

## Working Session #2:

# Coastal Flooding & Inundation Case Study

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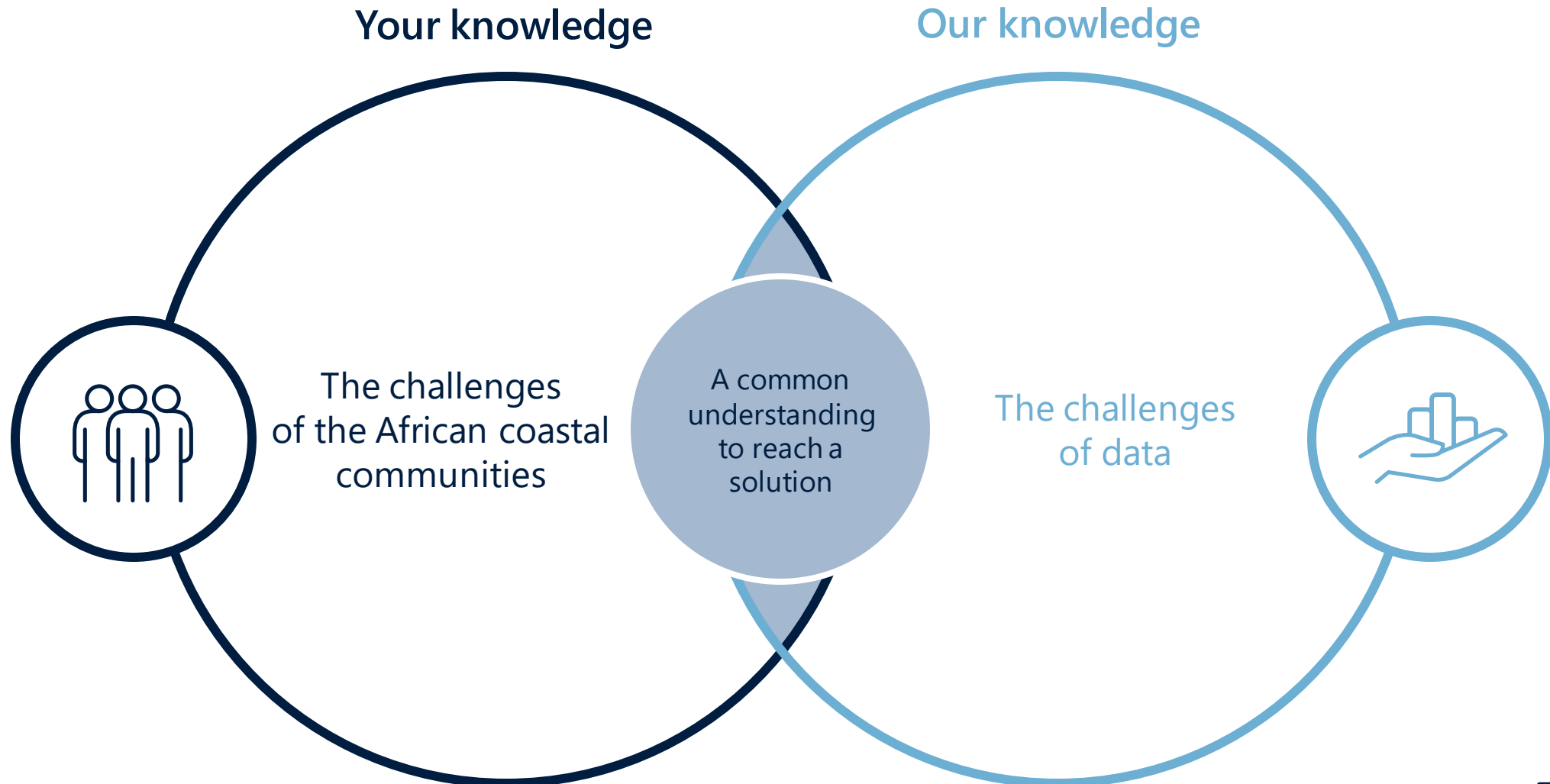


# Early Warnings for All



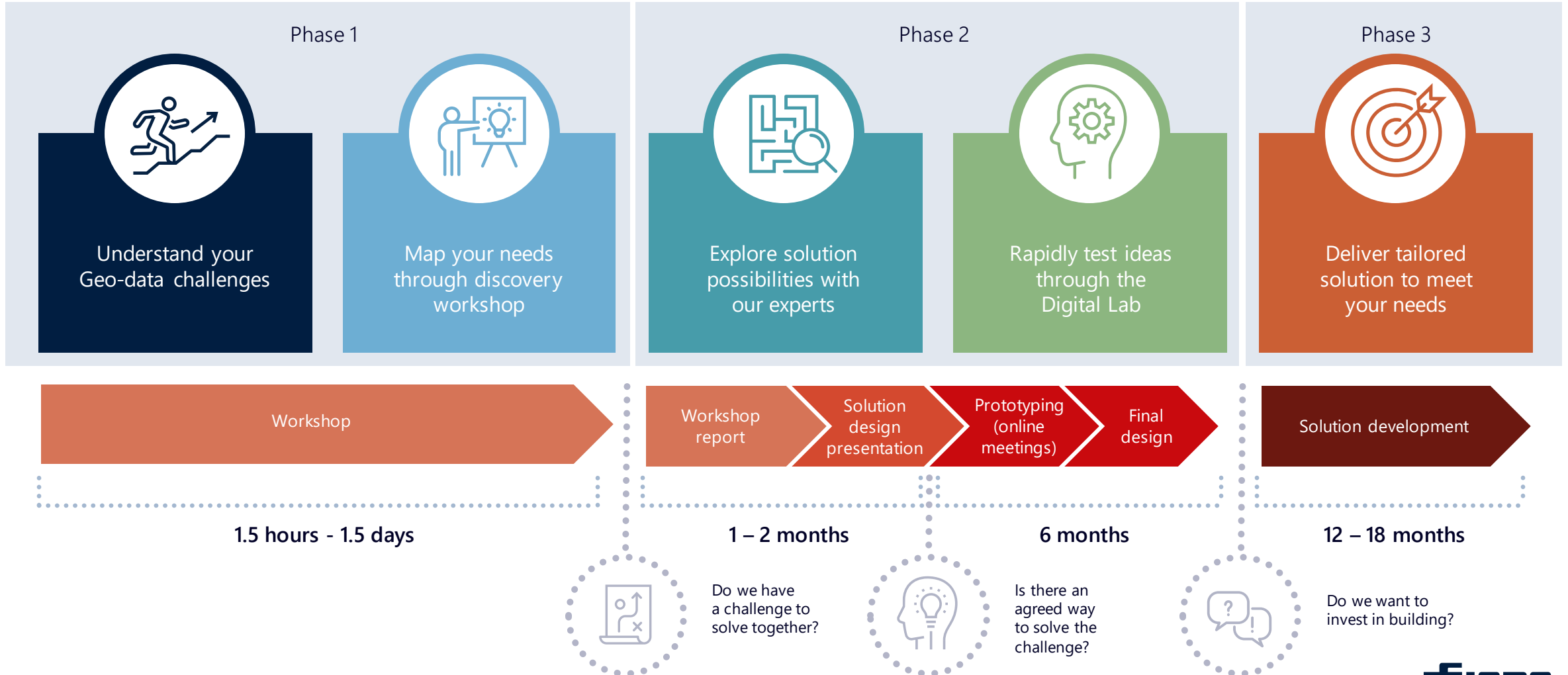
- Over the past twenty years, at least **1.6 billion people** having been affected by **floods** (World Bank, 2021)
- Climate, weather and water-related extremes → 15 times more deadly hazards for people in Africa, South Asia, South and Central America, and small island states.
- Over the last 50 years, nearly 70% of deaths from climate-related disasters have occurred in the 46 poorest countries.

# Co-design for digital solutions required for decision-making



# A digital co-design process

A flexible shared approach to improve digital solution design

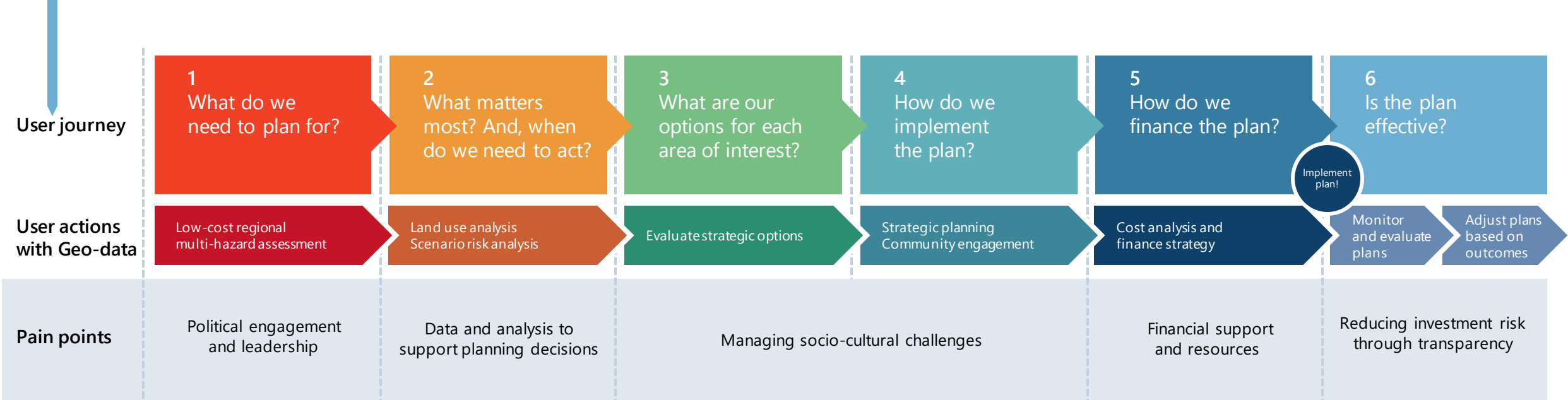


# Sea'ties-SPREP co-design workshop in Nadi, July 2023

Pacific region decision-makers require more access to data and digital tools to support climate adaptation planning and management

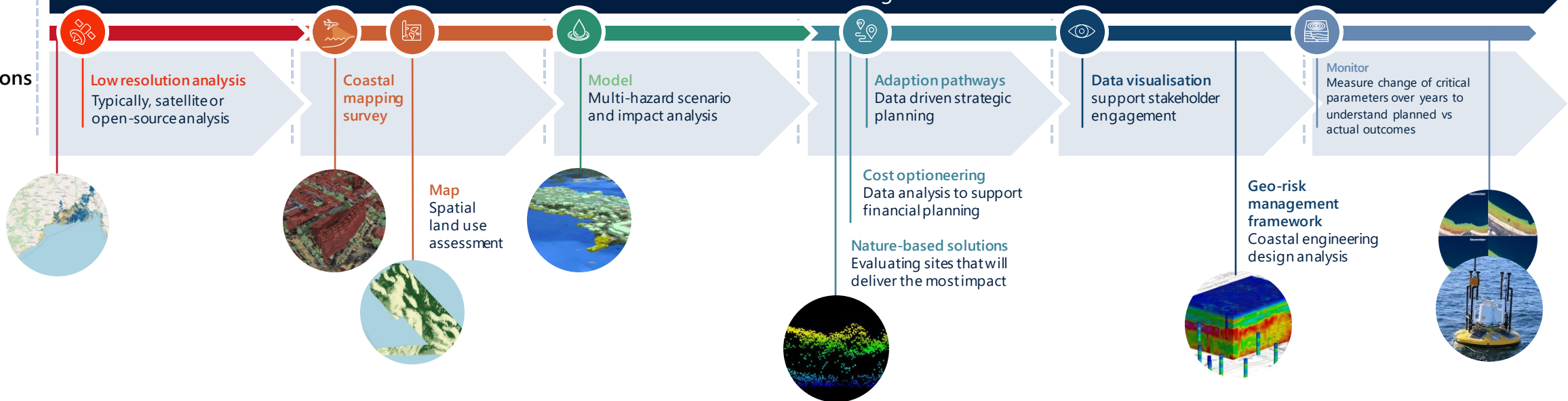


18 participants from 10 Pacific islands (including NZ)



**Data driven decision making solutions**

**Data solutions**  
The Geo-data value chain



# Aim of workshop is to map:



# Draft of the pilot solution

Pilot Solution Description				
End Users				
Target Audience	Decision Points		Benefits	
Technical resources				
Locally Available		Internationally Sourced		
Scalability				
Time	Theme		Location	
Financial Scheme				
Product Impact Assessment				
Long-term Commitment				
Self-Evaluation				
Strong Points	Weak Points		Improvements	
Unique Selling Points				
Feasibility	Engagement	Impact Potential	Added Value	Attractive
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# Fugro is an active member of numerous UN Ocean Decade programmes for Coastal Resilience & Digital Twins



**Digital Twins of the Ocean**  
Official partner



**CoastPredict**  
Aquarius project within  
PredictOnTime Core Project



**Ocean Decade Africa  
Roadmap**  
Jaco Stemmet – representing  
the private sector on the task  
force



**Ocean Decade Corporate  
Data Group &  
Ocean Decade Data  
Coordination Group**  
Via IOC-UNESCO partnership

# Aquarius project

- European-African collaboration
  - 4 African partners: Benin, Mozambique, South Africa, Cabo Verde
- Aims:
  - Deliver coastal predictive products for coastal zones vulnerable to extreme natural hazards.
  - Near-real-time insights through observations, modelling and forecasts
  - Deliver early-warning capabilities to support decision-making, policy development and capacity development
  - Protect people, nature and infrastructure via coastal resilience and preparedness.
  - Co-design of products to support decision-making

# II. Major Hazards and Impacts

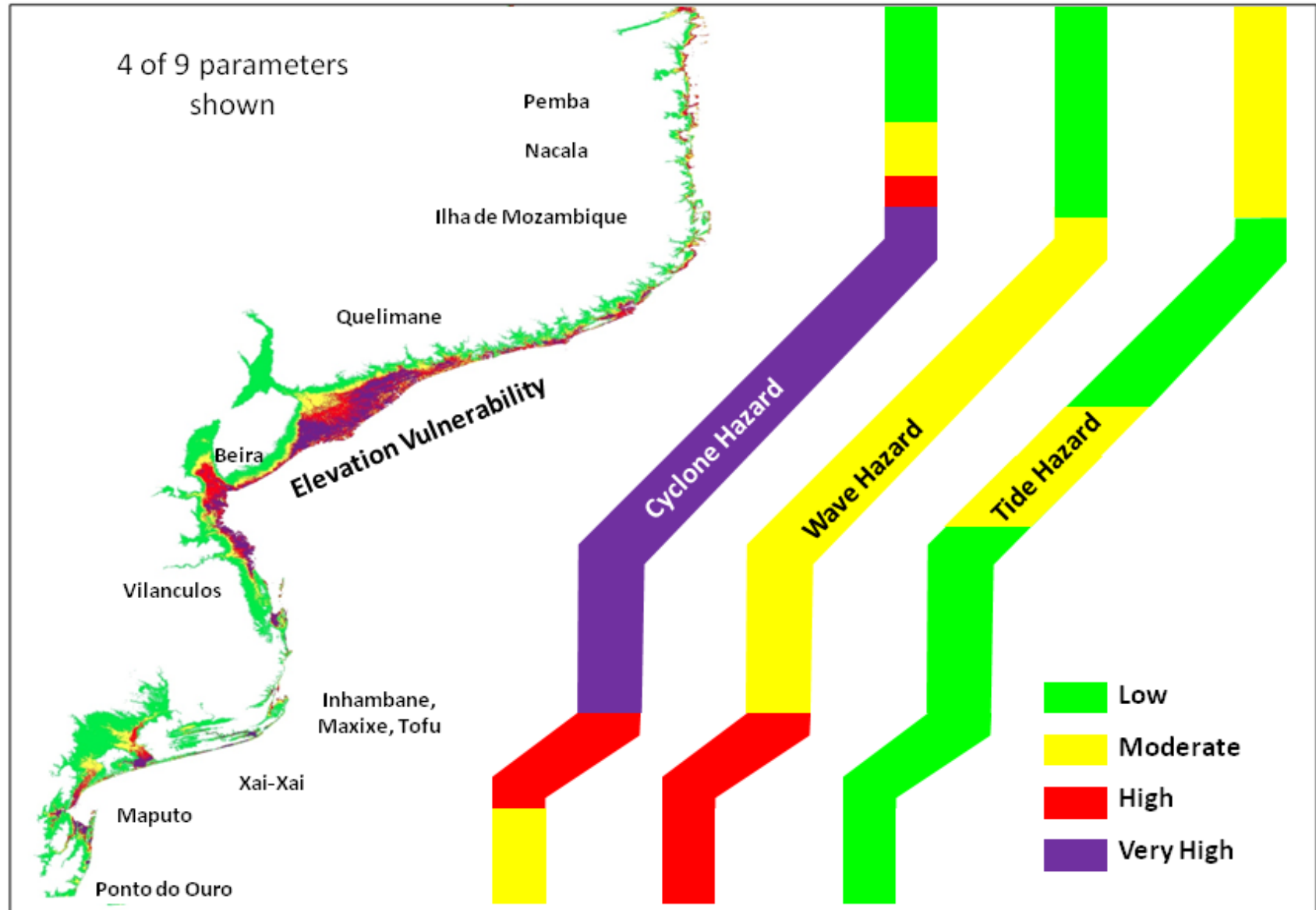
## Climate Change Factors

### Rising sea levels

- Flooding and inundation
- Erosion of coastal areas

### Extreme weather conditions

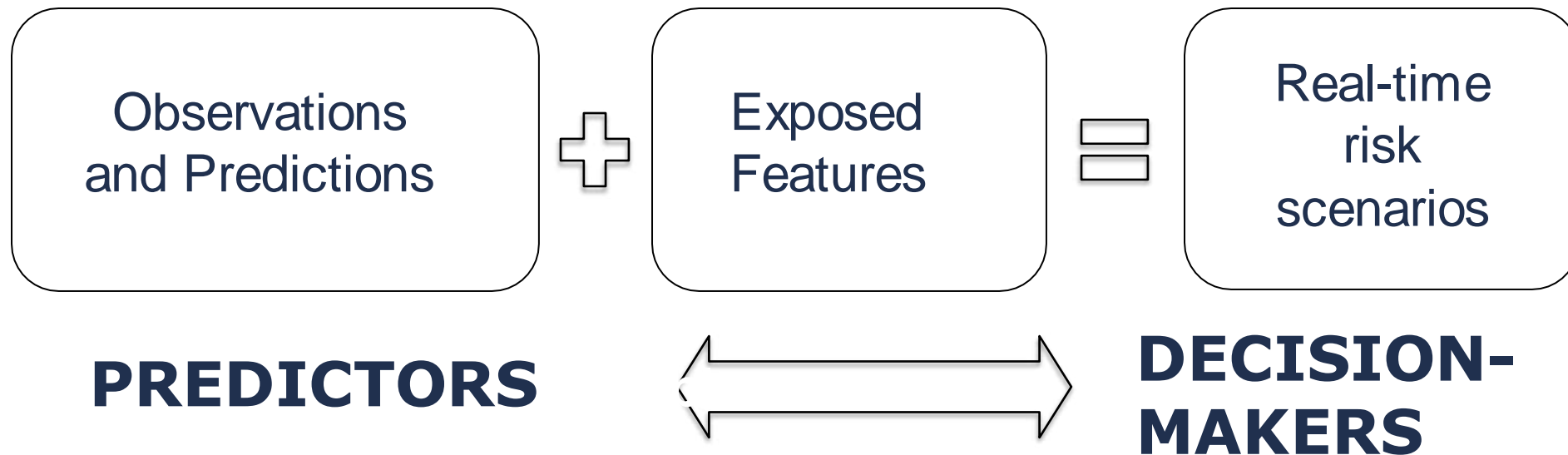
- Tropical cyclones
- Storms
- Floods
- Wind



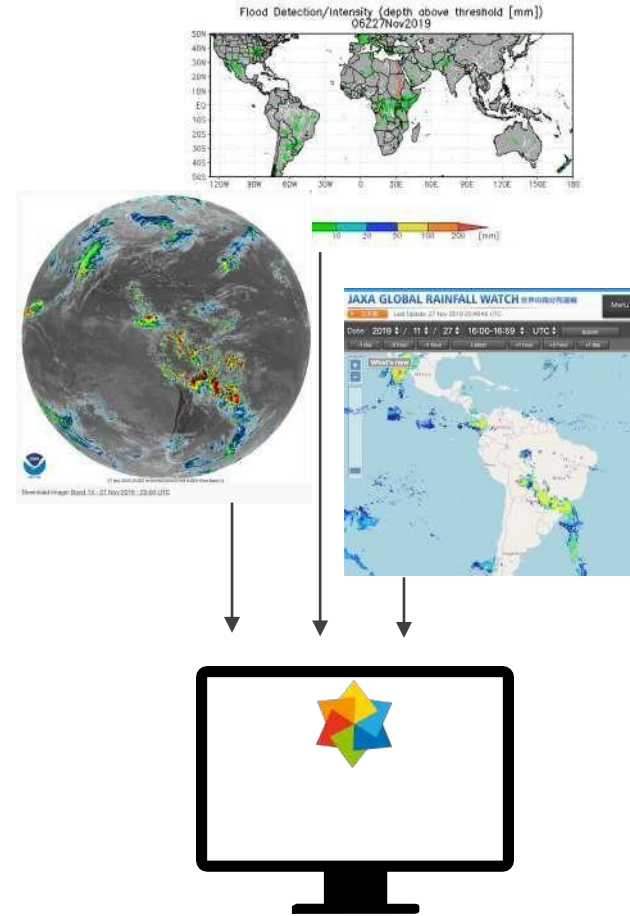
Coarse overview of hazards and vulnerability of Mozambican coast (source: INGC 2011)

**myDewetra** is a platform for creating risk scenarios in real time, which allows preventive measures to be taken and reduces the impacts of the predicted event.

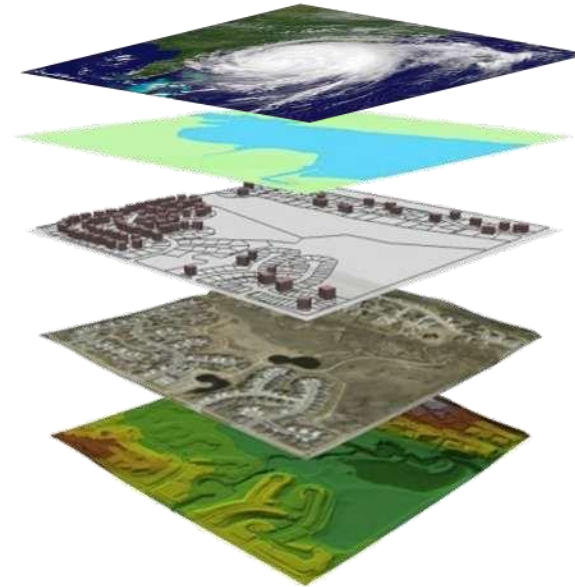
## MULTI-RISK PREDICTION AND MONITORING PLATFORM



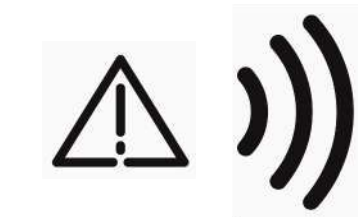
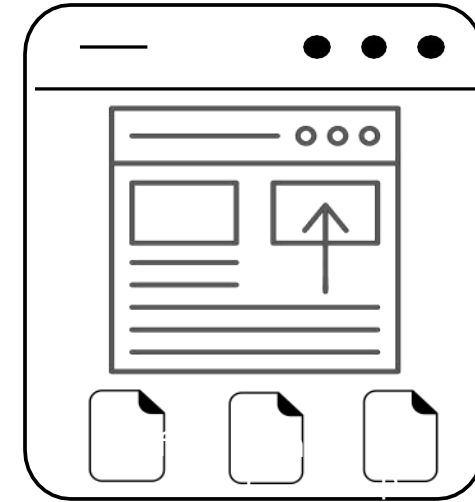
## RAPID AND ACCURATE INFORMATION



**AGGREGATE  
MULTIPLE SOURCE**



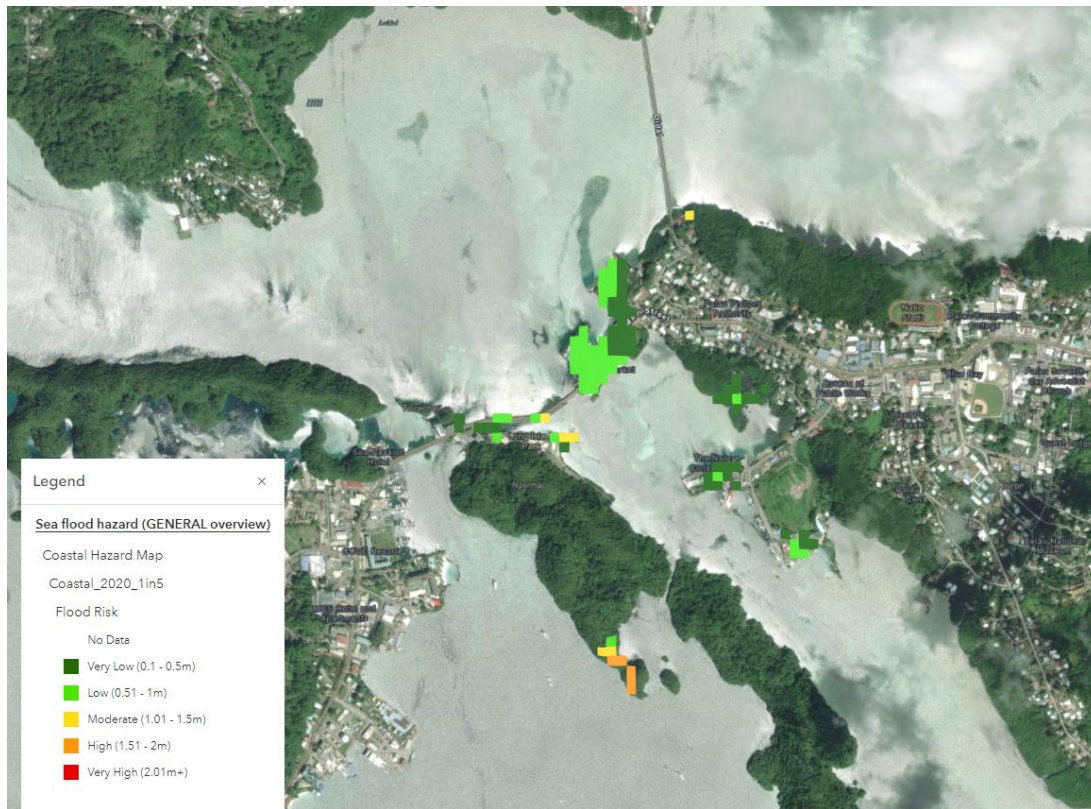
**OVERLAP**



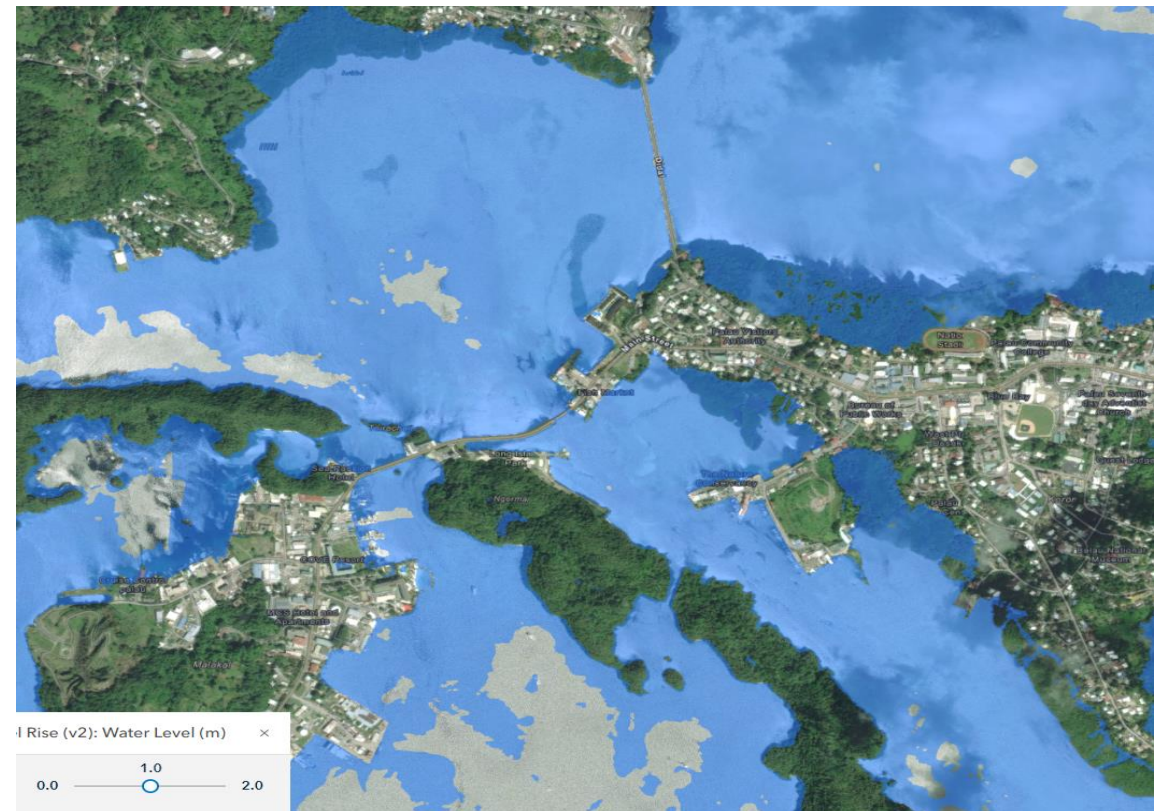
**COMMUNICATING**

# High-resolution coastal mapping baseline is critical to decision-making for coastal resilience

Satellite-based global flood model



Fugro digital elevation model (DEM)-based flood model (bathtub)



# Draft of the pilot solution

Pilot Solution Description		
Mozambique Digital Twin of early warning for cyclones and storm surge (multi-hazard impacts)		
End Users		
Target Audience	Decision Points	Benefits
Mozam Emergency Centre (e.g. Alberto Armando)	When to evacuate people, where the recurring hotspots are predicted	Save lives, livelihoods, reduce economic loss from damages
Technical resources		
Locally Available	Internationally Sourced	
myDEWETRA platform	Fugro + other near-realtime data, models and analytics to feed into platform	
Scalability		
Time	Theme	Location
3-year project (monitoring timescale)	Cyclones/storm surge	Hotspots of past storm surges

# Draft of the pilot solution

## Financial Scheme

Prototypes built with in-kind contribution from Fugro Innovation team, scaled solution by International Funding Institution funding (e.g. World Bank)

## Product Impact Assessment

Workshops with local stakeholders at the Emergency Centre to understand the usability, likeability and improvements to past systems. Continue improving the tool to ensure it is fit-for-purpose

## Long-term Commitment

Set-up a recurring tool subscription model with ensured post-production support and continued feedback sessions. Signed contract to keep collecting near-real-time data via satellite

## Self-Evaluation

Strong Points	Weak Points	Improvements
Highest resolution analyses	Near-real-time is not always possible	Tool usability

## Unique Selling Points

Feasibility	Engagement	Impact Potential	Added Value	Attractive
XXX□□	XXXXX□	XXXXX□	XXXXXX	XXX□□



The logo features the word "FUGRO" in a bold, white, sans-serif font. The letter "F" is significantly larger and stylized, with a vertical stem that tapers to a point at the bottom. The letters "U", "G", "R", and "O" are smaller and positioned to the right of the "F".

# FUGRO

Unlocking Insights  
from **Geo-data**