UTS

Who is actually dependent? Investigating coral reef dependency in the Philippines.

Presented by Bridget Mullany

Supervised by Micheal Fabinyi & Kate Barclay

I acknowledge the Gadigal people of the Eora Nation upon whose lands The University of Technology Sydney campuses now stands. I pay respect to the Elders both past and present, acknowledging them as the continuing custodians of these lands. Sovereignty was never ceded.

Acknowledgments

Michael Fabinyi & Kate Barclay

The University of Technology, Sydney

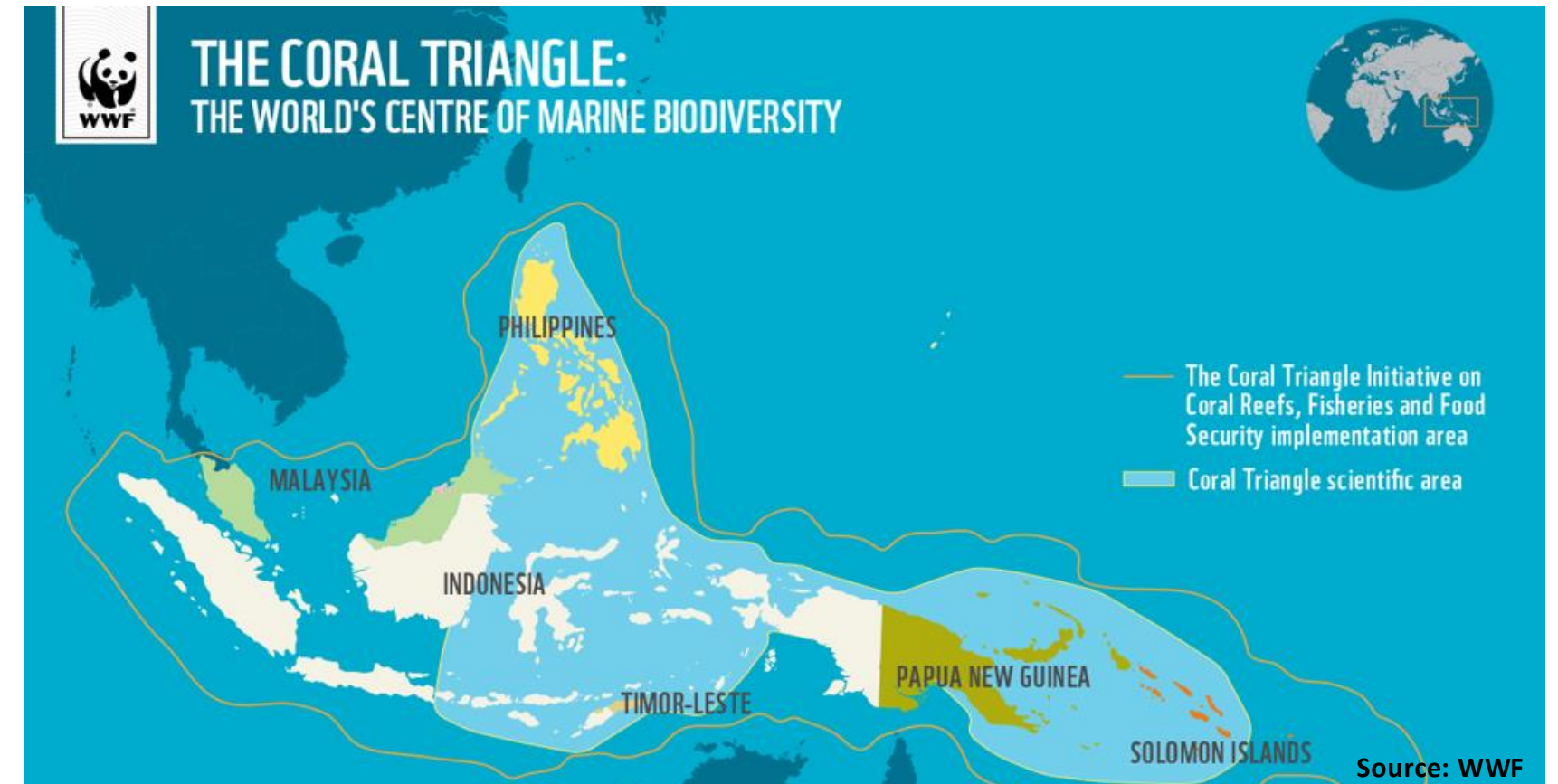Australian Centre for International Agricultural Research

The communities of San Vicente and Cordova.

Coral Reefs in the Philippines

The Philippines sits within the global epicenter of marine diversity and is home to:

- 76% of the world's total coral species

- 27,000 km2 of coral reefs.

Source: WWF

Coral Reef Threats

Climate Change is the biggest existential threat to coral reefs around the world.

Most coral reefs will not survive 1.5°C of warming (IPCC, 2018).

Destructive fishing, pollution, and coastal development within the Philippines further exacerbate pressures on coral reefs.

A third of the Philippines' coral reefs have been lost in the last decade (Licuanan, Robles et al. 2019)

Source: Coral Restoration Foundation

Source: James Cook University
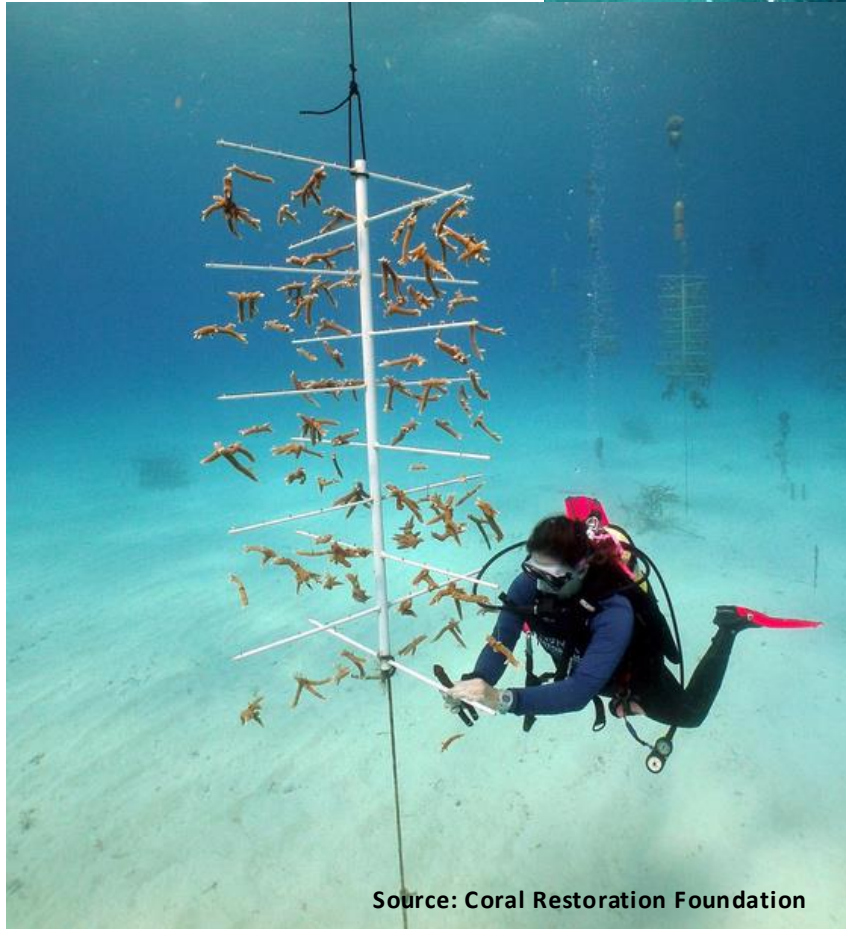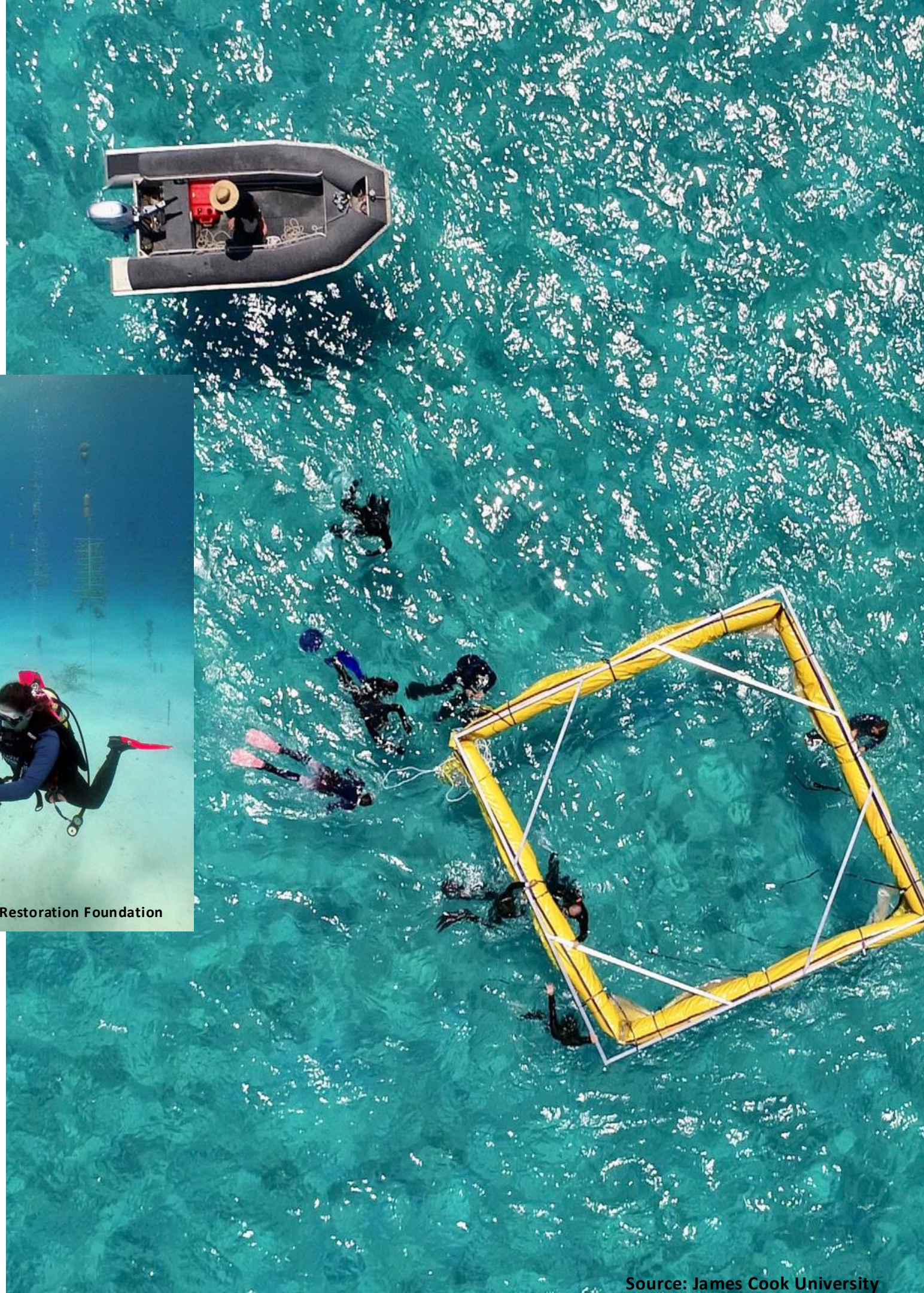
Emerging Technologies:
Coral Reef Restoration

"New interventions are needed to save coral reefs"
(Anthony et al. 2017)

Larval enhancement is a new technique with the ability to rapidly enhance recruitment, increase coral cover, fish abundance and perhaps most importantly is scalable to larger areas. (Harrison, dela Cruz et al. 2021).

Improving governance:

Capacity building & strengthening CRM plans and marine spatial planning.

**This project is integrated into
2 current ACIAR-funded projects:**

#1 Institutional effectiveness of coral reef restoration - **Lead by Dr Micheal Fabinyi**

#2 Regional coral restoration networks and appropriate technologies for larger-scale coral and fish habitat restoration in the Philippines and Australia - **Lead by Dr Peter Harrison**

Both projects work simultaneously across 4 sites in the Philippines.

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How do we prioritise conservation effort?

$ Conservation resources are limited, and decisions must be made about where to prioritise investment.

Practitioners have begun 'triaging' coral reefs based on the biological significance or resilience to climate change to prioritise conservation investment.

? What about coral reefs that communities depend on?

Why investigate coral reef dependent communties?

- Reefs have economic and social significance to millions of people throughout the Philippines. This significance warrants investment in maintaining and rehabilitating these coral reefs.

- Investigating the relationship between communities and coral reefs will strengthening coral reef management, as understanding local dynamics is central to the success of marine interventions and (Trialfhianty, 2017).

- If we can't identify where coral reef dependent communities are, then how can resources reach the right places?

Bridget Mullany
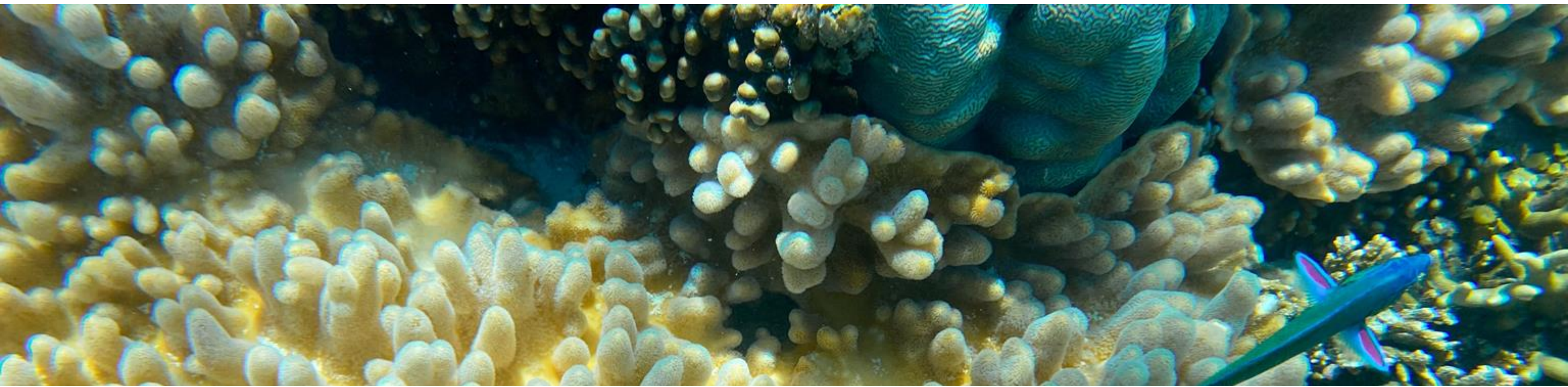
How do we determine coral reef dependence?

Ecosystem services? Economic indicators? Livelihoods? Social & cultural significance? Biological indicators? Wellbeing? Values?

Burke, Reytar et al. (2011) suggest 6 indicators for coral reef dependence at the national level:

- Reef associated population
- Reef fisheries employment
- Reef associated exports
- Nutritional dependence on fish and seafood
- Reef-associated tourism
- Shoreline protection

Study objectives

To determine the critical social and economic factors governing the coral reef 'dependence' of communities, including different social subgroups.

To help answer the question: how do we decide where resources are allocated in coral reef management and interventions so that resources end up in places where a. the communities need it and b. the governance can support it?

Study Methods
Indicators + social research

Transdisciplinary approach; combining 6 quantitative indicators and in-depth social research to investigate coral reef dependency in two communities in the Philippines:

1. San Vicente, Palawan
2. Cordova, Cebu
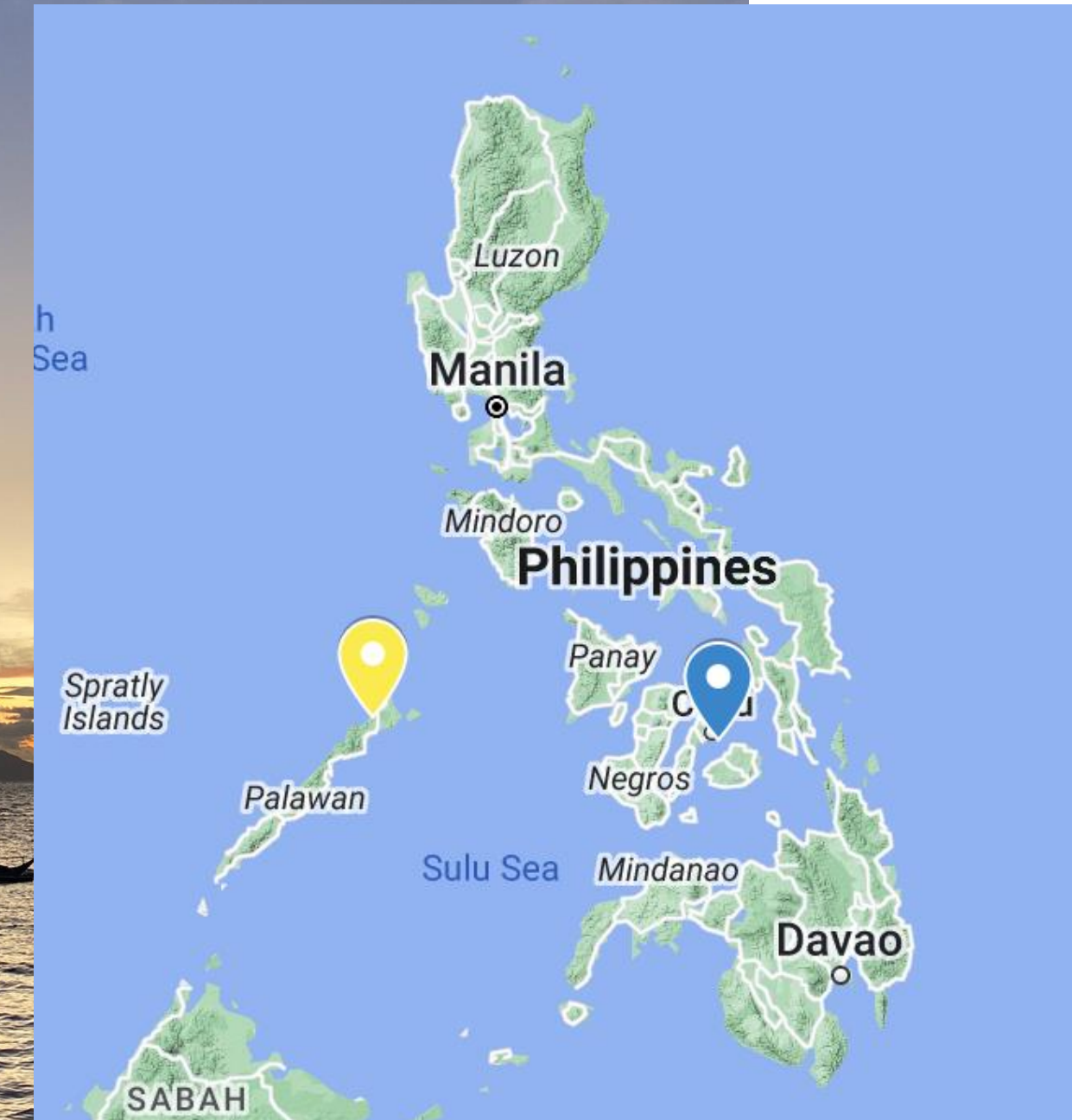
6 indicators for coral reef dependence
(Burke, Reytar et al. 2011)

Reef associated population

Number if people within 30km of coral reefs compared to the national average.

_____

Reef fisheries employment

The number of reef fishers as a proportion of LGU population.

_____

Reef associated exports

Value of landings of coral reef fish and food.

_____

Nutritional dependence on fish and seafood

Annual consumption of reef fish and foods per person.

_____

Reef-associated tourism

The number of coral reef connected shops and hotels ie. dive shops, boat hire, resorts.

_____

Shoreline protection

Population of people living less then 10m above sea level, near a shoreline 3km from a coral reef, and 4km from the shoreline.

_____

In-depth social research
Interviews + focus groups + governance analysis

Data was collected across the two sites through:

- 112 semi-structured interviews.
- 5 x focus group discussions.
- Analysis of local and national government ordinances.
- Fish catch surveys.

Stakeholders included:

- Fisherfolk, fish traders, fisherfolk association presidents.
- Tourism owners, operators & staff.
- Local & national government representatives.
- Women's organisation presidents & members.
- Tourists.
- Indigenous people's organisation presidents.
- Broader community members.

Consultation with local mayors and barangay captains.

Preliminary findings

Individuals and communities depend on coral reefs in a variety of ways.

- **Food & nutrition security**
- Livelihoods
- Recreation
- Identity
- Government revenue

- Celebration
- Cultural practices
- Shoreline protection
- Safety blanket
- Marketing material.
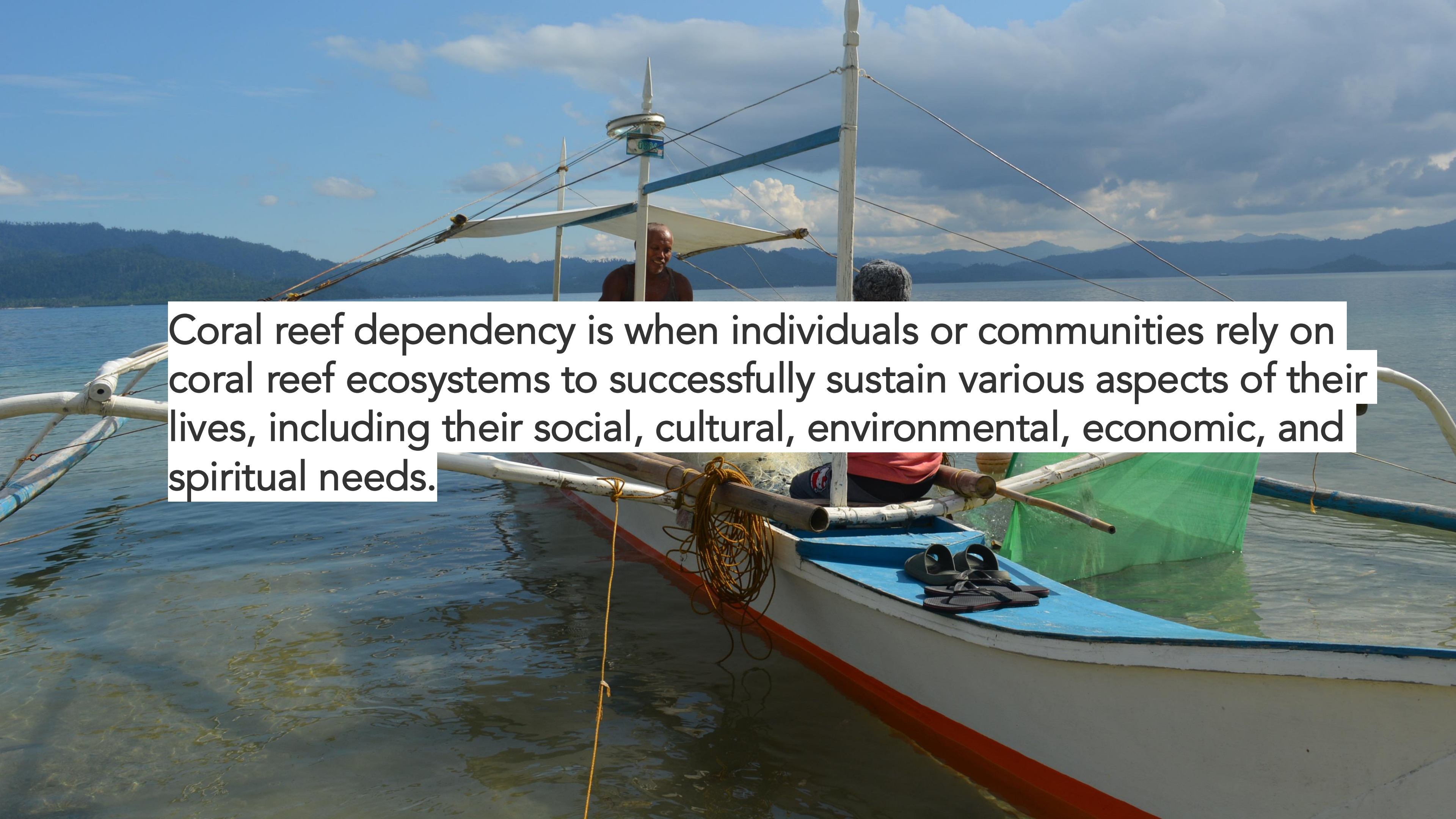
Coral reef dependency is when individuals or communities rely on coral reef ecosystems to successfully sustain various aspects of their lives, including their social, cultural, environmental, economic, and spiritual needs.

Food and nutrition security

- Both communities exhibited a high dependency on coral reef fisheries for food and nutrition security reporting 0.5-1.0 kilograms per day per household per day, above the national average.

- Economic indicators, landings & exports data are vastly inadequate at capturing information local consumption trends.

- Knowing local consumption preferences is critical in coral reef management.

Location	Commonly consumed seafood	
Port Barton + Población, San Vicente	• Pakol (triggerfish)!! • Dalagang bukid (fusiliers) • Sapsap (ponyfish)!! • Kanuping (emperors) !! • Talakitok (trevallies) • Sagisi (snapper) • Dangit (rabbitfish)	• Surahan (unicornfish)!! • Pusit (squid) • Bisugo (threadfin) • Burow (Indian mackerel) • Tulingang (tuna)!! • Talakitok (skipjack) • Mud crabs
Gilutongan + Población, Cordova.	• Mol-mol (parrotfish)!! • Katambak (emperors)!! • Buntok (giant trevally) • Pata (angelfish) • Norkus (squid) • Balo (needlefish) • Rompi (barracuda) • Budboron (trevallies) • Ipus-ipus (wrasse)!! • Buntogon (warsses) !!	• Lambayang (wrasses) • Bakasi (moray eel) !! • Anduhaw (Mackerel) • Tamban (sardines) • Bolinao (anchovies) • Ito (catfish) • Baga-baga (squirrelfish) • Dangit (rabbitfish) • Iring-irning (scads) • Saang-saang (spider conch)

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Preliminary findings

Coral reef dependency is determined by individuals or community's broader context. External factors, personal factors and values interact to influence dependency.

- **Access to healthcare**

- Economic isolation

- Access to education

- Geographic isolation

- **Cultural practices & traditions**

- Emotional connection

- Social status

- Worldview

Mol-Mol (parrotfish) Cordova vs. San Vicente.

Up to 499peso/kilo vs. 15peso/kilo

'I mean, yeah, when it comes to the economic side, the parrot fish were considered as target reef fish.......meaning they were a type of fish that are sold to the market at a high cost'

*'The Cebuanos really love to eat fish........they love parrot fish'*

'They say oooooooh it's so yummy, especially if you're gonna make it a broth.'

Government bodies have asked local communities in Cordova to limit their catch of mol-mol: *'we highly discourage the collecting of parrot fish' and they often reply with 'oh, it's so sad'*

Coral reefs contribution to food systems are not homogenous across the population. It necessary to recognize the array of social, economic and environmental conditions that will influence dependency upon coral reef foods (Andrachuk, Peckham et al. 2022). Coral reef management must always be site specific.

Preliminary findings

Coral reef dependence stretches far beyond individual livelihoods.

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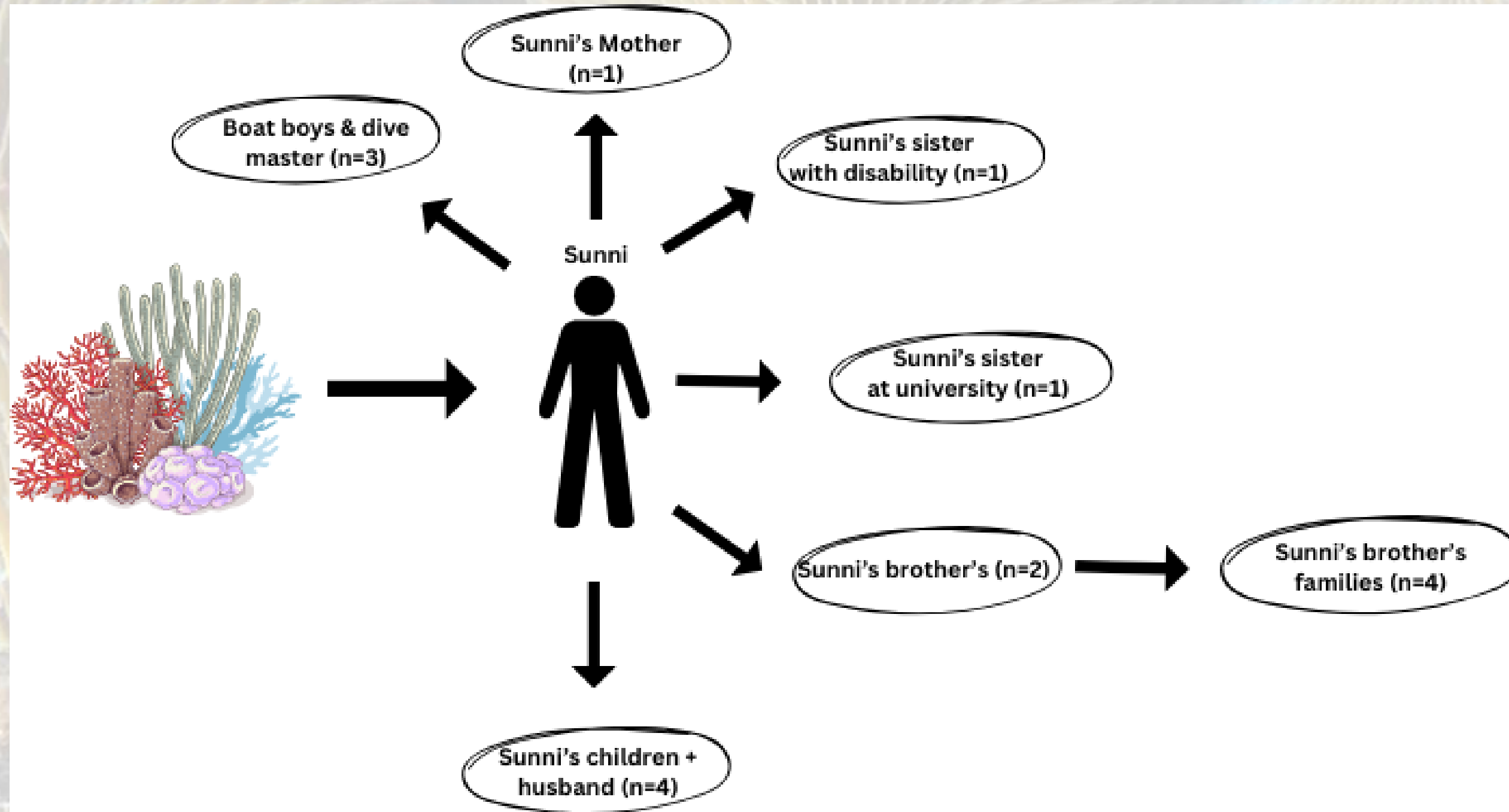
Preliminary findings
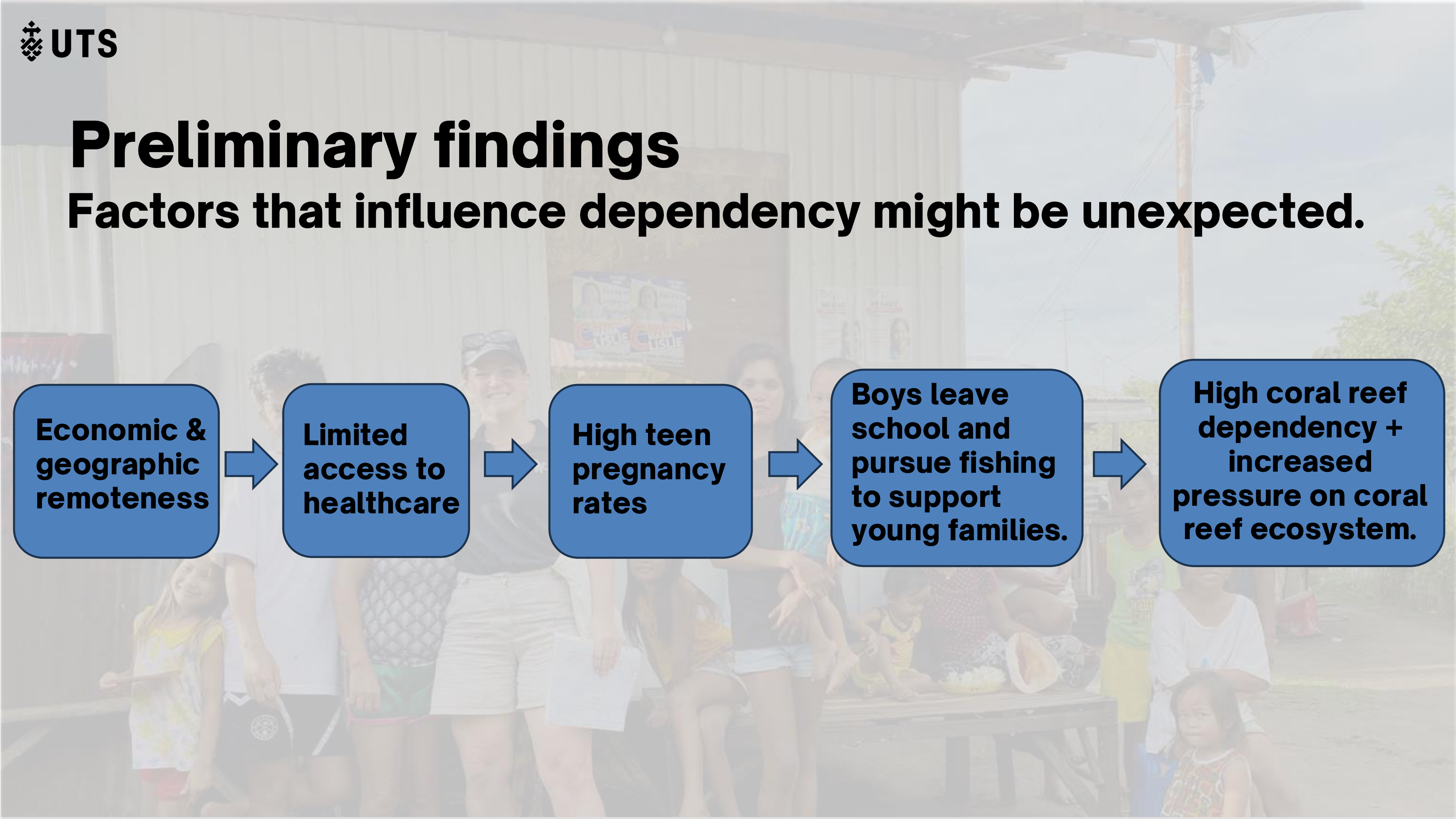## Factors that influence dependency might be unexpected.

Economic & geographic remoteness → Limited access to healthcare → High teen pregnancy rates → Boys leave school and pursue fishing to support young families. → High coral reef dependency + increased pressure on coral reef ecosystem.

Preliminary findings

Understanding local governance capabilities & priorities is essential to planning future coral reef interventions.

Large scale coastal development and reclamation priorities in next 10 years.	=	Less suitable location for further investment into coral reef management intervention.
Growing of ecotourism industry within next 10 years.	=	More suitable location for further investment into coral reef management intervention.

Key takeaway

Failure to include holistic coral reef dependency data within coral reef management will see us loose a chance at strengthening governance and safeguarding a future for coral reefs and communities who depend upon them.

Where to next?

- Continue governance analysis and further consider how results might be best integrated into coral reef governance.

- Synthesis findings to develop a broader set of indicators that can be used to wholistically assess coral reef dependency.

- Outreach materials to ensure study findings reach participants.

Thank you!!

Any questions?

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