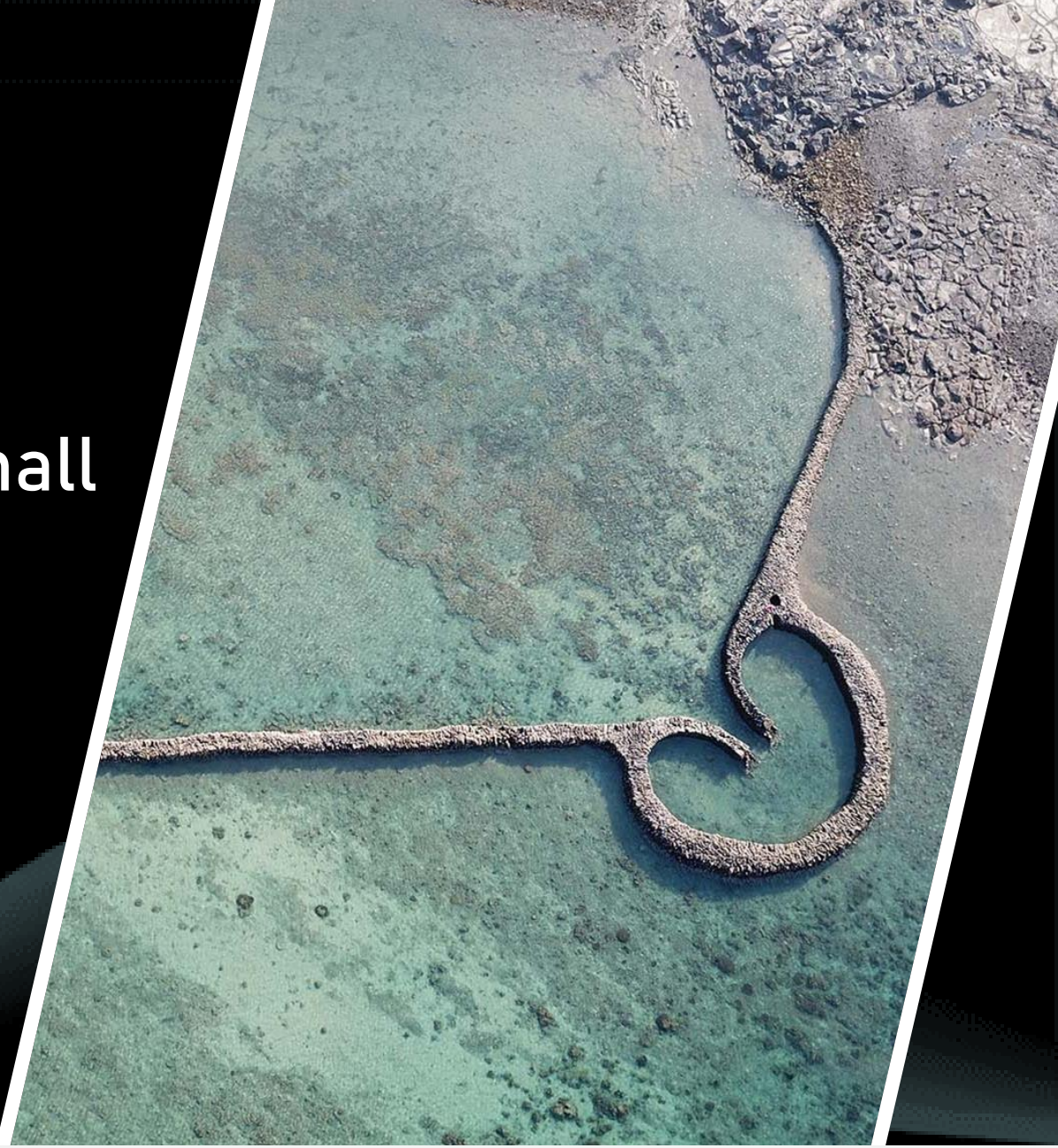
Exploring Traditional Fishery Methods and Heritages Policy Potential for Marine Protected Area: A Comparative Study in Taiwan, Marshall Islands, and Sri Lanka



Ming Cheng Chen
Anne McDonald, Niluka Prasadini Nanayakkara, Nover Juria

Island sustainability institute

Graduate School of Global Environmental Studies, Sophia University

Island Sustainability Institute

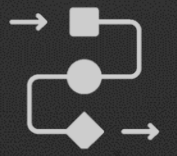
上智大学 SOPHIA UNIVERSITY

OUTLINE

1) Problem definition

2)Research Aim

3)Conceptual Framework



4)Research Methods

5)Results and Conclusion

OCEAN GIVES

Produce air to breath:

Our ocean mitigates non-renewable industry pollution by absorbing 25 per cent of all carbon emission, while generating 50 per cent of the oxygen we need to survive.

Feed us:

The ocean and its biodiversity provide our global community with 15 per cent of the animal protein we eat. In least developed countries, seafood is the primary source of protein to over 50 per cent of the population.

Prove livelihoods and jobs:

The ocean provides livelihoods to 3 billion people, nearly half of the entire global population. Marine fisheries provide 57 million jobs globally.

(United Nations, n.d.)

OCEAN IN PERIL

Five Threats to the Ocean (World Economic Forum 2014)
1. Overfishing
2. Coastal pollution
3. Habitat destruction
4. Global warming
5. Ocean acidification

G7 Ministers of Science Communiqué (Germany 2015)
1. Ocean acidification
2. Warming and de-oxygenation
3. Loss of marine biodiversity
4. Degradation of marine ecosystems

have profound impacts on human wellbeing and human societies in many regions of the earth.

WORLD ECONOMIC FORUM

G7 GERMANY

OUR OCEAN
PANAMA - MARCH 2-3, 2023
OUR OCEAN, OUR CONNECTION

Focus on effective area-based management measures, including **Marine Protected Areas**, the development of the global blue economy and proposing innovative solutions to address marine pollution. (Our Ocean Conference, 2023)

(https://ouroceanpanama2023.gob.pa/)

Marine Protected Area (MPA) Abrief history

1962, 1st World Conference on National Park (WCP)

1975, Great Barrier Reef Marine Park (GBRMP) established

1992, 4th WCP focus on marine and aquatic system coastal zone

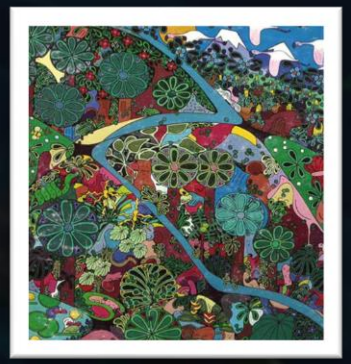
2010, Aichi target 11: 10 % of marine protected by 2020

2022, CBD COP15: 30 by 30 goal

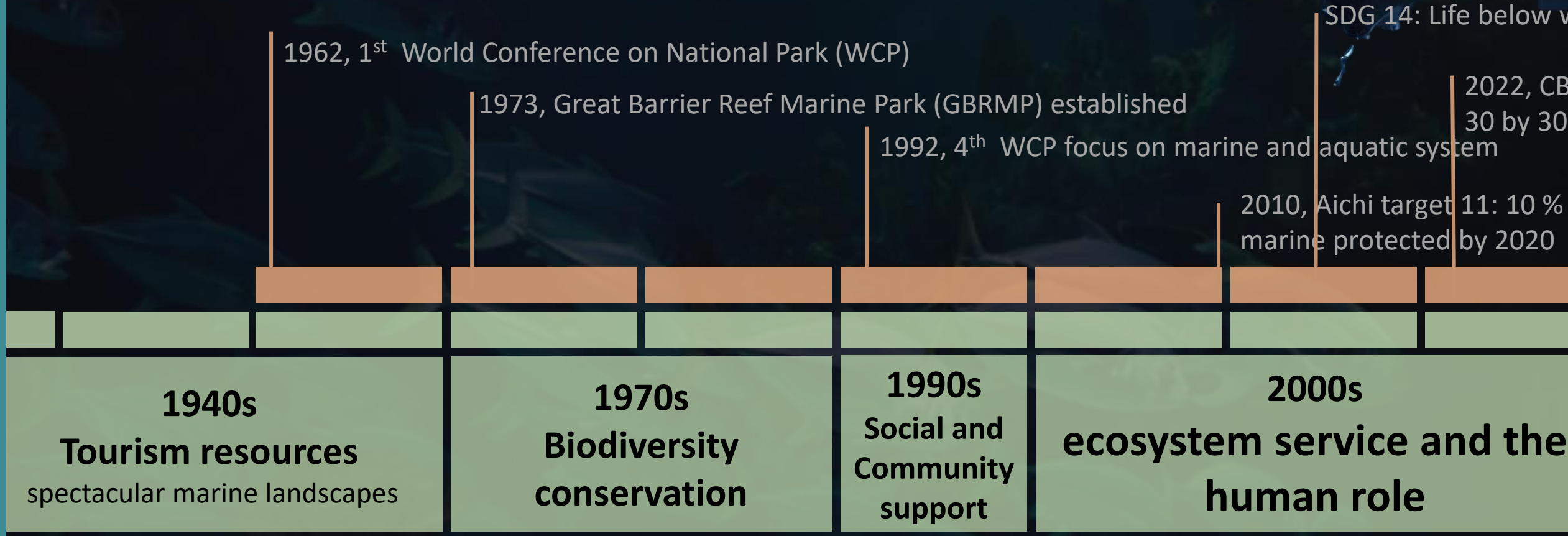
2015, SDG 14: Life below water

Australian Government

Great Barrier Reef Marine Park Authority

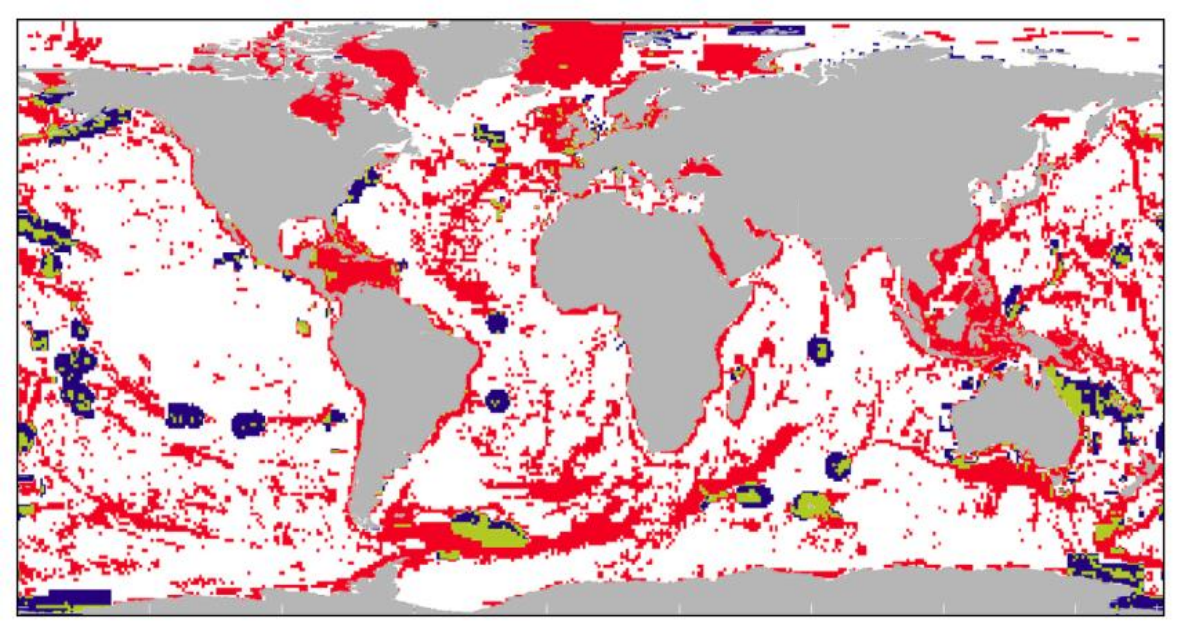


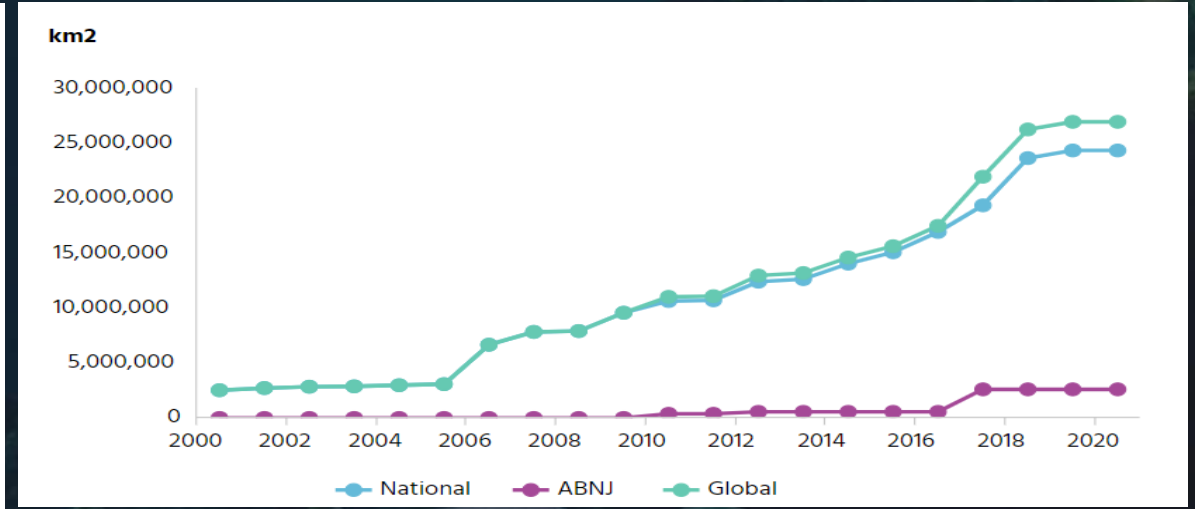
Marine Protected Areas (MPAs) Focus transformation

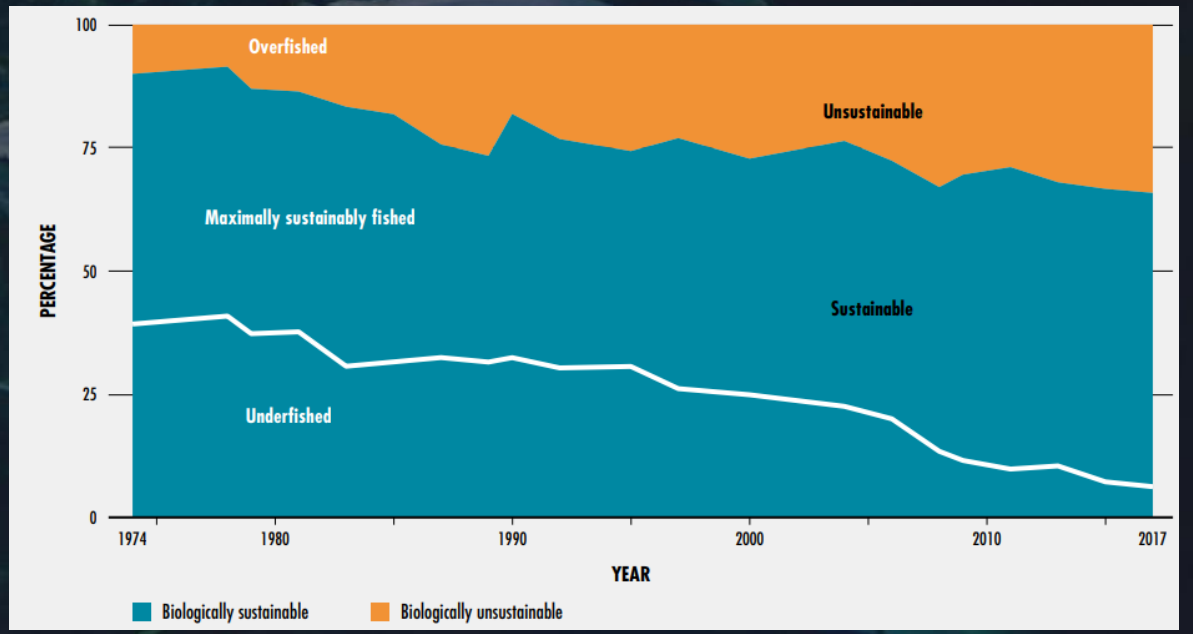


(Watson et al., 2014; Maestro et al., 2019; Picone et al, 2021)

MPA insufficiencies and inefficiencies





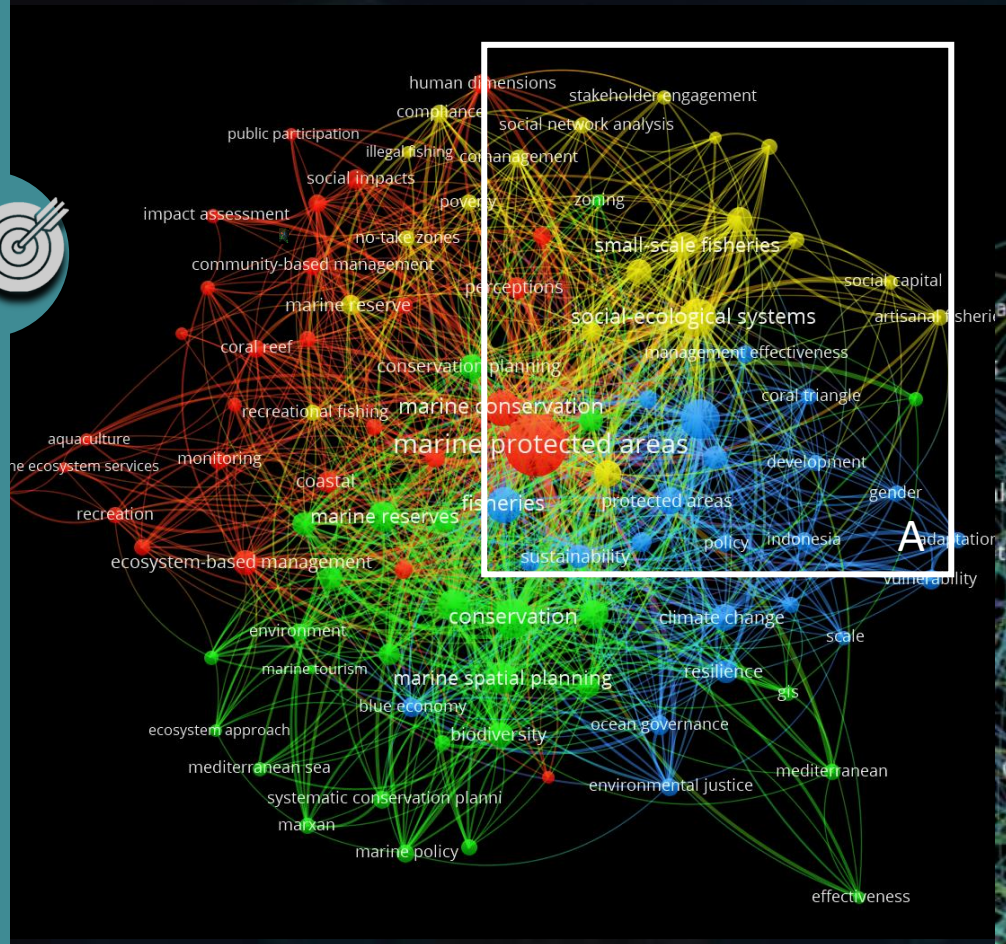


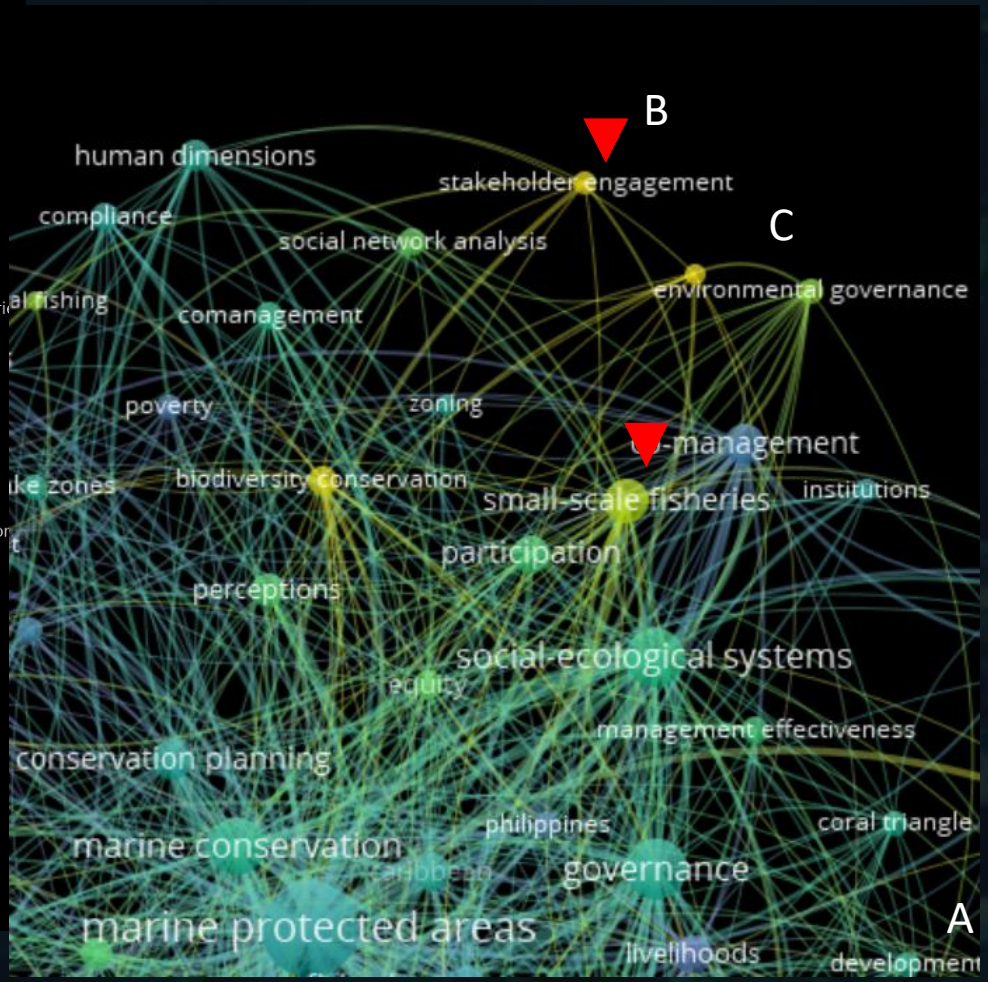
8.16 % of the ocean is protected, and 2.9 % is fully or highly protected from fishing impacts. (Marine Protected Areas, n.d.)

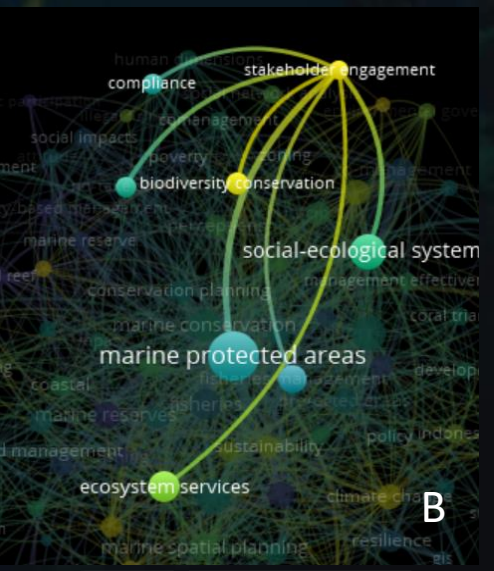
The overlap (green) between the Prioritized Areas (red) with the areas (blue) of all the MPAs. (Zhao et al., 2020)

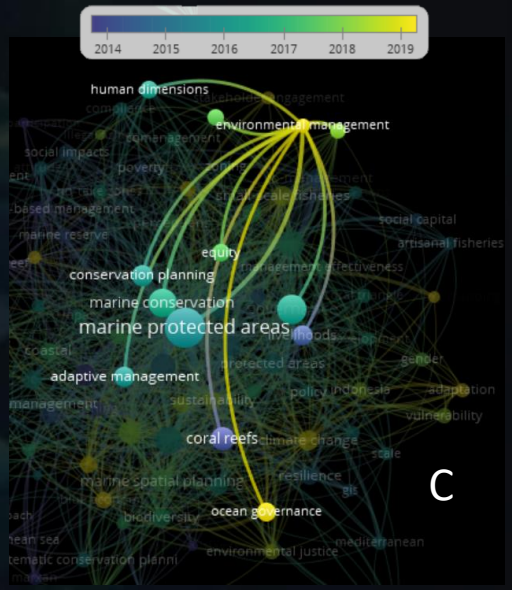
(Christie, 2004; Bergseth et al., 2018; Bennett et al., 2020).

Social-ecological is a focus of MPA



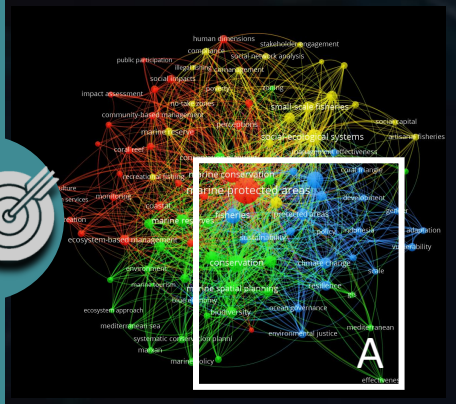


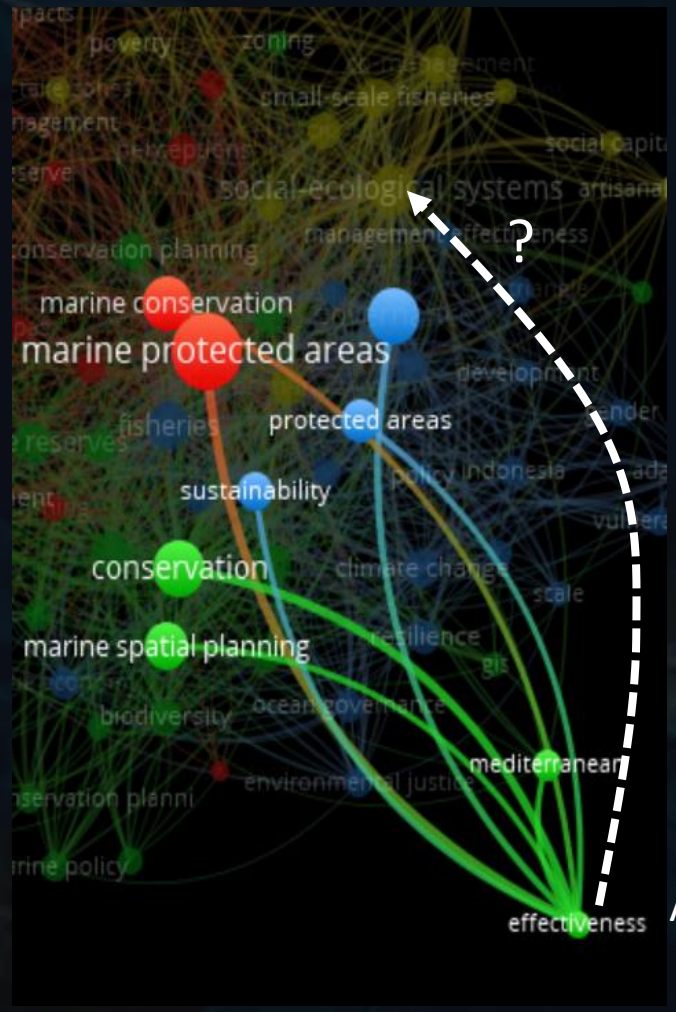


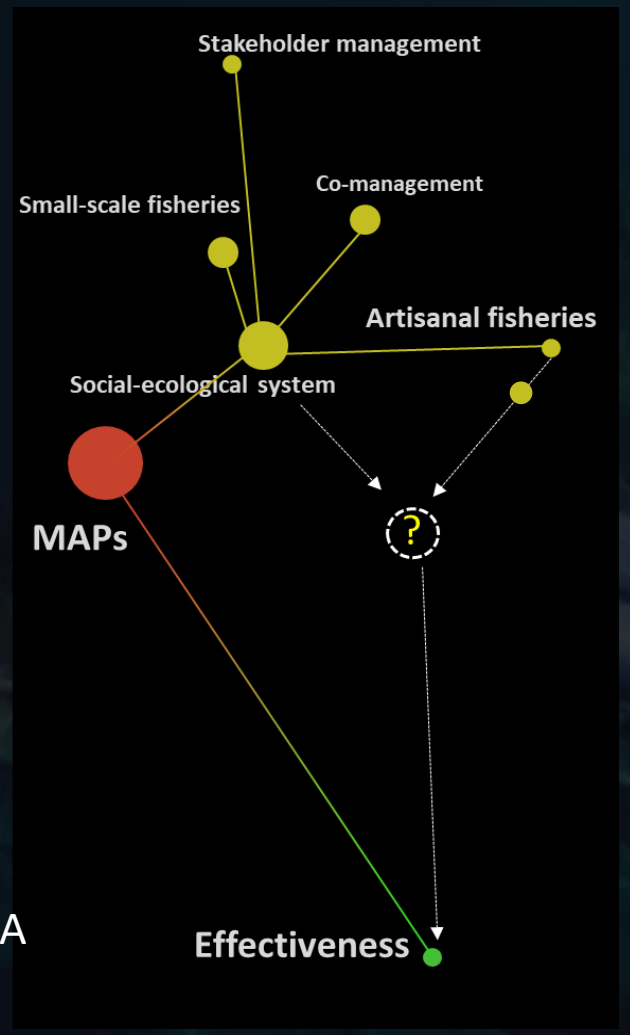


- Bibliometric analysis indicates that the social aspect is one of the most critical factors in MPAs.
- The engagement of stakeholders and small-scale fisheries has been a major focus of research in recent years.

What connects the social aspect and MPA efficiency?







(Halim et al., 2020)

(Khakzad, S., & Griffith, D, 2016)

- Connection missing between MPA effectiveness and the social aspect of marine management.
- Traditional fishery methods and place attachment may play a role in marine resource management.

Research Aim:

To evaluate the potential of traditional fishery methods and heritages to identify whether they could provide a policy approach to address ineffective MPAs.

Conceptual framework

Resilience

Adaptation

Traditional fishery methods & heritages

Social psychological phenomena formation

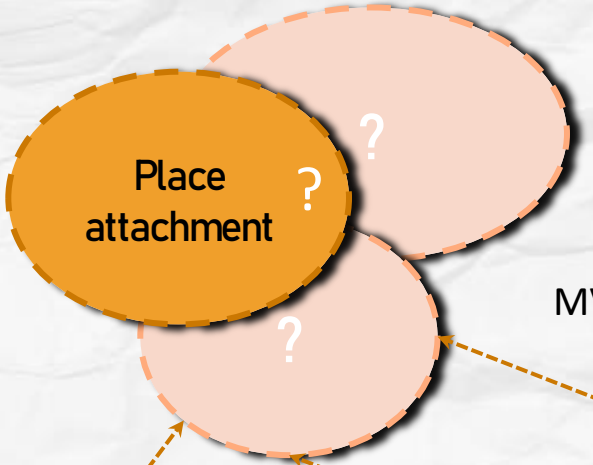
Perspective & Behavior change

Reaction to MPA

IV

Tangible/ and intangible practices, heritages

- Spearfishing, net fishing
- Stone weir, kraal
- Traditional fisher methods as a vector of place attachment?



MV

DV

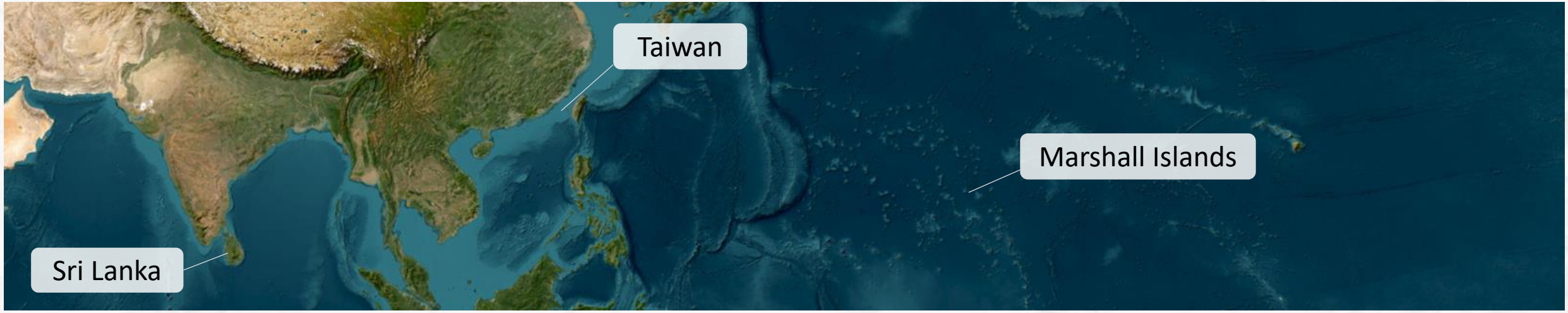
Social capital
Social networks
Social norms & rules
Trust & equity

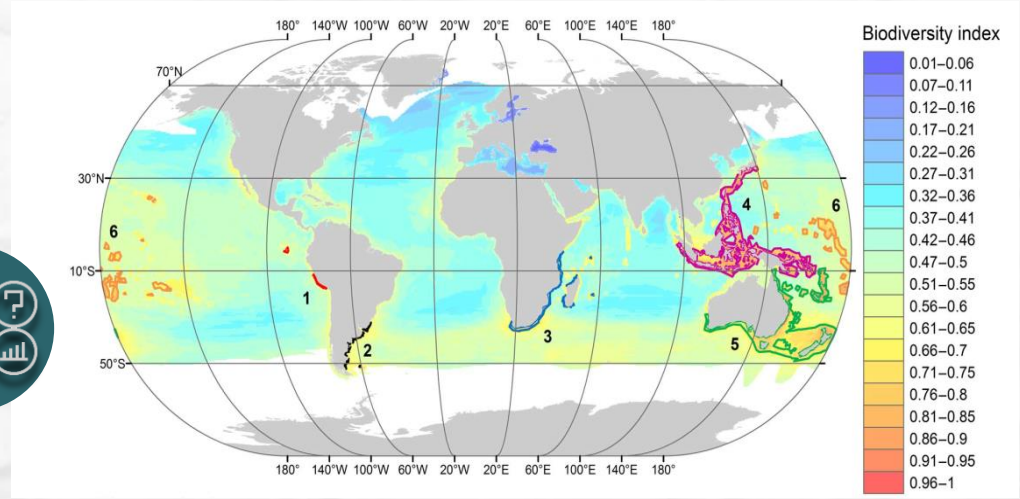
Human capital
Education
Employment
Spirituality
Free will

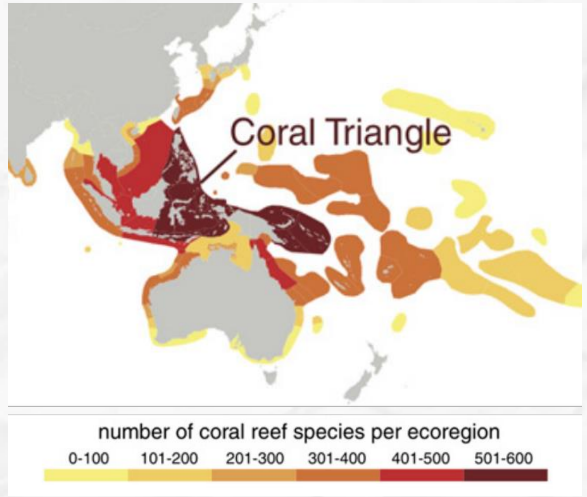
Natural impact
Climate change
Habitat destruction
Overfishing

MODV

Case studies: Taiwan, Sri Lanka, and the Republic of Marshall Islands







Site	Region	Traditional fishery heritages
Penghu	Central-west Pacific	Stone weirs Intertidal zone collector
Madu Ganga Rumassala	India Ocean	Kraal fishing Cast net fishing
Majuro & Arno Atolls	Central-west Pacific	Spearfishing Hand line fishing Cast net fishing

- A comparative study exploring behavior change and perspective transformation under different fishery heritages aims to investigate the validity and universality of the hypothesis under various natural, social, geographic, and political contexts.
- Notably, three case studies are located in global biodiversity hotspots and highly relay on marine resource.

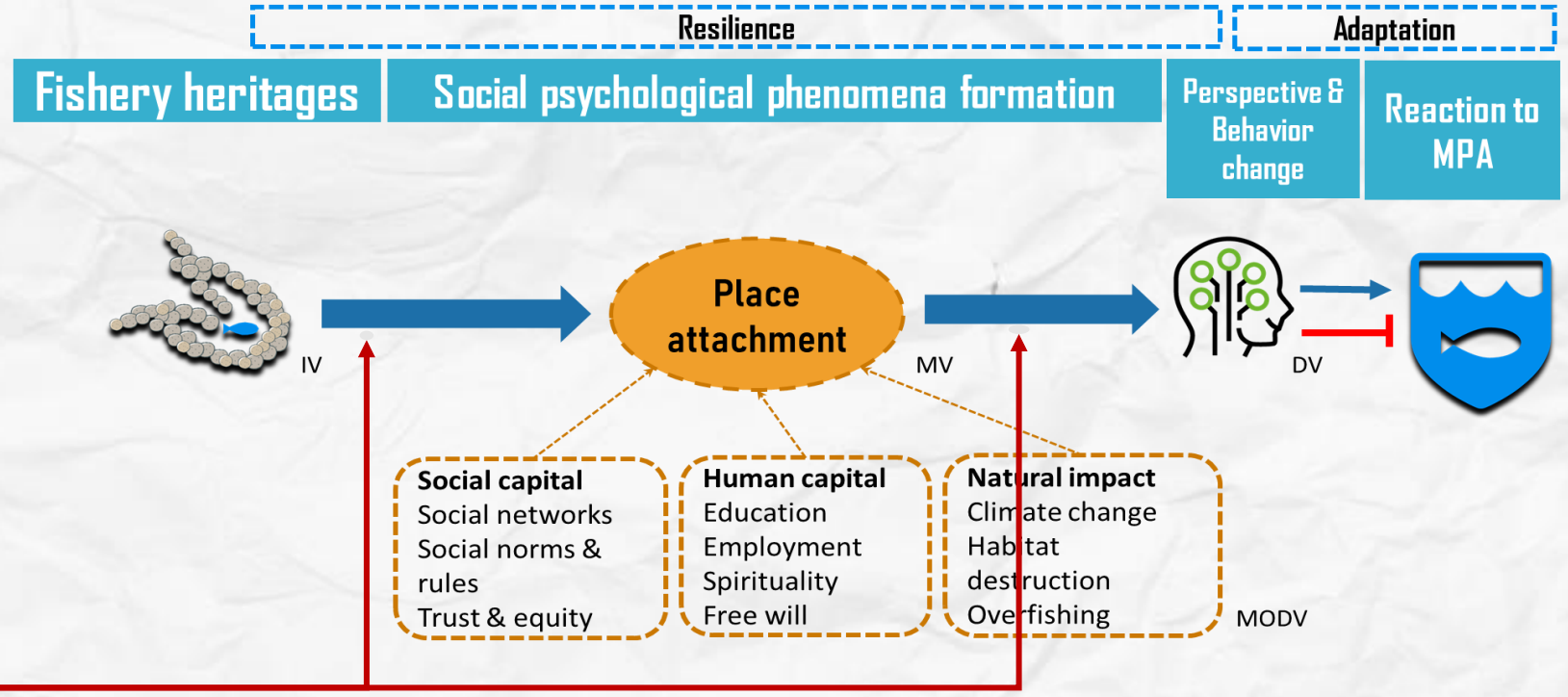
Traditional fishery methods and heritages in case studies

Stone weir

Kraal fishing

Spearfishing

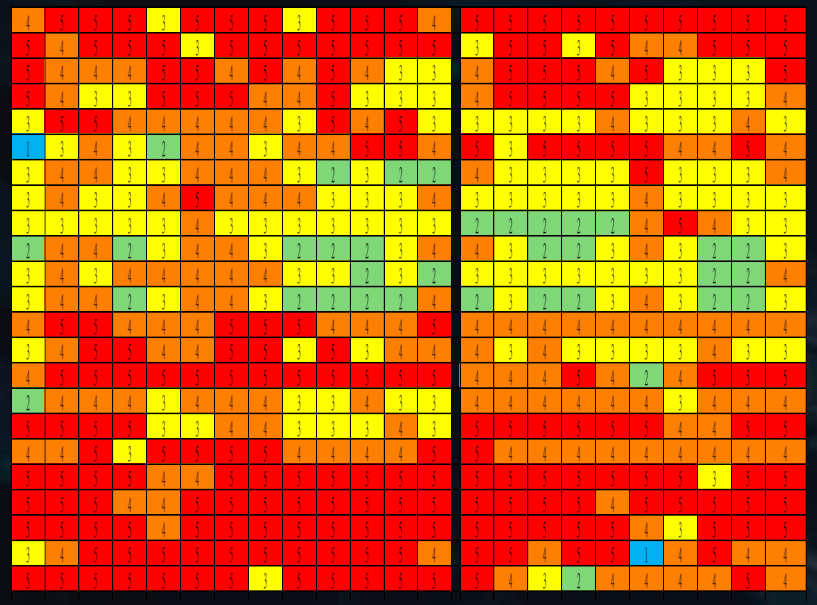
Open-end interview and Likert scale questionnaires



- Open-ended questions were analyzed using content mining through MAXQDA.
- Two sets of structured questionnaires were utilized to evaluate the relationship between place attachment and responses to MPA policy.

Heat Map of place attachment and marine protection behaviors

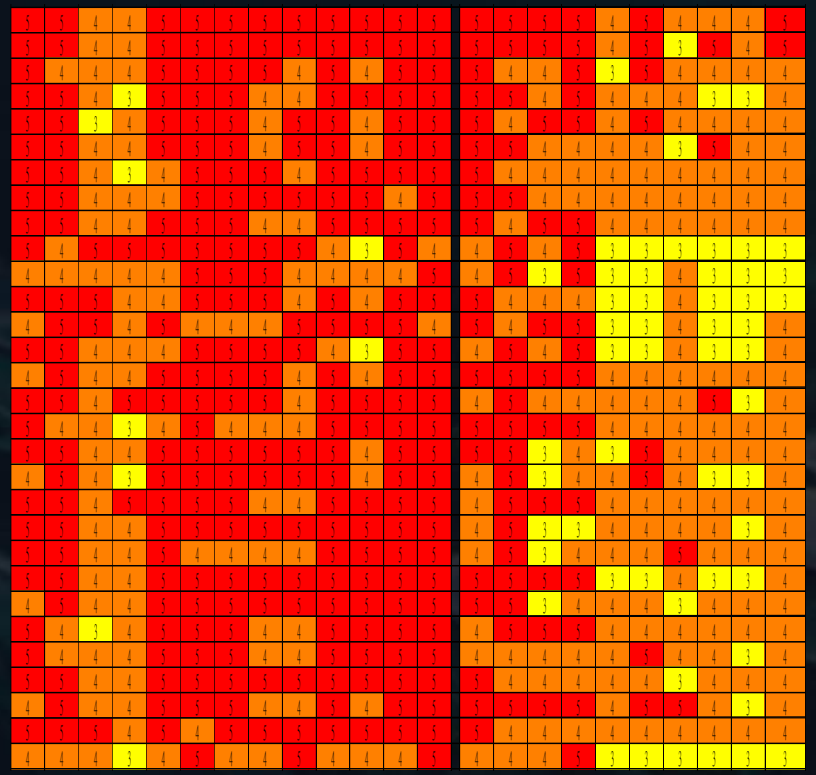
Taiwan



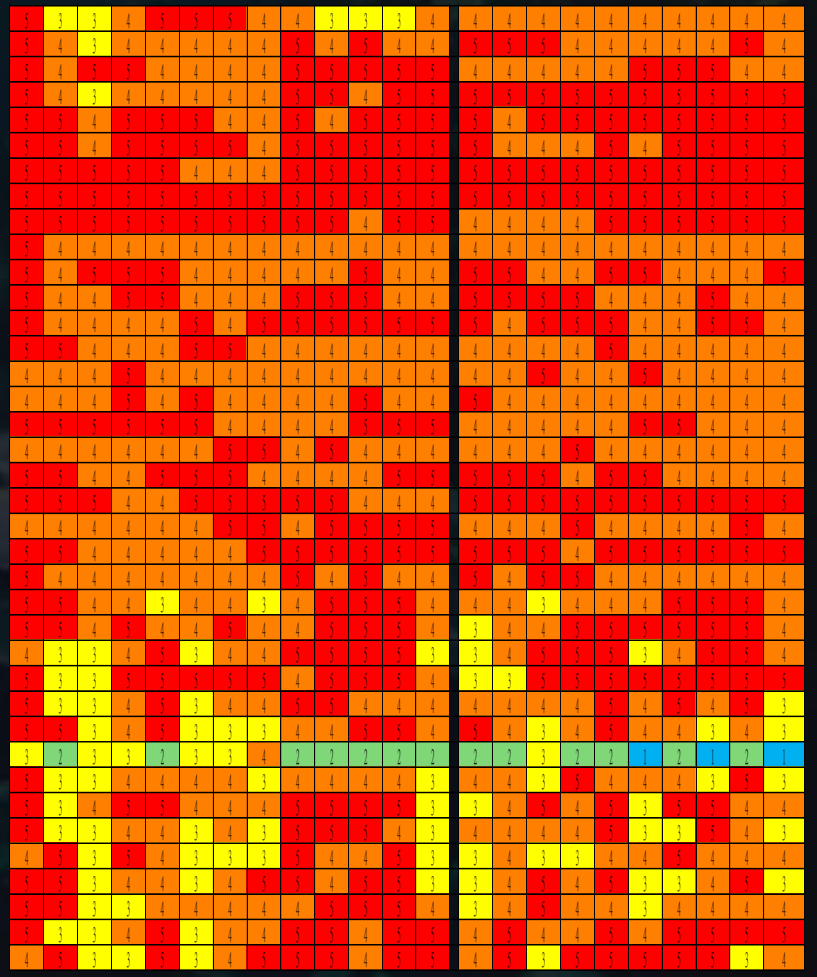
Place attachment formation derives from traditional fishery methods

Attitude to Marine Protected Areas

Sri Lanka

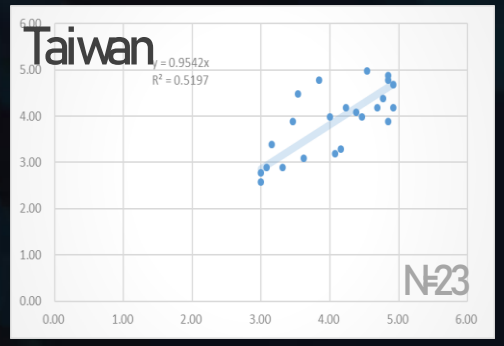


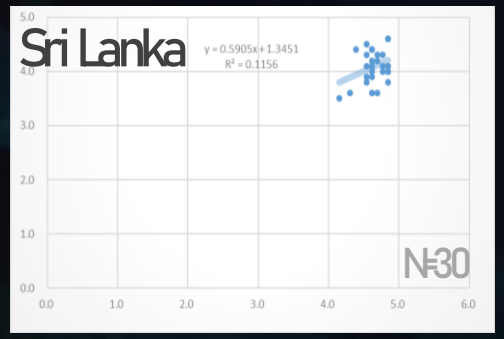
Marshall Islands

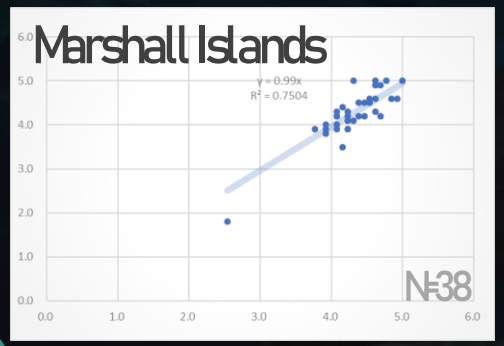


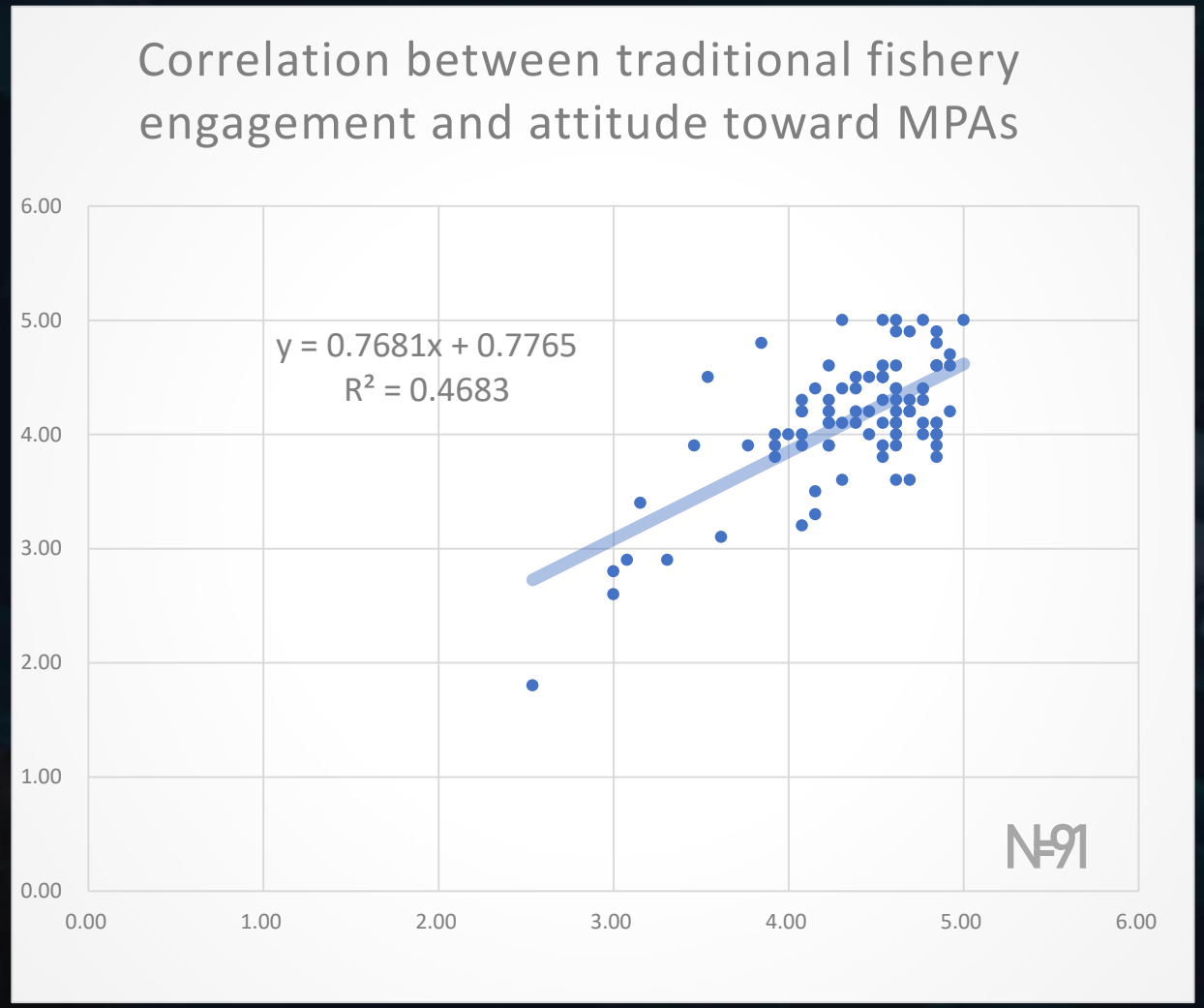
- Participants who consider traditional fishery valuable in their lives tend to be more inclined to support marine resource management in Taiwan.
- In Sri Lanka and the Marshall Islands, traditional fisheries are vital for culture, group identity, and social cohesion. A considerable portion of participants also showed a positive perspective toward MPA policy.

Correlation between traditional fishery engagement/ place attachment and attitude toward MPAs





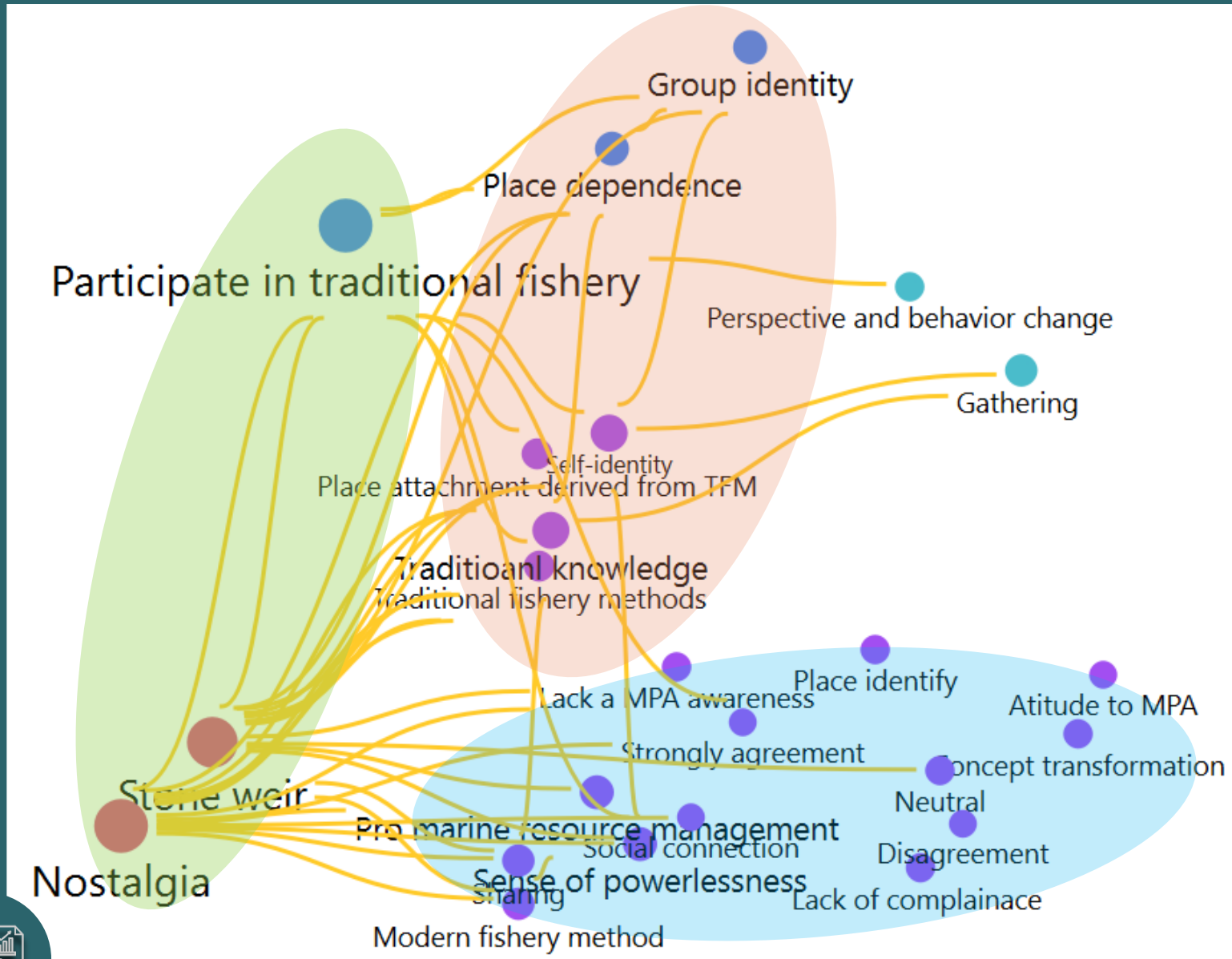




Case	R^2	R
Taiwan	0.52	0.72
Sri Lanka	0.12	0.35
RMI	0.75	0.87
Total	0.47	0.69

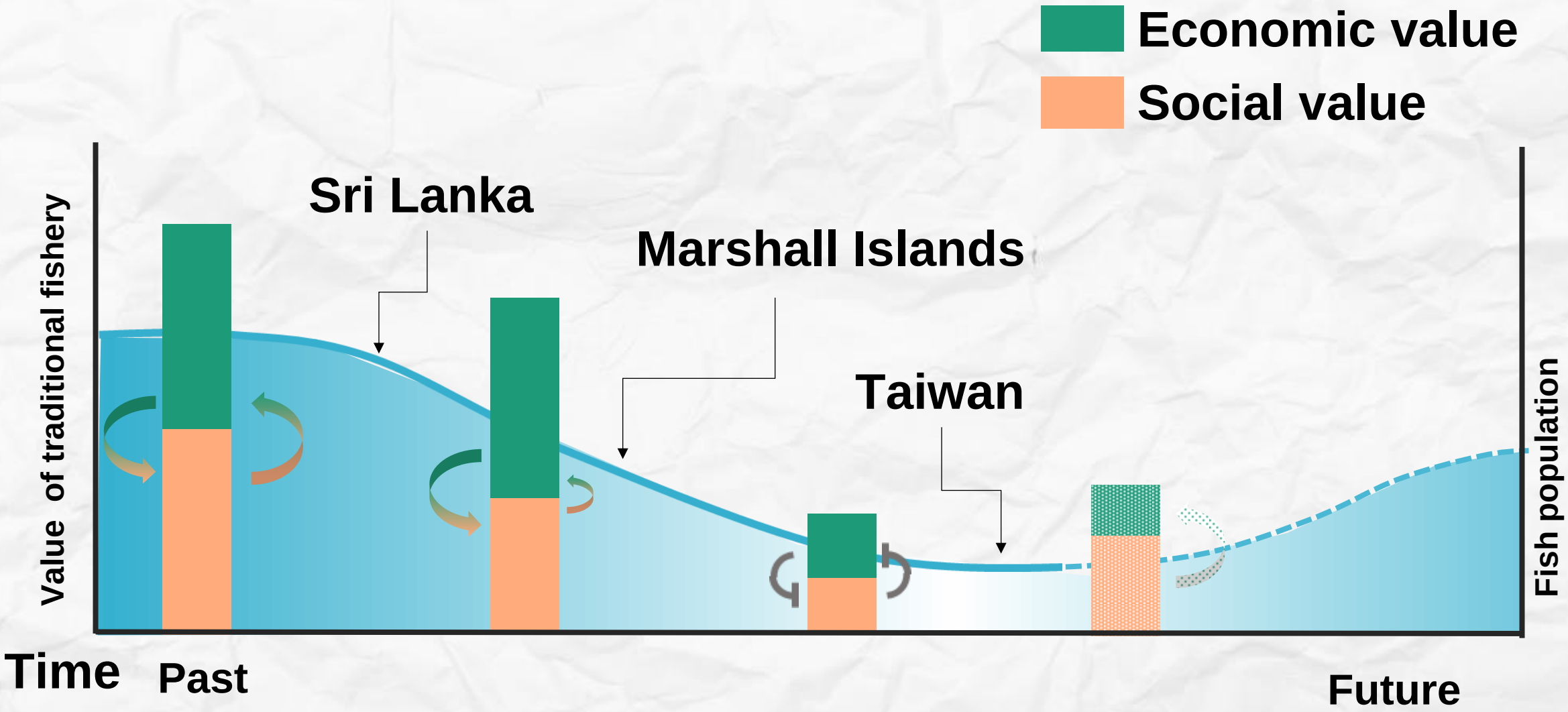
- The regression model reveals a strong correlation between engagement in traditional fisheries and support for marine protection in Taiwan and the RMI. However, in Sri Lanka, the available data does not sufficiently substantiate the relationship between these two variables

Engagement in traditional fisheries triggered place attachment



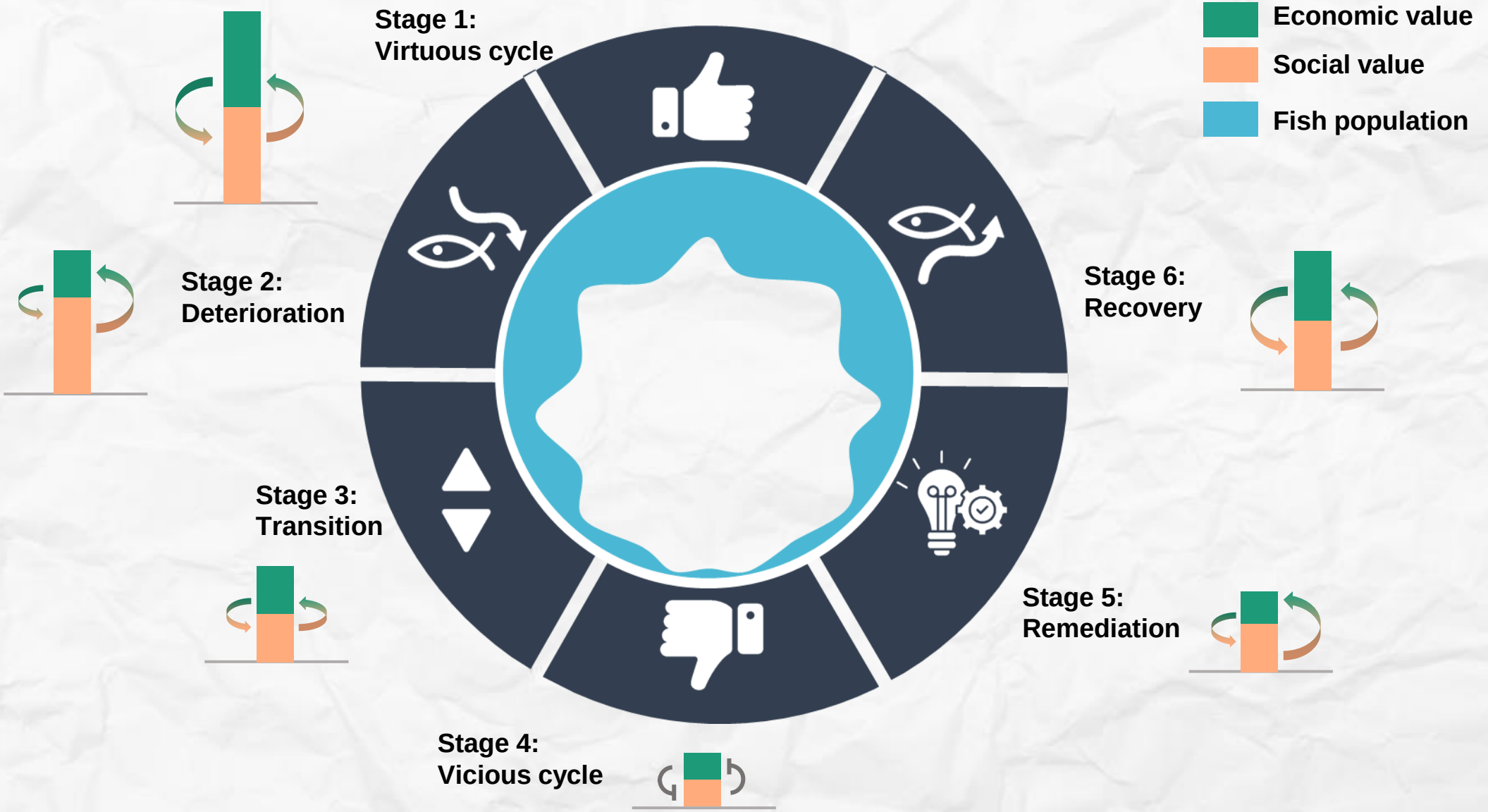
- Participating in traditional fishing methods will begin forming a sense of place attachment, which subsequently influences the conceptual transformation of local fishermen. Additionally, nostalgia plays a role in this transformation, as people long for the best times and are willing to recreate them.
- Further exploration is needed to deeply understand the connection between traditional fishing methods and the formation of social-psychological phenomena under different country contexts, periods, political circumstances, and environmental conditions.

Value transformation of traditional fishing in small-scale fisheries



*This pattern is based on the open-ended interview in Taiwan

Cycle of the interdependence of socioeconomic value and fish population



Conclusion:

- In this study, Individuals with stronger place attachments tend to demonstrate a higher commitment to sustainable marine resource management.
- Place attachment derived from TFM/H forms a psychological group within the community that is independent of occupation, gender, and age, which potentially eases the MPA conflicts.
- The cycle of interdependence between socioeconomic value and fish population can provide policy reference for fisheries activities under diverse circumstances, aiming to propose proper policy approaches.
- Engagement of TFM/H might be the key element between the social aspect and MPA inefficiency.

Thank you for your attention

https://stoneweir.info/