

Early Warning System Programming and Investment Opportunities in

TIMOR – LESTE

Severino da Costa Oliveira
Technical Analyst for DRR & EWS, Civil Protection Authority

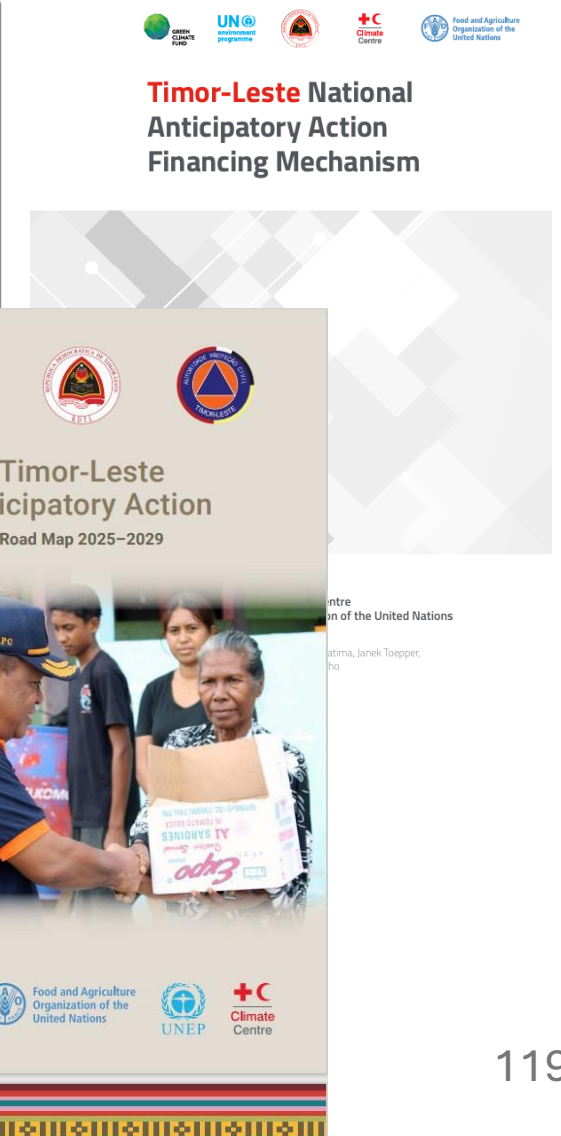
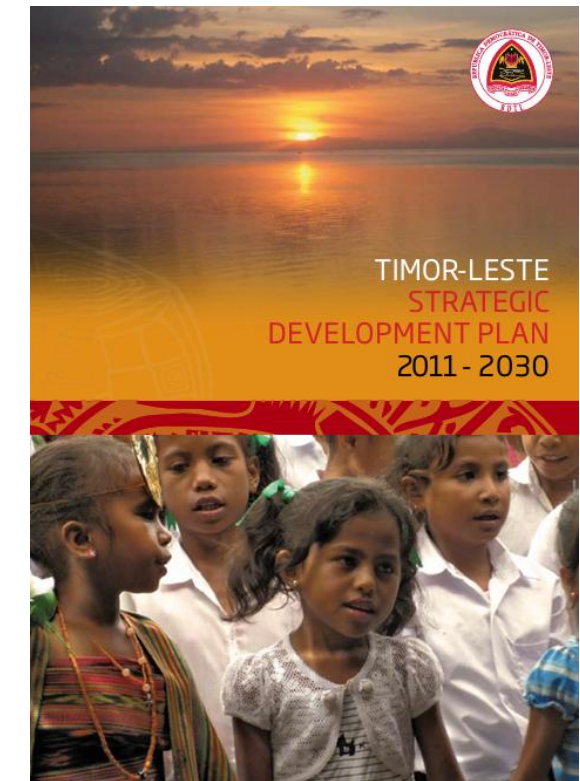
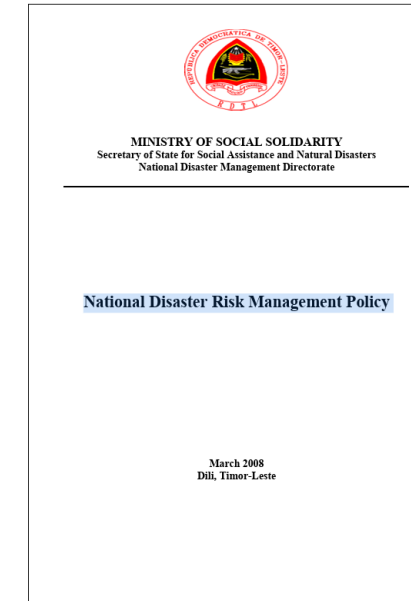
Early Warning System Investment Planning Workshop

2 September 2025, EDSA Shangri-La, Manila

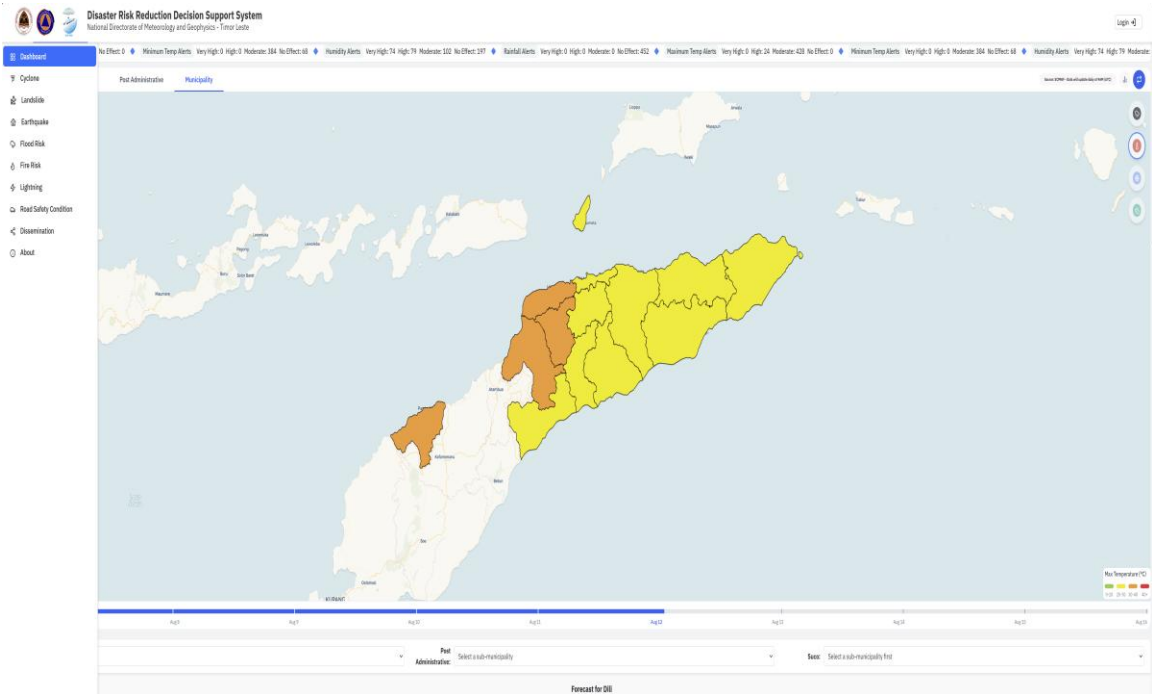
What are the policies/roadmap/strategies that prioritize Early Warning System and Climate Information Services in your country?

Policies & Strategies Prioritizing EWS and Climate Information in Timor-Leste

- ▶ **Civil Protection Law no 12/2020**
- ▶ **Civil Protection Decree Law 23/2024**
- ▶ **Civil Protection Diploma Ministerial N.º 49/2024 de 17 de Julho 23/2024**
(Regulamento da estrutura orgânica da Autoridade de Proteção Civil)
- ▶ **National DRM Policy (2012, revised 2020):** Prioritizes risk reduction, preparedness, and EWS.
- ▶ **Strategic Development Plan 2011–2030:** Mainstreams disaster resilience into national priorities.
- ▶ **Timor-Leste Anticipatory Action (AA) Roadmap 2025-2029 & TL National AA Financing Mechanism** – plan of action across 5 thematic areas, including EWS & risk information, plan delivery of AA, and financing mechanism.
- ▶ **National Framework for Climate Service (NFCS)** – await approval
- ▶ **Waiting for Endorsement :**
 1. Early Warning System Standard Operating Procedures.
 2. Inclusive Guidelines and Checklist of EWS focus on Gender and Social Inclusion



EARLY WARNING SYSTEM IN TIMOR-LESTE-DNMG



2. Ocean State Forecast and Advisory System (OSFAS).

Purpose: Provides short- to medium-range forecasts of ocean conditions.

Function: Delivers daily and seasonal updates on waves, currents, sea surface temperature, tides, and storm surges.

Benefit: Supports marine safety, fisheries, shipping, and coastal community planning.



1. Early Warning System for Disaster Risk Reduction – Decision Support System (DRR DSS).

Purpose: Integrates hazard monitoring, forecasting, and risk information to support disaster management decisions.

Function: Combines real-time hazard data with vulnerability and exposure information to provide warnings and recommended actions.

Benefit: Helps authorities and communities prepare and respond effectively, reducing loss of life and property.

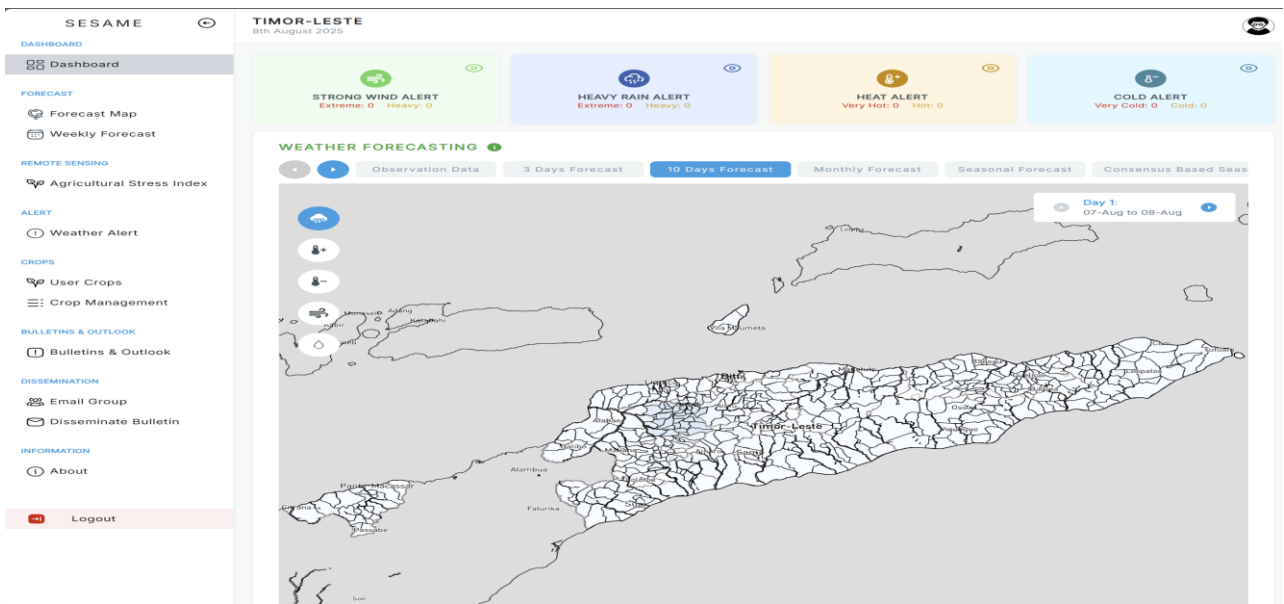


3. Climate Risk Information System for Public Health (CRISH).

Purpose: Links climate and weather information with public health risks.

Function: Monitors and predicts climate-sensitive diseases (e.g., dengue, malaria) using environmental and climate data.

Benefit: Helps health authorities take preventive actions, such as early vector control or health advisories.

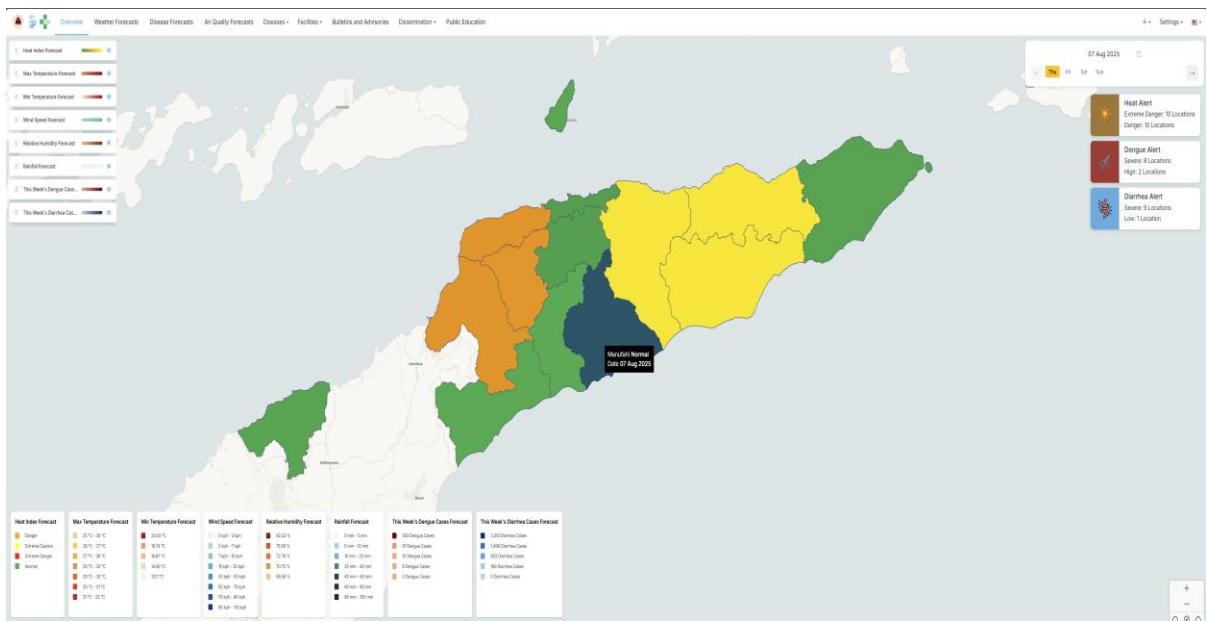


4. Specialized Expert System for Agro-Meteorological Early Warning for Climate Resilient Agriculture (SESAME).

Purpose: Provides climate-smart agricultural advice to farmers.

Function: Integrates weather forecasts, soil data, and crop models to recommend planting dates, irrigation scheduling, and pest/disease risk management.

Benefit: Increases agricultural productivity and reduces climate-related crop losses.



Has Climate Information Services been piloted or operationalized for any sector in your country (agriculture, water, energy, transport, tourism, or others)? What challenges did you encounter and lessons learned from these?

Sector	Institutional Arrangement of Climate Service Delivery	Challenges	Lessons Learned
Disaster Risk Reduction	A Climate Risk Information System (CRIS) was developed through the launch of a Multi-Hazard Risk and Vulnerability Risk Assessment (MHRVA) tool and the Timor Emergency Response System (TERS), a tool to collect loss and damage data in 2023 for better planning and emergency response. <i>Developed under UNDP-GCF support for Civil Protection Authority (CPA)</i>	<ul style="list-style-type: none"> Limited technical capacity for system maintenance and data integration. Infrastructure gaps in national and remote areas affecting system accessibility, such as internet connectivity Limited Risk Assessment to be conducted. Limited Coordination Mechanism in Data Sharing Ecosystems among relevant Ministries. 	<ul style="list-style-type: none"> Digital platforms improve transparency and access to localized hazard data TERS enables rapid field-level data collection and supports timely response coordination Institutionalization and capacity building are key to long-term sustainability
	Digital Platform (UNDP/GCF). CPA hosts MHVRA (MapStore & GeoServer) developed with UNDP/GCF; data inputs from DNMG & line ministries	Limited connectivity & staff capacity; sustainability of data updating	Digital tools make risk info accessible; building local ownership ensures continuity
	Coastal/Tsunami (UNESCO IOC) Civil Protection Authority (CPA) + UNESCO IOC coordinate tsunami warning & community drills	Weak last-mile warning dissemination; low public awareness	Combining scientific systems with local awareness raises preparedness
	DNMG in line coordination with NDMO (CPA) manage Automatic Weather Stations; UNDP/ADB to support flood early warning systems in Dili–Ainaro corridor	Infrastructure vulnerable; limited coverage in rural areas	Partnerships strengthen operationalization and maintenance of hydro-met networks

Sector	Institutional Arrangement of Climate Service Delivery	Challenges	Lessons Learned
<p>Transport</p> <p>Climate Information Services (CIS) have been piloted and operationalized in the transport sector in Timor-Leste, particularly through initiatives aimed at climate-proofing road infrastructure. These efforts are part of broader climate resilience strategies supported by international partners including the Asian Development Bank (ADB), Global Environment Facility (GEF), and the World Bank</p>	<p>Key Projects:</p> <p>Road Climate Resilience Project (World Bank)</p> <ul style="list-style-type: none">• Focuses on delivering climate-resilient road infrastructure to communities on key road links (Dili–Ainaro road corridor) <p>Toward Climate-Resilient Roads (ADB)</p> <ul style="list-style-type: none">• Assessed climate impacts on selected 10 road sections and 4 bridges across Timor-Leste.• Proposed adaptation measures tailored to Timor-Leste’s terrain and climate risks <p>Upscaling Climate-Proofing in Transport (GEF)</p> <ul style="list-style-type: none">• Aims to reduce vulnerability of road infrastructure through the National Adaptation Programme of Action (NAPA) <p>Integration of climate resilient road design and construction with financing support of ADB, WB, JICA :</p> <ul style="list-style-type: none">• About 500km of national road completed.• Capacity development and river protection investment projects <p>Emergency response management (Government)</p> <ul style="list-style-type: none">• Subject to flood EWS from BOM and DNMG, MPW will mobilizing heavy equipment to normalize road connectivity and flood control due to heavy rains.	<ul style="list-style-type: none">• Infrastructure vulnerability, especially in rural areas.• Frequent damage from extreme weather (floods, landslides).• Inadequate climate-resilient design standards.• Limited technical capacity in climate modeling and GIS.• Underfunded maintenance budgets.• Geotechnical instability due to terrain and soil conditions.	<ul style="list-style-type: none">• Embed climate risk early in design, construction, and maintenance.• Use localized climate models and data for accurate risk assessments.• Engage communities in monitoring and maintenance to build resilience.• Invest in capacity building for engineers and planners.• Apply risk-based planning to prioritize infrastructure investments.

Are your country’s Climate Information and Early Warning System priorities articulated in ADB’s Country Program Strategy (CPS) and programming pipeline/projects in your country?

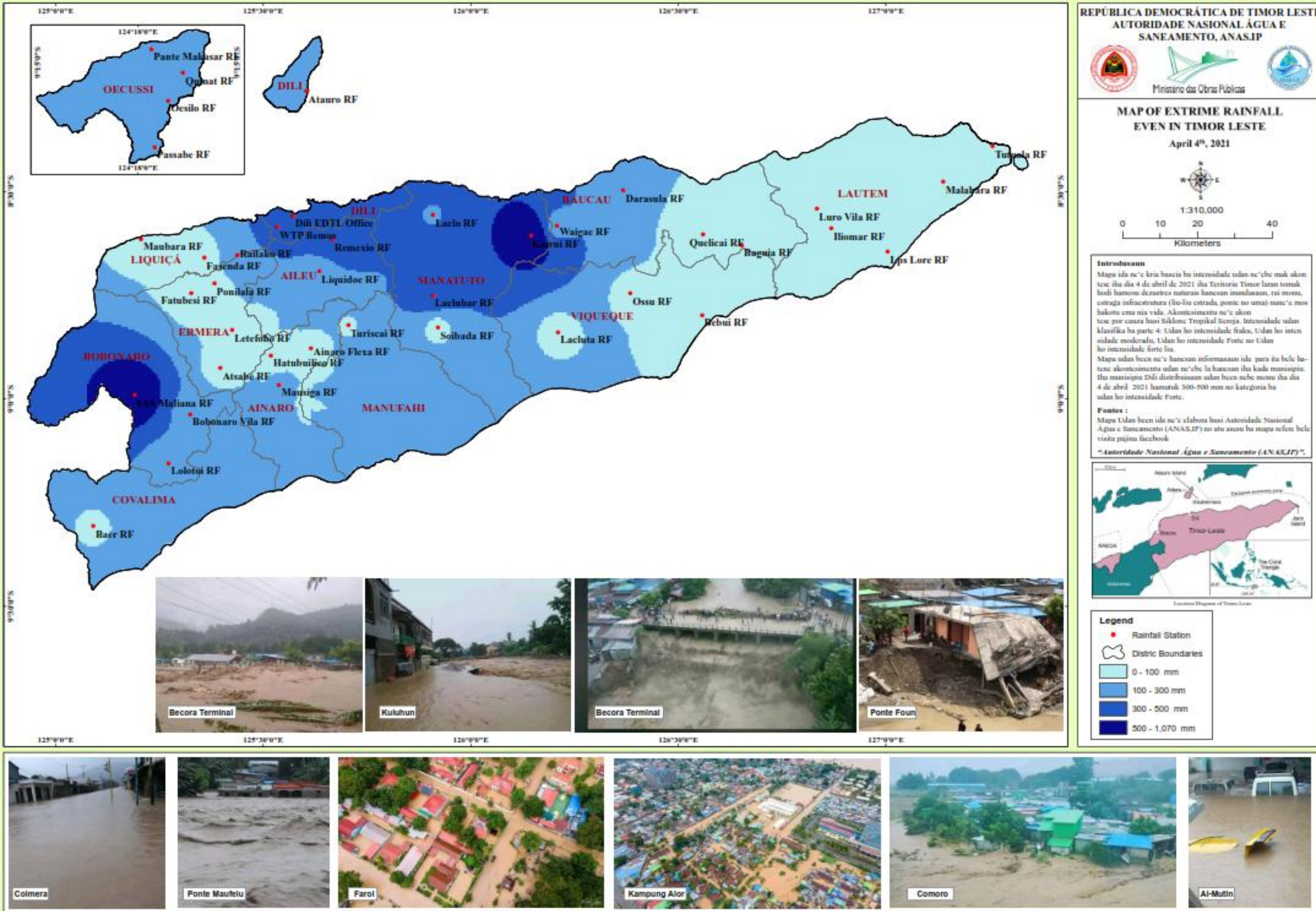
ADB CPS Priority/ Strategic Objective	ADB Programming Pipeline/ Projects (List of most relevant 2025-2028 projects pipeline for CIS and EWL integration)		
The following ADB CPS Priorities/Strategic may be relevant to CIS and EWS: <ul style="list-style-type: none">○ Build climate-resilient infrastructure and basic services○ Inclusive and sustainable rural development○ Strengthened governance and institutional capacity○ Promotion of innovation and knowledge	Project Name (approval year)	Sector/ Implementing Agency	Propose to consider CIS focus
	Climate Resilient Connectivity Enhancement Project (2025)	Transport/ Ministry of Public Works	<ul style="list-style-type: none">○ Use climate data to design resilient infrastructure;○ Support maintenance planning and emergency response;○ Optimize routes and improve system resilience
	National Road Networks Upgrading Project-Phase 1 (2026)		
	National Road Networks Upgrading Project-Phase 2 (2026)		
	Timor-Leste Public Transport Project (2026)	Transport/ Ministry of Transport & Communications	
	Dili and Secondary Cities Water Security Project (2026)	Water & Urban Dev/ Ministry of Public Works	<ul style="list-style-type: none">○ Guide water resource planning, infrastructure design;○ Flood/drought risk mitigation
	Municipality Health Infrastructure Improvement Project (2026)	Human & Social Dev/ Ministry of Health	<ul style="list-style-type: none">○ identify climate-sensitive health risks (e.g., heatwaves, disease outbreaks);○ guides resilient health facility design
	Coffee and Agroforestry Livelihood Improvement Project (Additional Financing) 2027	Agriculture, Fisheries and Rural Development/ Ministry of Agriculture, Fishery and Forestry	<ul style="list-style-type: none">○ Provide seasonal forecasts for crop and pest management.○ Support rural planning and climate-resilient livelihoods.○ Use ocean and climate data for planning.○ Promote sustainable resource use and disaster preparedness.
	Integrated Rural Development Sector Project (2027)		
	Agriculture and Fisheries Sector Development Project (2028)		

What potential Climate Information and Early Warning System sectoral investments could your country and ADB work together?

Indicative Project/ Investment Title	Time frame	Sectors Involved	Implementing Agency
Developing an EWS alert application based on Android & IOS.	2026-2030	Multi-Sectors	Civil Protection Authority (CPA), Ministry of Interior
<p>Propose for Timor-Leste and ADB to implement the investment projects outlined in the 2025–2028 country programming pipeline (slide 6):</p> <p>Propose for each sector to expanding collaboration/integration into climate-resilient sectors which will enhance agriculture, water, transport, health, fisheries, disaster risk reduction, and tourism through integrated Climate Information Services (CIS) and Early Warning Systems (EWS).</p>	2025-2030	DRR, Transport, Water & Urban Dev, Agriculture, Fishery and Rural Dev, Human & Social Dev (Health)	Ministry of Public Works Ministry of Agriculture, Forestry and Fishery Ministry of Health Ministry of Interior Ministry of Planning and Strategic Investments Ministry of Finance Ministry of Transport and Communications

What measures and reforms are needed to ensure sustainability of the identified Climate Information and Early Warning System investments?

Indicative Project/ Investment Title	Institutional Arrangement	Policy Reform	Budget Reform
National Council for Civil Protection	Highest Political decision Making Body	Transition from Reactive to Proactive Approach	Invest more on DRR
National DRR Strategy	Strategic document for DRR Financing and Investment	To guide the Proactive Approach	DRR Space will be more visible in national budget approval
Roll Out Early Warning For All Initiative	Roadmap for EWS investment and financing	Guidance for Investment	



TIMOR LESTE
THANK YOU