

Enhancing capacities of
local stakeholders in
Coral Triangle in
managing Blue Carbon
Ecosystems for climate
mitigation and
adaptation



CBA2020-05SY-Kohsaka

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1. Summary

The management of mangroves, seagrasses and salt marshes, collectively known as “blue carbon ecosystems” (BCEs) is significant because of global contribution to climate change mitigation while delivering co-benefits (e.g., food source, coastal protection) at the local level. However, despite their diverse ecosystem services, BCEs are continuously subjected to anthropogenic (e.g., land-use conversion) and natural (e.g., typhoons) threats which in turn result in the reduction or loss of their important services. In the context of climate change, there degradation could result to the increase of carbon dioxide in the atmosphere. Thus, the blue carbon concept has now reached international prominence and gained attraction from diverse groups of individuals including the scientific community, non-government organizations, intergovernmental bodies, and policymakers to conserve and protect, and to provide science-based recommendations for policy and management strategies of BCEs. Through the Asia-Pacific Network for Global Change Research (APN) funding, which supports global change research on climate mitigation, this project contributed to BCEs management from local perspectives of social and policy sciences which are largely overlooked, yet, integral parts of sustainability. Through a collaborative approach from scientists and national-to-local governmental bodies, with aspirations from Sustainable Development Goals (SDGs) and APN goals, a series of capacity development workshops was conducted in the Philippines and Indonesia. Results of the workshops highlighted that there are multiple factors to be identified and understood in enhancing stakeholders’ capacity. These included their perceptions, personal views or experiences, and external influencers (e.g., social media, non-government organizations). Availability and accessibility of capacity development tools was documented to be critical for local stakeholders to be more independent from external organizations. These workshops highlighted that by involving local stakeholders in climate change discussion, they are more likely to participate in various BCE management activities. Moreover, including them in scientific investigations empowers them, and making the research results more beneficial to community. Their participation to data generation can inform them on the importance of science-based activities and user-friendly decision-support guidelines.

2. Objectives

The main objective of the project is capacity development of the local key players in BCEs management using the results of assessments of BCEs’ various values and vulnerability including its prospects for adaptation and mitigation. To achieve this, there are six specific objectives:

1. To identify the key players (stakeholders, policy-makers) in BCEs management.
2. To conduct series of workshops for the stakeholders and policy makers about BCEs, management and services, and introduce citizen science concept.

3. To conduct monitoring workshop using cellphone applications and transfer the knowledge on visualization of the monitoring results to share the relevant information with local stakeholders.
4. To expose regional partners to global change researches through short research visit and collaborative works.
5. To create a localized guideline for capacity development activities for the stakeholders and the rest of the community, identifying the site-specific factors such as local customs and mechanism of local environmental issues and general factors which need to be addressed in the target sites and other sites in coral triangle region.
6. To develop a science-based policy framework and citizen science tool as means of locals' participatory monitoring and evaluation.
7. To publish reports, academic papers, and web sites which will disseminate the fruits of this project and facilitate the further development and application of the proposed capacity development methods.

3. Outputs, Outcomes and Impacts

Outputs	Outcomes	Impacts
Key players (stakeholders, policymakers) in BCE management in the study sites have been identified.	Various actors (e.g., different government units, people's organization) are involved in BCE management.	Presence of multiple players in BCE management increases the implementation of various management activities.
Capacity development workshops for the key stakeholders completed.	-More stakeholders know the blue carbon science. -Key issues on stakeholders' participation to BCE management are identified.	-Increasing level of awareness of BCE benefits. -More locals participating to BCE management activities. -More locals participating to capacity development workshops.
Monitoring workshop conducted.	-More stakeholders are aware of the threats to BCEs. -Existing management activities or programs are identified.	Increasing level of awareness on the importance of BCEs and why they should be protected and sustainably managed.
Regional partners and collaborators are exposed to global scale research.	-Collaborative manuscripts are in development and a few are published.	Indonesian collaborators have reached their goals in publishing two papers in high-impact international

		journals. This achievement is vital to their promotion and/or career.
Local monitoring guideline is created.	-Science-based monitoring guideline is tested in the field. -User-friendly monitoring guideline encourages more participation from local stakeholders. -Drivers of changes are identified. -Local stakeholders are effective in mapping BCE changes.	-User-friendly monitoring tools and participatory methods encourages local stakeholders to be more involved in monitoring BCE. -Improved appreciation of scientific investigations by local communities. -A promising reduction of illegal activities in BCEs.
Participatory mapping method is developed.		
Peer-reviewed papers are published and shared to stakeholders.	-More stakeholders know their importance of a multi-disciplinary research. -More stakeholders know the blue carbon science.	-Increasing level of awareness to BCE benefits -Increasing contribution of BC investigations in the Philippines and Indonesia to the global scientific community.

4. Key facts/figures

- Four capacity development workshops (two online workshops and two in-person workshops) was held to enhance local stakeholders' capacity in managing BCEs for climate mitigation and adaptation in the Philippines and Indonesia.
- Four study sites were identified for capacity development workshops.
- A total of sixty-six local stakeholders across the study sites have participated in the workshops.
- A total of forty-eight participants from the academe, national government offices, and non-government organizations across the study sites have participated in the workshops.
- Local monitoring and participatory mapping tools have been developed.
- Three local enumerators have been trained to conduct the monitoring tools.
- Three early-career professionals trained and collaborated.
- Nine peer-reviewed journals published in high-impact international journals
- Four conference/symposium presentations have been done.

5. Publications

1. Quevedo, J. M. D., Uchiyama, Y., & Kohsaka, R. (2021). Linking blue carbon ecosystems with sustainable tourism: Dichotomy of urban–rural local perspectives from the Philippines. *Regional Studies in Marine Science*, 45, 101820. <https://doi.org/10.1016/j.rsma.2021.101820>
2. Quevedo, J. M. D., Uchiyama, Y., Lukman, K. M., & Kohsaka, R. (2021). Are municipalities ready for integrating blue carbon concepts?: Content analysis of coastal management plans in the Philippines. *Coastal Management*, 49(4), 334-355. <https://doi.org/10.1080/08920753.2021.1928455>
3. Lukman, K. M., Uchiyama, Y., Quevedo, J. M. D., & Kohsaka, R. (2022). Tourism impacts on small island ecosystems: public perceptions from Karimunjawa Island, Indonesia. *Journal of Coastal Conservation*, 26(3), 14. <https://doi.org/10.1007/s11852-022-00852-9>
4. Quevedo, J. M. D., Uchiyama, Y., & Kohsaka, R. (2022). Understanding rural and urban perceptions of seagrass ecosystem services for their blue carbon conservation strategies in the Philippines. *Ecological Research*. <https://doi.org/10.1111/1440-1703.12325>
5. Quevedo, J. M. D., Uchiyama, Y., & Kohsaka, R. (2022). Community perceptions of long-term mangrove cover changes and its drivers from a typhoon-prone province in the Philippines. *Ambio*, 51(4), 972-989. <https://doi.org/10.1007/s13280-021-01608-9>
6. Rifai, H., Quevedo, J. M. D., Lukman, K. M., Sondak, C. F., Risandi, J., Hernawan, U. E., Uchiyama, Y., Ambo-Rappe, R., & Kohsaka, R. (2023). Potential of seagrass habitat restorations as nature-based solutions: Practical and scientific implications in Indonesia. *Ambio*, 52(3), 546-555. <https://doi.org/10.1007/s13280-022-01811-2>
7. Quevedo, J. M. D., Lukman, K. M., Ulumuddin, Y. I., Uchiyama, Y., & Kohsaka, R. (2023). Applying the DPSIR framework to qualitatively assess the globally important mangrove ecosystems of Indonesia: A review towards evidence-based policymaking approaches. *Marine Policy*, 147, 105354. <https://doi.org/10.1016/j.marpol.2022.105354>
8. Quevedo, J. M. D., Uchiyama, Y., & Kohsaka, R. (2023). Progress of blue carbon research: 12 years of global trends based on content analysis of peer-reviewed and ‘gray literature’ documents. *Ocean & Coastal Management*, 236, 106495. <https://doi.org/10.1016/j.ocecoaman.2023.106495>
9. Rifai, H., Quevedo, J. M. D., Lukman, K. M., Hernawan, U. E., Risandi, Alifatri, L., Risandi, J., Uchiyama, Y., & Kohsaka, R. (2023). Understanding community awareness of seagrass ecosystem services for their blue carbon conservation in marine protected areas: A case study of Karimunjawa National Park. *Ecological Research*. <https://doi.org/10.1111/1440-1703.12391>
10. Quevedo, J. M. D. & Kohsaka, R. (under review). A systematic review of cultural benefits of blue carbon ecosystems: Trends, gaps, and challenges in Asia and beyond.
11. Sofue, Y., Quevedo, J. M. D., Lukman, K. M., & Kohsaka, R. (under review). Identifying Changes/Drivers in Mangrove Landscapes: Analysis by Remote Sensing and Community Perceptions in Balangkayan (Philippines) and Muara Gembong (Indonesia).

6. Media reports, videos and other digital content

1. Contributed to APN Perspectives with the title “Engaging local policymakers in blue carbon and climate dialogues”, published online on 27 July 2021.

<https://www.apn-gcr.org/perspective/engaging-local-policymakers-in-blue-carbon-and-climate-dialogues/>

7. Pull quotes

“Understanding local perception and socioecological characteristics can serve a basis to enhance local community awareness and capacity. Applying bottom up ‘citizen science approaches’ for the management of BCEs is necessary to address specific local issues and to promote sustainability and community resiliency as well as apt climate change mitigation and adaptation practices”

-Prof. Ryo Kohsaka, The University of Tokyo, Japan

“I am very fortunate to have been involved in this project from the initial proposal development to project implementation. The main objective is to enhance local stakeholders’ capacity but the project has also greatly improved my capacity as a young researcher. Working with local communities has made realized that while doing research is challenging, presenting the results to the stakeholders is more challenging. It is necessary to effectively translate climate change science to a user-friendly mitigation and adaptation strategies”

-Dr. Jay Mar Quevedo, The University of Tokyo, Japan

“The project gave us insights on the importance of blue carbon. It made us appreciate and realize how humans and environment can symbiotically exist. If you understand nature, loving and nurturing it becomes a labour of love”

-Ms. Campanero Fe, Assistant Municipal Tourism Officer, Balangiga

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