# SECRETARIAT OF THE PACIFIC REGIONAL ENVIRONMENT PROGRAMME (SPREP)

# ENHANCING REGIONAL CAPACITY ON GIS FOR ENVIRONMENTAL STEWARDSHIP

**Presenter: Vani Koroisamanunu**
**Environmental GIS Specialist**

**11th October 2024**

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# Strategic Priorities

- **Vision:** A resilient Pacific environment sustaining our livelihoods and natural heritage in harmony with our cultures.
- **Principal Concern**: Climate Change
- **Cross-cutting Theme:** The  Ocean

**SPREP Strategic Priorities:**
✓Climate Change Resilience
✓Ecosystem and Biodiversity Protection
✓Waste Management and Pollution Control
✓Environmental Monitoring and Governance

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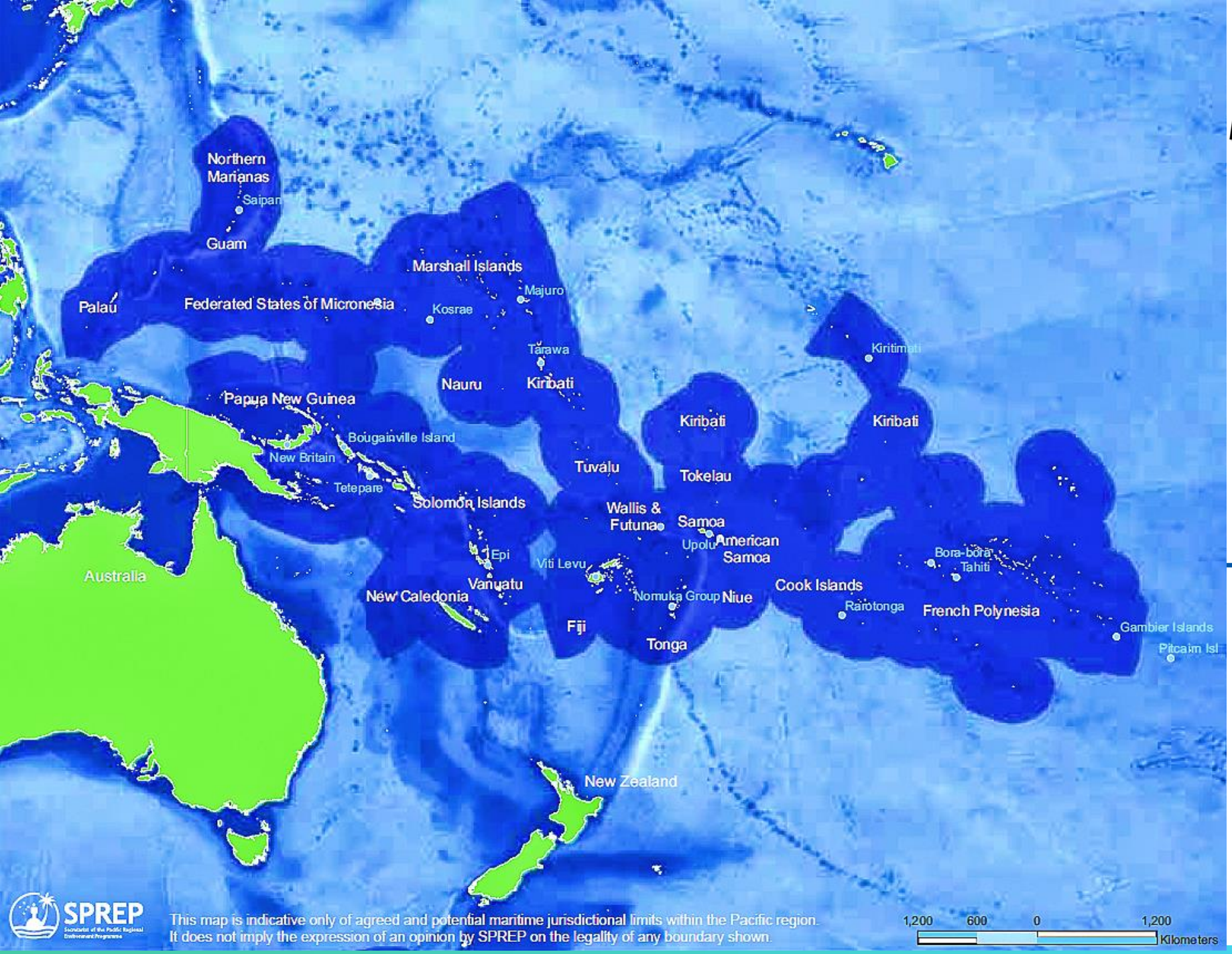
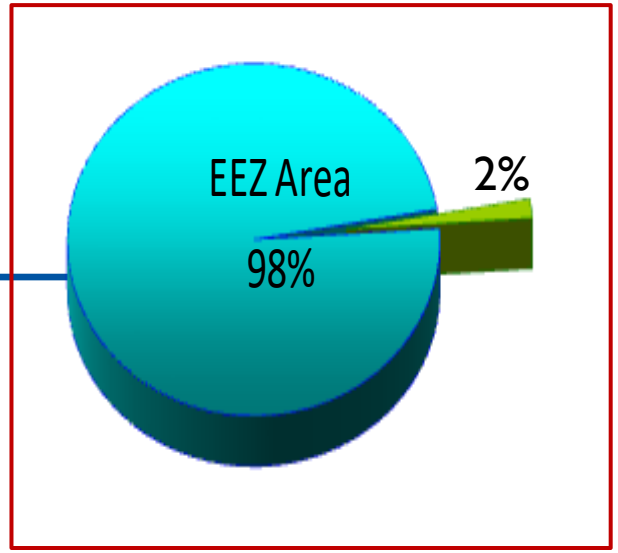



**21 Pacific Island Countries and Territories**

***Land Area:* ~553,000 km2 (~30,000 islands)**

***EEZ + Territorial seas area :* 30,000,000 km2 (~10% of the World's Oceans)**

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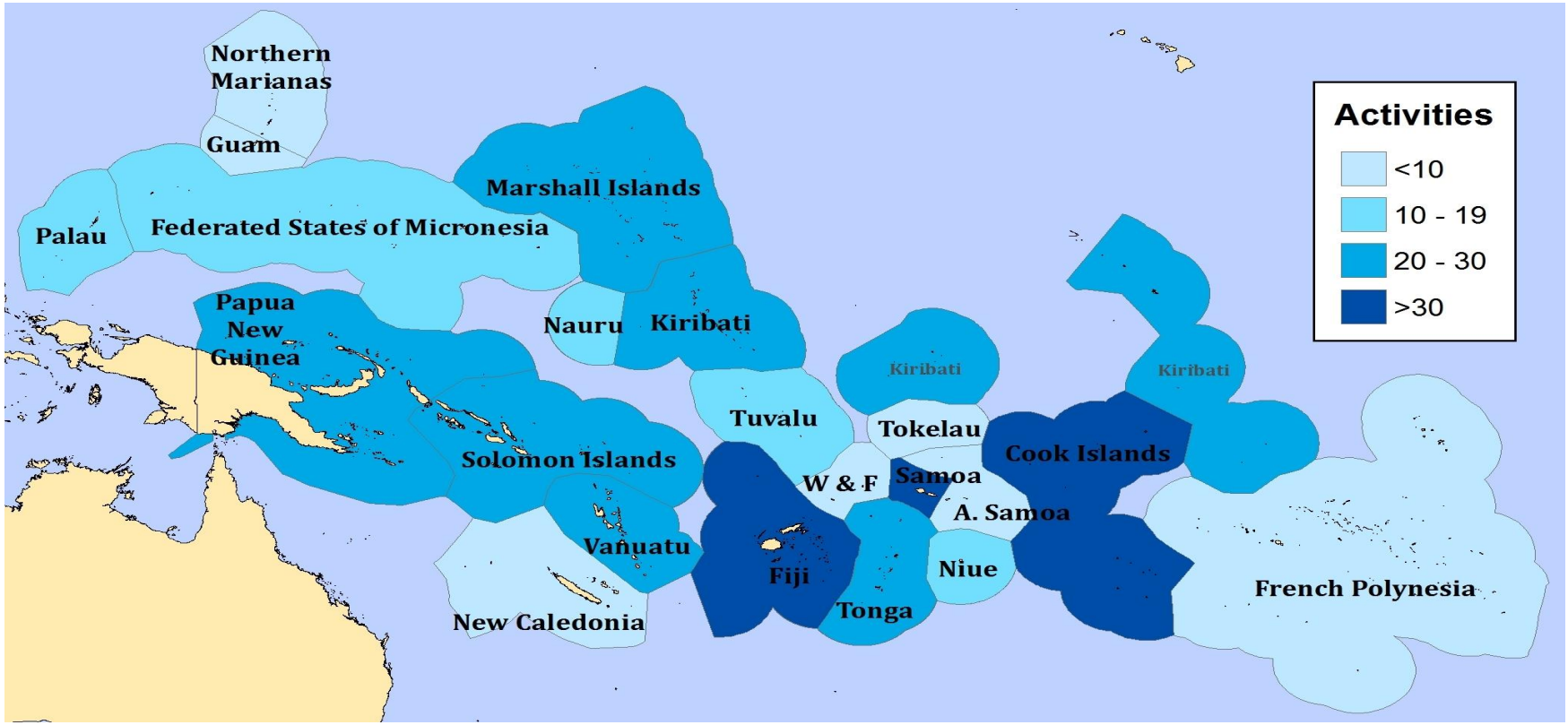
# SPREP Members

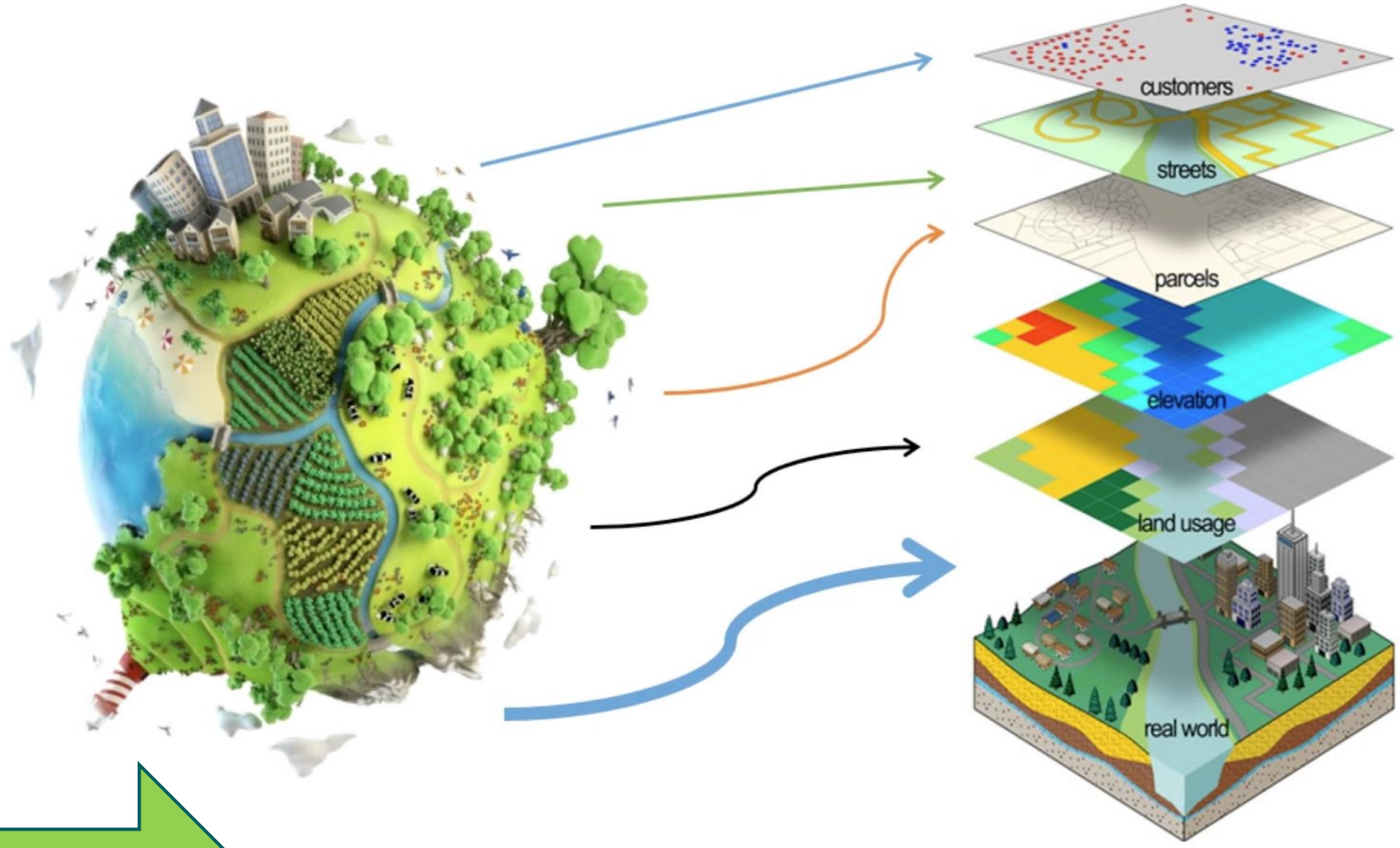
- Intergovernmental Membership-based Organisation
- 21 PICs + 5 Metropolitan members (Aus; NZ; France; US; UK)
- Annual SPREP Meeting (now bi-annual)
- Member of the Council of Regional Organisations in the Pacific (CROP)




Niue
Northern Mariana Islands
Palau
Papua New Guinea
Samoa
Solomon Islands
Tokelau
Tonga
Tuvalu
United Kingdom
United States of America
Vanuatu
Wallis and Futuna

# Understanding Environment Stewardship

Refers to the responsible management and care of the environment through practices that protect natural resources, ecosystems, and biodiversity. It involves taking actions to conserve and sustain the environment for current and future generations, often balancing the needs of people, the planet, and economic progress




**GIS applications for environmental management and conservation.**

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# INTRODUCING THE SPREP GIS TEAM

**Our Role:** The team aims to assist member countries with environment management and national reporting obligations using Geospatial Information System (GIS) and Remote Sensing (RS) applications to ensure informed and sound decision-making by our national leaders.

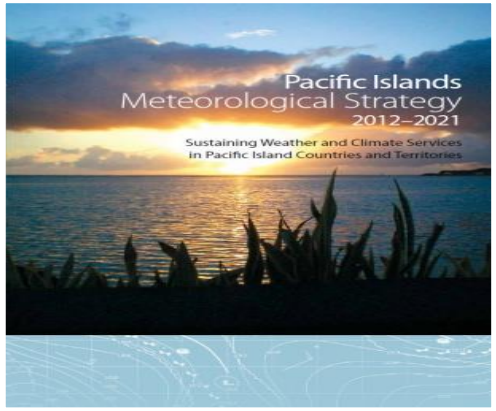
**Vani Koroisamanunu**
**GIS Specialist**

**Kasaqa Tora**
**Spatial Analyst Specialist**

# Key Areas of Work

Technical support to Members includes:

- Capacity building to fulfill commitments to international environmental conventions.
- Regional and national environmental policy development.
- Regional trainings.
- Strengthening of environmental management programmes in countries
- Public awareness and communications.
- Implementation of environmental management demonstration projects.
- Support to international negotiations such as COPs.



# 1. TECHNICAL GIS SUPPORT

- Waste mapping (disaster, asbestos, marine wrecks)
- Protected areas mapping
- Fisheries mapping
- Nature based solutions
- Loss and Damage

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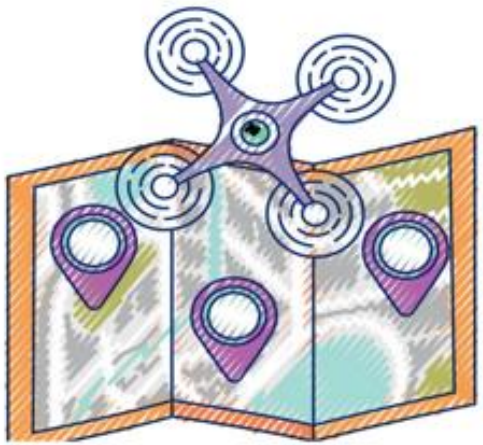
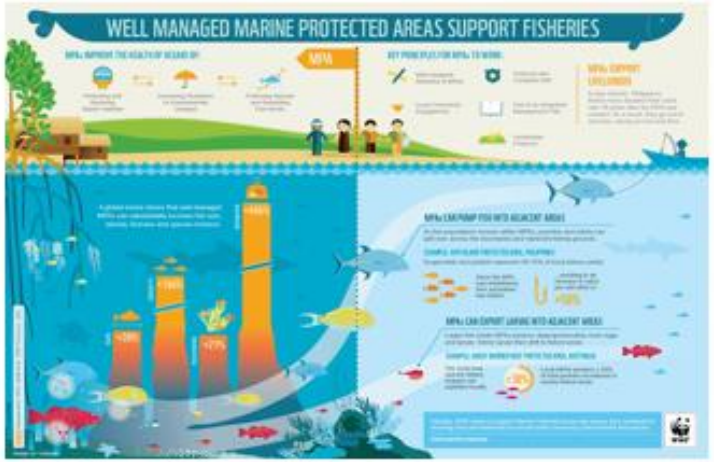
# 2. CAPACITY BUILDING





- Drone mapping for topographic surveys, environmental monitoring, and natural resources management.
- Strengthening Fisheries Management in Samoa through Geographic Information Systems (GIS)
- To equip the Solomon Islands Environment and Conservation Department (ECD) professionals with the necessary skills to effectively utilize Geographic Information Systems (GIS) for data capture, analysis, and reporting.
- Enhance the capacity of environmental practitioners to use EIA, GIS, and data management tools for sustainable management and ecosystem-based adaptation.

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# TRAINING CONDUCTED BY COUNTRIES

- **SAMOA**
  - Drone Training (Multistakeholder)
  - GIS Training (Multistakeholder)
  - GPS Training and data management
  - Fisheries GIS Training for community-based fish reserve management.

- **SOLOMON ISLANDS**
  - GIS Training (Multistakeholder)
  - KoBo Toolbox Training
  - GIS application for EIA processes.

- **NAURU**
  - GIS Training (Environment Department)
  - Protected Areas management (virtual)

- **VANUATU**
  - GIS Training (Multistakeholder)
  - KoBo Toolbox Training
  - GIS application for EIA processes.

- **FIJI**
  - GIS Training (Multistakeholder)
  - MapsMe Mobile Data Collection Tool
  - GIS application for integrated environmental management.

- **KIRIBATI**
  - GIS Training (Multistakeholder)
  - KoBo Toolbox Training
  - GIS application for integrated environmental management.

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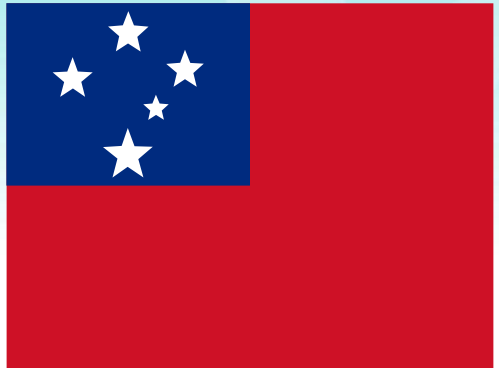
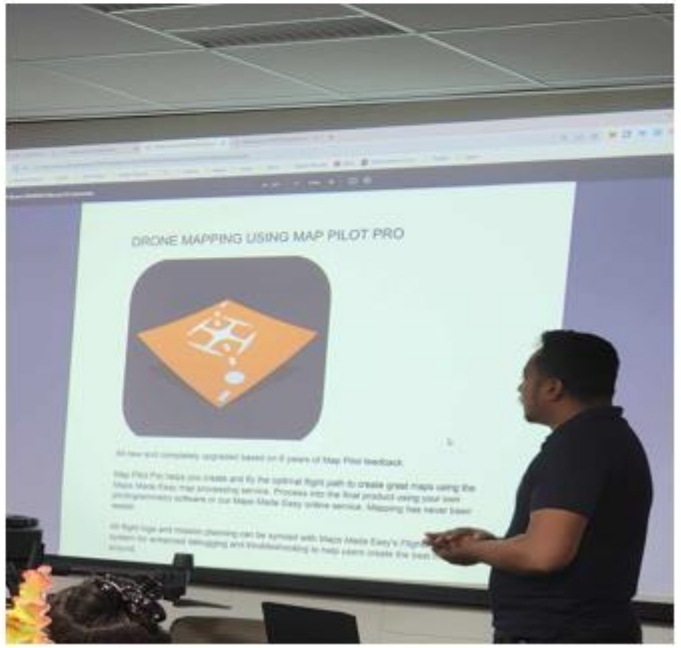
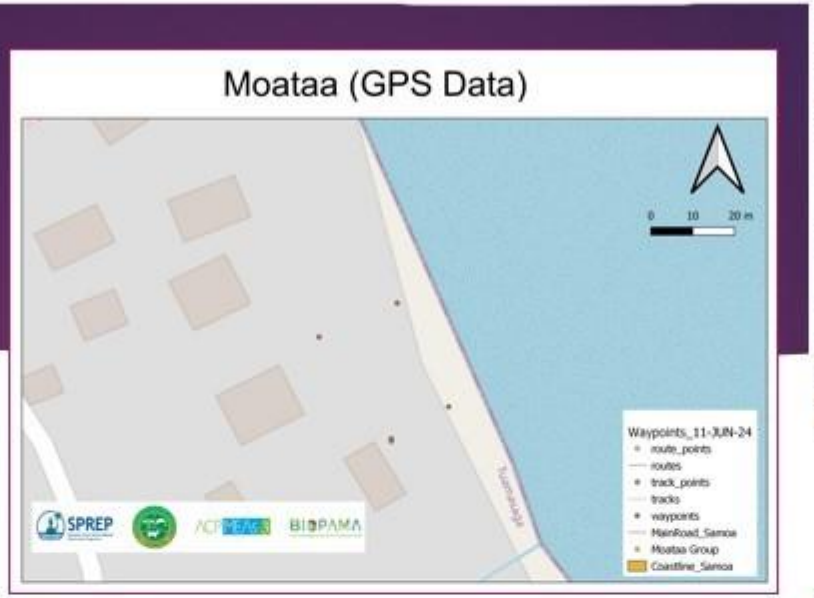


# SAMOA GIS TRAINING HIGHLIGHTS

# DRONE TRAINING AND GIS MAPPING





# Samoa Fisheries GIS and Data Management Training

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# SOLOMON ISLANDS GIS TRAINING HIGHLIGHTS

# Solomon Islands GIS and Data Management Training

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# VANUATU GIS TRAINING HIGHLIGHTS

# Vanuatu GIS and Data Management Training

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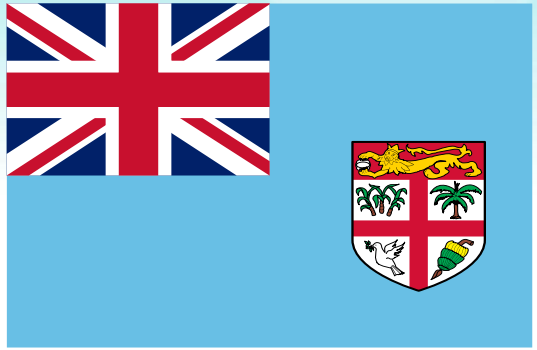

# FIJI GIS TRAINING HIGHLIGHTS

# Fiji GIS and Integrated Environmental Management Training

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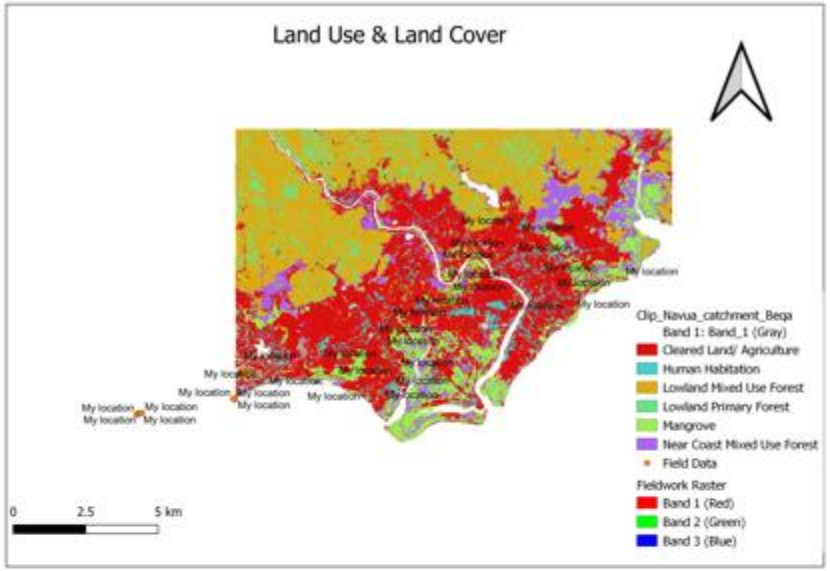
Natural Resource Management & Conservation; Spatially
The Pearl Resort – 20th – 24th August 2024.
GROUP : 1
Field Data Collections & Observations
Group members:
Diana Rakulu – MOAW
Sailasa Balamailautoka – MOFF
Sarwan Kumar - MOE

THUNDER STRUCK
Wainiyabia Beach Profile

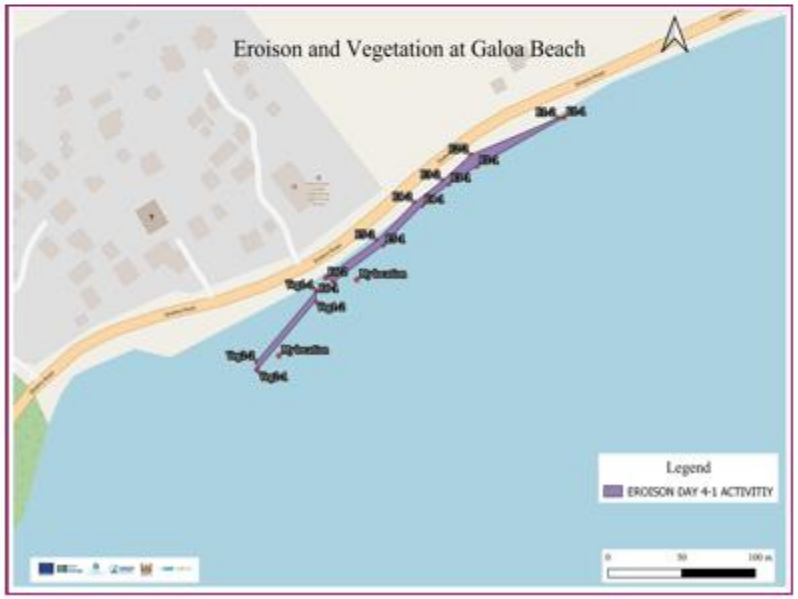
SPREP
BIOPAMA
EMPOWERING NATURAL RESOURCE MANAGEMENT AND CONSERVATION
IN FIJI THROUGH SPATIAL TECHNOLOGIES
Pearl Resort, Pacific Harbour Fiji
20th - 24th August 2024
GROUP 4 Group Work Presentations:
1. Ulaiasi Cagilevu – MTA (Snr GIS Officer)
2. Filipe Corerega – MTCA (ESRM Specialist)
3. Monani Makutu – ITAB (PCO Namosi)

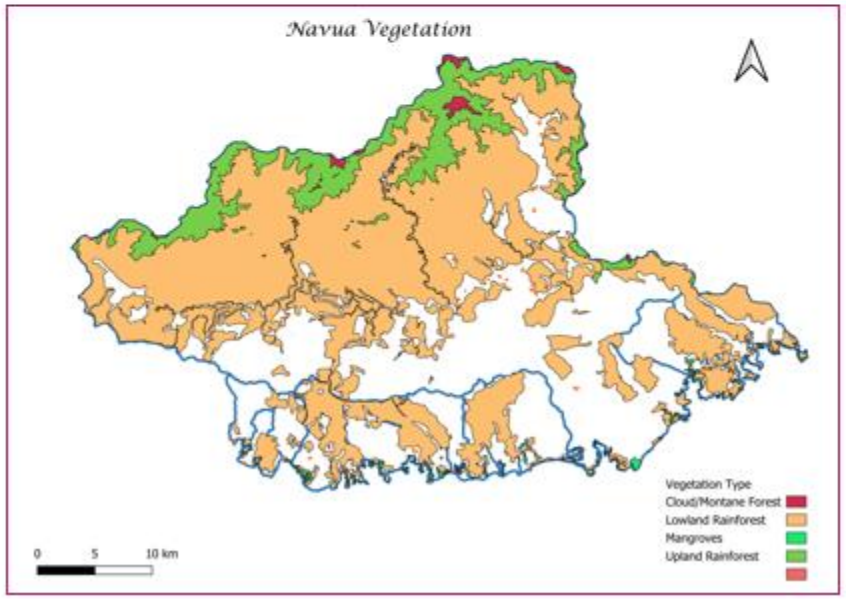
CLIMATE SERVICES FOR
INFRASTRUCTURE SECTOR
SPREP
BIOPAMA

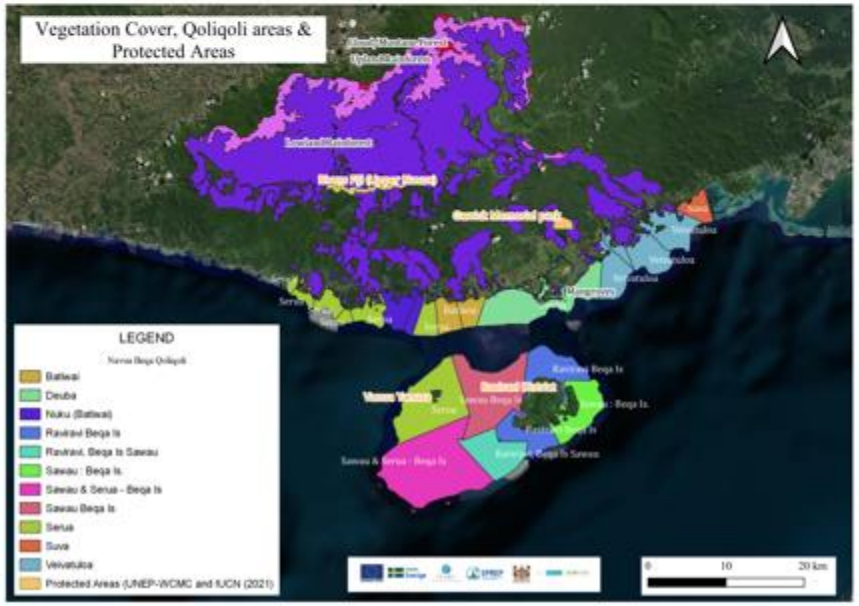
WAINIMABIA SITE 3 COASTAL ZONE
Beach Features
Spring
Waste
Low Dense Vegetation Cover
High Dense Vegetation Cover
Beach Area_Site3
Coastal Erosion
0 10 20 m


Land Use & Land Cover
Clip_Navua_catchment_Bega
Band 1: Band_1 (Gray)
Cleared Land/ Agriculture
Human Habitation
Lowland Mixed Use Forest
Lowland Primary Forest
Mangrove
Near Coast Mixed Use Forest
Field Data
Fieldwork Raster
Band 1 (Red)
Band 2 (Green)
Band 3 (Blue)
0 2.5 5 km

Navua Watershed
Contours
BIEM_Provinces
Protected Areas (UNEP-WCMC and IUCN (2021)
Village Boundaries
Rivers & Creeks
Navua Watershed
0 10 20 km


Eroison and Vegetation at Galoa Beach
Legend
EROESON DAY 4-1 ACTIVITIY


Navua Vegetation
Vegetation Type
Cloud/Montane Forest
Lowland Rainforest
Mangroves
Upland Rainforest
0 5 10 km


Vegetation Cover, Qoliqoli areas & Protected Areas
LEGEND
Batiwai
Deuba
Nuku (Batiwai)
Raviravi Bega Is
Raviravi, Bega Is Sawau
Sawau : Bega Is.
Sawau & Serua - Bega Is
Sawau Bega Is
Serua
Suva
Veivatuloa
Protected Areas (UNEP-WCMC and IUCN (2021)
0 10 20 km

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# TRAINING ON GIS APPLICATION FOR EIA PROCESS

# Application of GIS for Environmental Impact Assessment

**Environmental Impact Assessment**

- EIA principles, processes, and best practices
- Screening, scoping, and impact analysis in EIA
- GIS application in Environmental assessments

EIA Scoping

EIA Screening

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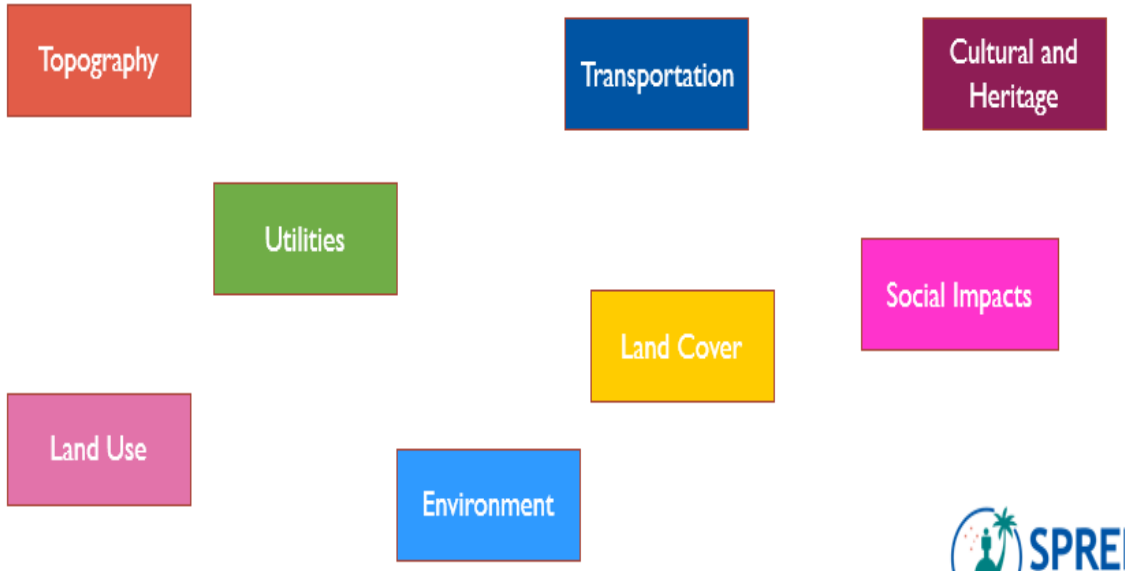
# GIS for Environmental Impact Assessment

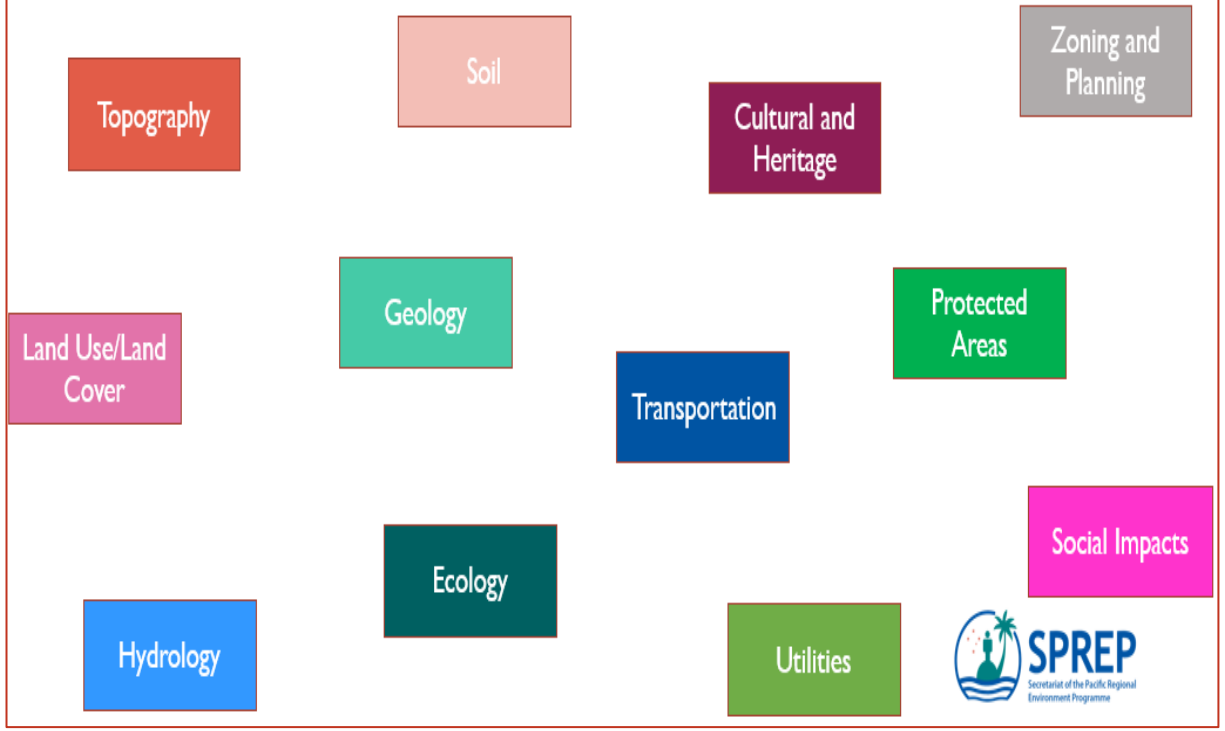
## GIS application in the Screening Process

GIS as a tool, allows project proponents and regulating authorities to determine whether an Environment Impact Assessment is necessary using maps derived from spatial data analysis using existing datasets.




## Using GIS in the Scoping Process

GIS as a tool assists enforcing authorities to decide of the boundaries of the EIA based on the maps and data collected in the screening stage, including the project area. Using maps, authorities can establish what the EIA will include in accordance with the terms of reference (TOR).



# EIA Screening

## Scenario 1 - Analyzing Socioeconomic Factors

- **Context:** A proposed **development project** in a densely populated area on Efate Island.
- **GIS Application:** Integrating **demographic data, infrastructure, and community services** to evaluate the potential social impacts.
- **Outcome:** Identification of areas that may require additional social infrastructure or services, ensuring community needs are addressed early in the planning process.

## Scenario 2 - Identifying Sensitive Ecosystems

- **Context:** A proposed **industrial project** near a coastal area.
- **GIS Application:** Using GIS to overlay the project location with maps of sensitive ecosystems such as **residential, mangroves, coral reefs, and wetlands.**
- **Outcome:** Identifying potential ecological impacts leads to early consideration of alternative sites or mitigation measures.

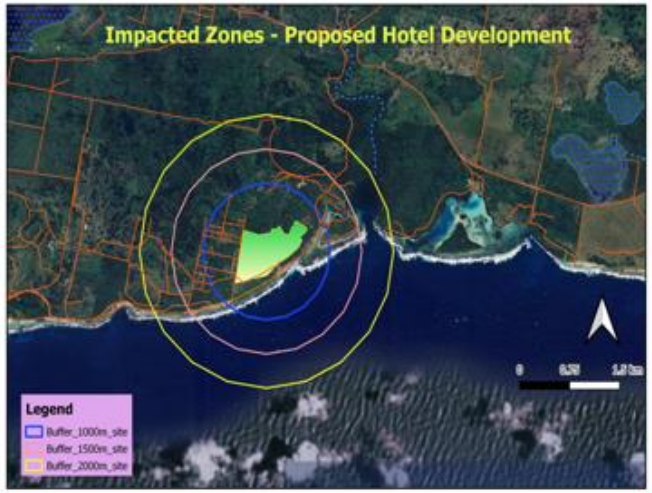
## Scenario 3 - Infrastructure and Accessibility Analysis

- **Context:** A proposed **healthcare facility** on Ambae Island.
- **GIS Application:** Mapping existing **transportation networks, accessibility to key services, and population distribution.**
- **Outcome:** Identification of optimal locations that maximize accessibility and service reach while minimizing environmental impact.

# EIA Scoping

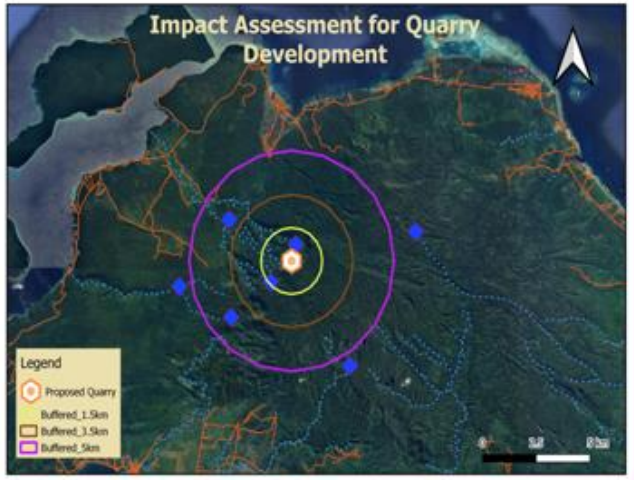
## Scenario 1: Air Quality and Noise Impact Zones

**Example:** GIS can model air quality and noise dispersion by creating buffer zones around project sites.
This helps in identifying the extent of pollution impacts and informing mitigation strategies. Spatial data layers such as land use and population density can be overlaid to assess these impacts.



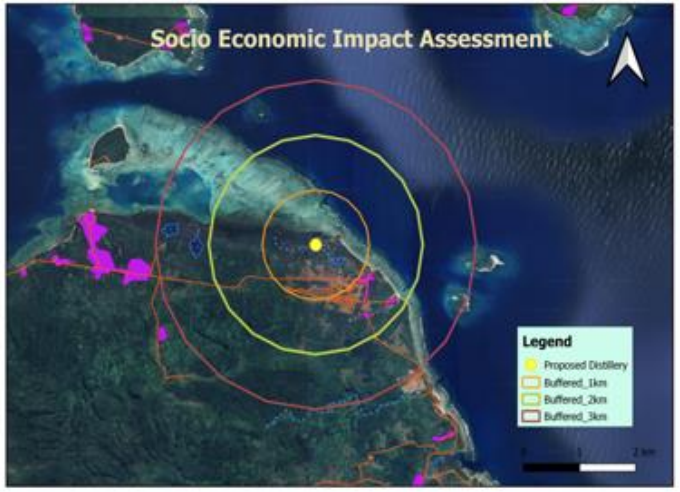

## Scenario 2: Hydrological Impact Assessment

**Example:** Hydrological GIS analysis involves mapping watershed boundaries, analyzing flow patterns, and identifying potential contamination paths.
This is crucial for assessing the impact of projects on water resources. GIS can help visualize and quantify land-use changes and their effects on hydrology.




## Scenario 3: Socio-Economic Impact Assessment

**Example:** Socio-economic GIS analysis includes mapping population distribution, land use, and infrastructure to identify communities potentially affected by development projects.
This helps in planning stakeholder engagement and assessing social impacts.



# CLIMATE COP28 SIDE EVENT, DUBAI

# CHALLENGES

Challenges identified by the team for GIS training in the Pacific include :

- Limited Technical Infrastructure
- Capacity Gaps
- Geographic Dispersion
- Funding Constraints
- Data Availability and Accessibility
- Sustainability of Skills
- Rapid Technological Change

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# FUTURE GOALS AND OPPORTUNITIES FOR ENHANCING GIS CAPACITY

- Expand Regional Training Programs and Workshop
- Invest in GIS infrastructure
- Encourage Sustainable Geospatial Practices
- Data sharing and partnerships

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# SUMMARY

GIS allows for in-depth analysis and visualization of spatial data, improving comprehension of environmental challenges.

Supports more effective planning, implementation, and evaluation of conservation efforts for informed decision-making.

Facilitates tracking of environmental changes and assessment of human impact on ecosystems.

Promotes data sharing and collaboration, essential for sustainable environmental management.

GIS Community of practice for the countries who have been trained and including them in the Pacific GIS and Remote Sensing user groups (for each pacific island countries)

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# Vinaka