

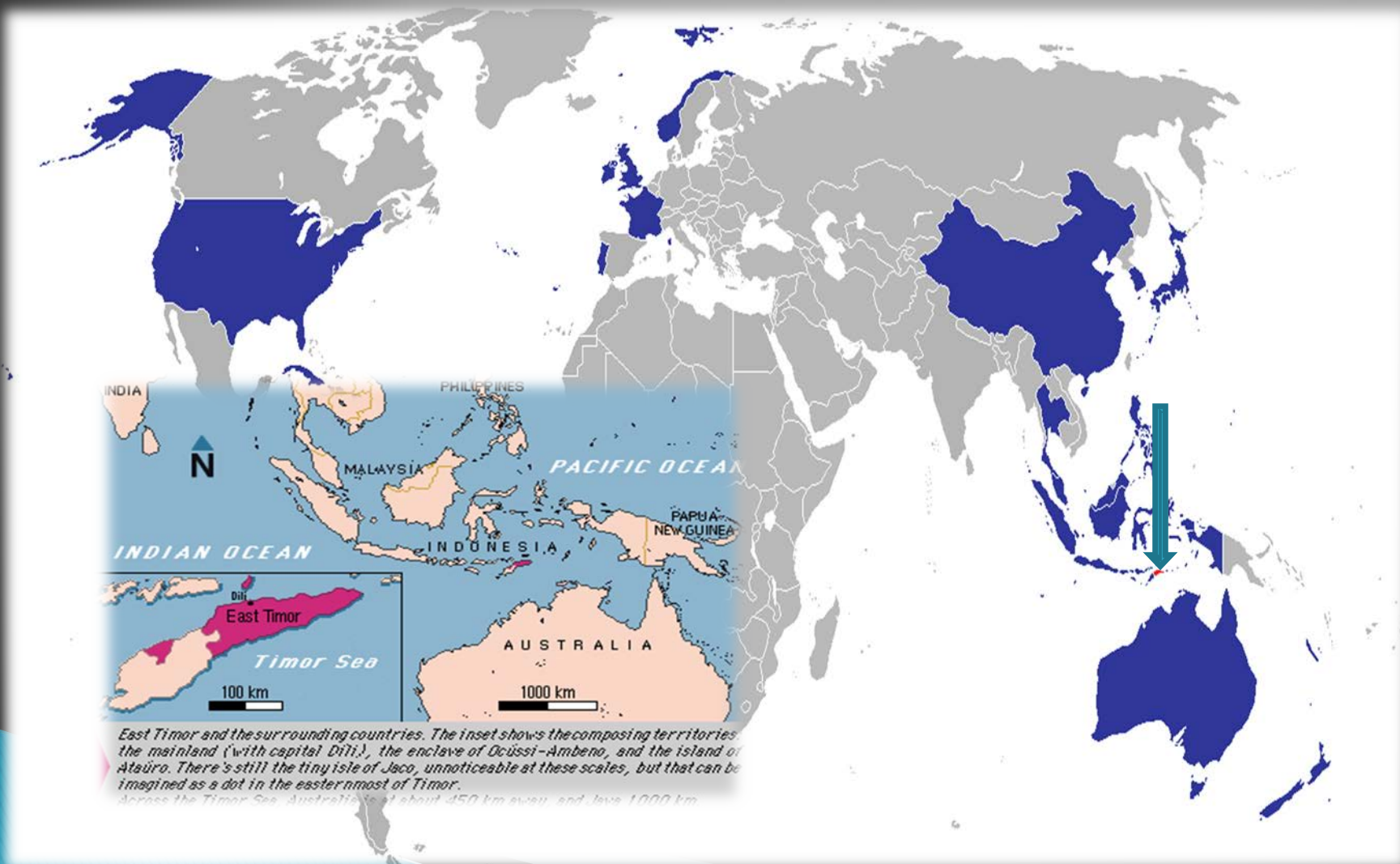
COUNTRY REPORT

Jakarta. July, 10–12th 2017

National Directorate of Meteorology
and Geophysics of Timor–Leste
(DNMG)

Carla Feritas and Crisostimo Lobato

TIMOR LESTE



East Timor and the surrounding countries. The inset shows the composing territories: the mainland (with capital Dili), the enclave of Ocuçsi-Ambeno, and the island of Ataúro. There's still the tiny isle of Jaco, unnoticeable at these scales, but that can be imagined as a dot in the easternmost of Timor.
Across the Timor Sea, Australia is at about 450 km away, and Java 1000 km.

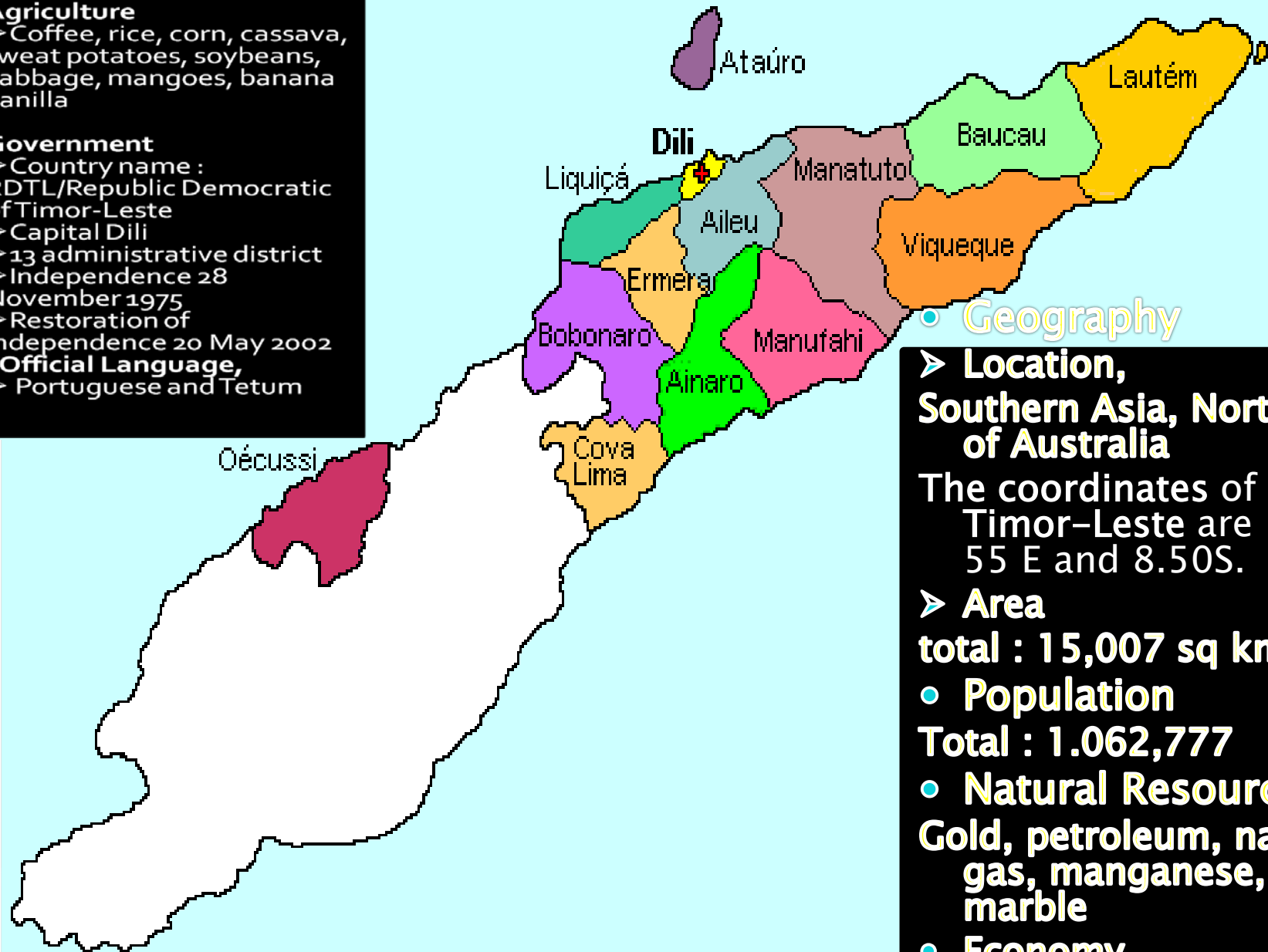
Democratic Republic of Timor-Leste

Agriculture

➤ Coffee, rice, corn, cassava, sweet potatoes, soybeans, cabbage, mangoes, banana vanilla

Government

➤ Country name :
RDTL/Republic Democratic of Timor-Leste
➤ Capital Dili
➤ 13 administrative district
➤ Independence 28 November 1975
➤ Restoration of Independence 20 May 2002
▪ Official Language,
➤ Portuguese and Tetum



Geography

➤ Location,
Southern Asia, Northwest of Australia

The coordinates of the Timor-Leste are 125.55 E and 8.50S.

➤ Area

total : 15,007 sq km

• Population

Total : 1.062,777

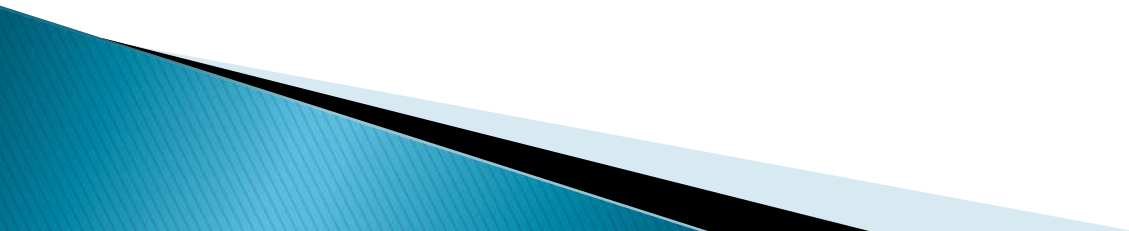
• Natural Resources

Gold, petroleum, natural gas, manganese, marble

• Economy

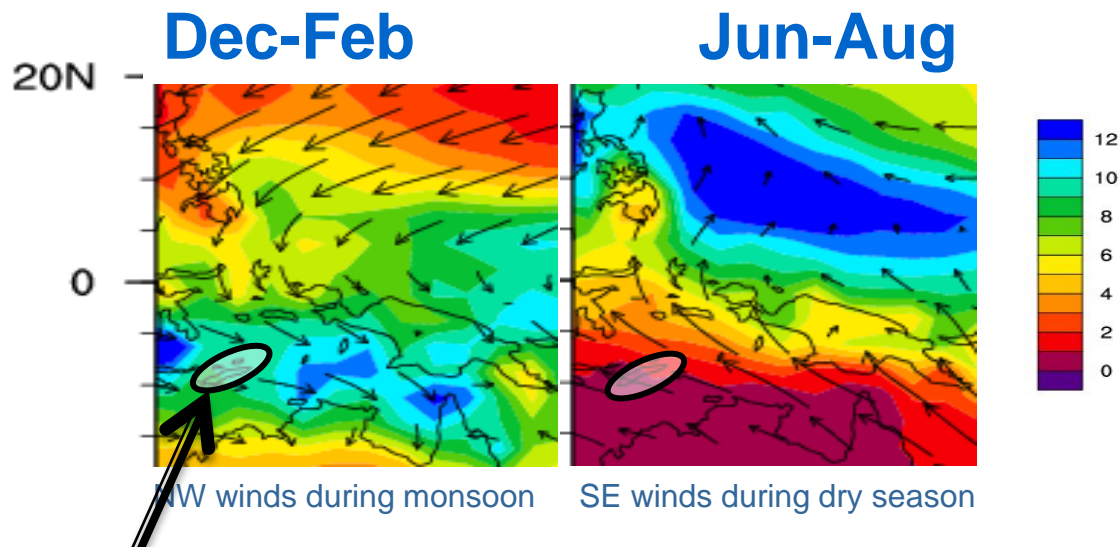
➤ GDP-per capita \$800

Main climate drivers for Timor Leste



Driver-1: Monsoon

- Its seasonal arrival usually brings a switch from very dry to very wet conditions. The normal south easterly trade winds in Dili (Jun-Aug) are replaced by westerly winds from the monsoon onset until the end of the monsoon season.

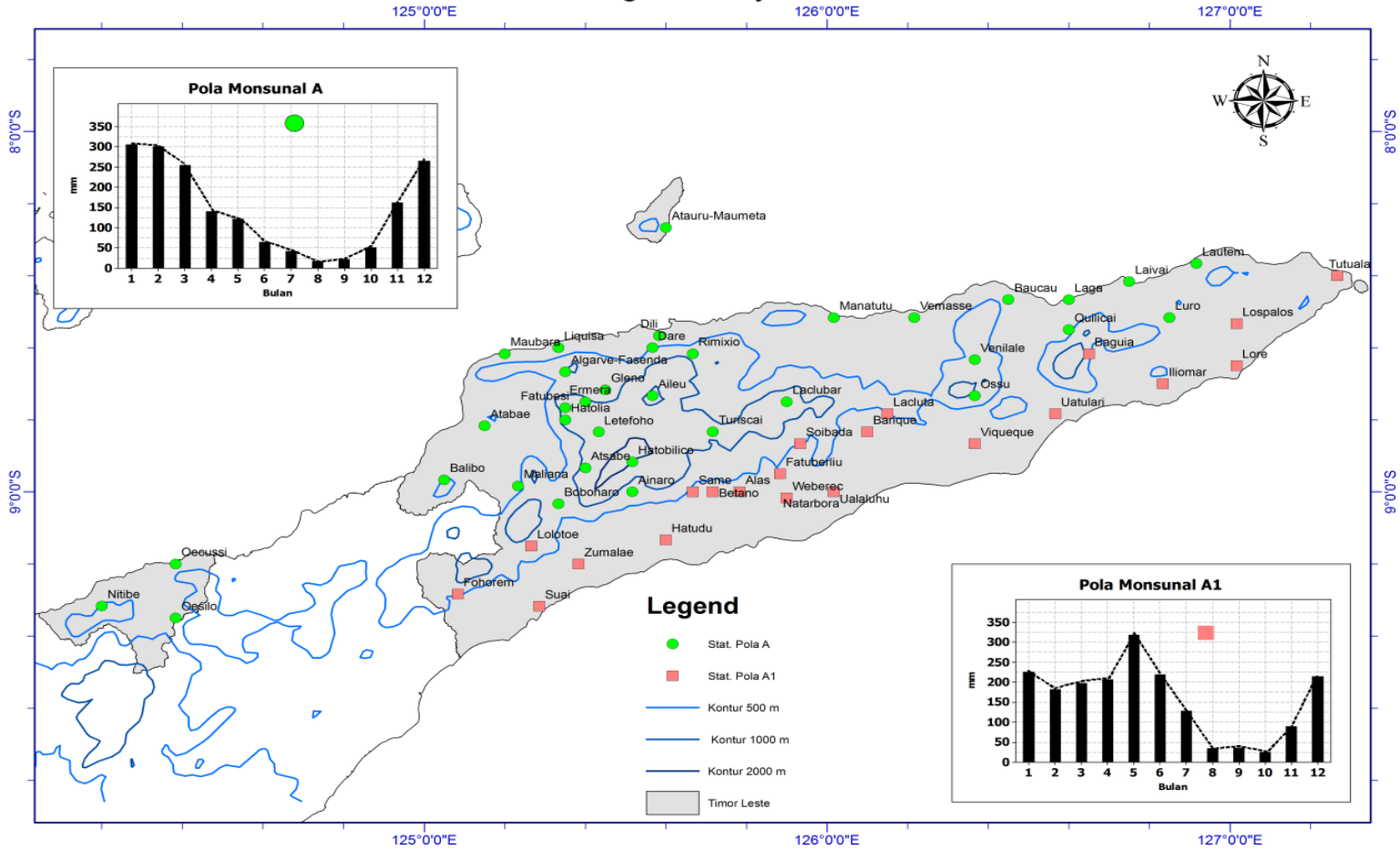


Location of TL

Blue/Red = regions of high/low rainfall
Arrows = direction of winds

Rainfall Pattern

Variasi Ruang Pola Hujan di Timor Leste



Observed Climate – annual cycles

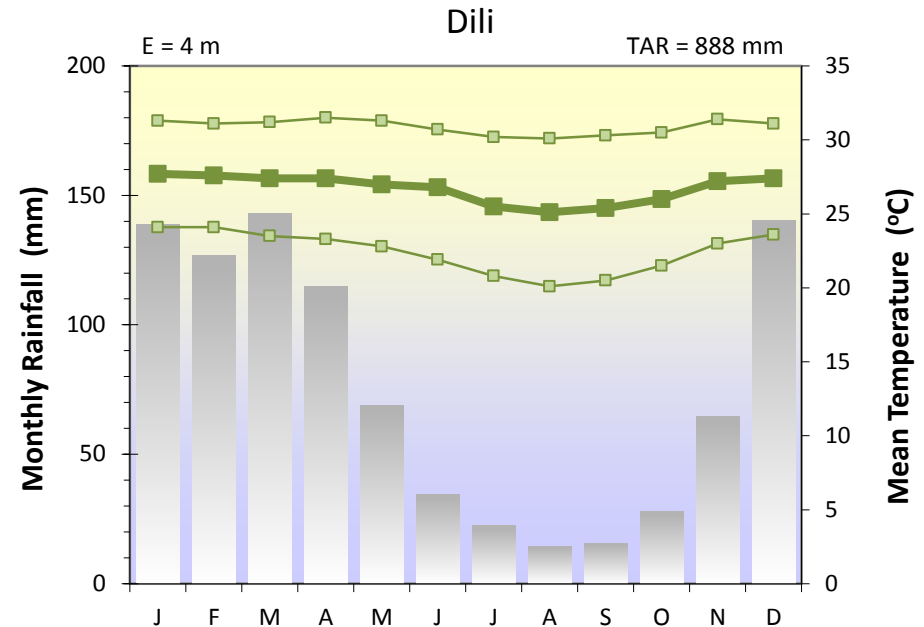
Rainfall:

Dili has a very marked wet season from December to May and a dry season a from June to November.

The average monthly rainfall is above 100 mm during the wet season and less than 30 mm during the dry season.

Temperature:

Temperatures show a weak seasonal cycle with highest temperatures in November, about 2.5° C warmer than those in July - the coolest month.



Mean annual cycle of rainfall (bars) at Dili Airport and Temperatures (mean, maximum and minimum).



Observed Climate – annual cycle of rainfall including impact of ENSO (1950-2012)

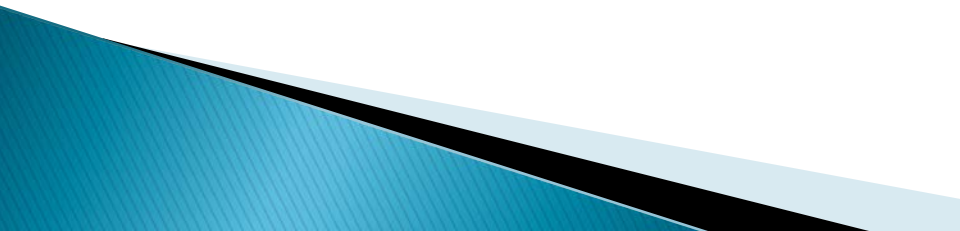
El Nino:

During years: 1957, 1965, 1972, 1982, 1987, 1991, 1997, 2002, 2009, 2015

- Less rainfall annually (~110mm less than normal)
- Later onset and earlier retreat of wet season (<6m)
- More rain concentrated on FEB-MAR

La Nina:

During years: 1955, 1964, 1971, 1973, 1975, 1988, 1999, 2008, 2010

- More rainfall annually (~ 140mm more than normal)
 - Longer wet season (9m)
 - More rainfall during dry season
- 

Observed Climate – annual cycle of rainfall including impact of ENSO (1950-2012)

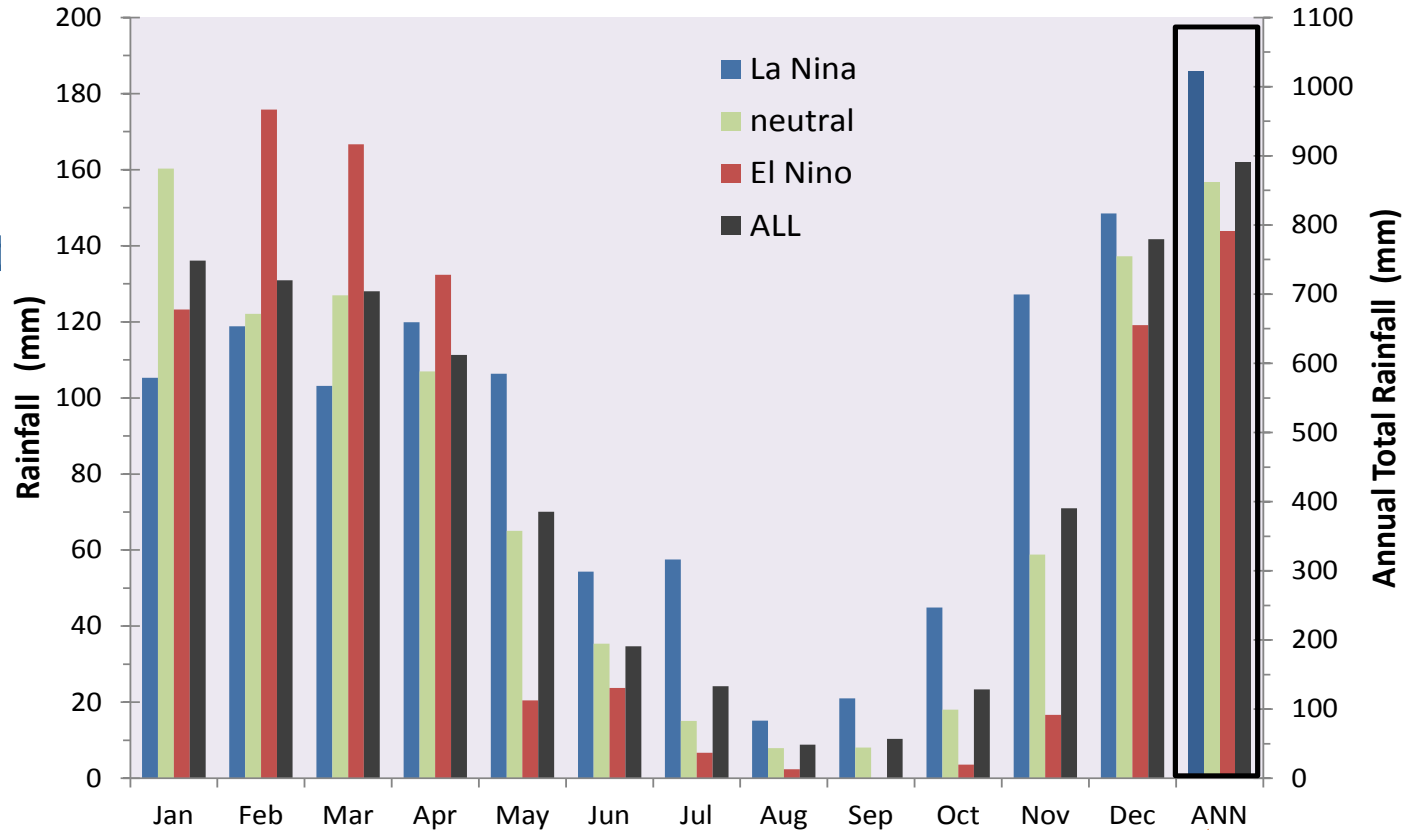
(UPDATED from last Country Report)

El Nino:

Less rainfall annually
 Later onset and earlier retreat of wet season (6m)
 More rain concentrated on FEB-MAR

La Nina:

More rainfall annually
 Longer wet season (9m)
 More rainfall during dry season



Annual Total Rainfall



Driver-2: ENSO

- Year to year variations in Timor-Leste's climate are due to El Niño Southern Oscillation (ENSO).

El Niño

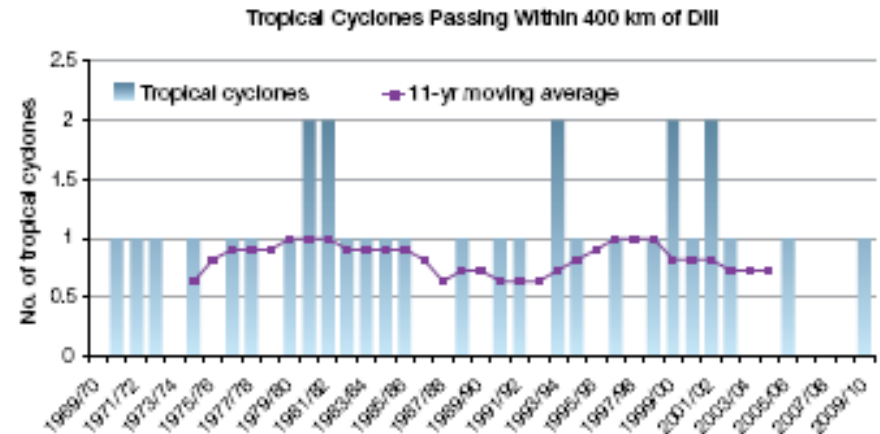
- Generally brings drier conditions to TL
- Often leads to a late onset and early finish to wet season
- Is associated with droughts.

La Niña (i.e. 2010/2011)

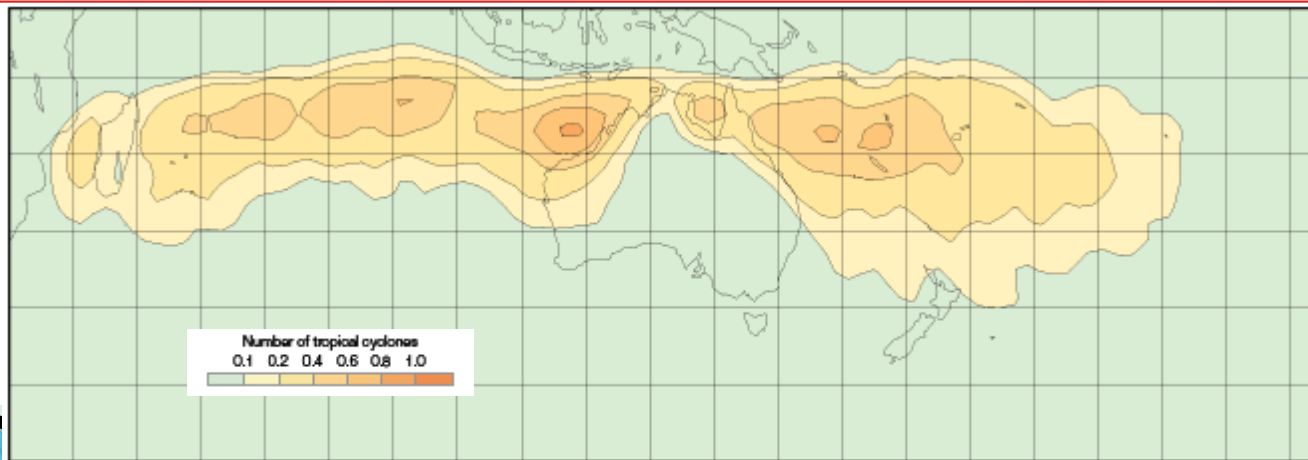
- Dry season rainfall tends to above normal
- Wet season often starts earlier and finish later
- Increased flooding and landslides.

Climate Extremes: tropical cyclones

On average eight Tropical Cyclones per decade pass within 400 km of Dili, with most occurring between November and April. However, the **impact is usually weak** due to Timor-Leste's proximity to the equator.

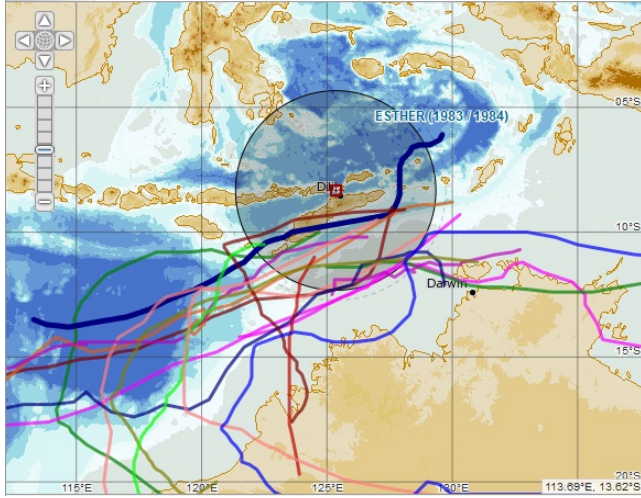


Average annual number of tropical cyclones per year in the Southern Hemisphere in an area $2^{\circ} \times 2^{\circ}$ over the period, 1969/70 to 2005/06. Source: http://www.bom.gov.au/jsp/ncc/climate_averages/tropical-cyclones.



EXTREME EVENTS

Tropical Cyclone



Landslide



Flooding



Strong wind



Flooding



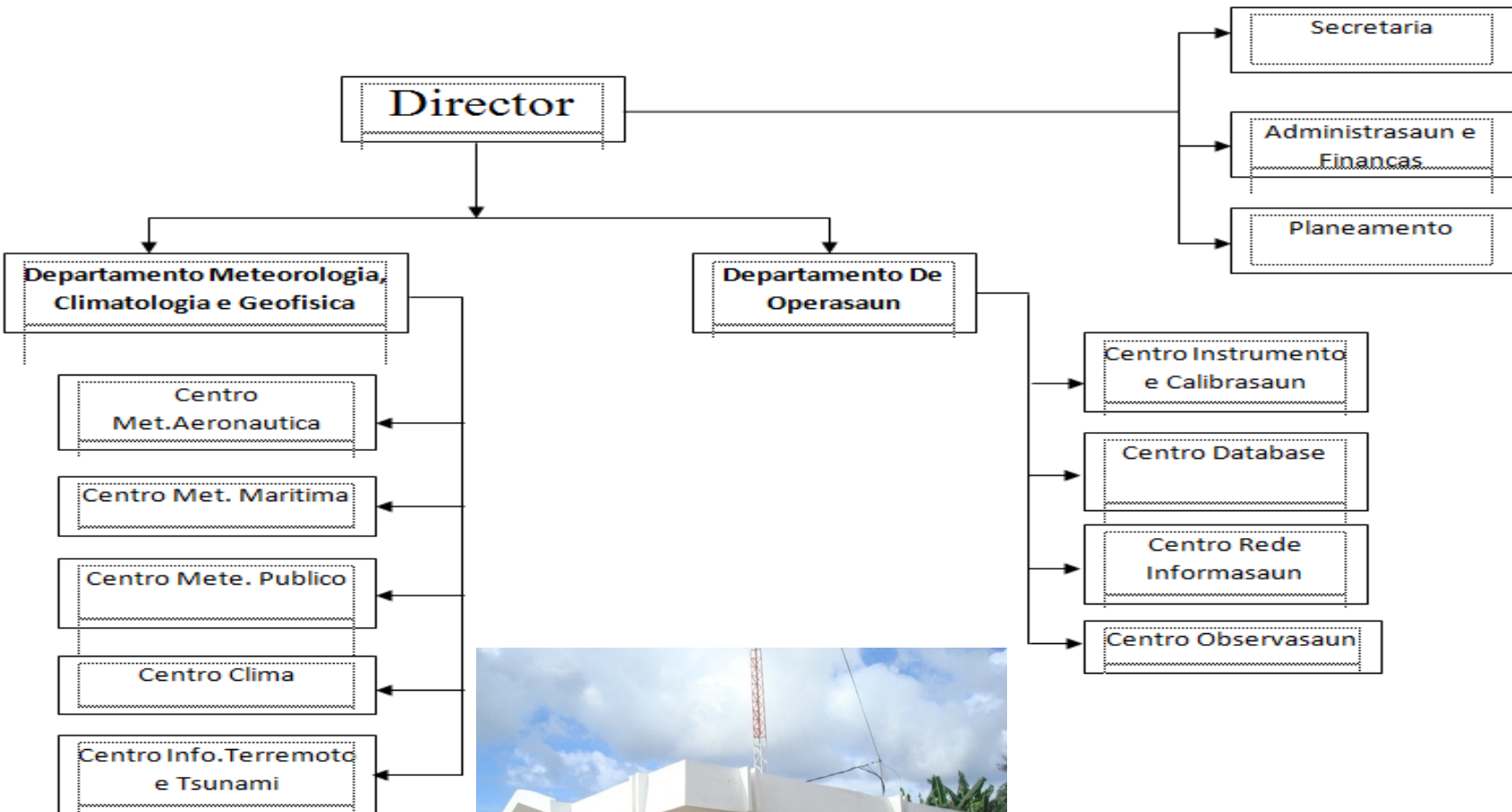
Bridge broke



DNMG PROFILE

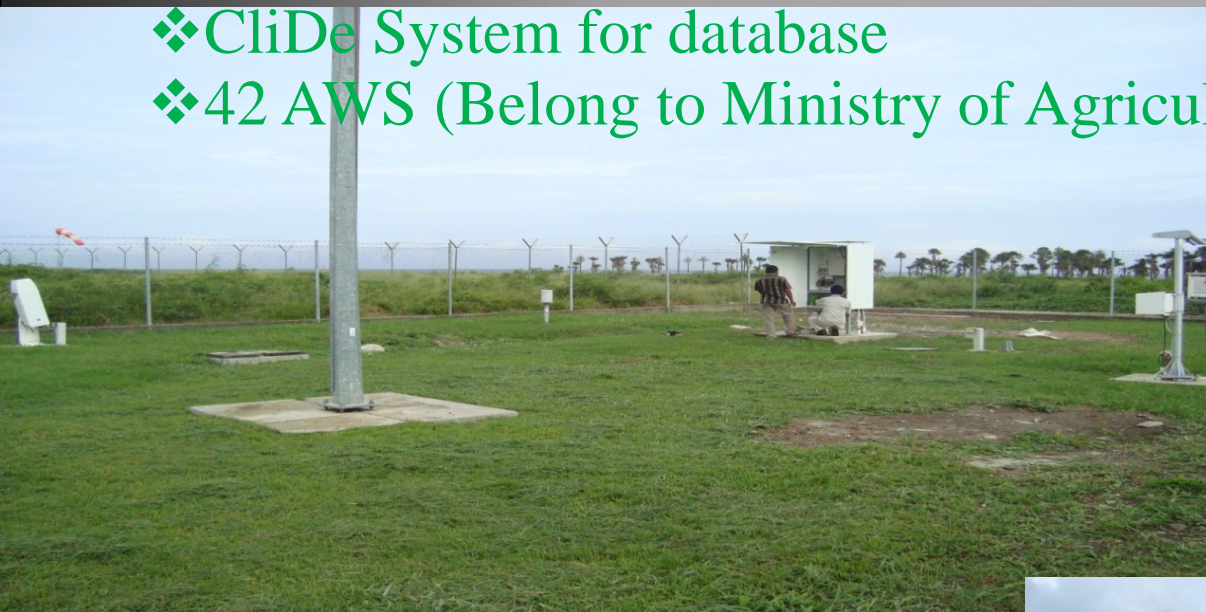
- ▶ DNMG established early 2003 under the ministry of Infrastructure
- ▶ Since the referendum held on September 1999 all Meteorology Services were destroyed in Dili Capital and other districts in Timor–Leste. During the UNTAET period in Timor–Leste meteorology service were provided by Bureau of Meteorology Australia (BoM) in Darwin (just for aviation up to date).
- ▶ DNMG become member of WMO on 4 December 2009 (189th)
- ▶ Currently, DNMG main office in DILI, under the Ministry of Public Works, Transport and Communications.
- ▶ With 24 staff

DNMG Structure



Facilities Infrastructure of DNMG

- ❖ 2 Automatic Weather Observation System (AWOS) in Dili Airport and Oecusse (Suai Airport under installation)
- ❖ 2 Manual Weather Station (Dili and Baucau Airport)
- ❖ CliDe System for database
- ❖ 42 AWS (Belong to Ministry of Agriculture)



✧ DNMG Activity

Observation and monitoring system

Collected data from AWS and Manual Observation



Entry to Data Base



Analysis of RIMES NWP product

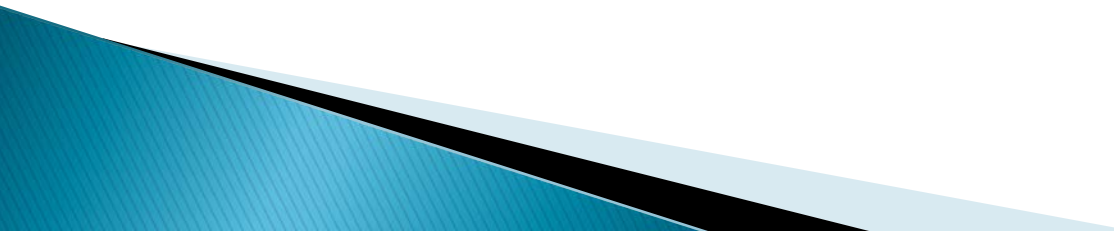
Hydrology Information Data Set

- ▶ Instruments: 7th automatic and manual rain gauge and 14 water level around Timor Leste
- ▶ Five water level monitoring stations in Dili
- ▶ Currently only collect the data.

Information Data

- CLIDE (data base)
 - Portuguese time, Data from 1952-1974
 - Indonesia Time, 1976-1999 (Dili and Baucau)
 - Timor Leste time, 2003 up to date (Dili)

KEY CHALLENGES

- ▶ Need add more staff with high capacity
 - ▶ Improve capacity with the training in area Forecasting, observation, instrument calibrating, models, etc.
 - ▶ Stablish new Headquarter with the modern system for the Meteorology, Climatology and Geophysics.
 - ▶ Stablish new AWS in other Municipality (at list 12 more).
- 

Support and Cooperation Partners country in Application Data Information with;

- ☐ BoM → Provide forecast for Aviation and Tropical Cyclone adversary
- ☐ RIMES → Provide three days forecast and Earthquake and Tsunami information
- ☐ JMA → Provide Satellite Imagery (SATAID)
- ☐ BMKG → on going process to provide technical assistant for training and calibration instrument
- ☐ Government instances: Agriculture, Water Resources, Mineral Resources and NGO' s (Local and International).

**THANK YOU
OBRIGADO**