

# Reviewing the effectiveness of Climate Change Adaptation outcomes: Mangaia Harbour Upgrade Project

Dr. Sandeeka Mannakkara<sup>1</sup> Dr. Niransha Rodrigo<sup>2</sup> Dr. Cody Mankelow<sup>3</sup> and Dr. Tina Newport<sup>3</sup>

<sup>1</sup> University of Auckland, New Zealand; [s.mannakkara@auckland.ac.nz](mailto:s.mannakkara@auckland.ac.nz)

<sup>2</sup> Massey University, Auckland, New Zealand

<sup>3</sup> University of Auckland, New Zealand



**ENGINEERING**



# SUSTAINABLE DEVELOPMENT GOALS



# Background

- ❖ OECD, World Bank and UN Environment analysis says: **USD 6.9 trillion** of infrastructure investment needed for climate resilience, per year, by 2030
- ❖ Least Developed Countries and Small Island Developing States need 10-30x than OECD countries

**How effective and truly impactful are these investments?**

# Background: The Cook Islands



# Background: The Cook Islands

- ❖ Heavily reliant on donor funding for infrastructure development and climate and disaster resilience
- ❖ Major donors: Asian Development Bank, the World Bank, MFAT NZ, DFAT Australia, Green Climate Fund
- ❖ After the five Cyclones in 2005: significant investment into port reconstruction and development for climate resilience – E.g. Avatiu Port in Rarotonga, Mangaia Harbour in Mangaia
- ❖ More funding for port developments earmarked for the future

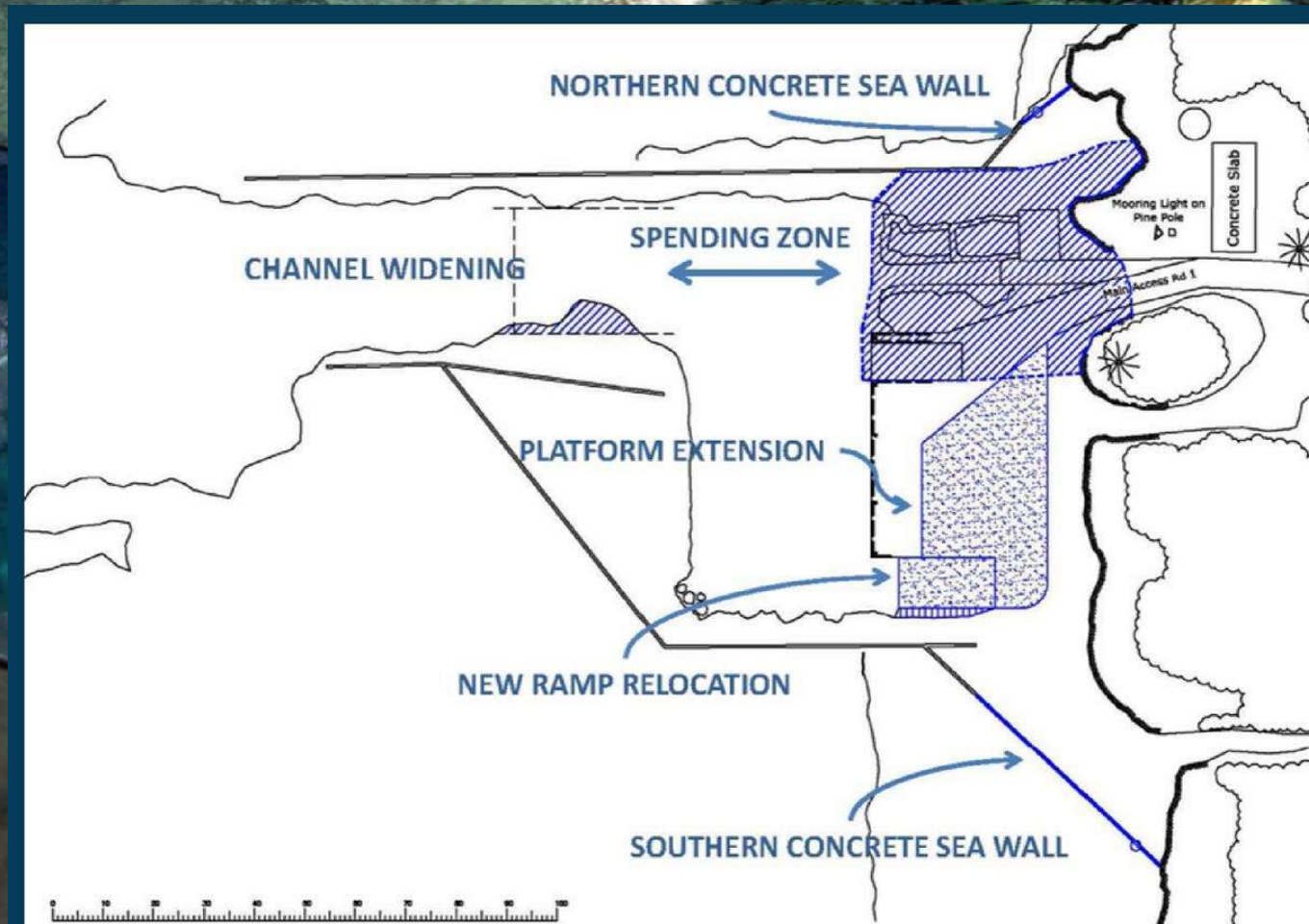
**How have communities found these projects?  
Have the investments been “worth it”?**



ENGINEERING

# Case Study: Mangaia Harbour

- \$574,203 NZD
- Funded by ADB
- Project objective: reduce cyclone risk by improving harbour strength and durability
- Coastal calculator used for climate risk assessment



# Case Study: Mangaia Harbour

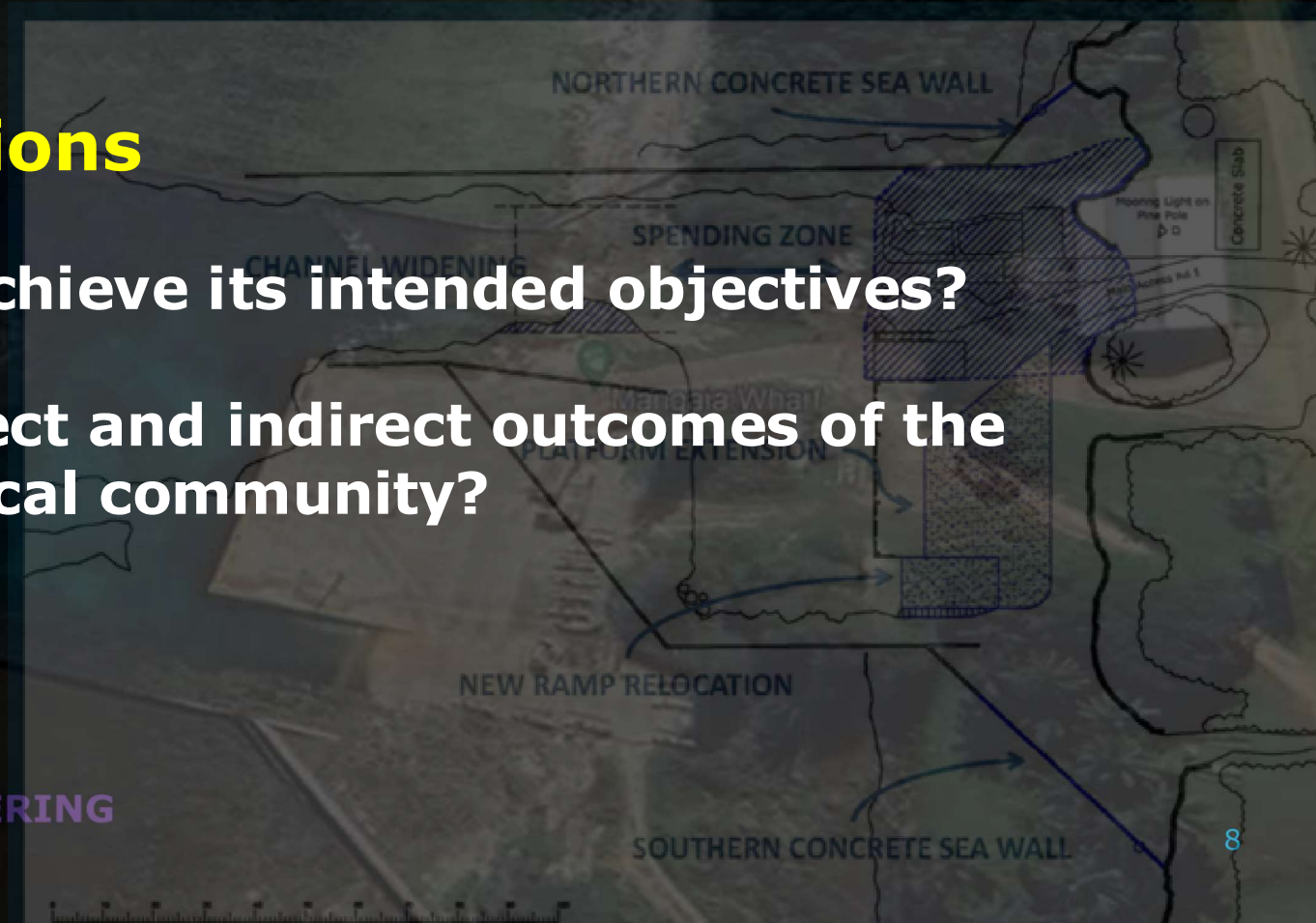
## Project Objectives

<b>Objective 1</b>	<b>Harbour operations/functionality:</b> <i>Increase the number of ships for berthing and enable unloading and loading of cargo during 15 knot winds.</i>
<b>Objective 2</b>	<b>Lifestyle:</b> <i>Reduce the number of people and time taken to launch and retrieve fishing vessels by fishermen under adverse weather conditions.</i>
<b>Objective 3</b>	<b>Health and wellbeing:</b> <i>Reduce the number of accidents at Mangaia harbour.</i>
<b>Objective 4</b>	<b>Health and wellbeing:</b> <i>Increase the number of days per annum where the harbour can be accessed safely.</i>
<b>Objective 5</b>	<b>Community:</b> <i>Increase the number of people and communities benefiting from the Mangaia Harbour Project.</i>
<b>Objective 6</b>	<b>Community:</b> <i>Deliver community satisfaction at the end of construction.</i>

# Case Study: Mangaia Harbour

## Research Questions

- ❖ Did the project achieve its intended objectives?
- ❖ What are the direct and indirect outcomes of the project for the local community?





# Case Study: Mangaia Harbour

## Research Methods

### ❖ In-person interviews:

- Key Government stakeholders (Climate Change Cook Islands Infrastructure Cook Islands, Ports Authority, National Environment Service, Emergency Management Cook Islands)
- Harbour users
- Local residents

### ❖ Talanoa (focus groups): Local community and harbour users

### ❖ Document Review



UNIVERSITY OF  
AUCKLAND  
Waipapa Taumata Rau  
NEW ZEALAND

ENGINEERING

# Findings

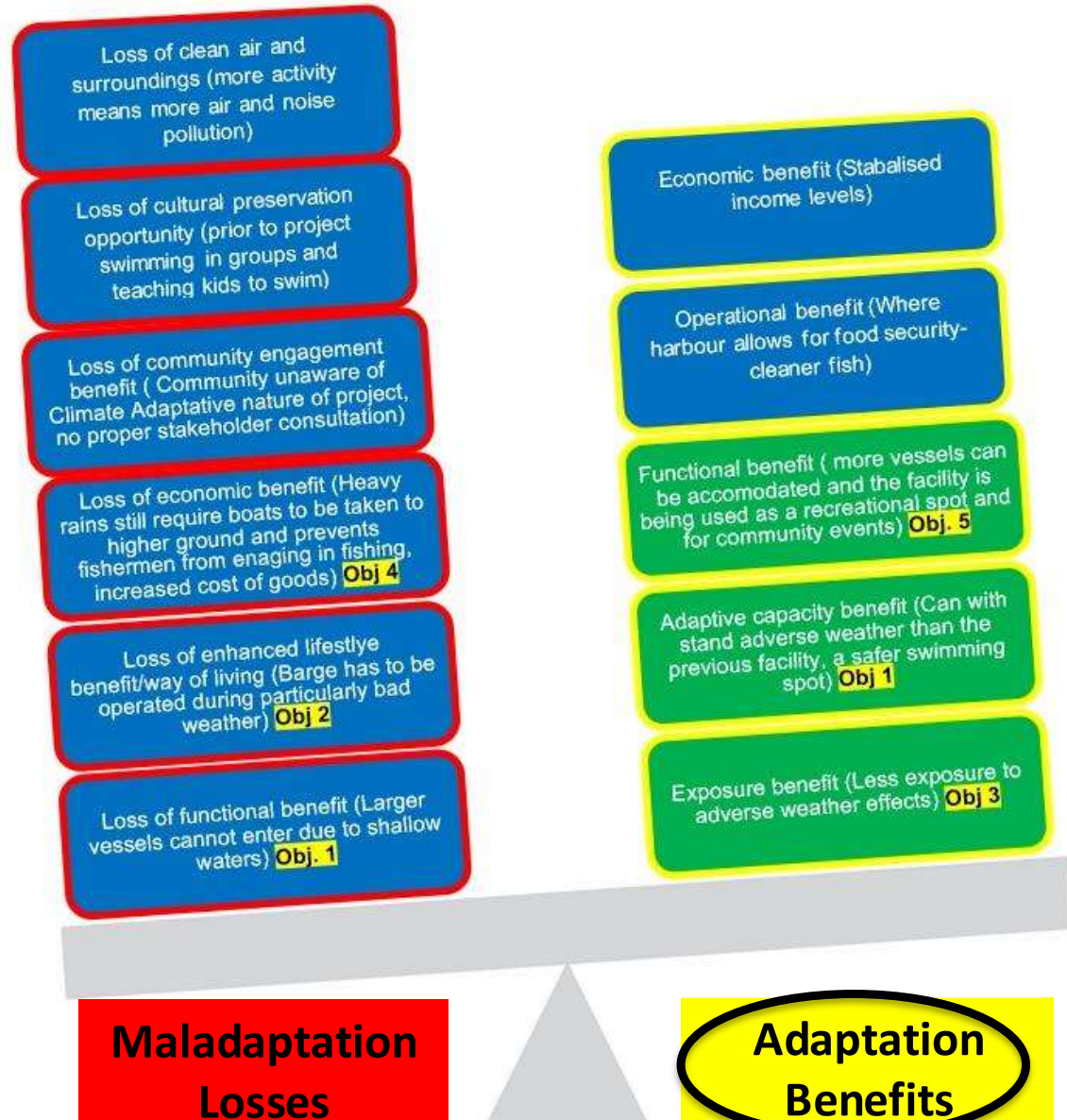
“The harbour is very much a community space. It's a place where people gather, where you go to see what's happening”

“It's not just a port facility, it is actually a community space”

“Regular access to goods”

“Since the harbour is spacious and deeper than before, it attracts different species of fish”

“Can launch your canoe on a rough day”



# Findings

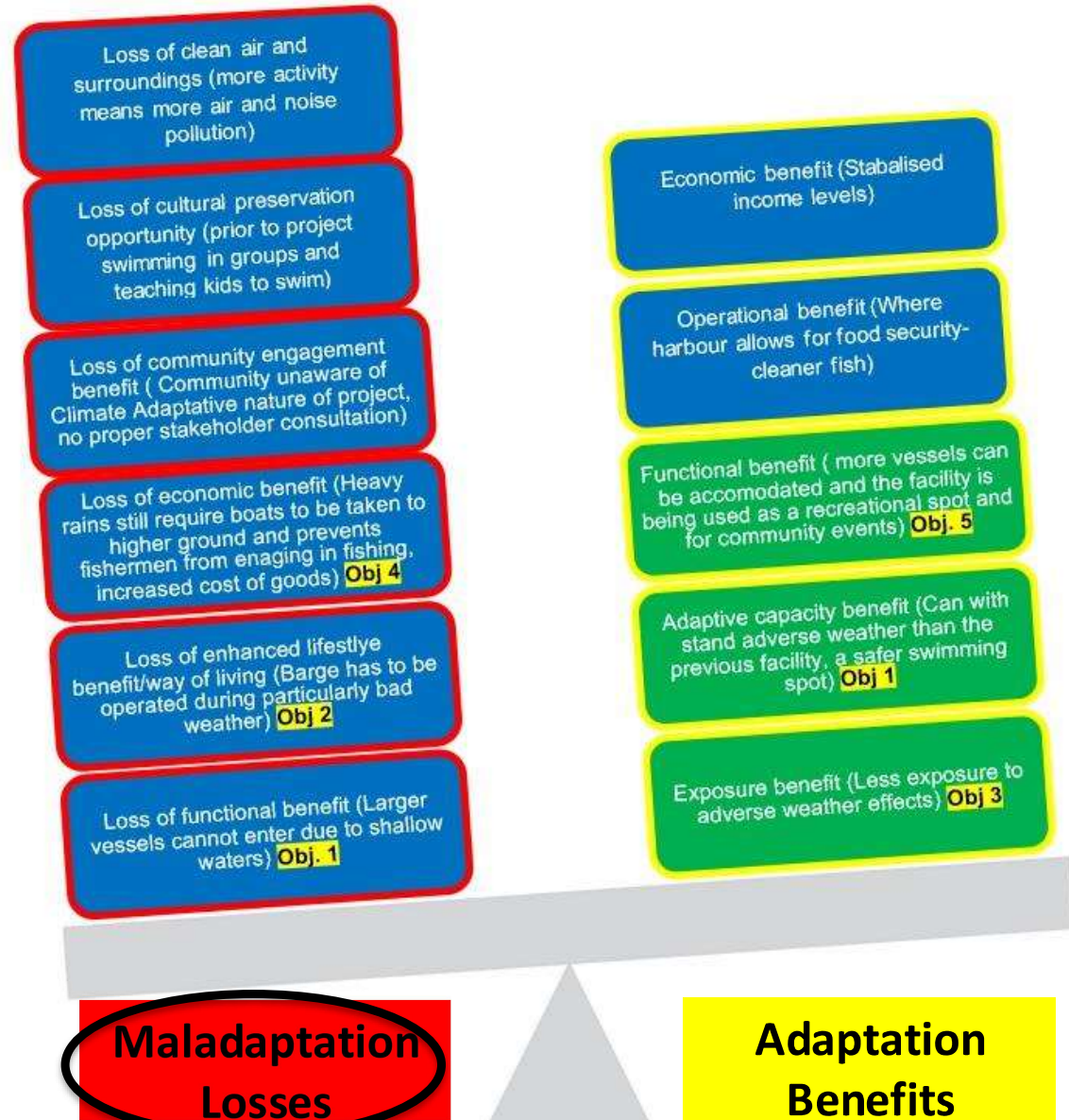
“Consultation process was cut short due to time and delivery pressures”

“On rough days we can't do anything”

“The goods are not unloaded on the shore as we would have expected”

“They don't consult with us, with our local people. They just draw their plan. I don't know where they got their plan from”

“Should consider further work to address these issues and improve functionality”



# Conclusions

## Project Objectives

<b>Objective 1</b>	<b>Harbour operations/functionality:</b> <i>Increase the number of ships for berthing and enable unloading and loading of cargo during 15 knot winds.</i>	<i>Partially achieved</i>
<b>Objective 2</b>	<b>Lifestyle:</b> <i>Reduce the number of people and time taken to launch and retrieve fishing vessels by fishermen under adverse weather conditions.</i>	<i>Partially achieved</i>
<b>Objective 3</b>	<b>Health and wellbeing:</b> <i>Reduce the number of accidents at Mangaia harbour.</i>	<i>Achieved</i>
<b>Objective 4</b>	<b>Health and wellbeing:</b> <i>Increase the number of days per annum where the harbour can be accessed safely.</i>	<i>Partially achieved</i>
<b>Objective 5</b>	<b>Community:</b> <i>Increase the number of people and communities benefiting from the Mangaia Harbour Project.</i>	<i>Achieved</i>
<b>Objective 6</b>	<b>Community:</b> <i>Deliver community satisfaction at the end of construction.</i>	<i>Mostly unachieved</i> 12

# Conclusions

- ❖ Port CCA projects offer more than just infrastructure - communities expect social, cultural, lifestyle, and economic benefits.
- ❖ It's crucial to understand the gap between project (client) objectives and community needs. When these differences are too vast, projects may be perceived as failures by the community.
- ❖ Infrastructure projects have significant direct and indirect impacts on local communities. A lack of deep understanding of the communities served can lead to unmet project objectives.
- ❖ Current levels of community consultation are inadequate—many community members are either not invited or unable to attend, leading to skewed results.
- ❖ Strong community engagement and partnerships throughout the project are key to achieving successful project outcomes.