



Addressing water security in Timor-Leste through Water Resources Management

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Direção Geral de Água e Saneamento

Direção Nacional de Gestão dos Recursos de Água

WATER SECURITY

The capacity of a population to safeguard access to adequate quantities of water of acceptable quality for sustaining human and ecosystem health on a watershed basis, and to ensure efficient protection of life and property against water related hazards - floods, landslides, land subsidence and droughts

WS through Water Resources Management in TL: diagnosis

- In Timor-Leste groundwater is a vast resource which greatly exceeds the amount of water in springs, rivers and lakes.
- Fresh water resources are vulnerable to climate variability (e.g. El niño)
- There is overexploitation of aquifers and saline intrusion in coastal areas
- Wastewater is discharged, in particular in urban areas, without adequate or any treatment, contaminating the quality of water sources and increase of water-related diseases



**WS through Water Resources
Management in TL:
DNGRA's work**

- **DNGRA** is the agency responsible for Timor-Leste's water resources management.
- DNGRA's interventions are planned and developed using as basis:
 - National Constitution – art.6 point f and art.139 numb 1
 - National Strategic Development Plan 2011-2030
 - Decree-Law n.6/2015 – Organic Law of VI Constitutional Government
 - Decree-Law n.20/2016 – Organic law of MOPTC
 - Environmental Decree-Law n.26/2012
 - SDG 6

- **DNGRA** promotes water resources management and research in Timor-Leste.
- **DNGRA** has developed a proposed National Water Resources Management Policy and a proposed Decree-law for Water Resources Management
- **DNGRA** has established:
 - Hydro-meteorological monitoring network
 - National groundwater monitoring
 - Dili Aquifer monitoring programs
- important projects
 - Hydrogeology Map of Timor Leste





WS through Water Resources
Management in TL:
DNGRA's work

**Draft of the National Water
Resources Management Policy**

The scope of this proposed Policy covers all existing water before entering a public supply system unless otherwise specified.

The vision for water resources management:

- All people have access to clean, reliable and sustainable sources of water for their vital human needs and for subsistence farming;
- Water resources management is equitable, sustainable and optimises the socio-economic and environmental outcomes from water for the benefit of all Timor-Leste's citizens;
- Water-dependent ecosystems must be protected and must be improved where they are degraded.

Purpose of Proposed Policy

This Policy sets out:

- the Government's *responsibilities, intentions, objectives and strategies* for water resources management.
- a *general framework and direction* for national water resources management plan until 2030.
- *guidance to inform public officials, water resource managers and all stakeholders* in the formulation and implementation of legislation, regulation, policies, strategies, plans and actions for water resources management.

Water Resource Management Drafted Policy – big picture

Water entitlements for private and public water (proposed Policy & DL)

Standards for water borehole construction & driller accreditation (proposed Policy & DL)

Recognise traditional norms & customs in water resources management (proposed Policy & DL)

Setting standards for the discharge of substances and pollutants (proposed Policy)

Integrated water Resources Management (proposed Policy & DL)

Setting standards for the quality of the water resource (proposed Policy)

Monitoring networks & data & information systems (proposed Policy & DL)



Water Resource Management Law and Policy – water resources planning framework

Plans for water related disasters
(proposed Policy & DL)

Water resource management plans
(proposed Policy & DL)

Specific water management plans
(proposed Policy & DL)





WS through Water Resources
Management in TL:
DNGRA's work

**Water resources studies and
programs**

1. National Hydrogeological Map

- 2 years to develop, involving many water and geology experts from Timor-Leste and Australia
- Important tool for future sustainable development and planning of Timor-Leste's water resources.
- There are 3 types of aquifers:
 1. Intergranular Aquifer (alluvial/sedimentary)
 - Along the coast, centered around river channels and are susceptible to reduced water storage and seawater intrusion due to changes in rainfall and sea level rise
 2. Fissured Aquifer (Karst)
 - Fissured karst aquifers are principally in the east of Timor-Leste and groundwater yield is susceptible to changes in rainfall. Examples of fissured karst aquifers include the Baucau Limestone Karst Aquifer and the Limestone Aquifer in Lospalos.
 3. Localised Aquifer (Fractured and confining units)
 - Localised fractured aquifers are principally in the west of Timor-Leste and groundwater yield is also susceptible to changes in rainfall.

2. Study on Baucau's Karst Limestone to identify groundwater flows



Dye-tracing - *connectivity between springs, caves, and groundwater flow directions*



Time-Domain Electromagnetic Survey (TEM) – *geological structure of a small area*



Airborne Electromagnetic Survey (AEM) - *the geological structure of the Aquifer*



Nuclear Magnetic Resonance (NMR) – *the presence of actual groundwater*



Water Borehole Exploration Drilling – *targeted water borehole drilling program*

3. Hydro meteorological monitoring



4. Groundwater Quality and Quantity Monitoring

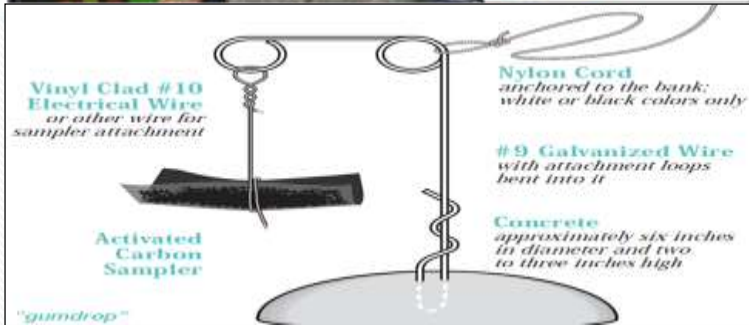
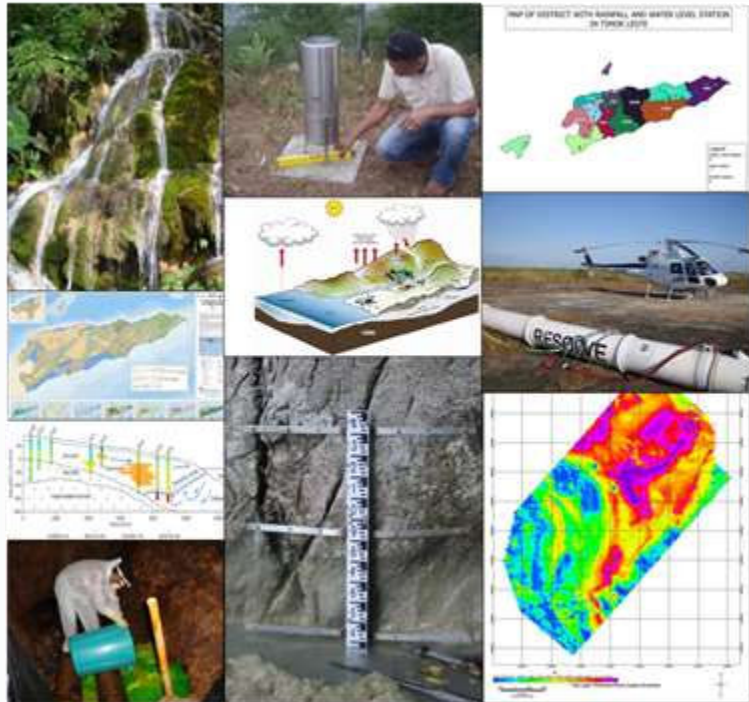




**WS through Water Resources
Management in TL:
challenges**

1. Need to strengthen legal framework and improved planning and management for sustainable and equitable access of water resources
2. Need for policy and coasted strategic plan for effective resource mobilization
3. Need to increase investment and O&M budget in water and sanitation infrastructures, to guarantee efficient use of water and decrease pollution and water-related diseases
4. Need to strengthen institutional capacity and coordination for effective program delivery and sustainability
5. Need to strengthen water resources monitoring and reporting systems
6. Need to increase technical knowledge related with the nation's water resources, including mitigation and adaption planning
7. Need to develop integrated water resources management

Obrigado



"ita nia bee, ita nia moris"