Vanuatu approach to infrastructure planning and improving sustainability and resilience

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The Republic of Vanuatu is divided into 6 provinces: Malampa, Penama, Sanma, Shefa, Tafea and Torba.

Covering a total land area of 12,189 sq.km (4,706 sq miles), Vanuatu is a Melanesian archipelago comprising of 13 larger islands and about 70 smaller islands.

The terrain of Vanuatu is diverse and is famed for its beautiful islands and active volcanoes.

Most islands have rugged mountains and are volcanic in origin (some still active), mainly covered in lush dense rainforests.

Many islands are protected by offshore coral reefs. The highest point is Tabwémasana, located on Espiritu Santo – the largest island, at an elevation of 6,165ft (1,879m).
Ministry of Infrastructure and Public Utilities (MIPU)
EFFECT OF DISASTERS ON THE ECONOMY

- Average Annual Loss from Disaster relative to GDP is between 6% to 7%, ranked 2\textsuperscript{nd} among Small Island Developing Countries (SIDS)
- Damages of infrastructure from Cyclone Pam in 2015 cost almost 60% of GDP
- Damages of infrastructure from Cyclone Harold in 2020 cost 14% of GDP

Source: Climate and Disaster Resilient Transport in Small Island Developing States: A Call for Action – World Bank 2017
TRANSITION PLAN TOWARDS RESILIENT INFRASTRUCTURE MANAGEMENT SYSTEM

• **Transition in Processes**: Usually through defining new strategies which realign the institutional structure and operating procedures for business modal.

• **Transition in People**: Usually through defining the skillset and competence needed to perform roles demanded by the business modal, associated with targeted training, capacity building, and staffing upsize;

• **Transition in Technology**: Usually through re-evaluating the data and information needs based on the business modal and investing in upgraded tools and system
Transition Plan towards a Resilient Road Asset Management SYSTEM (RESILIENT-RAMS) at PUBLIC WORKS DEPARTMENT (PWD)

• Principles:
  • a. Building on the existing capacities, systems, and skills that PWD/MIPU has established in the past and aim for compatible incremental changes;
  • b. Proposing a systematic roadmap to guide actions over short-/mid-/long-term, with most critical and urgently needed actions prioritized; and
  • c. Where applicable, specifying areas where a coordinated support from other development partners are required.

Source: Resilient Transport in Small Island Developing States – World Bank 2021
GENERAL APPROACH TO DEVELOP TRANSITION PLAN IN PROCESSES

Vision:
- Resilient Infrastructure
- Sustainable Financing
- Capable Institution (System and Human Resource)

General Approach:
- **Conduct a diagnosis** of the current road asset management process throughout *infrastructure lifecycle* - system planning, engineering design, operations and maintenance, and contingency programming;
- **Understand the ‘desired system’** the transport authorities like to establish, particularly of how to integrate resilience into sectoral governance;
- **Develop a Transition Plan** for improving current system and processes to achieve the ‘desired outcome’ via short-/mid-/long-term interventions;
- **Implement the most critical elements** in the Transition Plan using resources under the grant/loan from donor-funded projects in country;
- **Take ownership in coordinating among development partners** to implement other identified interventions in the Transition Plan.

Aim for a ‘Leapfrogging’ Impact:
The country-specific technical assistance aims to achieve a two-level leapfrog in SIDS:
1. Introducing or enhancing the transport asset management system that either did not exist in the past or underutilized;
2. Integrating climate and disaster resilience function into the transport asset management system
## Detailed Interventions Under the Developed Transition Plan

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<th>Improvement Theme: Business Processes from Planning to Execution</th>
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### Network Planning and Investment
- Lack of investment planning and prioritization criteria.
  Including no account for climate and seismic risk.

**Defining and Monitoring Asset Performance Levels**
- A better framework for the level of service of assets is required.

**Road Map towards a Resilient Road Network**
- Climate adaptation practices and expertise is currently outside the current MPJU / PWD skill set.
- There is currently no account for climate adaptation resilience in asset management practice and procedures.

**Engineering Design and Materials**
- There is currently no account for resilience on works planning and execution.
- The design guidance is outdated, and under-used.
- The Vanuatu Rural Roads Guide (VRRDG) is only relevant to rural roads, not urban.

**Operations and Maintenance**
- Maintenance work is re-active, with no pro-active work identified.
- No provision is made for climate adaptation or resilience during design or M&O of road related assets.
- Maintenance of road assets are underinvested.
- Monitoring of maintenance works is not linked with asset condition inspections.

**Contingency Programming**
- Emergency works following disasters are not integrated with forward work needs.
- Lack of a mechanism for disaster preparedness, response, and recovery for the transport sector.

### Network Planning and Investment
- Integrate climate and disaster risk profiles of roads into the road inventory and asset management system.
- Link budgeting process with road asset valuation and performance management.

**Defining and Monitoring Asset Performance Levels**
- Prioritize road investment based on the criticality and vulnerability of roads.
- Establish Levels of Service through the PRS.

**Road Map towards a Resilient Road Network**
- Develop a Road Map to Resilience for Road Infrastructure.
- Collect required data from existing sources to undertake vulnerability assessment.
- Determine hazard risk assessment for all departmental regions.

**Engineering Design and Materials**
- Review and update existing design and rehabilitation guidelines.
- Expand the VRRDG to be relevant for the entire network, including urban.
- Design and rehabilitation design guideline to incorporate all-hazard resilience approach.

**Operations and Maintenance**
- Prioritize preventative road maintenance.
- Regularly monitor road asset conditions.

**Contingency Programming**
- Establish a mechanism for disaster preparedness, response, and recovery for the transport sector.

### Review rehabilitation and O&M. design specifications and guidance, inclusive of climate adaptation and resilience into all planning, design and operational processes.

### Undertake network vulnerability assessment. For road network, to better understand climate adaptation and resilience risks.

### Network Planning and Investment
- Addressing climate and disaster risks starting from transport planning.
- Improving resilience at network level.

**Defining and Monitoring Asset Performance Levels**
- Optimize the value-for-money.
- Better information for reporting and decisions.

**Road Map towards a Resilient Road Network**
- A more resilient road network through adoption of robust climatic considered procedures and practices.

**Engineering Design and Materials**
- Best practice design guidance for the entire network.

**Operations and Maintenance**
- Improve the overall network performance and reduce the investment need for large rehabilitation and rebuilt

**Contingency Programming**
- Smooth and expedite disaster response.
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<th>Intervention for Climate Resilient Infrastructure</th>
<th>GOVERNMENT’S RESPONSE</th>
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| **SYSTEM PLANNING**  
Enhanced Systems Planning to Better Prepare for and Respond to Natural Disasters and Climate Change Impacts | Establish Road Asset Management System under Components 1 of the Vanuatu Climate Resilient Transport Project |

**ENGINEERING AND DESIGN**  
- Climate and Disaster Resilient Roads  
  - Maximize use of local materials for Climate Resilient Coastal Protection  
  - Consider Geosynthetic Reinforced Soils for Rapid and Low Cost Bridges  
- Design and construction of the South Santo Road  
  - Use material from Navaka river  
  - Already determined that Geosynthetic Reinforced soil doesn’t work due to in-situ condition of river embankments |

**OPERATION & MAINTENANCE**  
Development of a Risk-based Infrastructure Asset Management System  
Upgrading existing Road Inventory Management System (RIMS) to set up a Road Asset Management System and transitioning PWD to a Road Asset Manager |

**CONTINGENCY PROGRAMMING**  
Using the CERC in Limited Capacity Environments to Reduce Road Network Interruptions following a Disaster  
Prepare Contingency Emergency Response Component – Operation Manual (CERC-OM) to guide reallocation of funds to finance emergency needs |
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