



Social and policy science perspectives of local blue carbon initiatives in the Coral Triangle Region and considerations for upscaling the restoration

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EMPLOYMENT RECORD

2022- Professor at Graduate School of Agricultural and Life Sciences, The University of Tokyo
2019 - 2022 Professor at Graduate School of Environmental Studies, Nagoya University
2018 - IPBES external review panel / Asia-Pacific Regional Assessment Coordinating Lead Author
2017 - 2018 Visiting Professor at Seoul National University
2016 - 2019 Professor at Graduate School of Environmental Studies, Tohoku University, Japan
2012 - 2016 Associate Professor at Graduate School of Human and Socio-Environment Studies, Kanazawa University
2008 - 2012 Associate Professor, Economics, Nagoya City University
2006 - 2008 Professional Officer at UNEP Secretariat CBD
2004 - 2006 Post-Doctoral Fellow at University of Tokyo, Tokyo Japan
1997 - 1998 Project Officer at the Regional Environmental Centre for Central and Eastern Europe (REC), Hungary. Honoured as Life Fellow

EDUCATION

2000 - 2004 Ph.D. Univ. Freiburg, Germany
1998 - 1999 M.Sc. in Environment and Development, University of East Anglia
1994 - 1998 B.Sc. in Rural Dev., Agricultural Faculty, University of Tokyo

The **BLUE CARBON** (BC) Concept

BC refers to organic carbon that is captured and stored by coastal and marine ecosystems, particularly by mangrove forests, seagrass meadows, and tidal marshes [Nellemann et al. 2009]

BLUE CARBON ECOSYSTEMS
(BCEs)

Among the **most productive ecosystems** offering <u>beneficial services that directly or indirectly enhance people's well-being</u> and supporting local communities and national economies [Crooks et al. 2017]

Provisioning (e.g., food, timber)
Supporting (e.g., habitat for commercially important species)
Cultural (e.g., aesthetic, spiritual)
Regulating (e.g., coastal protection, natural buffer)

[Primavera 2000; Uddin et al. 2013; Mukherjee et al. 2014; Hansen and Reidenbach 2017; Dasgupta et al. 2019]

<u>key service</u> they provide is the capacity to mitigate climate change

<u>Carbon (atmosphere) captured</u> by coastal environments
[Pidgeon 2009]

<u>Stored Organic Carbon</u> in Biomass-above and below ground
[Mcleod et al. 2011; Alongi et al. 2016]

THREATS

Reclamation, deforestation, engineering and urbanization, transformation to aquaculture ponds

[Duarte et al. 2013]

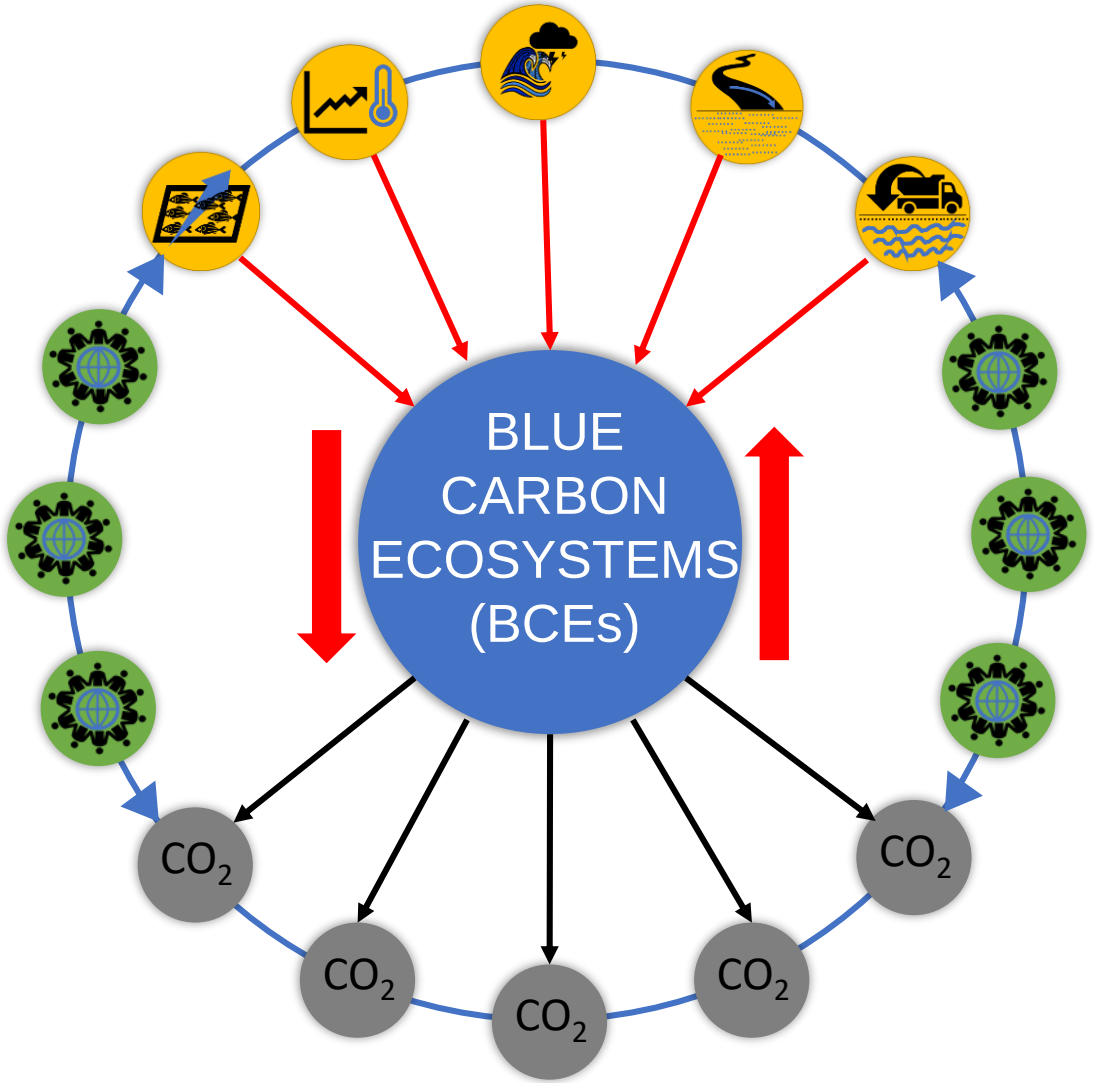
THREATS

Natural disasters

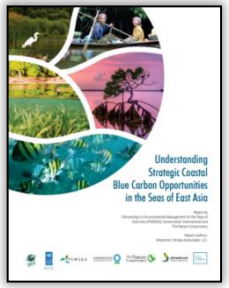
[Primavera 2000]

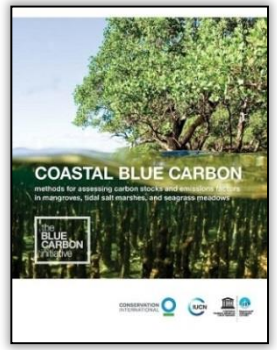
Warming Sea Surface Temperatures

[Fortes 2018]



GLOBAL INITIATIVES





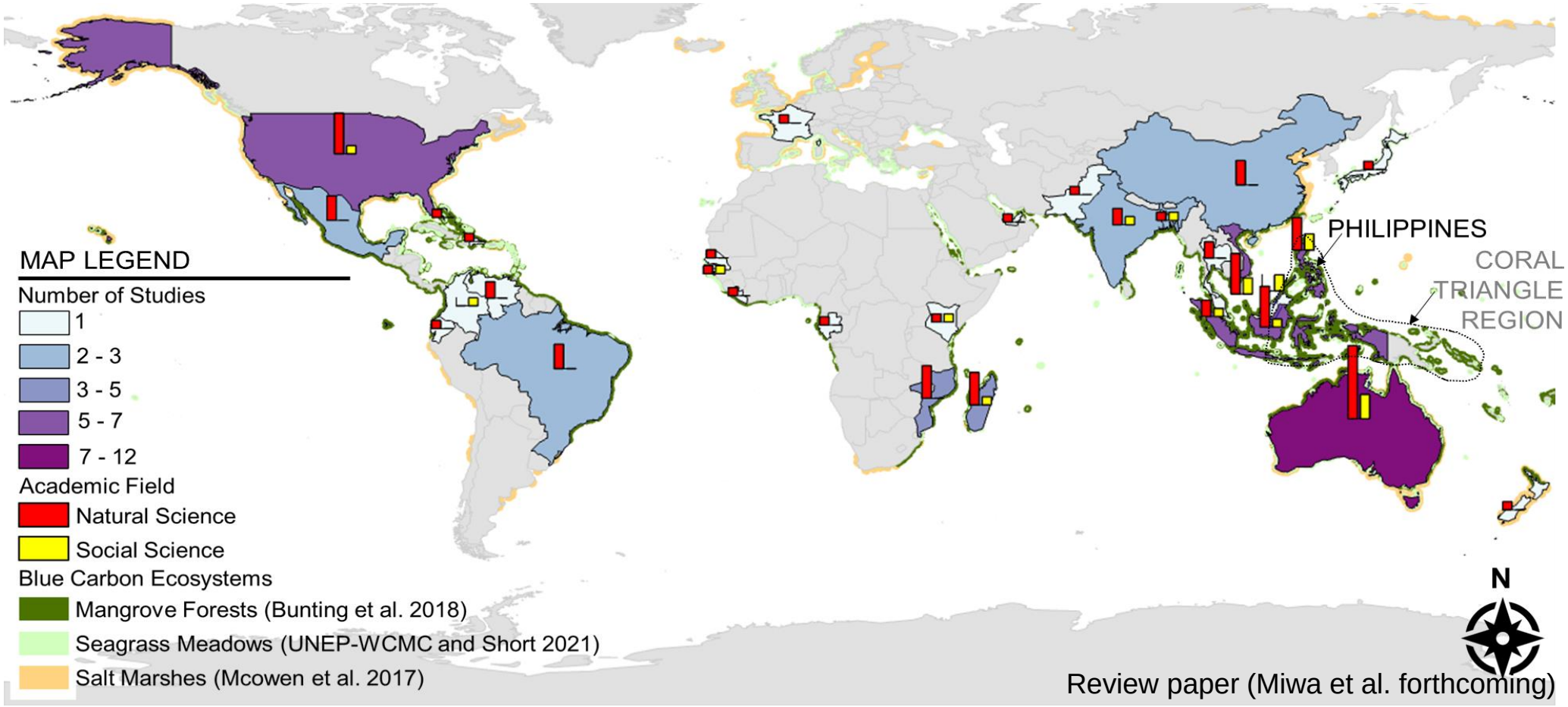
GLOBAL INITIATIVES

Scientific studies and peer-reviewed journals

EFFECT

When degraded or destroyed, they can be a <u>SIGNIFICANT</u> <u>SOURCE OF GREENHOUSE GAS EMISSIONS</u>, with thousands of years of sequestered carbon released over a period of years to decades [Crooks et al. 2011]

BCE-related studies have **progressed over the years**



Review paper (Miwa et al. forthcoming)

as of 2019 (limited to peer-reviewed articles)

Natural science disciplines are more focused as research topics (e.g., carbon sequestration rates) in the scientific community
[e.g., Alongi et al. 2015, Friess et al. 2016, Macreadie et al. 2017]

Social science-related studies on BCEs are limited globally, despite being an essential part of the research and practice of BCE management

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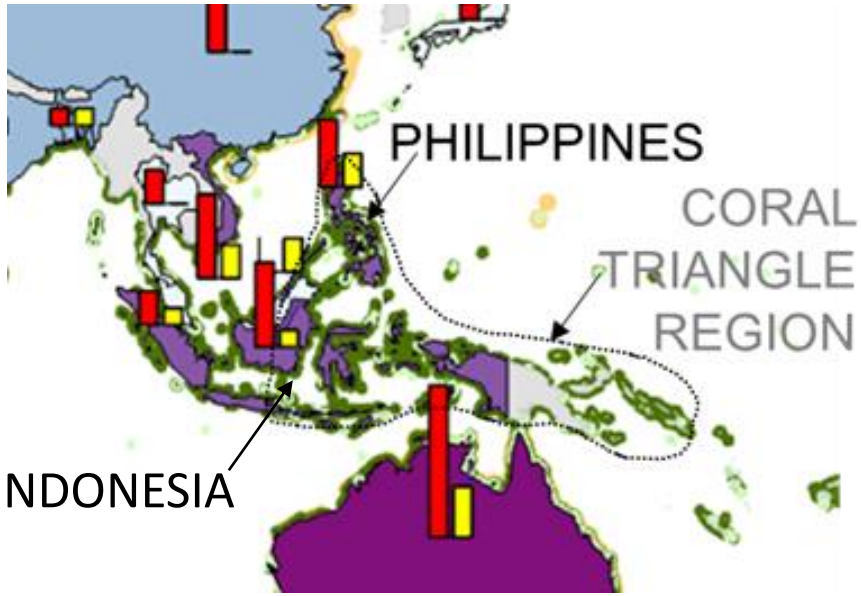


We **provide insights on the current local blue carbon initiatives in Indonesia and the Philippines,** where BCEs are among the main resource of many communities, yet, are continually being degraded by **utilizing social and policy science assessments tools**

Key informant interviews with key local and provincial policymakers

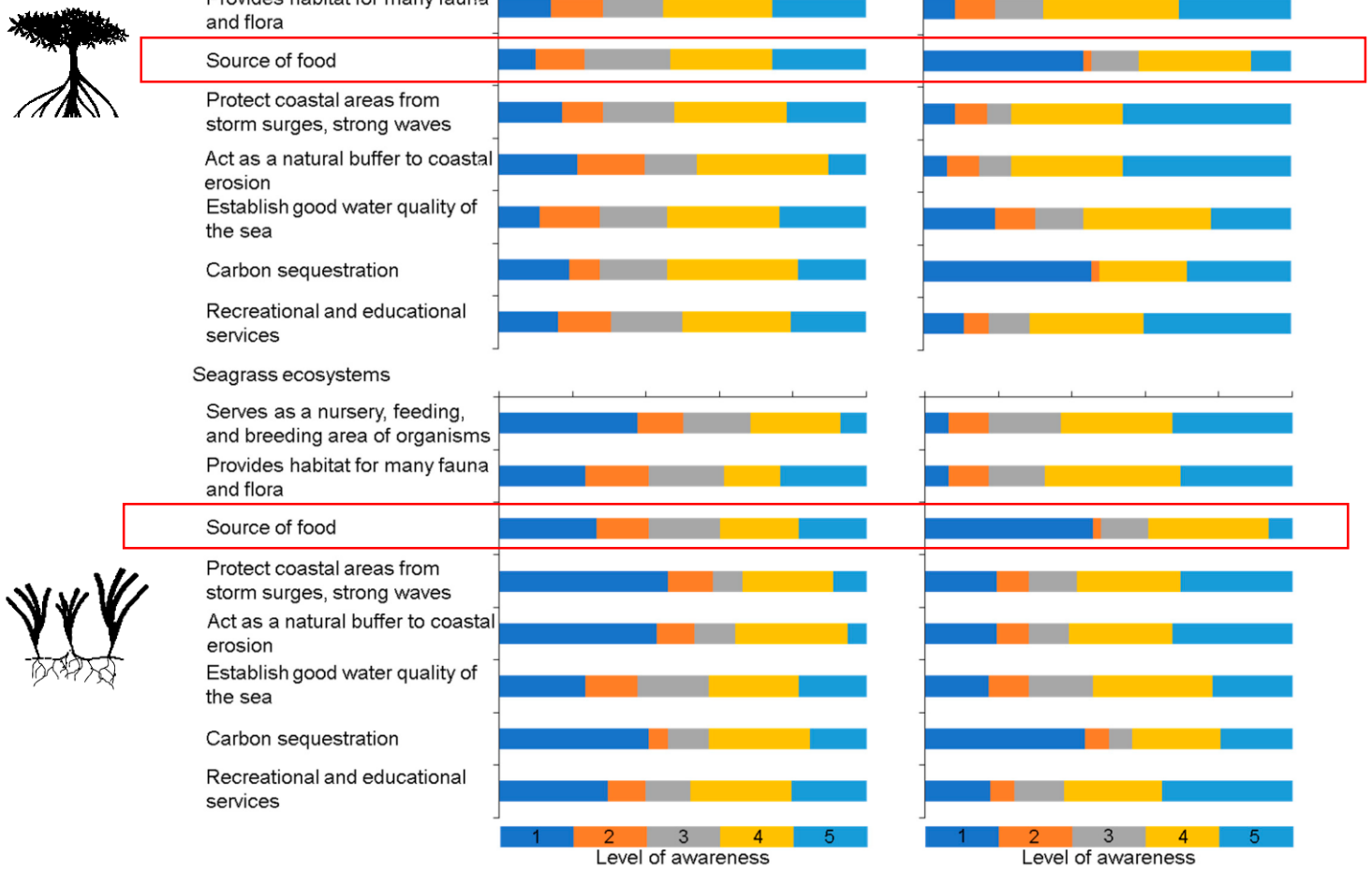
Household surveys (community perceptions)

Focus group discussions

Socio-ecological surveys (collaborating with other disciplines)

Community perceptions of BCE services

Insights from Busuanga Island, Philippines and Karimunjawa Island, Indonesia



How Blue Carbon Ecosystems Are Perceived by Local Communities in the Coral Triangle: Comparative and Empirical Examinations in the Philippines and Indonesia
[Quevedo et al. 2021]

Awareness level of mangrove ES in Busuanga is fairly consistent, with 27.6% to 35.7% of the respondents being "very aware" of all the ES

Recognition of seagrass ES depends on the type of service; provisioning, supporting, and cultural benefits are highly recognized while regulating services are poorly known ("not aware")

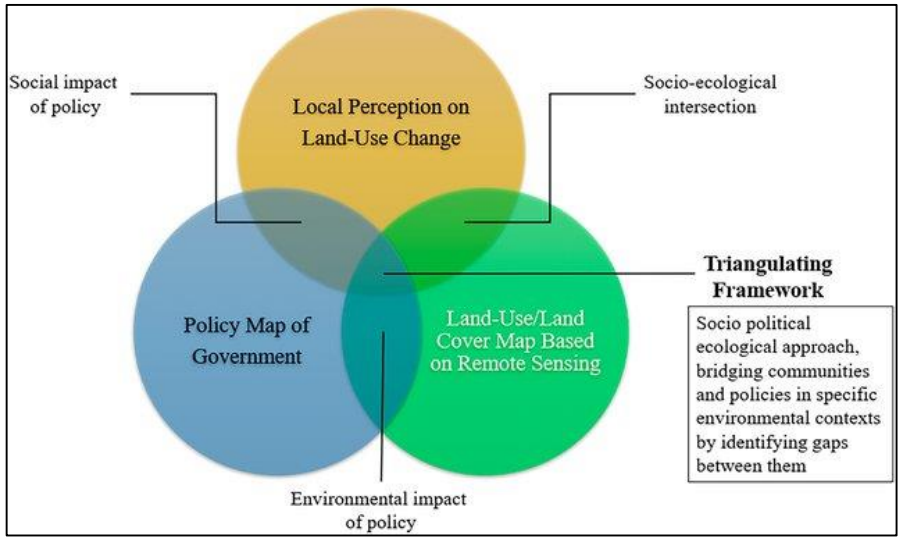
Awareness level of mangroves and seagrasses' ES have the same trends in Karimunjawa; respondents were "extremely aware" of supporting (serves a nursery, feeding, and breeding area), regulating (coastal protection and natural buffer), and cultural (recreational and educational) services

Interestingly, almost half (43.5% to 45.7%) of the respondents are "not aware" of provisioning services of BCEs

Community participatory mapping

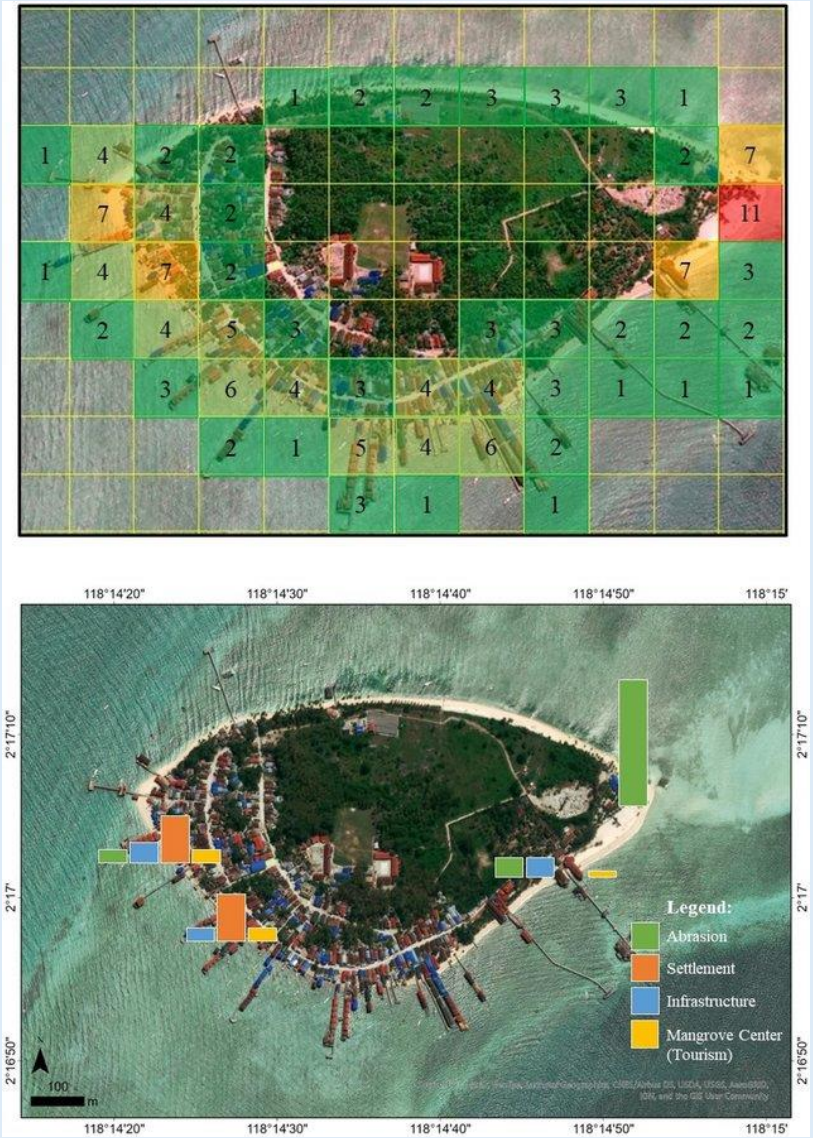
Insights from Derawan Island, East Kalimantan, Indonesia

Three datasets



The proposed **triangulating framework** provide a holistic approach of understanding the land-use change, its drivers and existing policy strategies

Land Use Changes Assessment using a triangulated framework: Perception Interviews, Land-Use/Land Cover Observation, and Spatial Planning Analysis in Tanjung Batu and Derawan Island, Indonesia [Lukman et al. 2021]

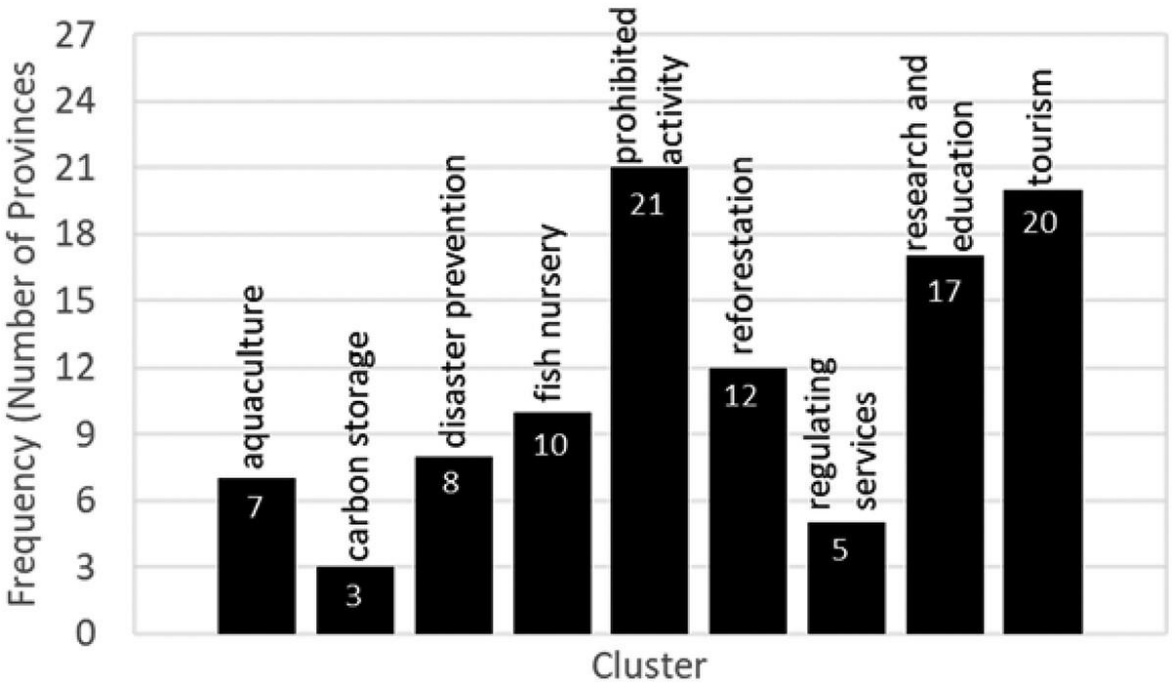


Community participatory mapping helps **identify the drivers affecting the BCEs and existing BC initiatives**

Derawan Island

- Perception: Drivers
- LULC map: Change in the vegetation detected
- Policy map: Island is classified as strategic zone for environment conservation and tourism activities

Current placement of BCE initiatives in provincial scale



Indonesia Provincial Spatial Plans on mangroves in era of decentralization: Application of content analysis to 27 provinces and "blue carbon" as overlooked components

[Lukman et al. 2019]

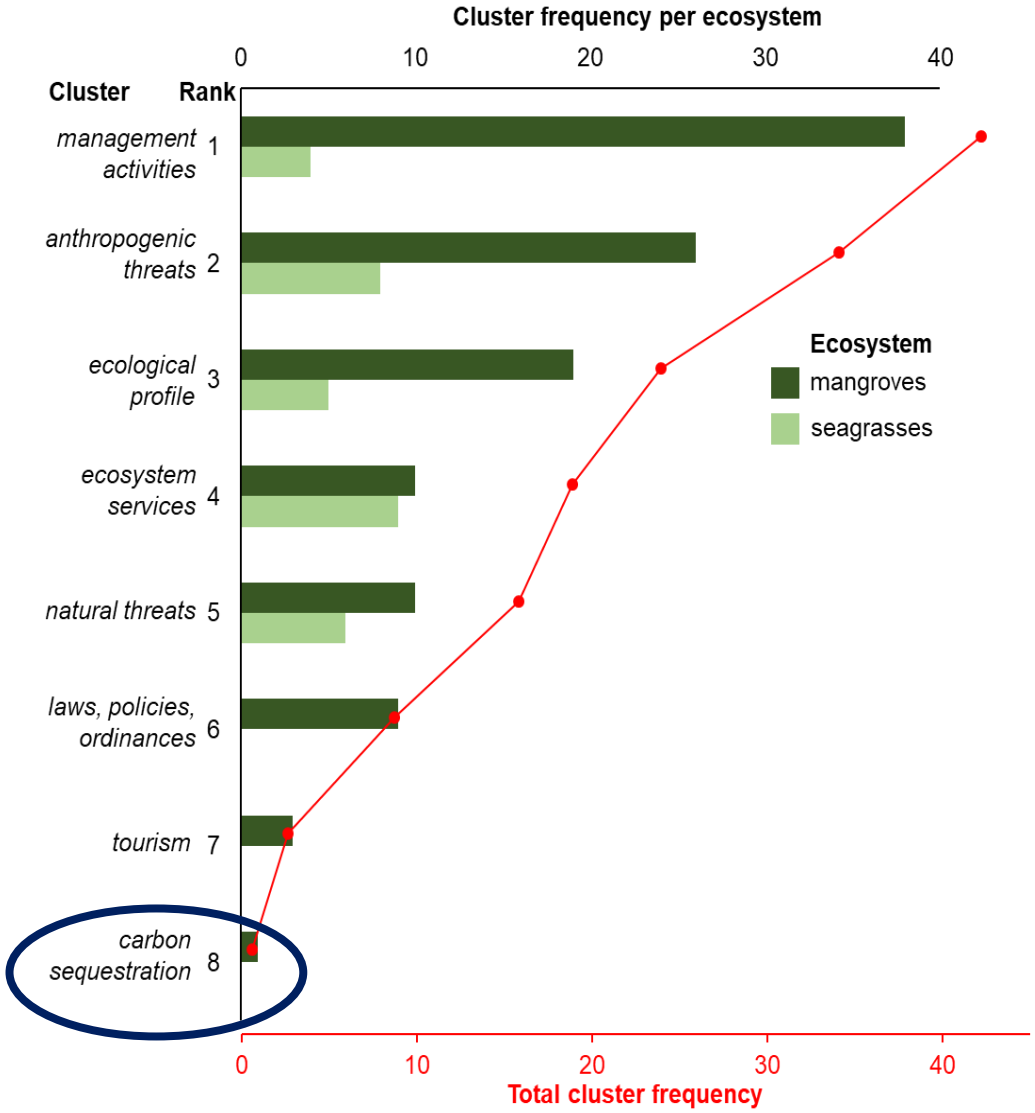
Among the 27 provincial spatial plans of INDONESIA that were analyzed, only three provinces (Central Kalimantan, Jakarta and Papua) mentioned the *carbon storage* cluster

Example: Jakarta aims to reduce 30% of greenhouse gas emissions by 2030 - carbon sequestration of mangrove ecosystems has been introduced [Rahmawati 2018]

In 2018, Berau – as part of the East Kalimantan province – issued a new strategic plan namely the Berau Forest Carbon Program (PKHB), which aims to reduce carbon emissions and improve carbon stock through forest management and conservation

[Yuwono and Hamzah 2018]

Current placement of BCE initiatives in local scale



Cluster ranks, cluster frequencies per ecosystem, and overall total cluster frequencies

Are Municipalities Ready for Integrating Blue Carbon Concepts?: Content Analysis of Coastal Management Plans in the Philippines

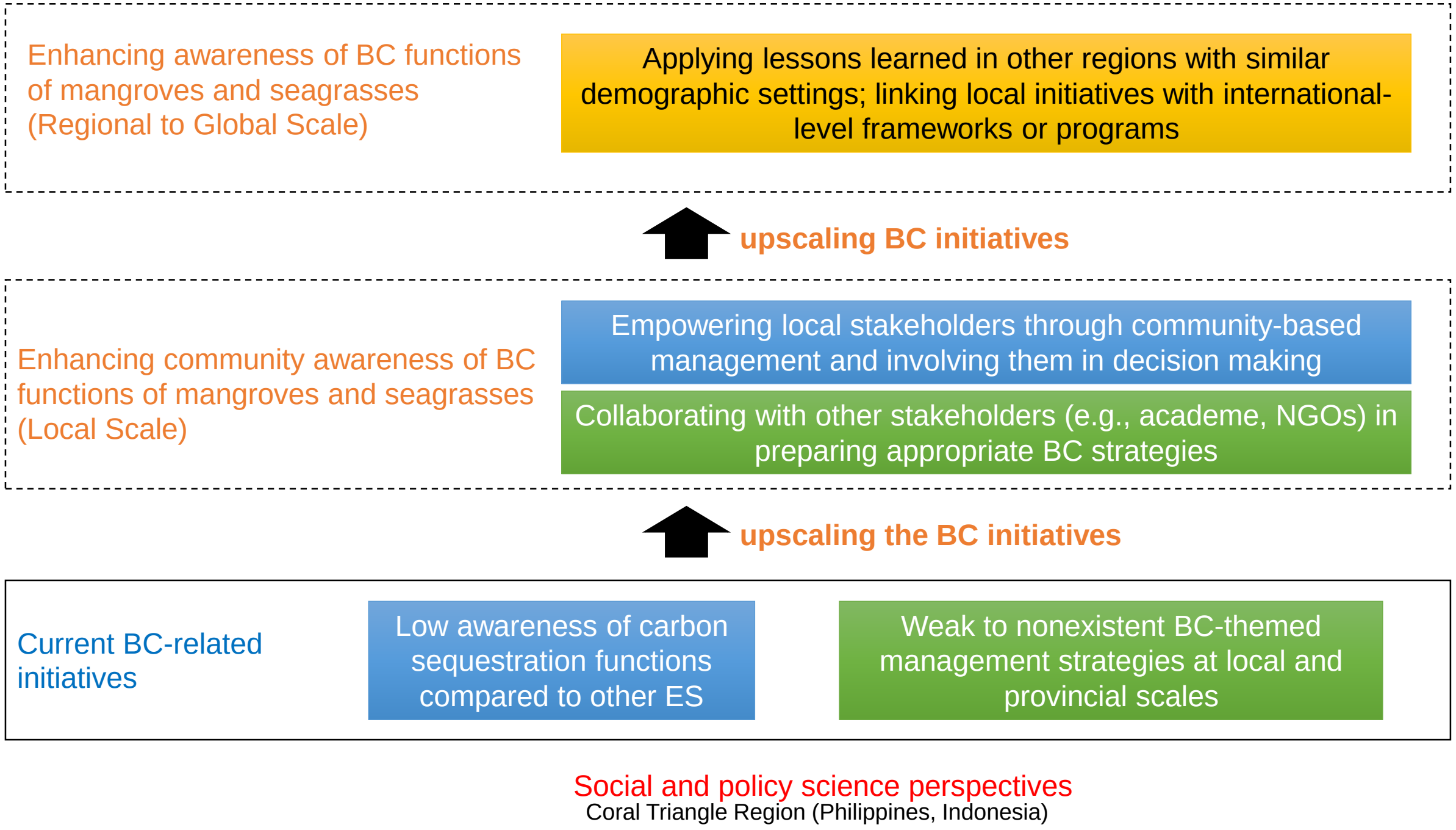
[Quevedo et al. 2021]

Present coastal management plans of selected municipalities (local) were analyzed for BC management strategies

Not much has been discussed in terms of carbon sequestration and storage benefits of BCEs at the local level

The least mentioned cluster is **carbon sequestration** with a total frequency of 1, indicating the **relatively low or lack of knowledge towards carbon sequestration and the economic potential** it could offer to coastal communities

There is an opportunity to **incorporate "blue carbon" concepts** into coastal management plan at local scales



Social and policy science perspectives

Coral Triangle Region (Philippines, Indonesia)

To know more about our works on social and policy science perspectives of blue carbon initiatives in the Coral Triangle Region, please feel free to check the links below.

THANK YOU for listening

- Various stakeholders' perceptions of BCE services
  - https://doi.org/10.1080/13416979.2019.1696441
  - https://doi.org/10.1080/21664250.2021.1888558
  - https://doi.org/10.1111/1440-1703.12325
  - https://doi.org/10.1016/j.rsma.2021.101820
  - https://doi.org/10.1016/j.marpol.2021.104462
  - https://doi.org/10.1016/j.ocecoaman.2020.105451
  - https://doi.org/10.1016/j.ocecoaman.2020.105181
  - https://doi.org/10.3390/su13010127
- Current BC initiatives at local and provincial scales
  - https://doi.org/10.1080/08920753.2021.1928455
  - https://doi.org/10.1080/13416979.2019.1679328
- Community perceptions and GIS integration
  - https://doi.org/10.1007/s13280-021-01608-9
  - https://doi.org/10.1007/s10745-021-00253-w

Blue carbon ecosystems in Eastern Samar, Philippines

Acknowledgements

Comprehensive Assessment and Conservation of Blue Carbon Ecosystems and Their Services in the Coral Triangle (Blue CARES)

Enhancing capacities of local stakeholders in Coral Triangle in managing Blue Carbon Ecosystems for climate mitigation and adaptation (CBA2020-05SY-KOHSAKA)