

Building Climate Change Resiliency through Participatory Mangrove Management

A Case Study of Alitas Farmers in Infanta, Quezon, Philippines



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Introduction

Objectives

Project site

Key findings

Summary

Tropical Forest Landscape & Seascape Ecosystem Services

- Upland forests capture rainwater, recharge ground water
- Good upland cover keeps soil from eroding
 - Eroded sediment are trapped and filtered by mangroves thus protecting coral reefs
 - Mangroves regulates tidal waves, thus minimizing coastal erosion
 - Mangroves sequester voluminous amount of carbon being a catchment for upstream organic materials



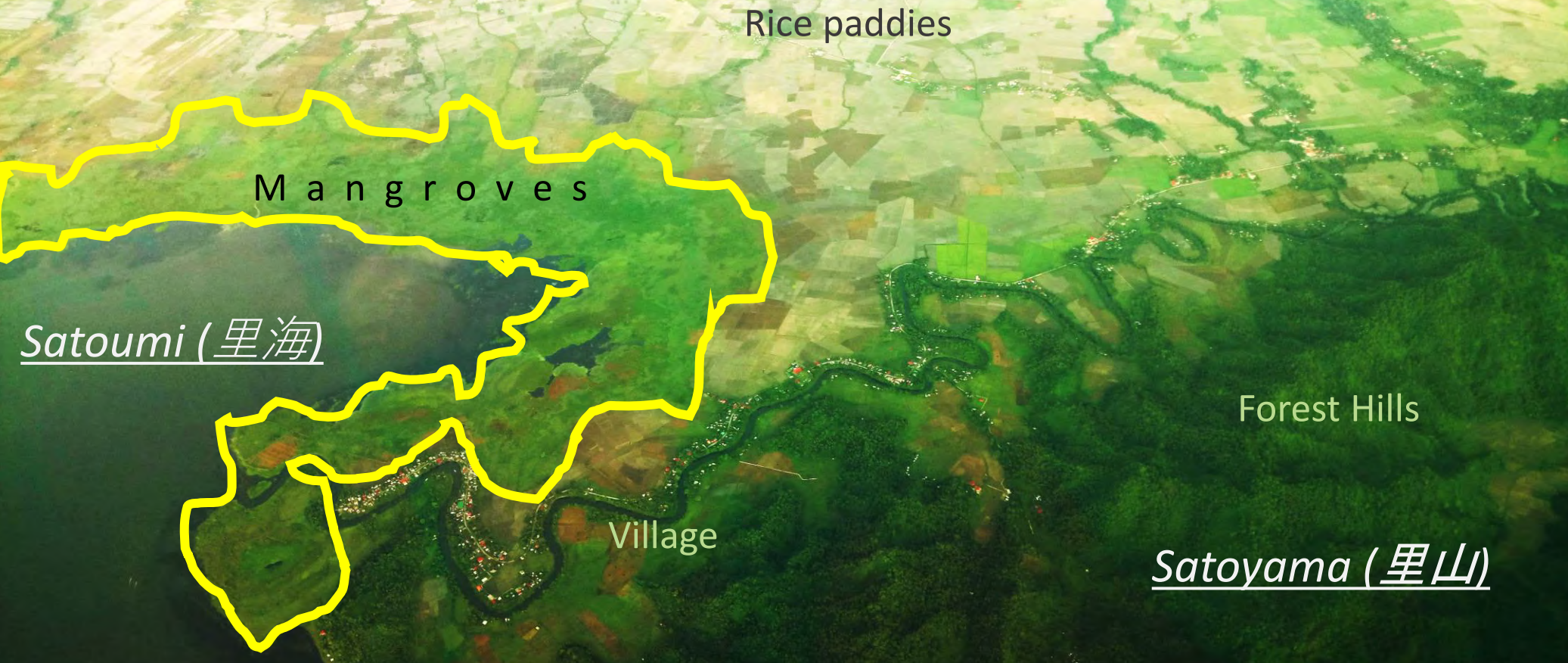
Mangrove

Forest ecosystem along coastal sediment and *brackish river habitats* exclusive in tropic and subtropic regions (latitudes 25° N and 25° S)

- **located between terrestrial and marine communities**, which receive a daily input of water from the ocean (tides) and freshwater, sediments, nutrients and silt deposits from upland rivers
- halophytic or **salt tolerant plants** in 12 genera, eight (8) families and 110 species – of these 65 species can be found in the Philippines



Mangroves link people and ecosystems along shared socio-ecological production landscapes and seascapes



Mangrove of Southeast Asia: Cover and trend

Country	Mangrove Cover in Year 2015 ('000 ha)*	Mangrove Loss between 2000-2012 (%)**
Indonesia	2244	1.7
Myanmar	299	5.5
Malaysia	521	2.8
Thailand	240	1.4
Philippines	356	0.5
Cambodia	50	2.3
Vietnam	270	0.3
Brunei	18	0.4
Timor-Leste	2	0.2
Singapore	1	0.0
Southeast Asia	4,001	2.1

*based on FAO (2015) ; ** based on Richards and Friess (2016)

Mangrove cover decline remains a major problem.



Rice farming



Industrial development



Oil palm plantation



Aquaculture production

Major threats to mangroves (Gevaña *et al.* 2018)

Philippine Mangrove Trend

- **Mangroves are state-owned.**
- From **500,000 ha** in early **1900s** to about **310,500 ha** (Brown and Fischer 1920; Chapman 1976; Primavera 2000; FMB 2010, FMB 2015).
- **Trend is now improving** with the recognition of biodiversity and ecotourism values and with implementation of **community-based forest management**.



Satoyama > Climate Resilience > Transformative Change

- **anticipating the conditions of a socio-ecological system** considering climate change and maintaining its integrity through adaptation
- **coastal communities** take deliberate collaborative actions to reduce risk from coastal hazards
- **Community development** encompasses enabling governance, improved SEPLS; capitalizes on multi-stakeholder collaboration



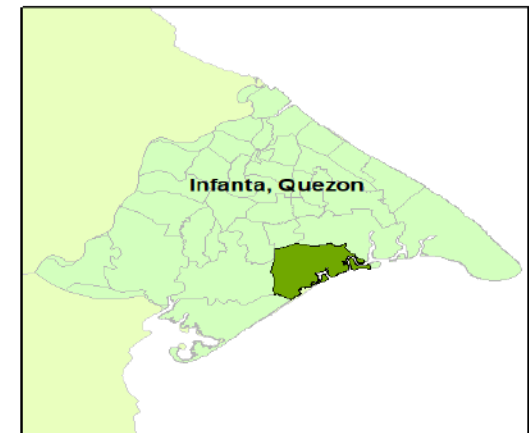
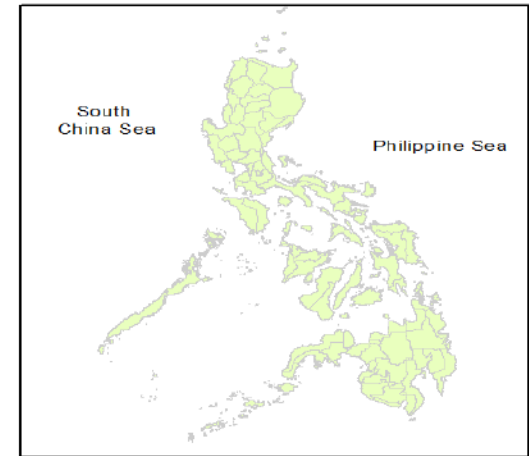
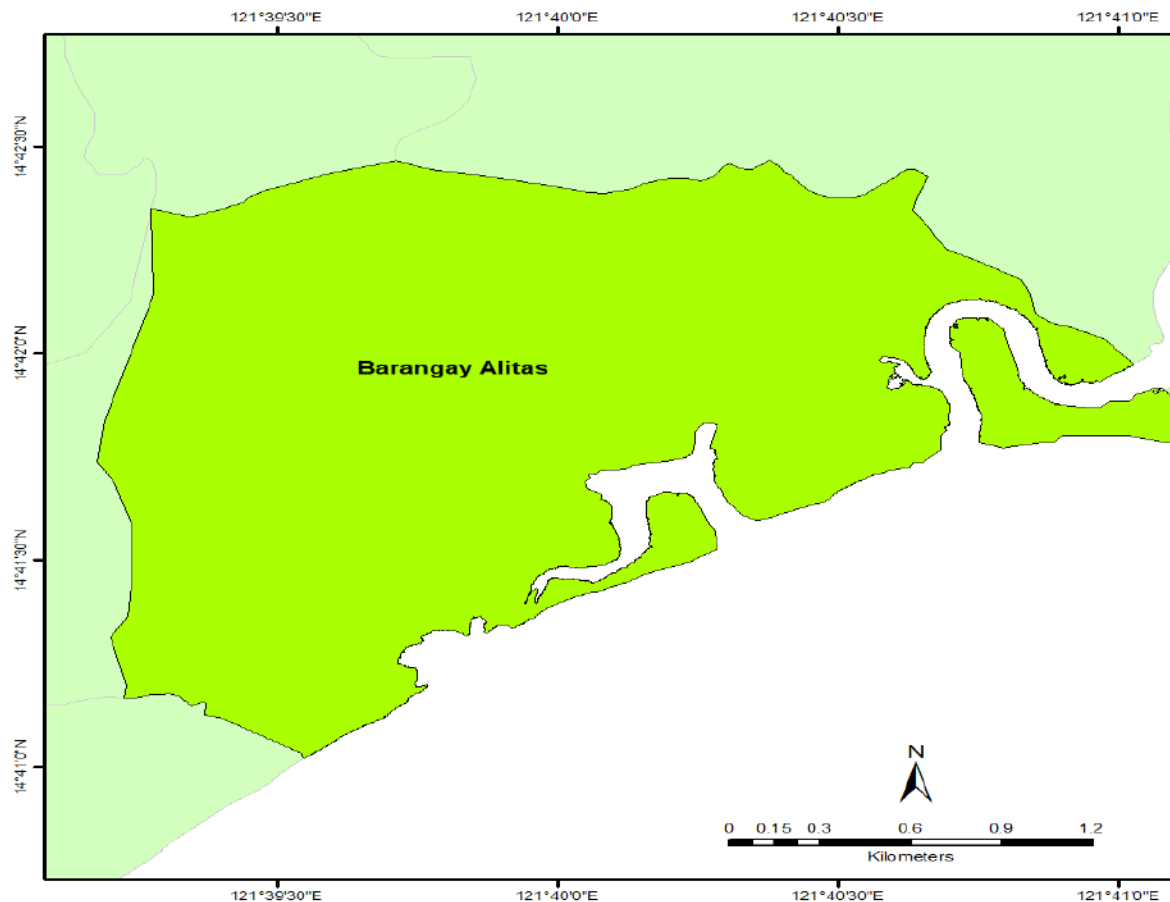
(Source: U.S. Indian Ocean Tsunami Warning System Program, 2007)

Study Objectives

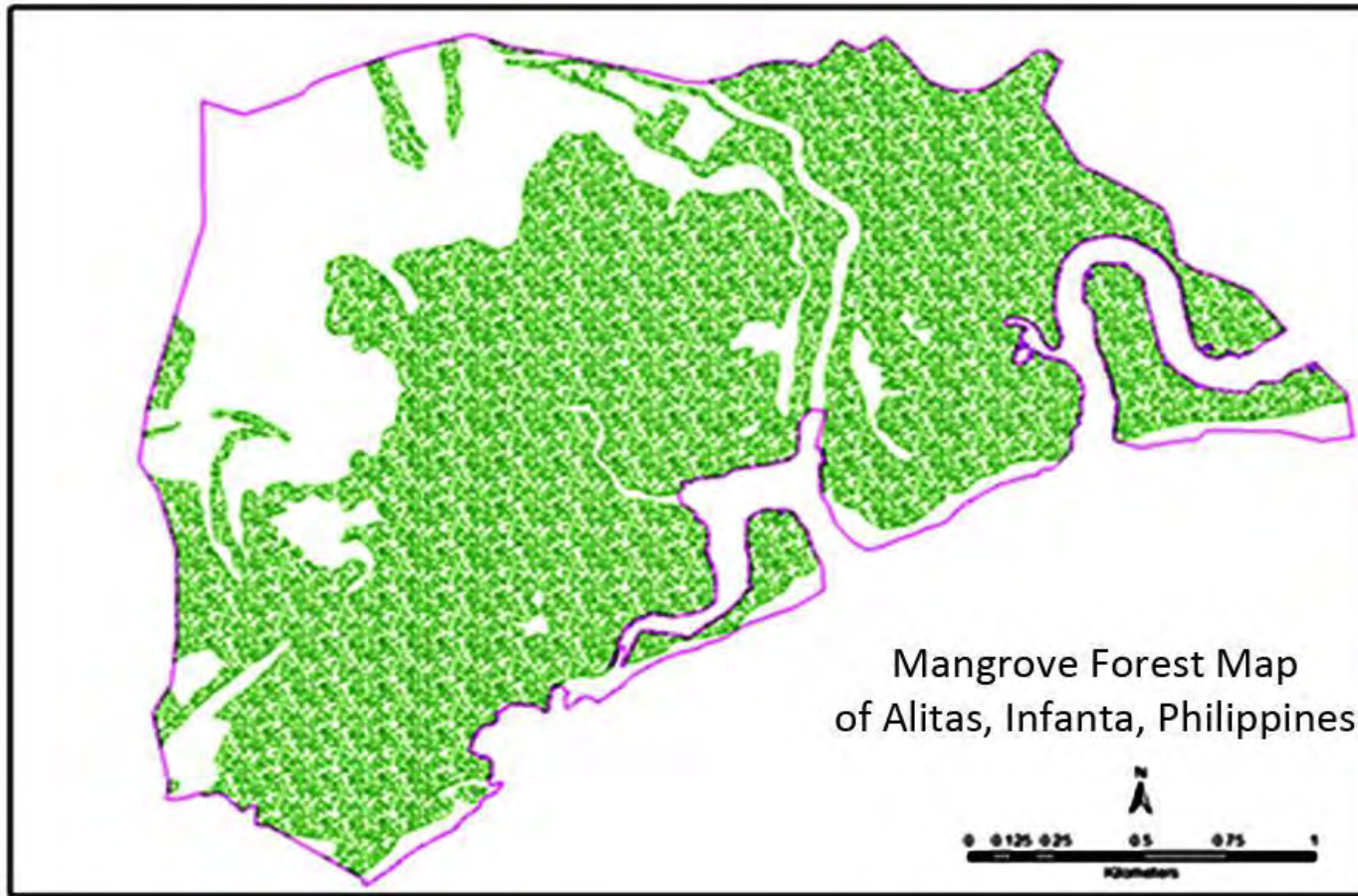
- To elicit various perspectives on the importance of mangrove conservation for enhancing climate resilience and draw lessons that foster transformative changes.
- To examine climate hazards and their impacts, socio-institutional arrangements in mangrove management promoting local adaptation
- To synthesize essential components of collaborative mangrove management towards promoting climate resiliency.



Case Study Site: Alitas Coastal Community



Location Map of Barangay Alitas



Mangrove Forest of Alitas, Infanta, Quezon

Methods:

Case study approach

(Participatory Mixed Methods)

- *Stakeholder analysis*
- *Resource and climate hazard mapping*
- *Institutional Capacity Analysis*

Through Focus Group Discussions and Key Informant Interviews





Socio-Demography

Size of the case study/project area	507 ha
Number of direct beneficiaries / whole community	1,124 persons
Geographic coordinates (longitude and latitude)	N 14.7054, E 121.6737
Dominant ethnicity	Tagalog



Nipa roof thatching



Nypa fruiticans

Socio-ecological and economic
production values



Nipa vinegar and wine production



Lambanog or nipa wine – 40-45% Alcohol



Socio-ecological and
economic production values



Mangrove nursery production
(primarily dominated by women; men
are more engaged in field planting)



Fishing and shellfish gleaning

Aquaculture
production
(mostly
owned by
non-
residents)





Before: Rampant mangrove clearing
for fishponds



Now: | Mangrove rehabilitation over
abandoned fishponds

Research Participants

Local Government Units

Role: Creation and enforcement of local policies

LGU

Department of Environment and Natural Resources

Role: Mangrove rehabilitation project

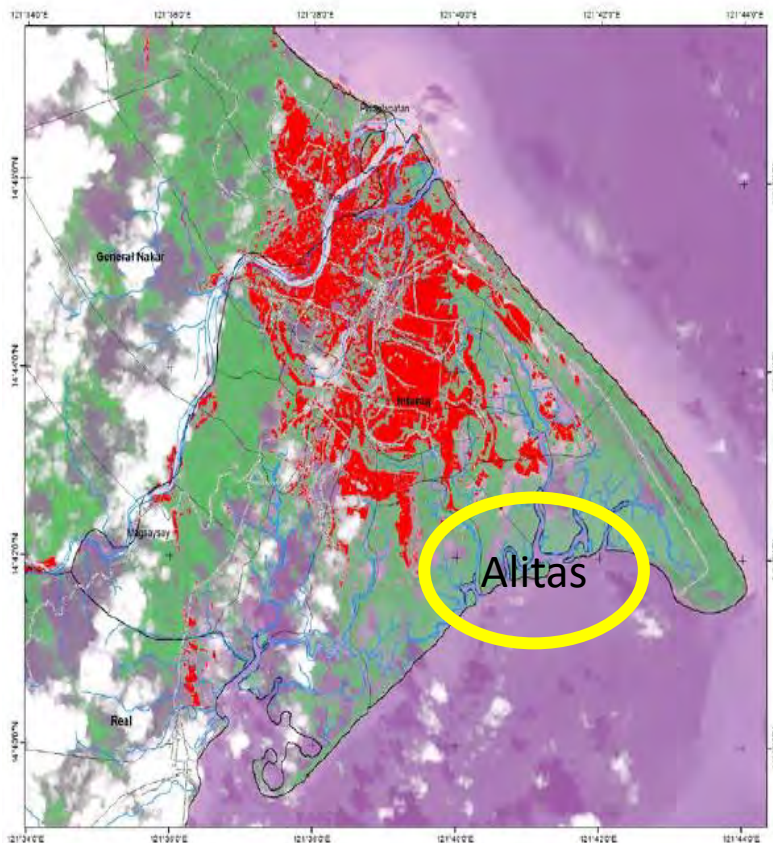
DENR

Local community represented by their People's Organization : Alitas Farmer Association (AFA)

Role: beneficiary, main implementor of mangrove rehabilitation activities, community project designer and implementor

**FARMERS /
COMMUNITY**

Community based forest management set-up.



- Philippines experiences 20-25 storms a year.
- Alitas is one of the most exposed being situated along the Pacific coast.

Key Findings: Climate Risks

- Storm-induced landslides and floods killing nearly 1,600 people in Infanta, Philippines in November 2004

Source: Rappler

Source: Talubo et al. (2015)

Key Findings: Climate Risks

Risk Event	History	Likelihood	Impacts	Degree of Impact*
Tropical depression	Winnie (Nov. 29, 2004) – strong winds and flooding	First time to experience	Agriculture <ul style="list-style-type: none"> • Ricefields were filled with mud Mangrove <ul style="list-style-type: none"> • Mangroves branches fell • Fishes died Facilities <ul style="list-style-type: none"> • No electricity for a month • Houses along the river were flooded • Wells were filled with mud hence no potable water. 	2
Typhoon	Tisoy (Dec 2019)	Often	Barangay is located in a higher elevation that made it less affected by flooding.	2
Buhawi (Tornado)	1995	Once	Only four houses were affected. Roofs of houses were destroyed	1

* Impacts: (1- Not Affected; 2- Affected; 3 -Extremely Affected)





Local Resilience

- Community resilience is commensurate to the area of mangrove forest cover that provides people with multiple ecosystem benefits.

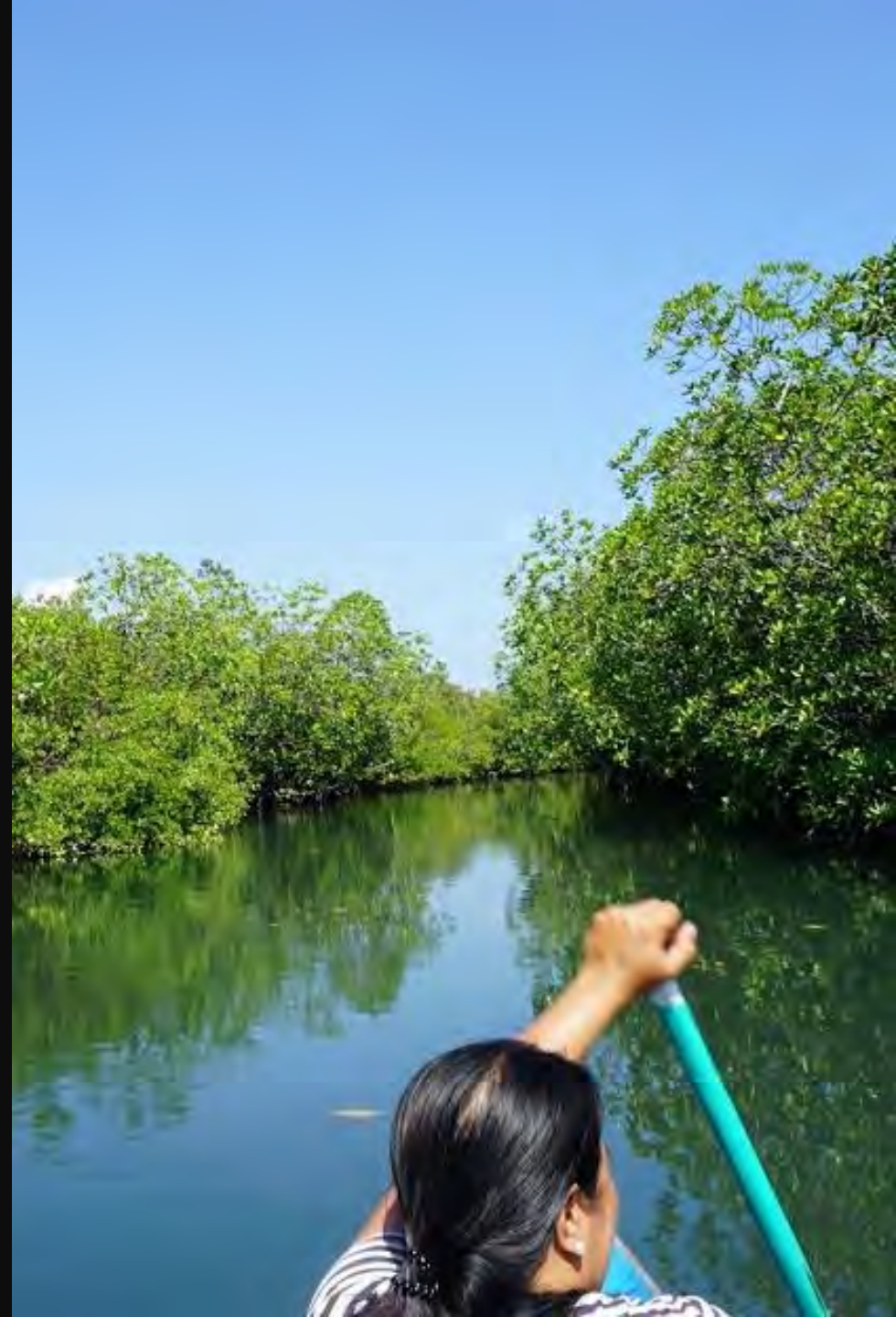
Local Resilience

- Joining mangrove rehabilitation project of the government provides additional income.



Local Resilience

- Local community regards mangrove ecosystem as shield against typhoons, strong winds, and monsoon floods.
 - Local initiatives to prohibit illegal fishing activities and mangrove cutting.
 - Local government has deputized fish wardens / community volunteers.
-



Resilience of local communities to disasters such as COVID 19

- High degree of cooperation and unity made Alitas folks adhere to local and national protocols to prevent Covid-19 disease spread among members of the community.
- Continued involvement in the mangrove projects and derivation of good income from rice farming, fishing and local wine production kept them buoyant in this COVID 19 situation.
- AFA members' stable source of income is enough to keep them connected by text since the general assembly was forbidden due to COVID 19.

Resilience of local communities to disasters such as COVID 19

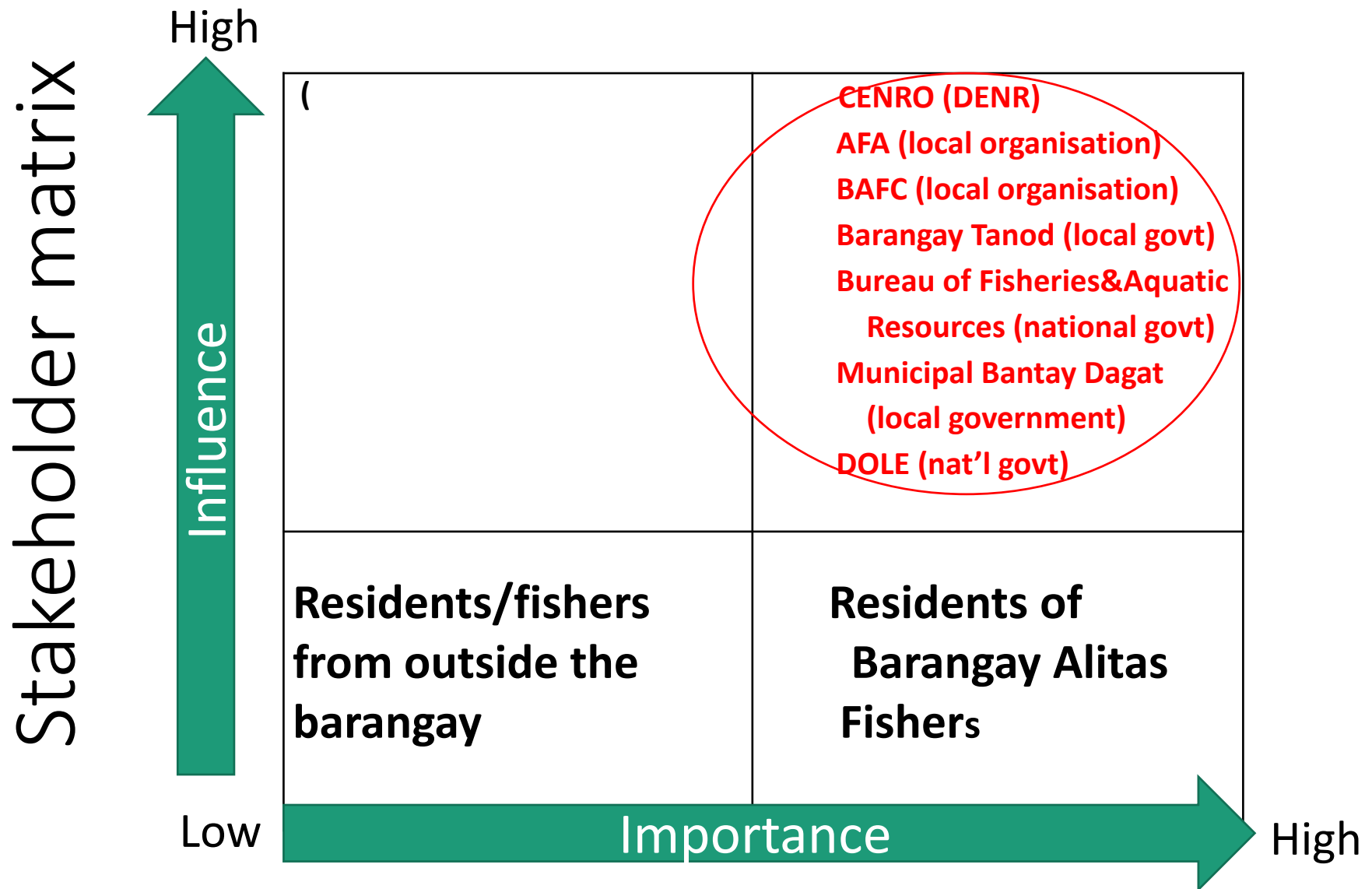
- The autosavings program of AFA made sure that members can withdraw their savings without going to the bank.
- Their good source of food (from mangroves and small gardens near the house) during the pandemic also provided them good health and kept their village COVID free until now.

Community Prospects in the post COVID 19 Era

- **Good leadership** – there is continuing mentorship of next leaders.
- The **organization** is very **stable**.
- **Finances** are very **liquid** and there is continued asset build up.
- The **organization** has **very good reputation from partner agencies** like BFAR, DENR, DA, DAR, NIA, LGU, etc.
- **AFA** asserts **strong representation in dialogues** with national and local agencies especially on matters related to environment, irrigation, agriculture, fisheries, peace and order and pollution.

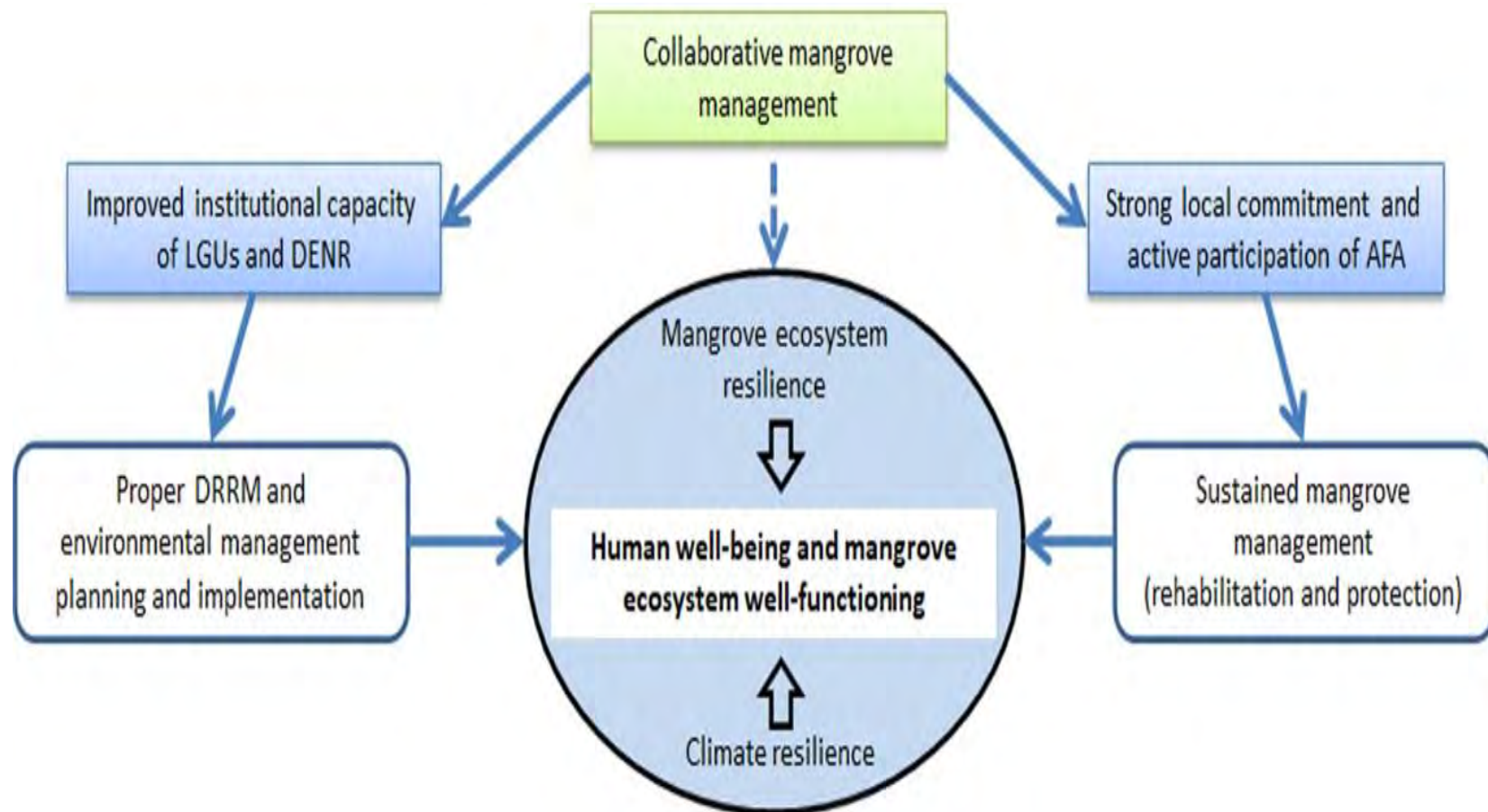
Community Prospects in the post COVID 19 Era

- **High survival rate** of rehabilitated mangroves (**99%**), both paid and voluntary, sustains the trust of the DENR.
- **Diversified cash income sources** due to improved mangrove quality.
- High collective consciousness.
- Deep regard for nature conservation
- Adherence to local and national laws, rules and policies.
- Continued support for community needs from LGUs, national government agencies (DA, DENR, DSWD, NIA, BFAR, DOLE, DTI) and academe.



Implies the need for active collaboration among major stakeholders (local community organization, local government and DENR)

Collaborative Mangrove Management: Key for Promoting SEPLS Sustainability and Resiliency



Summary



Seeds of Transformative Change

- increased appreciation of mangrove values
- Increased local participation in mangrove conservation to sustain socio-economic and ecological gains
- Willingness among stakeholders to collaborate
- Improved institutional capacity to manage climatic risks, capitalizing on mangrove conservation
- Stakeholders appreciate the connection between mangroves and climate resiliency

Summary



Local Community Development

- develops sense of ownership, organization and responsibility over mangrove management
- women and other marginalized sectors are being empowered through participation in mangrove conservation activities
- government stakeholders share responsibilities to assist local community in mangrove protection and development efforts thereby satisfying their institutional goals as well

Summary

Local Community Development



- mangrove programs (particularly reforestation) serve as conduit for creating jobs and local income sources
- a well-kept mangrove sustains and protects natural resource-dependent local livelihoods
- mangrove projects help build local institutional capabilities of people's organization
- good leadership and local organization promotes sustained mangrove resources and resilience



SATOYAMA
INITIATIVE

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Thank you.