guangxi, and Hainan provinces, which account for 95% of the mangroves in mainland China.
- China has diverse mangrove species with 77 native mangrove species. Since the first national mangrove reserve was established in Hainan in the 1980s, a total of 52 mangrove protected areas have been established which consist of a nature reserve, nature park and mini reserve.
- More than half of the mangroves in China are within protected areas. Aside from MPAs, some of these areas belong to the six national reserves and Ramsar wetlands.
- Guangdong province has the most mangrove protected area. Since 2010, a total of 45 projects have been conducted with support from the central financial funds. These projects are under the organization of the State, the former state administration, and the Ministry of Natural Resources. Around 3,900 hectares have been restored. After the release of the Action Plan in 2020, there was a substantial increase in project numbers and the planted areas of mangroves in recent years.
- Civil society also plays a role in coastal wetland conservation in China. For instance, in 2020, the Cerulean Sea Initiative aims to provide the platform to encourage and support civil society organizations to participate in coastal wetland protection and restoration with social welfare funds and scientific guidance. In two years, a total of more than 150 million Yuan has been invested on more than 10 conservation projects

in the coastline of China. Funding support continues to increase with the support of other foundations.

- A review of the five mangrove projects shows that the mangrove restoration in China mainly consist of reforestation of mudflat, reforestation in cleaned up mariculture ponds, cordgrass clearance and reforestation, and restoration of degraded mangroves. Among the four categories, the mudflat forestation accounts for the half of the planted mangrove areas in these projects. In history, the conversion of mangroves to agriculture land accounts for the majority of the loss of mangroves in China.
- The protection and the restoration efforts of the mangrove areas which started in 2000a have led to an increase by 5,000 hectares, making China among the few countries with a net increase in mangrove extent.
- Mangrove provides important service for the coastal zones in China. The estimated mangrove carbon stock in China is ~6 million tons of carbon, which is lower than the global value in mangrove. Further, 2.2 million tons of carbon were stored in the biomass pool and around 7.8 million tons were in the below-ground carbon stock. This data on stored carbon accounts only for less than 0.5% of the world's carbon stock. During the past 20 years, a net increase by 1,000 tons of carbon was estimated in mainland China due to the increase of the mangrove area.

## **6. RO Korea's Blue Carbon Inventory and Preparations for obtaining International Carbon Credit through blue carbon.**

6.1 Dr. Sukhui Lee of Korea Marine Environment Management Corporation presented the RO Korea's blue carbon inventory and how they incorporate the result in the RoK's new NDC.

- In its updated NDC, Korea raised its ambition to reduce 40% of the greenhouse gas emissions. Based on the Carbon Sink 2030 Enhancement Proposal, the ocean sector included mitigating measures such as coastal restoration, establishment of marine protected areas, mudflats restoration, and sea forest restoration.
- The National GHG Inventory in Korea is being overseen the Greenhouse Gas Inventory and Research Center (GIR), under the Ministry of Environment, who is responsible for overall management, while sector-specific accounting is responsible for mandated ministries and designated agencies.
- Starting from 2022, tidal marshes are included under "Land Use, Land-Use Change, and Forestry" (LULUCF) of national GHG inventory, while coastal wetland inventory is categorized based on management activities, and each activity has its own accounting method. The Korean Government has applied the 2013 supplement to the 2006 IPCC national GHG guidelines.
- The Korean Government has prepared an annual area of coastal wetland from the National Blue Carbon Information System (K-BIS) field data started in 1984 on an annual basis. This covered salt marshes and seagrass meadows. The data production was done through the collection and analysis of satellite images and verification and



adjustment through field surveys.

- The Korean Government followed the following steps in coastal wetland inventory:
  - Production of annual area for three types of coastal wetlands(intertidal zone, tidal salt marsh, and seagrass meadow). This included the following activities: Collect satellite images and latest field survey data, Apply developed methodologies and tune algorithm, comparison of satellite image classification vs field data classification, and visualization of nationwide area.
  - Process for classifying coastal wetlands from satellite images. Images were classified based on the ecosystem i.e., tidal marsh or seagrass meadows.
- In the Inventory Improvement Plan, Korea intends to improve the completeness and accuracy of data, hence, the inventory will cover mangroves, seagrass meadows, and tidal marsh. It will also include activities such as mangrove management, extraction, drainage, rewetting, vegetation, and creation.

6.2 Dr. Lee also presented the preparations being done to obtain international blue carbon credit including the Korean Emissions Trading System, and the international cooperation mechanisms within Asia Pacific.

- On Korean Emissions Trading System, it is a system that allocates emissions permits to companies eligible for allocation and allows the trading of excess/unused emissions. The eligible company is defined as a company with an annual average GHG emissions of 125,000 tons (tCO<sub>2</sub>-eq) or more over the past three years or a company that has at least one business establishment generating 25,000 tons (tCO<sub>2</sub>-eq) or more. It also includes companies that generate less than the permitted emissions can sell their unused emissions to the market, and businesses with low mitigation capacity can purchase emissions permits.
- The legal basis of the emissions trading system is the Act on Allocation and Trading of Greenhouse Gas Emission Permits (“Emissions Trading Act”) and Enforcement Decree. In accordance with the former Framework Act on Low Carbon, Green Growth, the Emissions Trading Act was enacted and came into effect on January 1, 2015.
- The emissions trading system has also flexibility ensured for companies to efficiently achieve their reduction goals:
  - Emissions permits can be borrowed from other compliance years;
  - If there is a surplus of emissions permits, they may be carried over to the following compliance year; and
  - Offset system: The mitigation outcomes (MO) obtained through project beyond the allocated activity(businesses) can be converted into additional emissions permits and used.
- The Korean Government also launched a coastal revegetation project as a new type of tidal restoration:
  - Funding period: 4 years per location
  - Financial support per project: KRW 15 to 20 billion (70% from central government, 30% from local government)

- Requirement: restoration about 5km<sup>2</sup> with 80% or more vegetation community
- Expected outcome: Sinan, Jeju
  - Vegetation area: 15.4km<sup>2</sup> (tidal marshes: 8.7km<sup>2</sup>, seagrass meadows: 6.7km<sup>2</sup>)
  - Soil Carbon removals: 4,000 tCO<sub>2</sub>/year
- Korea developed a national strategy to promote cooperative approaches. This includes the bilateral agreement to establish a consultative body related to the distribution of reduction amounts and transfer of mitigation outcomes when promoting an international mitigation project through bilateral cooperation between Korea and a recipient country (Article 6.2 of Paris Agreement). Under this, Initial discussions are underway to conclude a bilateral agreement with priority countries including Vietnam, Mongolia, the Philippines, Indonesia, Laos, Thailand, Myanmar, India, Bangladesh, Sri Lanka, Uzbekistan, Saudi Arabia, UAE, Morocco, Brazil, Colombia, Peru, Chile, etc.

## 7. Panel Discussion

7.1 A guided panel discussion followed the presentation of country experience on blue carbon. .

The panel reactors answered questions in certain topics under blue carbon and provided additional insights on the presentations. The two panel reactors were Dr. Francesco Ricciardi, Senior Environment Specialist from the Sustainable Development and Climate Change Department of the Asian Development Bank, and Dr. Siti Maryam Yaakub, Director of the International Blue Carbon Institute at Conservation International.

7.2 Dr. Ricciardi addressed the points on blue carbon initiatives being supported by Asian Development Bank, the role of funding institutions and private sector to help boost the blue carbon market and climate financing.

- ADB is doing a few initiatives in this space including an overall action plan for the oceans and sustainable economies. The target of ADB is to reach and expand financing solution up to \$5 billion by the end of next year.
- There are a few blue carbon initiatives being supported by the ADB, especially in in the Pacific and East Asian Seas region. One of them is called the Blue Southeast Asia Finance Hub. It was established in 2021 and is supported by the ASEAN catalytic green finance facility. This hub targets to create bankable projects that are worth about 300 million by 2024, and to catalyze some co-financing.
- For any bankable project, it is important to project the potential return of investment. For example, ADB has a large project in Cambodia on sustainable fisheries that will help the local communities and the government to increase the revenue from the coastal fisheries, by employing sustainable fishing practices. This approach helps the coastal ecosystem to recover from the pressure of fishing, and at the same time, provides the government and the communities the increase in income and fish production.
- Financial institutions like ADB or other multilateral and bilateral funding institutions can help propel the blue carbon market by providing financial financing solutions and

technical assistance. Based on the recent studies, the climate adaptation market could be worth about \$2 trillion per year in the next few years. The promotion of ecosystem services as climate change adaptation and mitigation measures can support the release of financial resources from the private sector. These resources for the protection and regeneration of the blue carbon ecosystems and nature-based solutions can also fill-in the gap of adaptation finance, especially in generating green jobs and creating more sustainable cities and communities.

- Developing a standard mechanism that can accurately account blue carbon can be very challenging. In scientific perspective, every ecosystem differs, and an approximation is unlikely. But a standard accounting method can help boost climate finance. Investors are always interested to see the potential return of investments. Having a standard accounting method can provide a clear and transparent framework for more private investors to assess the economic value of blue carbon.

7.3 Dr. Yaakub addressed the points on the sustainability of blue carbon as climate a mitigating measure, the opportunities for the government in tapping blue carbon market to improve their blue carbon ecosystems, the existing methodologies explored by Conservation International, and the mission of the International Blue Carbon Institute (IBCI).

- The blue carbon ecosystems are actionable, and there are array of activities and actions to tap its potential. They could be included in the NDCs or through the voluntary carbon market. On the aspect of voluntary carbon market, there are on-going discussion on mechanisms.
- Financing plays a big role for the blue carbon market to be sustainable. Monitoring and verification of blue carbon are laborious practice since ground-truthing requires to do on-site data collection. It requires a lot of resources – both financial and technical resources, coupled with challenges to establish standard methodology to account carbon offsetting projects.
- Currently, the Verra Standard is the only internationally accepted in the voluntary blue carbon market. The Verra method requires to discount the 2/3 of the carbon contributions that are coming from the outside, i.e., those carbon that are absorbed potentially due to other factors aside from the blue carbon project. The rigorous process of accounting blue carbon ensures that there is no double-counting, may it be under NDC or voluntary blue carbon market.
- While there is a rise on blue carbon market, carbon offsetting should not be singled out as the only solution to reduce greenhouse gas emissions. There should be a balanced effort also to decarbonize other sources and sectors.
- The number of blue carbon projects globally is still relatively small. The volume of the output of credits from the current blue carbon projects is very small compared to the total volume of what is traded. The speaker from Indonesia pointed out the value of the carbon credits from nature-based solutions, including those from forestry and other land use, are very high. Due to this fact, these credits coming from nature-based solutions are deemed more valuable. The benefits that the government can get from

this is potentially through an avoidance credit to prevent future deforestation or future habitat degradation, and therefore, locking in the carbon for the long-term.

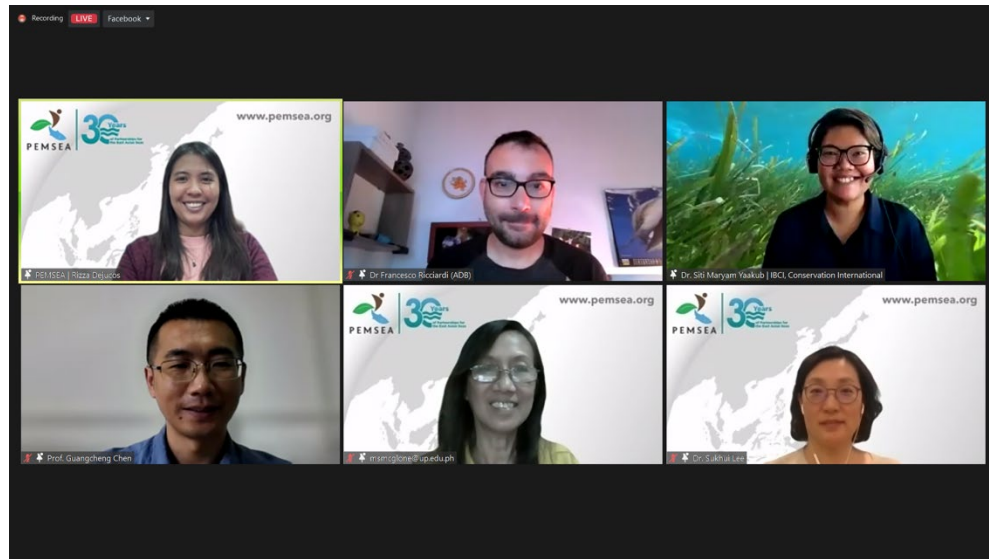
- There are some loopholes that still need to be tightened that could potentially be abused as was the case in the past. There has been a move recently for blue carbon buyers to only go for removal credits, e.g., reforestation and rehabilitation efforts. However, this can be considered unsustainable as there is only so much area that can be rehabilitated. In worse cases, mangrove reforestations have damaged other coastal ecosystems just by looking for more areas to be planted with mangroves. While blue carbon markets have big potential, the governments need to first understand the full inventory of blue carbon ecosystems in their respective countries.
- For temperate countries like China and Korea, tidal flats are also significant carbon sink aside from mangroves and seagrass beds. The governments can capitalize on this potential if they know their blue carbon inventory. Prior to directing commitments, it is important to conduct proper assessment and inventory to fairly determine they can tap the maximum potential of their existing blue carbon ecosystems.
- The IBCI focuses on three pillars:
  - To innovate on the science of blue carbon, i.e., to be able to provide global leadership in translating some of the cutting-edge science into tools and methodologies for the application of blue carbon in climate mitigation and adaptation.
  - To build the capacity on blue carbon. There is a lot of interest on blue carbon market but not a lot of training programs and information available to understand better the mechanisms and apply them into action including policy and sustainable financing.
  - To develop a global blue carbon network. Conservation International has been involved since the inception of The Blue Carbon Initiatives. The IBCI organized the international blue carbon science working group meetings almost annually except during the COVID pandemic. It aims to develop a global network and resource hub for the exchange of blue carbon expertise including knowledge sharing.
- One of the challenges that the IBCI encountered was the lack of standard mechanism to account blue carbon. Based on IBCI's experience, it would depend on the where the blue carbon credit will be channeled – is it going to the NDC or to the voluntary carbon market?
- There should be universal principles that can be used as a basis for developing accounting standards. These global principles should commonly promote transparency in any accounting methodology. When verifying carbon credits, any member of the public would like to know how carbon auditors conduct monitoring of these blue carbon habitats.
- The IBCI is hoping to develop these principles, together with the International Blue Carbon Science Working Group (SWG). These information from IBCI are publicly

available as a resource for people who are interested to create their own standards for their country that is suitable for specific context.

- There are already standards, field guides, and handbooks available in assessing blue carbon stock, including the accepted methodologies. These materials are available for download on the Internet (but IBCI website is currently being updated), and IBCI is still exploring new approaches developed by the scientific community over the last decade.
- The IBCI is also creating a training program for policymakers to include NDCs in the countries' national inventories. The reporting on blue carbon vis-à-vis NDC has increased in the last couple of years, which means that the work on blue carbon is making great strides toward including these very important habitats in national policies.
- While there are existing field guides and tools in accounting blue carbon, there is still a need for new approaches that can help hasten the process of accounting blue carbon including below-ground or soil carbon. There are lots of environmental factors that can dictate how much blue carbon is stored and how much is yet to come into the system (potential sequestration). Unlike the REDD+ in forestry where carbon sequestration can be estimated based on the growth rate of trees, sunlight, and other nutrients, the same cannot be done for the blue carbon ecosystems because the rates of sequestration can be wildly different even among the same species (e.g., mangroves) even if in the same country.
- The IBCI has already produced some papers to look at the correlations of different factors affecting blue carbon. This includes but not limited to:
  - How coastal tropical mangroves are probably better than the estuarine ones or the ones that are further inland because of the saltwater influence on how much GHG and methane are being degassed from the environment.
  - The need for new approaches could be in the realm of machine learning or process modeling, which has proven very useful in some cases. These tools need to be developed and they need to be able to deploy on masses. The IBCI will be working with the Smithsonian who has currently the global blue carbon data atlas. The Institute aims to develop a global database of blue carbon soil values collected in a standardized way, so that data can be comparable from one site to another, or there could be proxy sites nearby or have similar conditions in which data can be useful for calculations.

## **8. Open Forum**

8.1 Due to time constraints, most of the questions from the online participants were answered through the Question and Answer chat box of ZOOM. Below were the list of questions answered by the resource persons.



Question	Answer
What is the reason that the forest cover is declining? What can be done about that?	Dr. McGlone: Due to deforestation. Provincial ordinance is being developed to address this.
Is the remote sensing of carbon stocks related to the above ground C only? Or is it also correlated to belowground?	Dr. McGlone: Remote sensing is essentially for above ground blue carbon ecosystems.
I hope this seminar recording will be available for those who have missed it?	PEMSEA: Yes, the recording will be available on our Facebook channel.
Is the toolkit downloaded in the internet? If no, can we have a copy? Thanks	Dr. McGlone: Please email me <a href="mailto:msmcglone@up.edu.ph">msmcglone@up.edu.ph</a>
Multiple drivers seem to be included to the model simulation of mangrove health such as sea level rise, sea temperature rise, soil sediment, pollution among others. Could you elaborate on the significance of each driver on mangrove health especially in terms of promoting blue carbon?	Dr. McGlone: All those drivers affect coastal dynamics which influence mangrove growth and production.
So how to precisely and quickly assess the belowground carbon stocks for blue mangrove ecosystem as we reckon field survey is costly and requires more time?	Dr. McGlone: No quicker way than quantification of carbon content in sediment or soil using loss of ignition method or elemental analysis.

Why is action (project, research etc.) for seagrass still not as much as mangrove?	Dr. McGlone: There has been quite a bit of work on seagrass but remote sensing of seagrass is challenging. More validation is also needed.
Pak Andreas, how can the private sector support their goal to achieve the reforestation targets in Mangroves and rehabilitation of seagrass beds?	Dr. Andreas: Its open to any institutions to be a part of these actions. You could email me at : andreas0212@gmail.com for further discussion
For Mr, Andreas, if private company in Indonesia than Head Quarter in South Korea want to apply Blue Carbon Credit with VCM. The Credit will belong to Indonesia or South Korea?	Dr. Andreas: For international trading is still on-going discussion. At the moment, The new regulation is for domestic trading only.
In Indonesia, under FOLU sector for the future targets of the sinks, are mangroves included or it is only based on the terrestrial ecosystems?	Dr. Andreas: By the new Ministerial regulations, in practice the carbon trading/offset for FOLU is ready to start.
In Indonesia, under FOLU sector for the future targets of the sinks, are mangroves included or it is only based on the terrestrial ecosystems?	Dr. Andreas: Mangroves live on transition ekosistem, land and ocean.
Can we receive the recordings of this seminar?	PEMSEA: Hi, we will share the link. It will be automatically saved on our Facebook channel – <a href="https://www.facebook.com/pemsea">https://www.facebook.com/pemsea</a>
Interested to hear more about plans for seagrass restoration in China.	Dr. Chen: Yes, the restorations of seagrass was more successful in the northern part of China. Now, seagrass receives great public attentions.
Thanks you so much for your great presentation, How many categories do you study beforehand planting mangrove in the areas?	Dr. Chen: Before plantation of mangrove, an ecological survey is needed to understand the status, degradation, driving factors, and the necessary of restoration. The methods for restoration is then planed under clear goals.
What were the survival rates for the mangrove replanting in China?	Dr. Chen: It depends.... we have successful cases and also failure. According to standards, preservation rate by 45%~60% of mangrove plantation is recommended.
Ok. Thank you. I noticed however that your presentation was mostly about mangroves, I wonder what can be done to really bring seagrass further up the agenda...	Dr. Chen: Yes, we are promoting the seagrass restorations in China. Actually more seagrass projects are funded in recent years, and the management agencies are developing guidance for seagrass restoration. I hope I can share more in the future. : )

<p>(I am based in HK, and seagrass has potential in the Southern Guangdong area)</p>	<p>Dr. Chen: Yes, I noticed some seagrass meadows in Hong Kong. I guess I saw them adjacent to the mangroves. There are many seagrass locations in Guangdong, Guangxi dominated by halophila spp.</p>
<p>Which one is the most suitable and practicable at recent time for East Asia country, between carbon trading, RBP or carbon tax?</p>	<p>Dr. Ricciardi: The most suitable approach varies depending on the specific context of each country. In East Asian countries, the suitability and practicability of different approaches—carbon trading, REDD+ programs, and carbon tax—depend on various factors. Carbon trading can be suitable if there is a mature market infrastructure, potential for significant emission reductions across diverse industries, and robust regulatory capacity. REDD+ programs may be applicable in countries with substantial forest resources and effective forest governance, where financial incentives can drive forest conservation and sustainable management. Carbon tax can be considered if there is political acceptability, potential for emission reduction, and a clear plan for revenue utilization. For carbon trading, evaluating market readiness, emission reduction potential, regulatory capacity, and stakeholder engagement is fundamental. REDD+ programs require assessing forest resources, policy and governance structures, monitoring and verification systems, and access to financing. Carbon tax feasibility depends on political acceptability, emission reduction potential, revenue utilization plans, and mitigating social and economic impacts.</p>
<p>How can we become a blue carbon network?</p>	<p>Dr. Yaakub: You may visit <a href="https://www.conservation.org/about/international-blue-carbon-institute">https://www.conservation.org/about/international-blue-carbon-institute</a> for more information. The network component is still being ramped up at the moment.</p>



Thanks for the great presentations and insights !  
Was surprised to hear that mangroves are more efficient as carbon sink, compared to sea grass systems... Or did I get it wrong?

Interesting also to observe European DECREASE in development of C market compared to Asia, which is 'exploding.' Why is that?

Dr. Ricciardi: The decrease in the development of the carbon market in Europe compared to the growth observed in Asia can be attributed to several factors. Europe has been a pioneer in carbon market development with the establishment of the EU ETS in 2005. As a result, the initial rapid expansion of the European market may have slowed down as Governments shifted their focus to other climate priorities such as renewable energy and comprehensive climate policy frameworks, at least in some countries. Having been in operation for many years, the market has established its mechanisms, trading infrastructure, and regulatory frameworks. This maturity can result in slower growth compared to emerging markets in Asia that are in the early stages of establishing their own carbon market systems. Policy changes and reforms, such as adjustments to the emissions cap and the introduction of Market Stability Reserves, have also contributed to a period of adjustment and stabilization in the market.

In contrast, Asia's carbon market development has been driven by the region's increasing focus on climate action, sustainability, and rapid economic growth. Rising emissions in developing Asian economies have emphasized the need for carbon pricing mechanisms to drive emissions reductions and support sustainable development.

#### 8.2 The following general conclusions were observed from the forum:

- To promote and maximize the potential benefits from the blue carbon market, the support from the national government is necessary in terms of providing fiscal and regulatory incentives, financial support, and promoting community participation in planning and implementation and ensuring the protection and restoration of this blue carbon ecosystems at the same time.
- Countries in the East Asian Seas Region have already started exploring blue carbon, either as part of their NDC or the voluntary blue carbon market. They are in various stages, i.e., some countries are yet to complete their blue carbon inventory while others have already established a trading system. There should be a continuous exchange of knowledge and learnings such as this forum to appraise key partners on the respective work of each country. Sharing of information can help organizations, scientific bodies, and other networks to review and improve the existing approaches.
- Establishing a harmonized standard blue carbon accounting method does not only help countries in doing blue carbon inventory but can also increase traction among funding institutions and private investors to support the blue carbon market. A standard blue carbon accounting method can help calculate investment returns,

which is one of the primary factors being considered in financing.

- The Verified Carbon Standard or Verra remains the benchmark institution in carbon credits. While there are countries who have developed their own trading system, there is a growing opportunity for organizations to review and consolidate these methodologies and systems to come up with a more streamlined process that can cater countries in East Asia based on their regional context.

## Annex 1. Program

### The Rise of Blue Carbon Credits: A learning exchange on blue carbon initiatives in East Asian Seas 27 June 2023 | Hybrid event

Schedule	Discussion
09:00-09:05	Preliminaries <ul style="list-style-type: none"> <li>Introduction by the host/moderator</li> </ul>
09:05-09:10	Opening Message  <b>Aimee Gonzales</b> Executive Director PEMSEA Resource Facility
09:10-09:05	Setting the tone: What is Blue Carbon?
09:05-09:25	<b>The BlueCARES Project in the Philippines</b>  <b>Dr. Maria Lourdes San Diego-McGlone</b> Professor Emeritus Marine Science Institute University of the Philippines
09:25-09:45	<b>Blue Carbon Strategy in Indonesia: Highlight Climate Actions Agenda Post Presidential Decree No. 98/2021 on the Economic Value of Blue Carbon</b>  <b>Dr. Andreas Hutahaean</b> Deputy Director Coordinating Ministry for Maritime and Investment Affairs Republic of Indonesia; National Focal Point – Blue Economy Indian Ocean Rim Association
9:45-10:05	<b>Improving Blue Carbon Sink Capacity in China</b>  <b>Prof. Guangcheng Chen</b> Third Institute of Oceanography Ministry of Natural Resources People’s Republic of China
10:05-10:25	<b>RO Korea’s Blue Carbon Inventory and Preparations for obtaining international carbon credit through the blue carbon</b>  Dr. Sukhui Lee General Manager Korean Marine Environment Management Corporation
10:25-11:00	<b>Panel Discussion – Reactors</b>  <b>Dr. Francesco Ricciardi</b> Senior Environment Specialist. Sustainable Development and Climate Change Department Asian Development Bank  <b>Dr. Siti Maryam Yaakub</b> Director International Blue Carbon Institute Conservation International
11:00 -11:30	<ul style="list-style-type: none"> <li>Open Forum</li> </ul>
11:30-11:40	<ul style="list-style-type: none"> <li>Closing / Synthesis</li> </ul>

Annex 2. List of Secretariat  
**PEMSEA Resource Facility**

Name	Position
Ms. Maida Aguinaldo	Training and Capacity Development Officer
Mr. Renato Cardinal	Consultant
Ms. Rizza Sacra-Dejucos	Communications Specialist
Ms. Abigail Cruzada	Secretariat Coordinator
Mr. Rodante Corpuz	Integrated Information Management Services/IT Specialist
Mr. Jun Dacaymat	Photo/Video Library/Database/IT Support
Mr. Thomas Bell	Technical Officer (Timor-Leste Manager)
Ms. Suzette Bacay	Intern (Secretariat)
Ms. Hannah Panda	Intern (Comms and KM)
Ms. Angela Villano	Intern (Comms and KM)
Ms. Jeanne Francesca Cortez	Intern (ED and Research)

### Annex 3. List of Resource Persons

#### PEMSEA Partners / Presenters

Name	Affiliation
<b>Dr. Maria Lourdes San Diego-McGlone</b>	Marine Science Institute University of the Philippines
<b>Dr. Andreas Hutahaean</b>	Coordinating Ministry for Maritime and Investment Affairs Republic of Indonesia; National Focal Point – Blue Economy Indian Ocean Rim Association
<b>Prof. Guangcheng Chen</b>	Third Institute of Oceanography Ministry of Natural Resources People’s Republic of Chin
<b>Dr. Sukhui Lee</b>	Head of International Coo Korean Marine Environment Management Corporation

#### Reactors

Affiliation	Name	Position
Sustainable Development and Climate Change Department Asian Development Bank	<b>Dr. Francisco Ricciardi</b>	Senior Environment Specialist
International Blue Carbon Institute Conservation International	<b>Dr. Siti Maryam Yaakub</b>	Director