



**PROCEEDINGS OF THE
ROUNDTABLE
DISCUSSION ON BLUE
CARBON
ACCOUNTING IN EAST
ASIA**

Online via Zoom

27 June 2023



P E M S E A

Roundtable Discussion on Blue Carbon Accounting in East Asia

27 June 2023, 2 pm - 5 pm (UTC+8) via Zoom

PROCEEDINGS

INTRODUCTION

- i. The Roundtable Discussion on Blue Carbon Accounting in East Asia was held online via Zoom last June 27, 2023. The small group was composed of select representatives from the PEMSEA Resource Facility (PRF) and the PEMSEA Network of Learning Centers (PNLC). The objectives of the small group discussion were to (1) present the concept on PEMSEA Blue Carbon Credit system, including the general mechanism, roles of partners, and services; (2) share existing initiatives on blue carbon by partners (COMI-Xiamen University, CCMRS-IPB, MSI-University of the Philippines, Zhejiang University); and, (3) identify challenges and opportunities in blue carbon industry to determine strategic ways forward for PEMSEA in the blue carbon industry.
- ii. The supporting documents can be found in the annexes:
 - Annex 1: Links to the forum materials (documents, presentation slides, video recording, documentation); and
 - Annex 2: List of participants.

ROUNDTABLE DISCUSSION ON BLUE CARBON ACCOUNTING IN EAST ASIA

1.0 Opening Remarks and Introduction of Participants

- 1.1 The roundtable discussion commenced at 2:04 PM (UTC+8) with Dr. Keita Furukawa, PEMSEA Technical Session Chair, delivering the Opening Remarks.
- 1.2 He emphasized that PEMSEA, as a leader in coastal and marine management, is at the helm of engaging the blue carbon system, which drives conservation, biodiversity, and the climate system. He noted that engaging the blue carbon system creates a positive impact on the livelihood of communities involved in the blue carbon market.
- 1.3 Dr. Furukawa shared the objective of the discussion, i.e., to learn from the existing blue carbon initiatives among country partners and determine the potential role of PEMSEA in the blue carbon market. He encouraged a fruitful discussion among PNLC and PEMSEA partners.
- 1.4 The host, Ms. Rizza Sacra-Dejucos, made a round of introductions for the PEMSEA

Research Facility (PRF), followed by the presentation of the resource speakers.

2.0 Potentials of Blue Carbon in the Philippines

- 2.1 Ms. Dejucos formally introduced the first speaker, Dr. Laura T. David, the Director of the Marine Science Institute at the University of the Philippines (UPMSI). Dr. David is an expert in coastal oceanography, remote sensing of coastal and marine environments, and climate change adaptation. Her research on harmful algal groups, fish population estimation, and the resilience of mangrove ecosystems brought significant contributions to her field.
- 2.2 Dr. David highlighted the need to protect coastal ecosystems including mangrove, seagrass beds, and coral reefs. She mentioned that these provide for biodiversity and several ecosystem services.
- 2.3 Mangroves, for example, are known nursery grounds for fish. Dense and mature mangroves, in particular, provide coastal protection, as evident in the events of Typhoon Haiyan.
- 2.4 Tourism has also increased in mangrove forests, with the overall ecosystem service per hectare per year estimated to be \$33,000 to \$57,000 per hectare. Aside from tourism-related services, she emphasized that these ecosystems have climate regulation potential through carbon storage.
- 2.5 She explained that both mangrove and seagrass sequester carbon dioxide, particularly below-ground. Considering the carbon dioxide sequestered both above and below ground, it was found that mangroves store about, at least, three times more than the tropical forest. Global numbers report that on average, mangrove sequestration for carbon dioxide is 386 megagram per hectare. Seagrass on the other hand, sequesters an amount of 108 megagram per hectare on average.
- 2.7 Dr. David shared that most mangroves in the Philippines were converted to fish ponds or as development areas.
- 2.8 In measuring this lost mangrove cover, it was found that they could potentially store a billion megagram of carbon or 3,824 million metric tons of carbon dioxide. This is a sizable number that could make a dent on the carbon emissions of big countries such as China and the US.
- 2.9 She reiterated that the mangrove resource must be utilized and carbon sequestration should be properly accounted for.

- 2.10 Her findings revealed that numbers are higher in the Philippines as compared to the global average. Mangroves in the country, rather than storing about 300 megagrams, can actually store about 510 to 780 megagrams of carbon per hectare. While seagrasses in some areas in the Philippines store about 307 megagrams of carbon per hectare, much higher than the global average of 108 megagram per hectare.
- 2.11 Dr. David emphasized that mangroves and seagrass must be protected. In the case of mangroves, in which only 10% is left of what was previously widespread in the Philippines, initiatives to restore the 90% is crucial.
- 2.12 She also mentioned that there may be a need to include mudflats in conservation efforts, since such a practice is not prevalent in the country.
- 2.13 Based on data acquired from 17 sites in the Philippines, Dr. David found that the carbon stock accumulated was 2.7 million tons of carbon dioxide. In addition to that, seagrass bed sequestration was 1.7 up to 4.3 thousand tons per year. She noted that these numbers are equivalent to the annual offsetting of 15,000 to 29,000 average Filipino households.
- 2.14 At the local level, private and public partnerships are open for opportunities for the companies to conduct corporate social responsibility on various sites, including carbon offsetting in those areas. However, there are no procedural guidelines or policy on this.
- 2.15 Dr. David suggested the following steps to further encourage private partnerships:
- Crafting of policy to conserve, manage, and develop blue carbon ecosystems or resources of the Philippines;
 - Incentivize private sector participation for investments that protect marine habitats.
 - Streamline carbon sequestration policies between national governments, local governments, and the private sector.
 - Create and implement guidelines on where to plant, what to plant, and the target carbon sequestration.
 - Establish an organization that standardizes how to account for carbon sequestration activities
 - The organization will be responsible for certifying the data on carbon sequestration of involved parties.
 - Dr. David cited existing international organizations that are doing this kind of work: Verra, Gold Standard, American Carbon Registry, and Climate Action Reserve.

- Dr. David recommended that PEMSEA can take on this role of organization for Southeast Asia, so that the region will have its standard methodology and accounting method on carbon sequestration.

3.0 COMI: Coastal Blue Carbon Monitoring, Assessment and Trading in China

- 3.1 Ms. Dejucos introduced the next speaker, Dr. Luzhen Chen, Professor at the College of the Environment and Ecology/Coastal and Ocean Management Institute in Xiamen University.
- 3.2 Dr. Chen began by defining blue carbon as the coastal wetland ecosystems that store more carbon per unit area than terrestrial forests. She recognized how coastal wetland ecosystems play a key role in climate change mitigation. She presented an illustration showing how blue carbon cycling operates. It depicted the pathways within ecosystems that can accumulate carbon.¹
- 3.3 Dr. Chen explained that the coastal wetlands in China span 5,000 square kilometers of blue carbon ecosystems. Along the coastlines, there are mangroves, tidal marshes, and seagrass beds.
- 3.4 In northern China, salt marshes and seagrass beds are prevalent. In southern China, particularly in the provinces of Zhejiang, Hainan, and Guangxi, there are mangroves, as well as seagrass in areas further south.
- 3.5 She emphasized that these ecosystems serve as habitats for endangered animals, maintain extremely high biodiversity, and offer a wide range of ecosystem services.
- 3.6 Dr. Chen also mentioned that the state of blue carbon ecosystems in China are similar to global conditions. Mangrove forests face the challenge of continuous loss and unsustainable use. As an example, she described the mangrove ecosystem in Fujian province, which is at risk due to two issues:
- Aquaculture ponds situated to its right
 - Agricultural wastewater from these ponds affect the mangrove ecosystem
 - Abundance of invasive species of *Spartina* to its left
 - *Spartina* is invasive across all the coastlines of China
- 3.7 Despite these challenges, Dr. Chen noted that they still do a lot of work to measure carbon stock and carbon accumulation in mangroves and salt marshes. She stressed

¹ See 3rd slide of Dr. Luzhen Chen's presentation.

that it is fundamentally important to accurately estimate the changes in the carbon storage of these ecosystems. She mentioned that one of the methods they use to measure carbon is by using the Blue Carbon Manual released by the Blue Carbon Initiative in 2014.

3.8 Apart from this, they also use two other methods:

- Measuring carbon accumulated by plants
 - Typically done on mangrove ecosystems
 - Use of a permanent sample plot to measure net primary production
 - Annually measuring treatment and collecting litterfall production
- Measuring carbon accumulated by sediment
 - Use of the Surface Elevation Table (SET)

3.9 Based on their data set, Dr. Chen learned that sedimentation rate is the key parameter for carbon accumulation. The SET method, which was developed by scientists from the United States Geological Survey, is now being used on mangroves in the Pacific area, as well as in the United States.

3.10 She stated that they have set up multiple SET observation networks in the mangroves, salt marshes, and seagrass beds across the coastlines of China. They have almost 300 operational SET sites that conduct sedimentation monitoring. She reiterated that these observation networks are important because the data can reveal accumulation on the sediment.

3.11 **On the carbon market:**

3.12 Dr. Chen brought up how data on carbon accumulation can also be used in the carbon market, which has emerged globally. She added that there are about twelve blue carbon projects in China, and methodologies in carbon accounting are being developed based on the ecosystem characteristics of the country.

3.13 **On blue carbon trading cases in China:**

3.14 The first blue carbon trading case in China was launched in 2021. It is called the Zhangjiang project, and it followed the Clean Development Mechanism (CDM) methodology.

- The methodology is also referred to as AM-AR0014 (Afforestation and reforestation of degraded mangrove habitats)
- The Zhangjiang project was on the Verified Standard Carbon market.

3.15 Dr. Chen mentioned that in 2021, she developed the first blue carbon methodology

for mangroves in China at Xiamen University. This methodology was used for the mangrove restoration project in Fujian province. Another new methodology was developed in Fujian province, and this was announced in 2023.

3.16 The third mangrove restoration project was launched in 2022 in Haikou, Hainan. Another methodology was also developed there around the same time. Dr Chen explained that they continue to develop new methodologies for other ecosystems such as salt marshes and seagrass beds.

3.17 Dr. Chen presented the details on three blue carbon projects in China:

- Quanzhou Mangrove
 - She presented news clipping with the headline, “Restored Mangroves in Quanzhou of Fujian becomes the first Blue C project traded by domestic trade platform “Xiamen C Stocks Exchange Center of China.”
- Haikou Mangrove
 - She noted that the Haikou project is significant because about 130 hectares of forest were restored in the Sanjiang site.
- Xiamen Mangrove
 - In 2017, there was a summit held in Xiamen, which led to the restoration of about 20 hectares of mangrove. It was considered as a carbon offset for the carbon emission from the previously held summit.
 - Currently, they are conducting regular monitoring to account for annual changes in the carbon accumulation in the said site.

3.18 Dr. Chen ended her presentation by emphasizing how collaboration with other research institutes and universities can be crucial to the development of their carbon accounting methods and mangrove biodiversity protection. She cited a few partners including the United States, Brazil, Europe and their networks within Asia.

4.0 The Experience of Center for Coastal and Marine Resources Studies on Blue Carbon Research and Training Program

4.1 Ms. Dejudos introduced the third presenter, Dr. Yonvitner, director of the Center for Coastal and Marine Resources Studies (CCMRS) at the Bogor Agricultural University (PKSPL-IPB) in Indonesia, and the incumbent president of the PEMSEA Network of Learning Centers.

4.2 Dr. Yon began by emphasizing that it is important to try and find the ecosystems that can adopt and absorb greenhouse gas emissions as mitigating measures to climate change.

4.3 He underscored how impacts of climate change have significantly affected the local

communities particularly the coastal and island areas. Both the economic and non-economic losses due to climate change should be accounted for and evaluated.

- 4.4 He stated that Indonesia is committed to carbon emission reduction. They are acquiring information on mangroves, tidal marshes, and seagrasses, as information about these blue carbon ecosystems can impact the works of research institutes, governments, and communities.
- 4.5 Dr. Yon explained that the Indonesian Government has adopted two strategies to reduce carbon emissions by 25% on its own, and by more than 35% with the help of global institutions:
- Adaptation - strengthening the capacity building of communities
 - Mitigation - countermeasures to prevent climate change
- 4.6 He shared the Blue Carbon Roadmap of Indonesia in relation to the achievement of Nationally Determined Contributions.
- 4.7 In reference to the diagram he presented, the following were the main key points:
- Capacity building through seminars, workshops, and internships;
 - A localized approach to carbon research and rehabilitation to ecosystem;
 - Need for human resources to support national and sub-national research projects and carbon reduction; and
 - Training for NGOs, local governments, and educational institutions.
- 4.8 Dr. Yon also listed the following reasons to justify the need for capacity building among stakeholders:
- To increase community understanding about the impacts of climate change;
 - To enhance the capacity of communities to address these impacts; and
 - To disseminate information on blue carbon methodologies, technical skills, and instruments used to assess and manage emissions reduction.
- 4.9 He enumerated the areas covered by CCMRS' capacity building efforts. This included the following:
- Awareness of climate change impact and greenhouse gas emission;
 - Policy on climate change and emission reduction (global and national);
 - Inventory of blue carbon ecosystem;
 - Carbon stock assessment method and analysis of blue carbon ecosystem;
 - Emission Reduction Method and Analysis;
 - Reference Emission Level for Mangrove (FREL) and Seagrass (SREL);
 - Project Design Document or Mitigation Action Plan Document (PDD);
 - Monitoring, Reporting and Verification (MRV) policy and institutional

strengthening;

- Emission monitoring and reporting;
- Validation and verification of mitigation action; and
- Benefit sharing and stakeholders engagement strategy.

4.10 Dr. Yon explained the training process for Blue Carbon Accounting (BCA) using the diagram that showed the necessary input, training process or capacity development, and target output. By the end of the training, the participants are expected to be certified blue carbon accountant or analyst.

4.11 Part of the training program is a field visit to learn firsthand about the methodology, implementation, and calculation of carbon.

4.12 He also presented the training process for the monitoring, reporting, and verification/validation of blue carbon. The MRV blue carbon training aims to capacitate a practitioner to become a blue carbon accounting arranger or validator. The training is also essential for developing a national database. In Indonesia, there is a need to develop a national database for blue carbon.

4.13 Dr. Yon explained that there are two levels of blue carbon accounting.

- **Level 1 Qualification - Carbon and Emission Accountant/Measurer of Blue Carbon**
 - Policy and inventory of blue carbon greenhouse gas emissions;
 - Policy, theory, and practice of collecting data on mangrove and seagrass ecosystems;
 - Carbon stock analysis on mangroves and seagrass; and
 - Introduction to emission calculation procedures for seagrasses and mangroves.
- **Level 2 Qualification - Blue Carbon Specialist**
 - Forest/seagrass reference emission level (FREL/SREL);
 - Analysis of emission reduction in blue carbon;
 - Deforestation and de-seagrassion;
 - Deforestation and degradation of mangrove;
 - Project Design Document (PDD) arrangement;
 - Validation process in National Registry System (SRN); and
 - Verification and validation process in Emission Reduction Project.

4.14 He clarified that a Blue Carbon Specialist deals not only with carbon assessment, but also carbon management. They are able to implement projects in provincial sites.

4.15 Dr. Yon presented materials and documentation of BCA Training. This includes the BCA

Training Module, as well photos from BCA training seminars and field visits. He also showed an example of a certificate that is granted to trainees who have acquired a level of qualification in BCA. This was distributed by the CCMRS, together with Indonesia's Ministry of Marine Affairs and Fisheries. For **Level 1 Qualification** or the basic level for carbon training, it requires 42 hours to complete the course. This is a prerequisite to **Level 2 Qualification** or becoming a blue carbon manager. Prior to becoming a carbon manager, trainees also need to learn information about:

- National and subnational data management
- Research and monitoring management
- Blue carbon market management
- Blue carbon benefit share
- Blue carbon community feedback
- Blue carbon ecosystem sustainability
- Blue carbon sustainability society

4.16 Dr. Yon shared the series of training that they conducted in 2021, delivered by a diverse group of researchers, experts and scientists from CCMRS, ministries in Indonesia and their National Research and Innovation Agency.

- Coaching Methodology Series #2 - hybrid online and offline (undergraduate and graduate students)
- Blue Carbon Accounting Training Level #1 - Offline training (undergraduate, graduate students, researcher, company and professional)
- Blue Carbon Accounting Training Level 1 Batch #2 - Offline training (undergraduate, graduate students, researcher, company and professional)

4.17 The series of trainings were composed of different activities:

- Class activity - trainees were given basic knowledge about the blue carbon ecosystem and measuring carbon stock.
- Seagrass field survey simulation - measuring carbon in seagrass including the biomass and list of species.
- Mangrove field survey simulation - measuring carbon in mangrove (above-ground and below-ground) including list of species.
- Working group and discussion - measuring carbon in mangrove (above-ground and below-ground) including list of species.
- Biomass sample handling and analysis - cleaning samples from the field, weighing biomass and recording data.
- Pre-test and post-test - participants were given a basic test about blue carbon and carbon accounting and measurement before and after training.

4.18 Dr. Yon pointed out that a global approach to blue carbon assessment, data, market intelligence, and empowerment is crucial, however, there is also a need to enrich the

local approach that may differ for each country, depending on their experience and methods. This would entail enlisting local facilitators.

- 4.19 He also gave an overview of the initiatives conducted by CCMRS in Indonesia:
- Blue Carbon and Climate Vulnerability (Adaptation) in the Karawang Regency;
 - Research in the north and outset of Java; and
 - Field Observations in West Lombok.
- 4.20 He wrapped up his discussion, emphasizing that sharing this information through the small group discussion was a step towards capacity building in East Asia, but more collaboration would be needed to increase opportunities of carbon training in the region.

5.0 From Blue Carbon to Ocean-based Solution and Its Management

- 5.1 Ms. Dejudos introduced the fourth and final presenter, Dr. Guanqiong Ye, an Associate Professor at the Institute for Island and Coast Research in Ocean College, Zhejiang University.
- 5.2 Dr. Ye introduced the three well known blue carbon ecosystems — salt marshes, mangroves, and seagrass — as well as their trading systems, which were presented by the first speakers.
- 5.3 She mentioned that there is a need to pay attention to human activities and their impacts on these three ecosystems and climate change threats. There is also a need to take into account the ecosystem services, which includes regulating, supporting, provisioning, and culturing.
- 5.4 She presented their published work entitled, “The Contribution of Ocean-based Solutions to Carbon Reduction in China.” As part of the working group in China, she discussed the integrated assessment framework for ocean intervention engineering for climate change mitigation. They characterized these intervention engineering as: foam engineering, macroalgae cultivation, alkalinity addition, artificial upwelling, iron fertilization, cloud seeding, and offshore seabed.
- 5.5 She presented their conceptualized Blue Carbon Technical Road Map of Zhejiang Province, wherein they planned to expand the blue carbons definitions to ocean-based solutions.
- 5.6 The five key activities that they proposed for the blue carbon development vis-a-vis climate change mitigation are renewable energy, low carbon transportation, blue

carbon ecosystems, and fishery ecosystems.

- 5.7 She also shared the collection of the typical ocean carbon reduction projects, plans, and strategies in China from the national level to the local level. Currently, there are 24 representative projects and plans.
- 5.8 She introduced national level plans such as the program initiated by Xiamen University, i.e., One Active Carbon Emission. The program is also being supported by the Ministry of Education, the Chinese Academy of Sciences, the Ministry of Natural Resources, and the Ministry of Ecological Environment.
- 5.9 China also supports the United Nations Decade of Ocean Science for Sustainable Development.
- They have a special action plan for mangrove protection and restoration projects which will be implemented on the local level.
 - Implementation of Blue Bay Comprehensive Renovation Action, which is ongoing for 10 years now, that seeks to restore the bay areas.
 - Develop an Action Plan to decrease carbon emission by 2023, as issued by the State Council. Offshore wind power is also included in this plan.
- 5.10 Dr. Ye presented a map that shows the 11 coastal provinces have initiated Blue Carbon Projects. This includes the provinces of Tianjin, Shandong, Jiangsu, Shanghai, Zhejiang, Fujian, Guangdong, Guangxi, Hainan, Liaoning, and Hebei.
- 5.11 She showed data, which was the preliminary accounting number for the global oceans carbon emissions from human activities in the marine sector. The data considered oil production, ocean renewable production, and blue carbon loss, which is huge per year.
- 5.12 She presented data on total ocean carbon sinks, mariculture carbon sinks in the year 2020, long-term blue carbon, short-term blue carbon, and offshore carbon sinks. The data implied that short-term blue carbon sink was the total carbon storage of the above-ground ecosystems while the offshore carbon sinks were different areas of the sea that are carbon storage including the marine waters itself.
- 5.13 She also considered blue carbon for Blue Carbon Welfare. She shared a paper on NCC where blue carbon wealth is huge and one of the best nature-based solutions for climate change and sustainability.
- 5.14 She explained how they determined the co-benefits of blue carbon welfare.
- Consideration of human activities, climate change, and generation of the

ecosystem services from the blue carbon ecosystem.

- The framework of the methodology to be used in coordinating these co-benefits.
- Management aspect of blue carbon accounting and the ecosystem itself.
- Maximizing the benefits and minimizing the disadvantages of the restoration of the blue carbon ecosystems or the blue carbon trading systems.

5.15 She presented one example of the study where they calculated the cost benefit of reeds and mangroves from the longtime scale to determine if it was cost-effective. The cost benefit has increased significantly as time went. Specifically, the blue carbon ecosystem on seaweed cultivation was increasing dramatically as time went by.

5.16 She presented a model on how to do the trade-offs between blue carbon sinks and the added value of seaweeds. They considered direct and indirect ecosystem services and its blue carbon storage ecosystems. They showed that if they harvested 80% of the seaweed every year for processing production, they could get maximum cost benefits from the ecosystem services and edible values. After harvest, all seaweed will be provided or accounted for food edible values. They can also reduce carbon emissions by 24 to 25 trillion gigatons per year, which is equivalent to 224,000,000 trees or 14 million cars for one year (the oil used for cars).

5.17 She mentioned that a blue carbon framework in China has been developed. It covers the mangrove blue carbon trading system, and considers carbon capture. It seeks to enhance the ecological function, and the public community's involvement on the cost of the restoration projects.

6.0 Open Forum

6.1 Dr. Keita facilitated the open forum. He requested Dr. Yon to elaborate on the training and educational system management issues on benefit sharing. He also asked what kind of benefit sharing IPB was considering, who will pay for it, and who will benefit from it.

6.2 Dr. Yon explained that many institutions in Indonesia have been involved in blue carbon projects and activities. The success of the carbon restoration, in fact, depends on the monitoring and control of these institutions. They also reap the benefits from the carbon trading that involved mangroves and seagrasses. In return, these institutions allocate resources or invest to support the blue carbon projects. They strategically targeted institutions and communities that have high involvement or stake in blue carbon.

- 6.3 Dr. Keita added that there are many contributions so some coordinating mechanism is required as contributing communities may conduct themselves differently from private investors who come in.
- 6.4 Another participant, Mr. Goro Tamaru asked Dr. Yon on the project adaptation co benefits in Java, how are its drivers identified and what the barriers are to promote adaptation co-benefits.
- 6.5 Dr. Yon cited their projects in Java, Lombok, Tangerang, Sumatra and others in the South China Sea and in Papua. Since the carbon trading in Indonesia is expected to start in September, they are in the process of determining the real core benefit of carbon in their country. They explore this through training and community empowerment. Community plays a key role in delivering information on mangrove population and technical counting. They train communities on how to calculate carbon contribution and provide them knowledge on technical processes. In this process, the community knows and appreciates their role in the blue carbon trading or market. Currently, the private sector in Indonesia is involved in carbon management but they do not have significant contribution yet in the restoration and rehabilitation aspect.
- 6.6 In Dr. Yon's insights, the carbon trading benefit will be delivered to the local government until the village government gets support from the national government. The local villages get a share from the carbon storage contribution as the national government will deliver budget allocation to them. Dr. Yon mentioned his willingness to share more information if people are interested by sending him their contact details.
- 6.7 Mr. Tamaru expressed his appreciation in answering his questions. He also introduced himself as part of the Institute for Global Environmental Strategies (IGES), an organization that focuses on climate change adaptation and risk management.

7.0 PEMSEA Proposed Blue Carbon (BC) Certification Program

- 7.1 Mr. Renato Cardinal, PEMSEA consultant, introduced the proposed blue carbon certification program of PEMSEA.
- 7.2 Mr. Cardinal reiterated that East Asia is a global hotspot for coastal blue carbon ecosystems. He explained that it is one of the areas where we have an opportunity to improve the management of coastal blue carbon ecosystems, as they serve to address climate change.
- 7.3 He pointed out that a step towards improving and conserving these blue carbon

ecosystems would be to establish the PEMSEA Blue Carbon Certification Program. At present, there are not a lot of organizations that provide services for Blue Carbon certification in the region.

7.4 He explained that only Verra has initiated standards in blue carbon accounting and certification. Given the rich ecosystems in East Asia, it is high time that the region develops its own certification program that will tailor-fit the local context of each country. He explained that there are developments regarding this in each country, however, a consolidated regional standard is still necessary.

7.5 He enumerated the reasons why PEMSEA could be a viable or potential organization that can take on the role.

- It has decades of experience in integrated coastal management in East Asia.
- It is widely connected to a network of experts and institutions related to the field of coastal management.
- It has experience in providing certification to local governments and other institutions that implement integrated coastal management systems. Majority of those local governments have projects related to blue carbon (mangrove, seagrass, habitat restoration, etc.).
- It has also worked with the private sector, particularly those in the port or maritime industries. In the port sector, PEMSEA has over 10 years of experience in developing certification for health, safety and environmental management.

7.6 He also reiterated that there are available blue carbon programs all across the East Asian Seas region. Countries are taking a step towards including blue carbon ecosystems in their Nationally Determined Contributions (NDCs). There are currently 71 countries that include coastal and marine nature-based solutions in their updated NDCs.

7.7 Additionally, more and more companies from the private sector are considering blue carbon as an option in their carbon offset certifications.

7.8 Mr. Cardinal explained that there are two types of programs for certification.

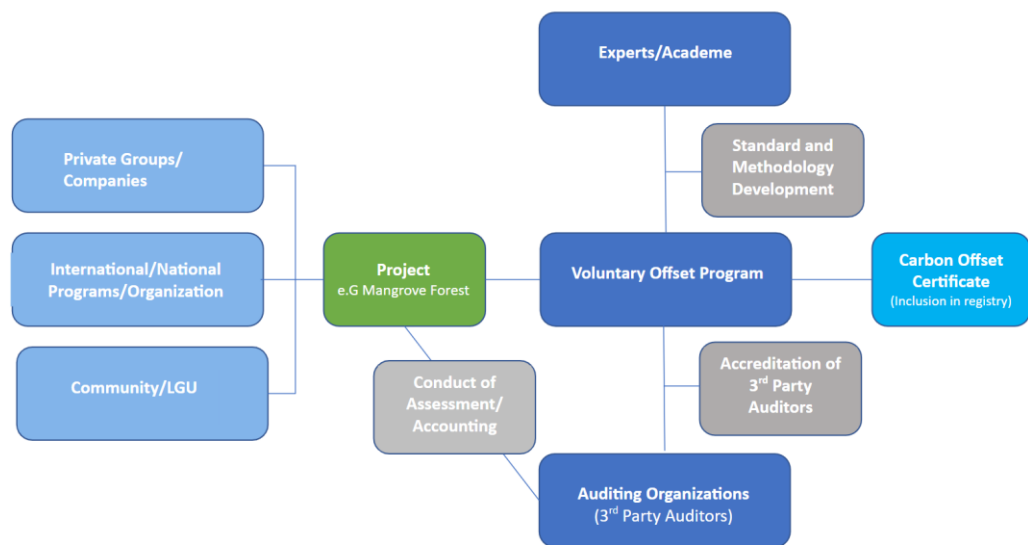
- **Compliance**
 - Program being run by government bodies, e.g., programs related to the UN Clean Development Mechanism, Regional Greenhouse Initiatives
- **Voluntary Compliance**
 - Program being run by non-government organizations, e.g., American Carbon Registry, Climate Action Reserve, Gold Standard, Plan Vivo, Verra

- Regional voluntary offset programs are also being initiated, such as J Blue in Japan

7.9 PEMSEA will fall under the **voluntary compliance program**.

7.10 Mr. Cardinal presented an overview of the process and roles using the diagram below:

DIAGRAM OF VOLUNTARY OFFSET PROGRAM CERTIFICATION STRUCTURE



7.11 In summary, he explained that:

- An alliance of private groups, international/national organizations, and community or local governments will drive the process by organizing and implementing a project.
- This project will be assessed by the voluntary offset program, along with experts and third party organizations, who will verify the data.
- Upon completion and validation of results, the program will be able to grant a carbon offset certificate, which shall be included in the Carbon Offset Registry.

7.12 He highlighted that in order to complete this process, there is a necessity for a standard methodology that can be used for the conduct of the validation and verification process. He emphasized that this methodology should be developed urgently. He described this as the critical stage in setting up the voluntary offset program.

7.13 He explained that after developing the standard methodology, the voluntary offset program shall organize the process for the conduct of verification and validation,

which is usually conducted by third party auditors.

7.14 The third party auditors will provide information to the voluntary offset program. The resulting data will be used by the voluntary offset program to either include the project design in the Carbon Offset Registry or to issue a carbon offset certificate.

7.15 Mr. Cardinal proposed the following process for implementation:

Project Development and Implementation	Certification Process
The alliance between the private sector, NGOs, international organizations, and community/local governments will initiate the project design .	Project design will be submitted to the certification process. A methodology for verification will either be created or chosen.
	Project validation will be conducted by auditors on behalf of the Carbon Offset Certification Program. If the project is approved, then it will be included in the registry of approved projects.
Project implementation can then begin, as spearheaded by the alliance of sectors and organizing bodies.	Using the established methodology , the project will be continuously monitored and verified.
	If data from project implementation successfully shows that it has offset carbon, then a carbon certificate will be issued, depending on the quantity of the sequestered carbon.

7.16 Mr. Cardinal first emphasized the need for consultations with other stakeholders already experienced in measuring carbon sequestration. This includes national initiatives by the likes of Indonesia (existing carbon accounting method), Japan (J Blue project) and China (mangrove assessment methodology). He also cited that relevant research from experts, institutions, and academes may be helpful.

7.17 He outlined these action points, which will startup PEMSEA’s blue carbon certification program:

- Establish a methodology, which requires extensive consultations with the PNLC partners. Other stakeholders that can help in this process are those experienced with national initiatives, such as experts from Indonesia (existing

carbon accounting methods), Japan (J Blue project) and China (mangrove assessment methodology).

- The objective of organizing these stakeholders is to eventually have a standardized method extracted from various sources.
 - PEMSEA will oversee this entire process.
- After the initial step, PEMSEA will begin establishing partnerships with existing local governments or communities that implement blue carbon projects. The objective here is to integrate the methodology previously developed with the PNLC partners.
 - This step will initiate the certification program's pilot projects.

7.18 He emphasized that what is crucially needed is knowledge sharing with partners about their existing blue carbon projects, accounting and certification processes. These discussions will lead to a regional standard for blue carbon certification.

7.19 Mr. Cardinal enumerated the following steps **to initiate/pilot the PEMSEA blue carbon certifications**:

- **Conduct a roundtable discussion** with PEMSEA partners and academe to discuss the initial concept.
- **Gather experiences and existing methodologies** for blue carbon activities and initiatives of PEMSEA partners, academe and experts. **Conduct a detailed market study for blue carbon certification.** Establish the demand and willingness to pay for such a program.
 - Considered here is whether the market for blue carbon certification is viable. A market study will be conducted to assess if there are enough blue carbon projects and support from the private sector to push through with a certification program.
- **Develop the detailed concept and process** for voluntary offset program certification.
 - This will be done with the PNLC and other partners.
- **Develop the Blue Carbon Certification Program**
 - Develop organization for certification (Governing Body, Program Administration, Pool of Experts, Auditors, etc.).
 - Develop methodology and standards for certification (including protocol, process, procedures, fees, etc.).
 - Develop the technical systems to manage and file certifications.
- **Organize partnership** among LGU, Private Sector and other sustainable development organizations.
 - These partnerships will be foundational to project designing and implementation of blue carbon initiatives.
- **Implement the Blue Carbon Certification Program certification activities**
 - **PEMSEA Blue Carbon Certification Auditors** conducts validation of the pilot projects.
 - **PEMSEA Blue Carbon Program Registry** – inclusion of project to the “Registry”

- **PEMSEA Blue Carbon Certification Auditors** conducts verification of the implementation of the project.
- **PEMSEA Blue Carbon Program** - issue carbon offset certificate.
- **Develop and implement “marketing/advocacy and sustainability activities”** for the PEMSEA Blue Carbon Certification

7.20 Mr. Cardinal also enumerated the following challenges:

- Existing standards and protocols for carbon offset certification are focused on forest application. There is a need to fill in the gap, and develop more appropriate methods for blue carbon.
- Existing blue carbon accounting methods need to be standardized.
- There is a need to encourage countries to implement policies and programs for blue carbon ecosystems. It would also help to have blue carbon integrated into their NDCs.
- At the global level discussion, policy-maker and negotiators need to highlight blue carbon initiatives more.

7.21 Mr. Cardinal highlighted the following points:

- Sharing of expertise and experience with regard to blue carbon (project implementation/participation experiences; case studies; scientific/academic knowledge for measurement/accounting/ assessment; etc.).
- Identify initiatives and resources for moving forward/development of blue carbon service (including certification).

8.0 Open Discussion on PEMSEA Blue Carbon Certification Program

8.1 Before opening the discussion, Dr. Keita first presented an existing blue carbon marketing exercise in Japan.

8.2 He explained that by 2030, Japan seeks to become a no net carbon emission society. This is an effort of the government; particularly, it is being spearheaded by the Ministry of Land, Infrastructure, Transport and Tourism.

8.3 He briefly described the blue carbon ecosystem, highlighting seaweed and kelp beds, tidal flats, seagrass beds and mangrove forests. He shared that Japan, through the Ministry of Fishery Agency, has existing methods for quantifying the carbon sequestration of these ecosystems. Simply defined, carbon sequestration is carbon captured in the marine ecosystem for long periods of time (hundreds to thousands of years). An easy formula would be carbon sequestration equals carbon sequestration ratio multiplied by the habitat area or:

- (Value of Carbon Production)(Remaining Ratio)(area of action/habitat)

- 8.4 He also mentioned that drifting seaweed and seagrass are led into the deep sea, which is also another form of sequestration, but in an isolated area.
- 8.5 Based on a matrix done, Japan has 1700 square kilometers of blue carbon ecosystems which may be used for blue market credit.
- 8.6 Japan has a Blue Economy Association where the blue carbon producers or the NPO groups/citizens create blue carbon by conserving or restoring BC ecosystems. The J Blue Economy Association makes the credit certification also through consultations and transfers these offsets to credit buyers who are mostly private companies wanting to reduce their carbon emissions.
- 8.7 JBE, as a science-based organization, makes the credit certification and provides coordination between the credit creator and credit buyer. JBE then acts as an authentication institution and as a coordinating institution for the carbon market in Japan.
- 8.8 In terms of carbon credit production, he noted the importance of societies to act and for scientists to make evaluations for certification. It is also necessary to acknowledge the traditional knowledge and livelihood activities which need a good network of communities to support carbon credit production.
- 8.9 PNLG members or ICM/IRBM project sites may be very good candidates for implementing this network of stakeholders. And he also proposed PEMSEA to act as coordinator for this complicated voluntary marketing mechanism. For certification and authentication, which requires highly scientific activities, the RCoEs and PNLC may act as the body for this.
- 8.10 Dr. Keita then opened the floor for discussion posing the following questions: What could PEMSEA's role be in Blue Carbon which is emerging as a new 'currency'? And what are PEMSEA's needs, limitations and challenges, contributions, methodology and certification standards and possible activities in the next 3 years?
- 8.11 Suggestions, comments, contributions of the participants:**
- 8.7 Dr. Qinhua Fang began by stating that he is not an expert in blue carbon, but learned a lot throughout the whole day of discussions. He is impressed by all the presentations.
- 8.8 On behalf of the Xiamen University, he offered the expertise of their faculty and networks in mangrove ecosystems, like Dr. Chen who has also recently developed

methodologies and has rich experience in blue carbon and has practiced trading in China. They are also connected with experts, like Dr. Zhu Xudong, who does remote sensing, satellite imaging, and drones to monitor the details of data of mangrove trees which will also contribute to the measurement of blue carbon. They also have experts like Dr. Penrong Beng, on economics, economic valuation of ecosystem services including blue carbon. They also have other experts in modeling and mapping. COMI can provide expertise and may be involved in future initiatives and projects of PEMSEA. He mentioned that they are also willing to offer a training program in cooperation with other learning centers on blue carbon accounting and certification and other aspects. Good practices of blue carbon trading in China are widely reported in China but would be good to make it known in the world. COMI can compile case study materials and participate in the brainstorming sessions to move PEMSEA's blue carbon certification program forward.

- 8.9 Dr. Yon found it a great opportunity to collaborate. He suggested to initially conduct workshops and seminars regarding approaches to carbon accounting and trading for East Asia. He affirmed that PEMSEA can develop the general approach and methodology for East Asia.
- 8.10 Dr. Yon also mentioned that varying methodologies likely yield different data or focus on different aspects (carbon price, quality, quantity). He is supportive of the PNLC contributing to the development of new methodology, matching, among other things. Afterwhich, other support partners in East Asia may be invited. He also emphasized that targets for certification and capacity building (for groups or individuals, as carbon assessors or carbon managers) need to be set to develop strategies and capacities for carbon assessment, trading, and management and that the progress of the next three years will be defined by the group's efforts.
- 8.11 Dr. Yon suggested that the small group should meet each month to define their next steps, and to come up with standardized concepts/methods/modules/approaches.
- 8.12 Dr. Keita summarized the discussions: (1) needs are carbon trading in East Asia and a good management system for blue carbon; (2) limitations are in data quantity and quality; (3) contributions: COMI as BC CoE, PNLC as certification/supporting institution and the communities as participants/managers (4) own accounting methodology and certification standards (5) next step is to start with a small group to compile standards.
- 8.13 Mr. Fukuda stated that IGES is exploring the opportunities to develop co-benefit between adaptation and the field of blue carbon and that while certification is key to blue carbon, it may be far-removed from adaptation. It will be useful to define the roles of the demand side, the supply side and system development side. JBE, as

mentioned, is a system developer and acts as the coordinating mechanism between the demand side and the supply side. The presentations mentioned that there is a huge demand from the national and local sector and the business side for carbon credits. PEMSEA can play the role as demand side support, supply side support and system development. In this, it is useful to learn from the JBE experience.

8.14 Dr. Ye stated that PEMSEA is a good platform to implement co-benefit projects. East Asia is a hotspot for biodiversity and BCEs. She is interested in the concept of blue carbon as a 'new currency' but if we want to combine the benefits of blue carbon credit and blue carbon welfare, we will have challenges or barriers to integrate them. The Climate, Community and Biodiversity (CCB) has standards to combine carbon benefits and ecosystem services benefits but the methodology for accounting carbon credits and ecosystem services are different. In considering both the carbon credits and ecosystem services, it will be a barrier as they usually separate the two. Though for the CCB program, they consider carbon as one of the ecosystem services. The sharing mechanism is important if the community is involved. All projects need to have investments. Dr. Ye posed a question on how these benefits can be shared if we are to cross boundaries of administrative management. She reiterated that PEMSEA would be a good platform for a regional program such as this as it will be able to address transboundary issues.

8.15 Ms. Aimee T. Gonzales, PRF Executive Director, shared her insights:

- She emphasized that the afternoon's discussion was the beginning of a long process to startup PEMSEA's blue carbon certification program. There is an interest in blue carbon market initiatives and numerous partners want to join or contribute.
- She also noted that a discussion on blue carbon currency is also an interesting topic to explore in relation to PEMSEA's proposed blue carbon certification program.
- Further discussion is necessary to determine clearly the potential role of PEMSEA in the growing field of the blue carbon market. There is a need to gather concrete figures on market demand and supply.
- She mentioned that PRF is looking for partners to get the initiative started, pending other details. The opportunities are promising, and are currently under negotiation.
- She committed that the PRF will continue to pursue this endeavor and keep its partners informed on their areas of collaboration. She also reminded the group to keep PRF and each other informed of the different opportunities wherein knowledge gaps can be addressed or discussed.

8.16 Dr. Keita extended his thanks to Ms. Gonzales for synthesizing the afternoon's discussion. He formally adjourned the meeting, but emphasized that this was only the

beginning of more insightful knowledge sharing and brainstorming.

8.17 Closing remarks:

8.18 Ms. Dejudos formally closed the small group discussion, reiterating the potential role of PEMSEA in the blue carbon sector in East Asia, and the areas for collaboration to explore among partners.

8.19 The group took a photo for documentation purposes.

ANNEX 1. LINKS TO RELEVANT FILES.

Meeting Documents

- [Program - Blue Carbon Regional Forum and Roundtable Discussion](#)
- [Concept Summary for PEMSEA Blue Carbon Certification](#)
- [Small Group Discussion Program Guide](#)

Presentation Files

- [Presentation Slides of Speakers](#)

Video Recording

- [Zoom Recording](#)

Photo Documentation

- [Small Group Discussion Photos](#)

ANNEX 2. LIST OF PARTICIPANTS.

Executive Committee

Name	Position
Dr. Keita Furukawa	Technical Session Chair

PEMSEA Resource Facility

Name	Position
Ms. Aimee Gonzales	Executive Director
Ms. Rizza Sacra-Dejucos	Communications Specialist
Mr. Renato Cardinal	Consultant
Ms. Maida Aguinaldo	Training and Capacity Development Officer
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)

PEMSEA Network of Learning Centers

University	Name	Position
University of the Philippines	Dr. Laura David	Director, Marine Science Institute
Xiamen University	Dr. Luzhen Chen	Professor, College of the Environment and Ecology/Coastal and Ocean Management Institute
	Mr. Qinhua Fang	Vice-President, PNLC Director and Professor Coastal and Ocean Management Institute
Institute for Global Environment Studies	Mr. Goro Tamaru	Fellow

IPB University	Dr. Yonvitner	Head, Center for Coastal and Marine Resources Studies
	Isdahartatie	Researcher, Center for Coastal and Marine Resources Studies
Zhejiang University	Dr. Ye Guanqiong	Associate Professor, Institute for Island and Coast Research, Ocean College