

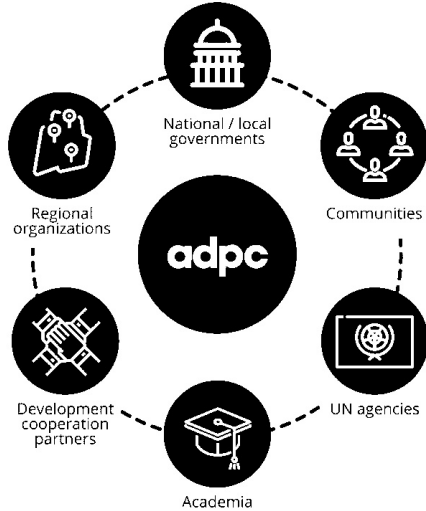
Practices and Approaches to Establishing and Maintaining Transboundary Coordination (Mekong River Basin)

Senaka Basnayake
Director - Climate Resilience
Asian Disaster Preparedness Center (ADPC)
Thailand

Introduction: Asian Disaster Preparedness Center (ADPC)



Partnerships:



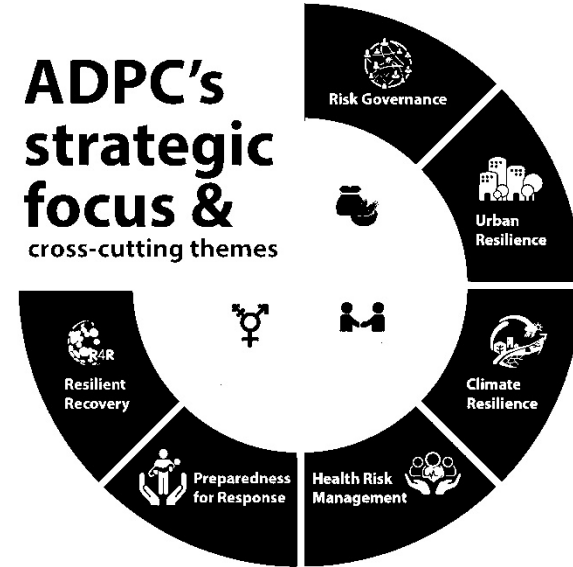
Over **30** years

Advancing DRR & CR

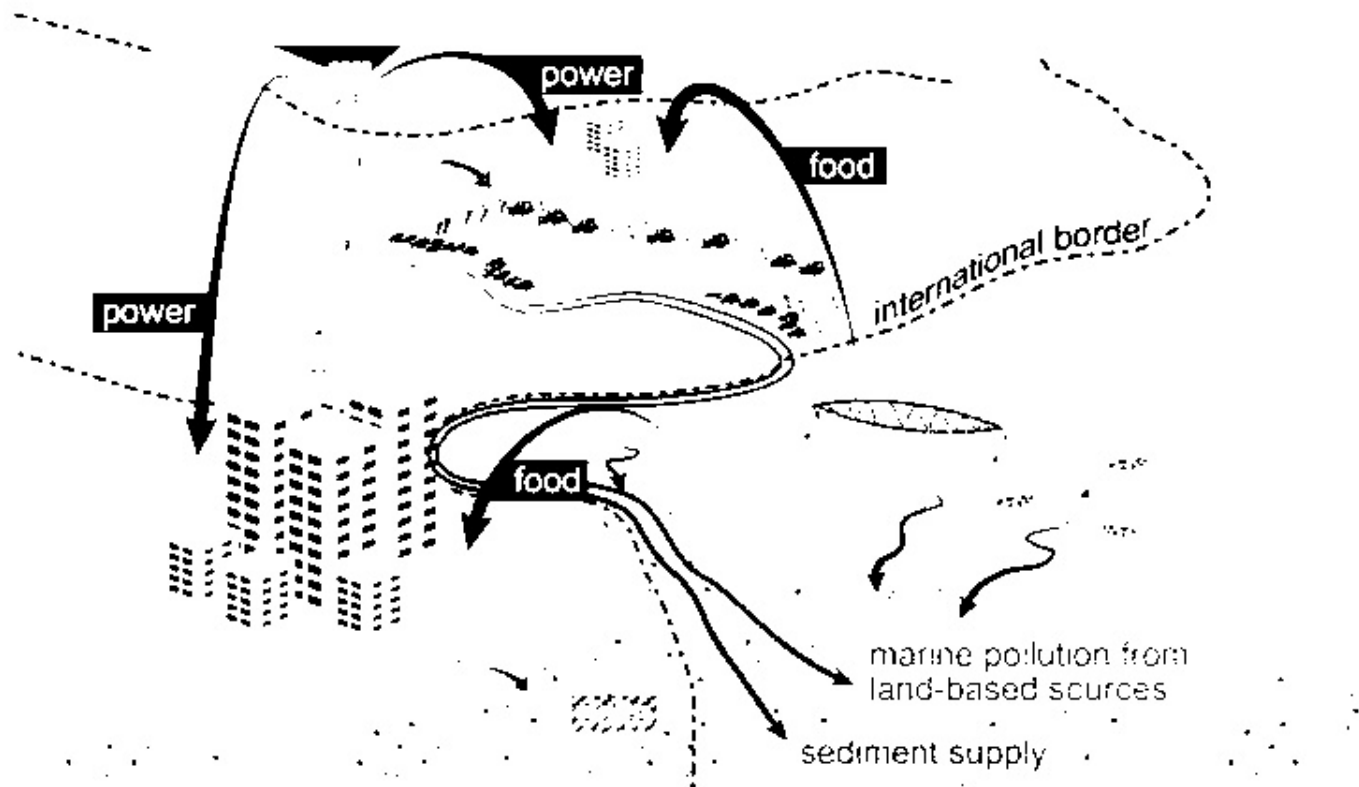
Offices and representations:

- Bangkok, Thailand
- Dhaka, Bangladesh
- Yangon, Myanmar
- Colombo, Sri Lanka
- Jakarta, Indonesia
- Bihar State, India
- Kathmandu, Nepal
- Manila, Philippines
- Phnom Penh, Cambodia

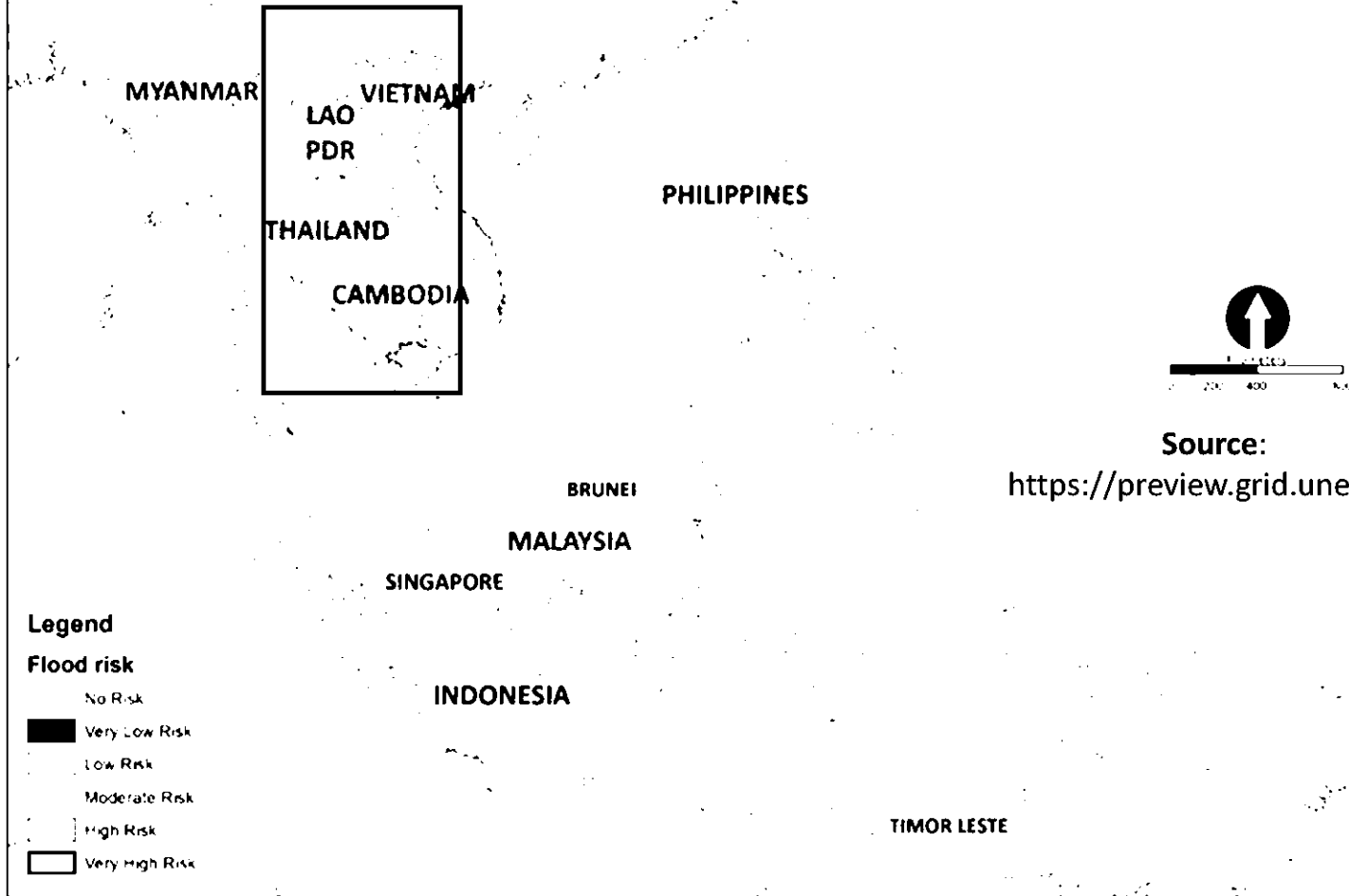
ADPC's strategic focus & cross-cutting themes



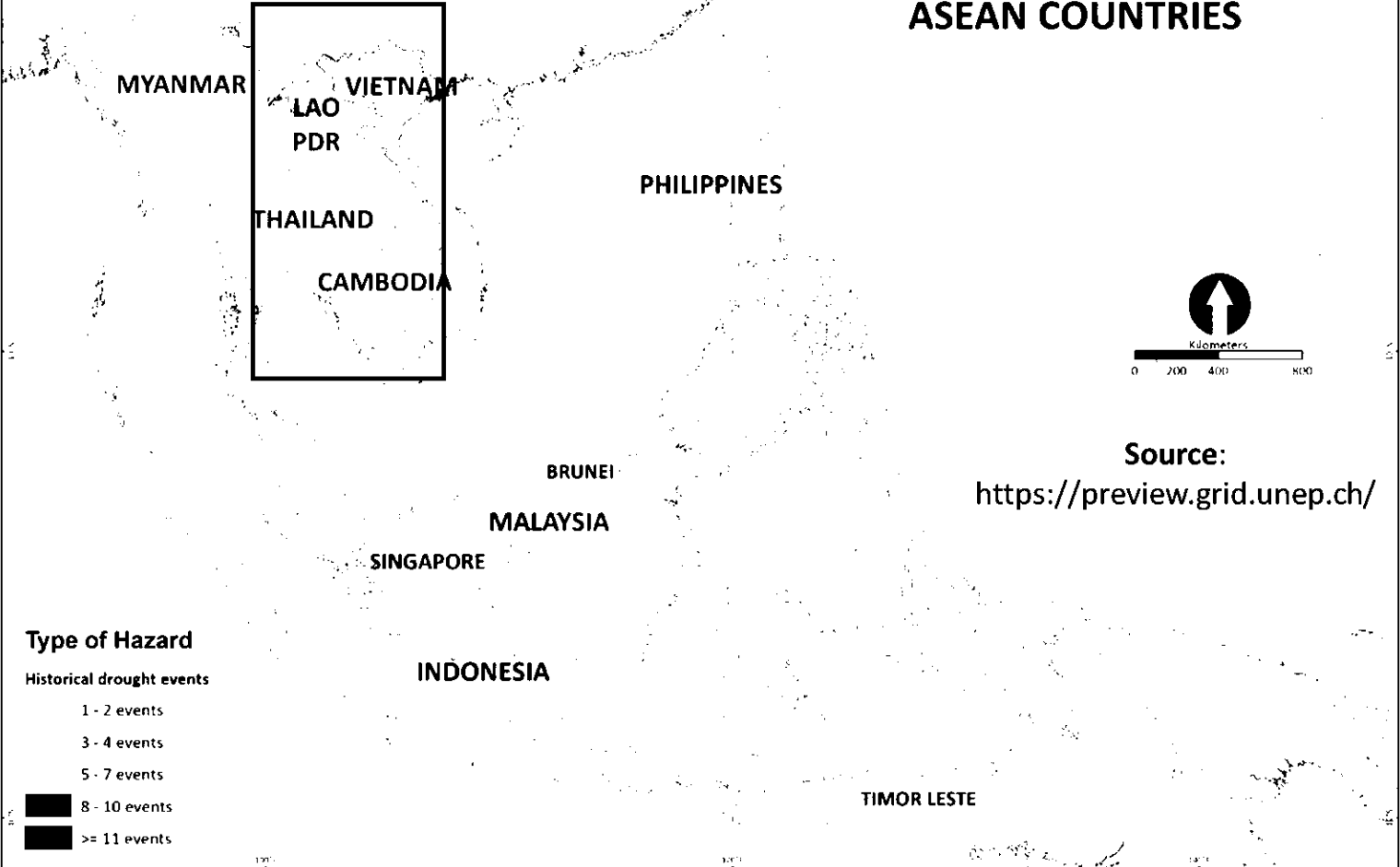
- Value derived from river use links countries
- Pollution e.g. wastewater and agricultural runoff



FLOOD RISK MAP ASEAN COUNTRIES



HISTORICAL DROUGHT EVENT MAP ASEAN COUNTRIES



Type of Hazard

Historical drought events

- 1 - 2 events
- 3 - 4 events
- 5 - 7 events

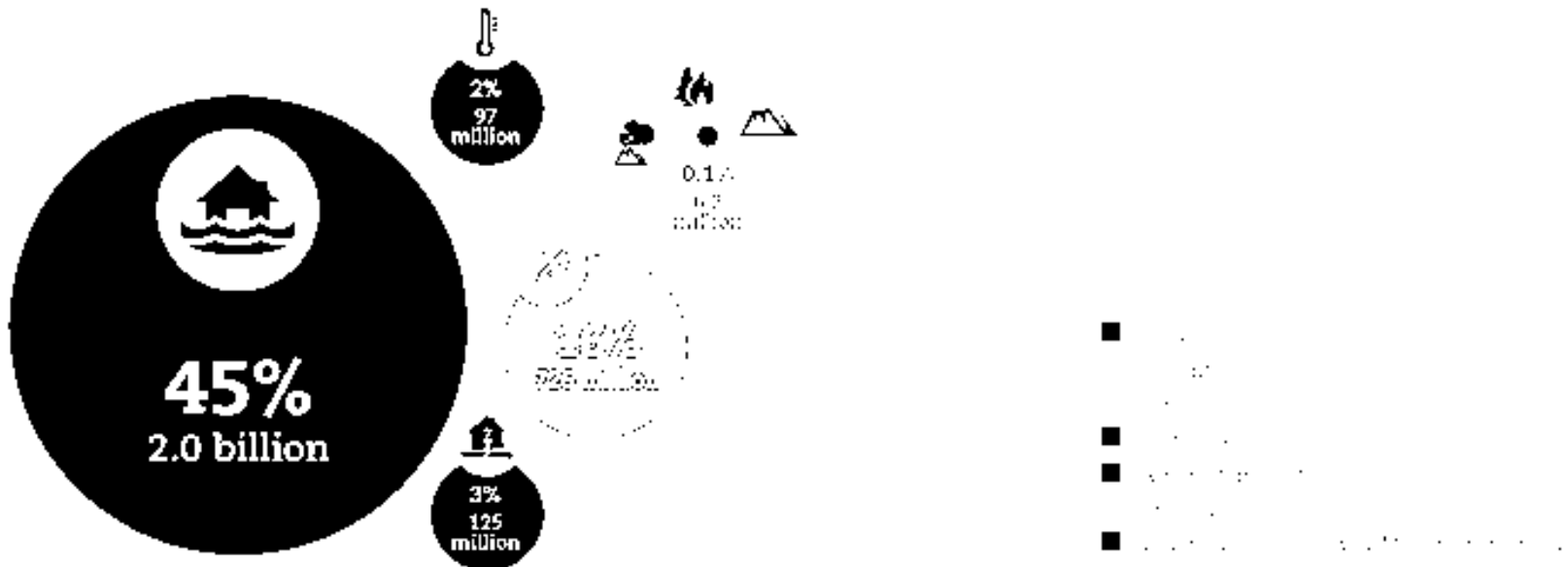
- 8 - 10 events
- >= 11 events

Source:
<https://preview.grid.unep.ch/>

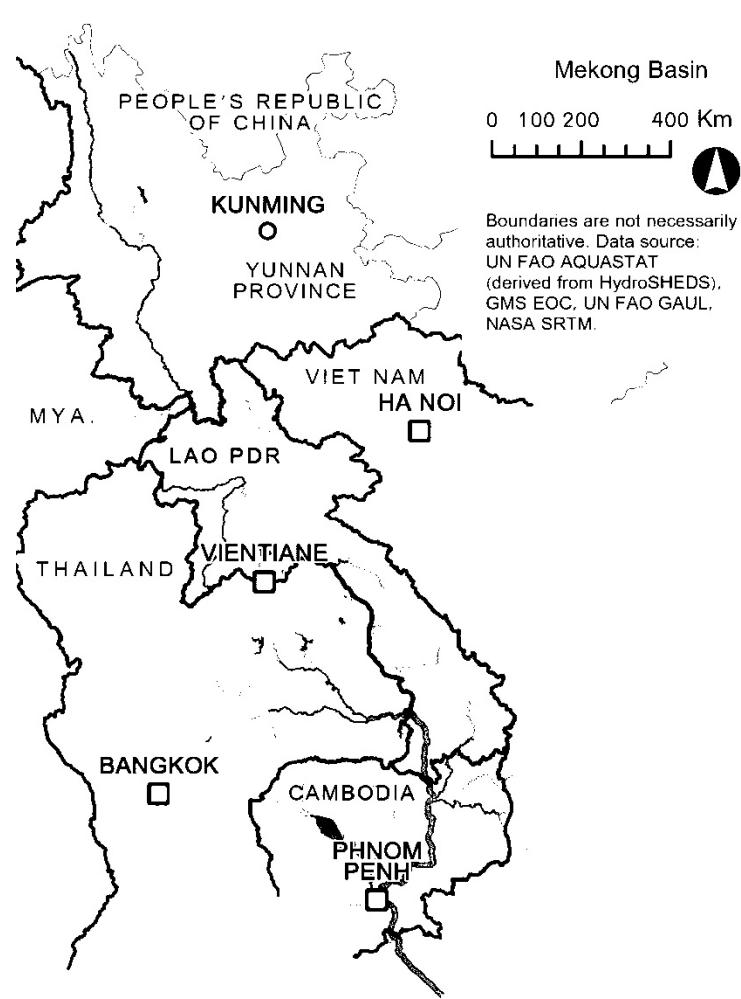
People Affected by Type of Disasters



Number of people affected per disaster type 1998-2017



Mekong River Basin



The Mekong is a trans-boundary river in Southeast Asia.

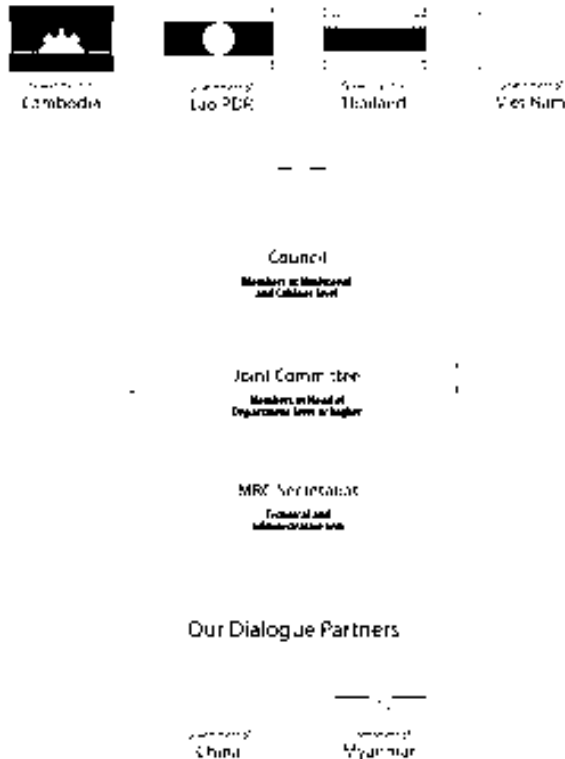
The Mekong River is one of the world's great river systems, flowing 4,909 km through six countries: China, Myanmar, Thailand, Lao PDR, Cambodia, and Viet Nam.

It drains an area of 795,000 km² (307,000 sq mi), discharging 475 km³ (114 cu mi) of water annually.

Governance of the Mekong



Mekong River Commission Governance Structure

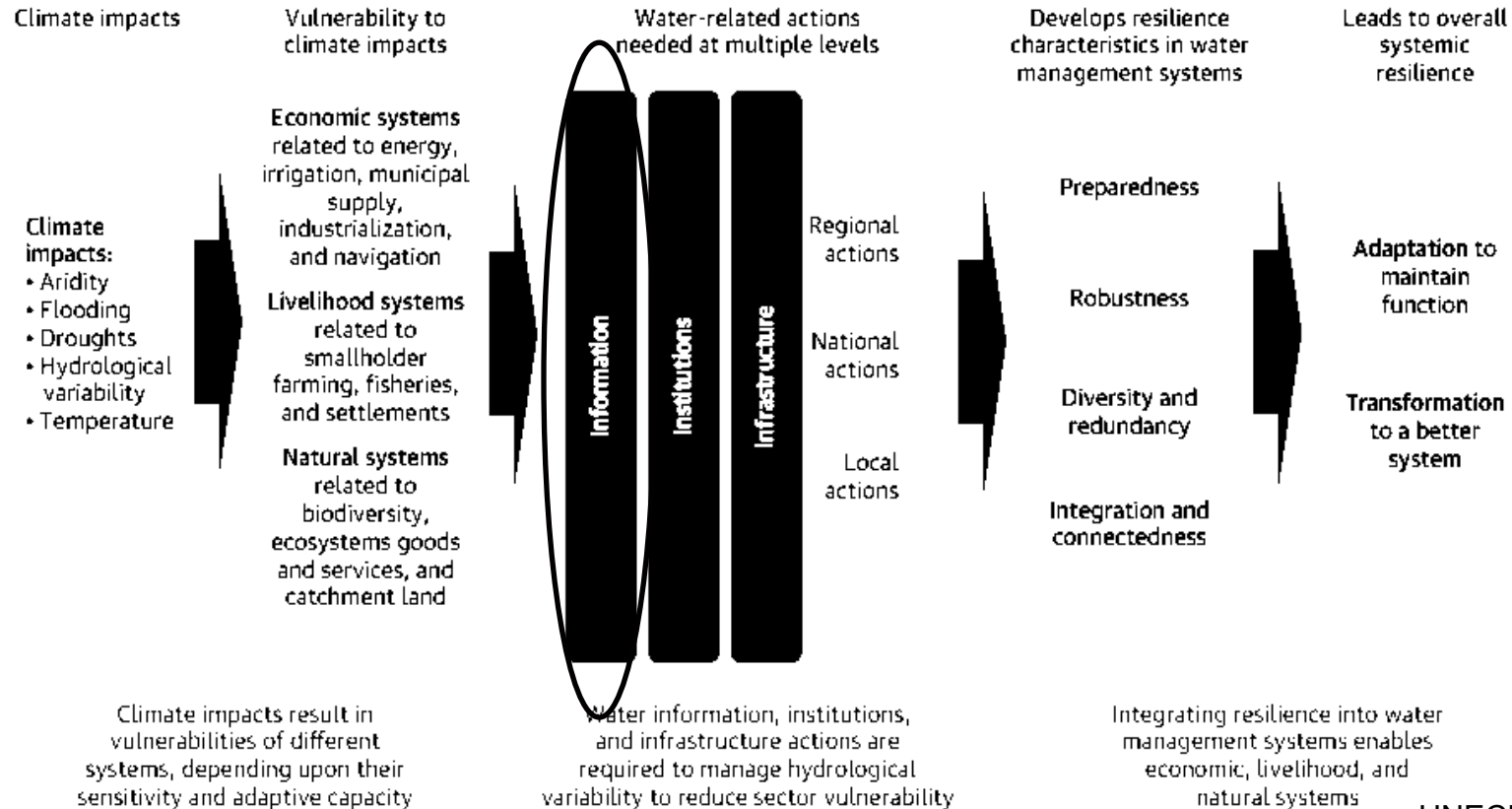


- Mekong River Commission Secretariat (Vientienne, Laos) - MRCS
- Mekong River national committees (NMCs)
- Member countries: Cambodia, Lao PDR, Thailand, Vietnam
- Observer countries: People's Republic of China and Myanmar (Burma)

“3i Approach”



Transboundary Coordination



What we do?

<https://servir.adpc.net>



SERVIR MEKONG

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search...



Connecting Space to Village in the Lower Mekong Region

SERVIR-Mekong is a geospatial data-for-development program that responds to the needs of Lower Mekong countries. [Learn more](#)



DECISION
SUPPORT TOOLS



GEOSPATIAL
DATASETS



RESOURCES &
PUBLICATIONS

Request Technical Assistance

SERVIR-Mekong priorities are set by the expressed needs of stakeholders. Let us know the needs of your organization by requesting assistance.

FEATURED

**Create/invent
Tool from remote
Sensing to
improve water
management**

Introduction:

<https://servir.adpc.net>
SERVIR-Mekong



<https://servir.adpc.net>

SERVIR  **GLOBAL**

CONNECTING SPACE TO VILLAGE

WHAT IS SERVIR?



Partnership between USAID and NASA



Establishes long-term regional hubs to get geo-spatial information and tools to decision makers



Identifies, addresses and resolves data and information challenges



Focuses on climate change and implications on land use, agriculture, biodiversity, disasters, forests, health, water and weather



**AGRICULTURE AND
FOOD SECURITY**



**LAND COVER / LAND USE
AND ECOSYSTEMS**



WEATHER AND CLIMATE

**WATER RESOURCES AND
DISASTERS**



Service Planning to Delivery

Regional Drought and Crop Yield Information System

Problem: Loss of rice production due to severe drought



Limited Rain Data

Limited Modeling Capacity

Inaccurate Drought Forecast

Unreliable Crop Advisories

Loss of rice production

What we do?

<https://rdcyis-servir.adpc.net>

: Regional Drought and Crop Yield Information System



20+ drought and crop related indices/variables

- **Nowcast**

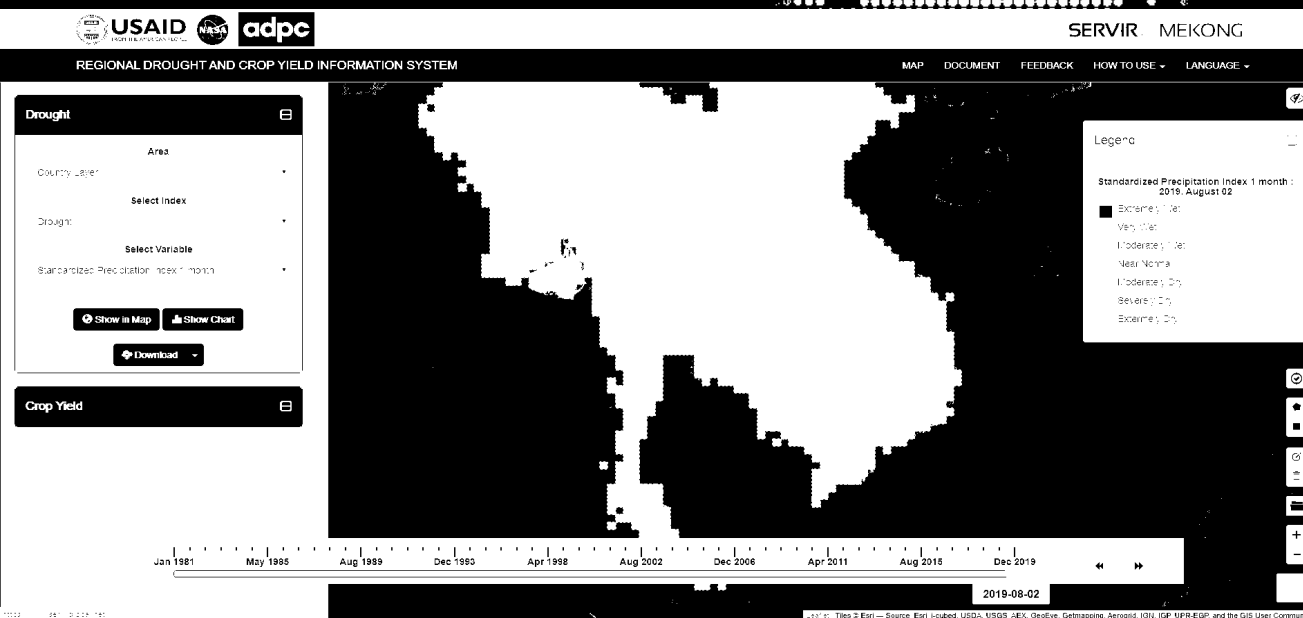
Actual condition of a particular day (or period) from 1981 onward

- **Seasonal Forecast**

Forecast for 90 days ahead



Connecting space to farmers

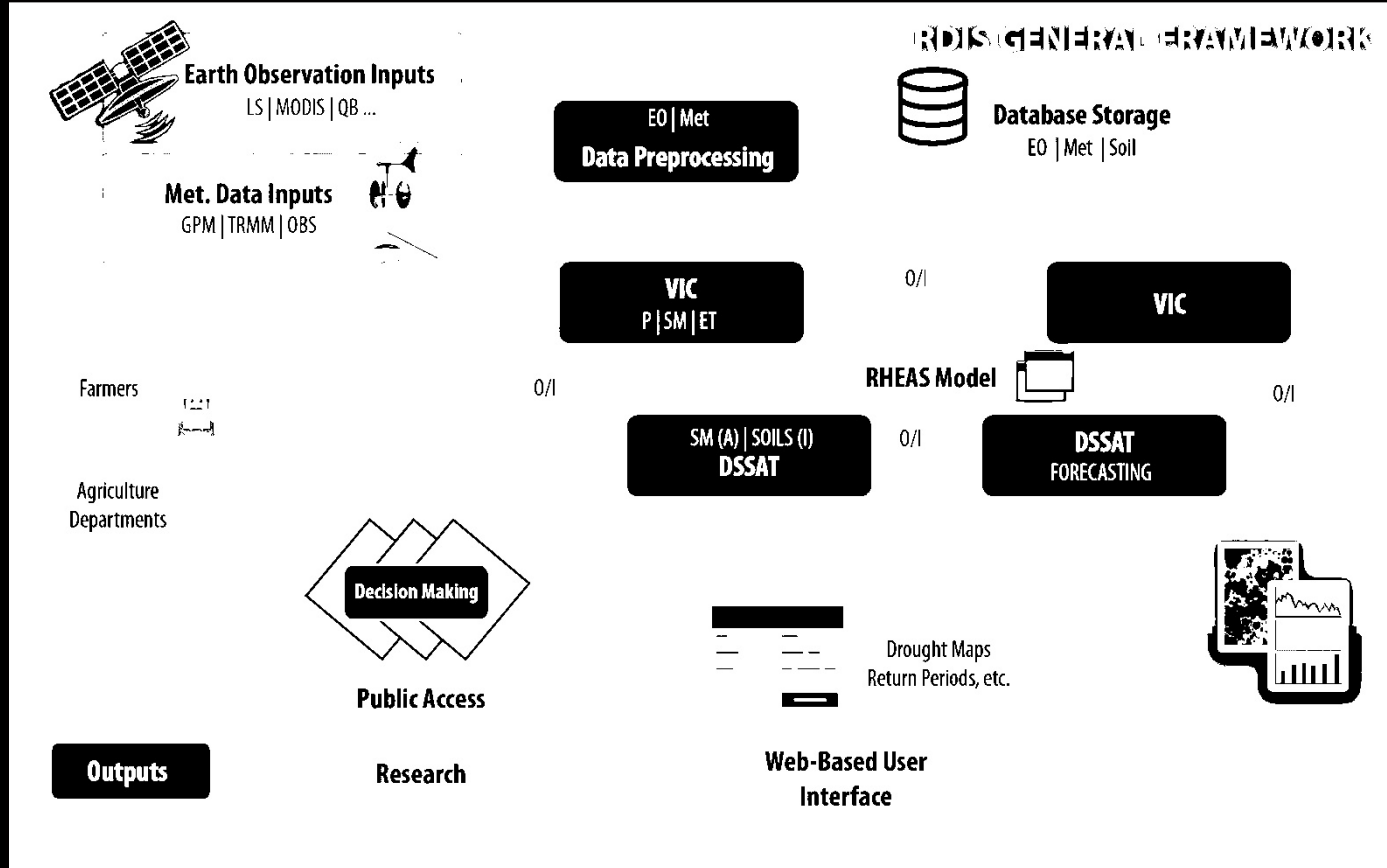


Earth Observations and NASA Products Used

- Regional Hydro-Extreme Assessment System (RHEAS) Model
- Climate Hazards Group InfraRed Precipitation with Station data (CHIRPS)
- NCEP Reanalysis Data
- NMME Meteorological Forecast Data
- AMSR-E/SMAP/SMOS Soil Moisture
- MODIS Leaf Area Index Data
- MODIS Evapotranspiration Data
- Harmonized World Soil Database

What we do?

: Regional Drought and Crop Yield Information System



What we do?

Regional Drought and Crop Yield Information System



MRC Drought Portal: <http://mekong2.tengri.com>



UPTAKE



HOME ABOUT PRODUCTS FORECASTING MONITORING ABOUT US CONTACT US



Drought Early Warning Lower Mekong Basin

Date: 04/08/2019

Weekly Combined Drought Index (CDI) Forecast

■ D4: Extreme Drought	■ LMR
■ D3: Severe Drought	■ South/Southern
■ D2: Heavy Drought	■ Mekong Basin
■ D1: Moderate Drought	
■ D0: No Drought	

The drought monitor focus on broad scale conditions. Local conditions may vary. See accompanying text summary for forecast statements



Disclaimer: This drought monitor and forecasting map is developed based on the satellite imagery with no ground verification. MRC does not guarantee the values and accuracy of the products nor be responsible for any risks of using the products

This Week's Drought Summary

The forecasting index indicates that one extreme and one moderate drought is located in the North and Southeast of Lower Mekong Basin in place during July, are moving away. In this coming weeks of August, nevertheless the D0 areas are still dominated by moderate and severe drought condition (D1 & D2).

The soil moisture condition in general is at average and is at condition except the areas of containing rain less Northeast of Thailand and remain the extreme condition less Cambodia, Siam, Thailand and Laos PDF in the Southeast of the LMB. However the dry areas in Cambodia will gain some moisture gain from the second week of August on and are predicted.

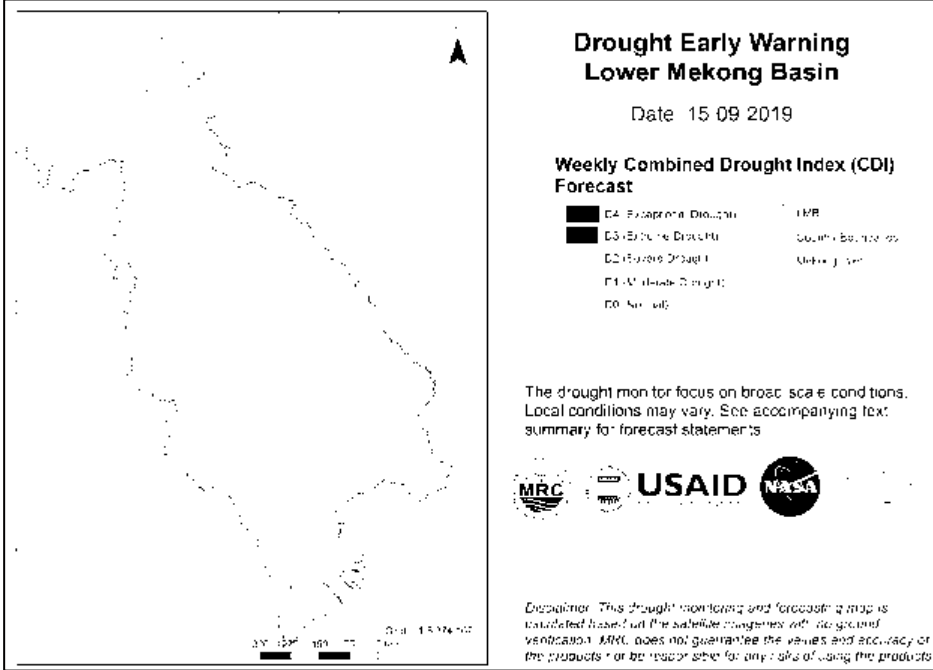
In general, the forecasting seen from 29 July to 04 August 2019 is a depending some meteorological drought in the Northern and Southeastern areas as affecting from July, by means of some moderate dry of soil moisture. This might affect some agriculture crops in the soil moisture areas if measures are not in place.

Mekong Drought Tool: Outreach



Lower Mekong Basin
Drought Monitoring and Forecasting

HOME ABOUT PRODUCTS FORECASTING MONITORING ABOUT US CONTACT US



- Drought monitoring and forecasting data: Regional Hydrologic Extremes Assessment System (RHEAS)
- Able to monitor and forecast all types of drought (i.e. meteorological, agricultural, hydrological).
- Based on the best available science and data.
- Practically useful for Mekong River Commission (MRC) Member Countries and their Line Agencies.

- National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory,
- Asian Disaster Preparedness Center (ADPC),
- Drought Management Team (DMT) of the Mekong River Commission Secretariat (MRCS),
- Centre for Water, Climate and Land (CWCL) at the University of Newcastle, Australia

User Engagement

Regional Drought and Crop Yield Information System

Capacity Building on RHEAS Modeling



Dialogue on Application of Drought Monitoring and Forecasting for Management and Response to Drought in Vietnam

Virtual Rain and Stream Gauge Information Service (VRSGIS)

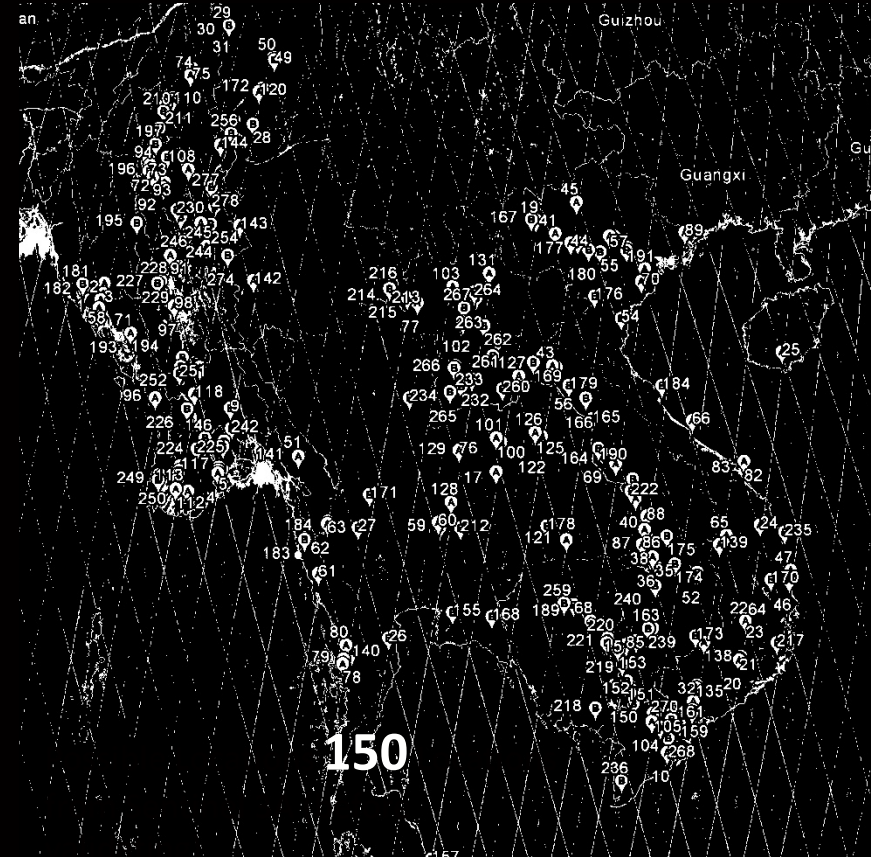
What is VRSGIS Tool?

Global rainfall and water level are available!

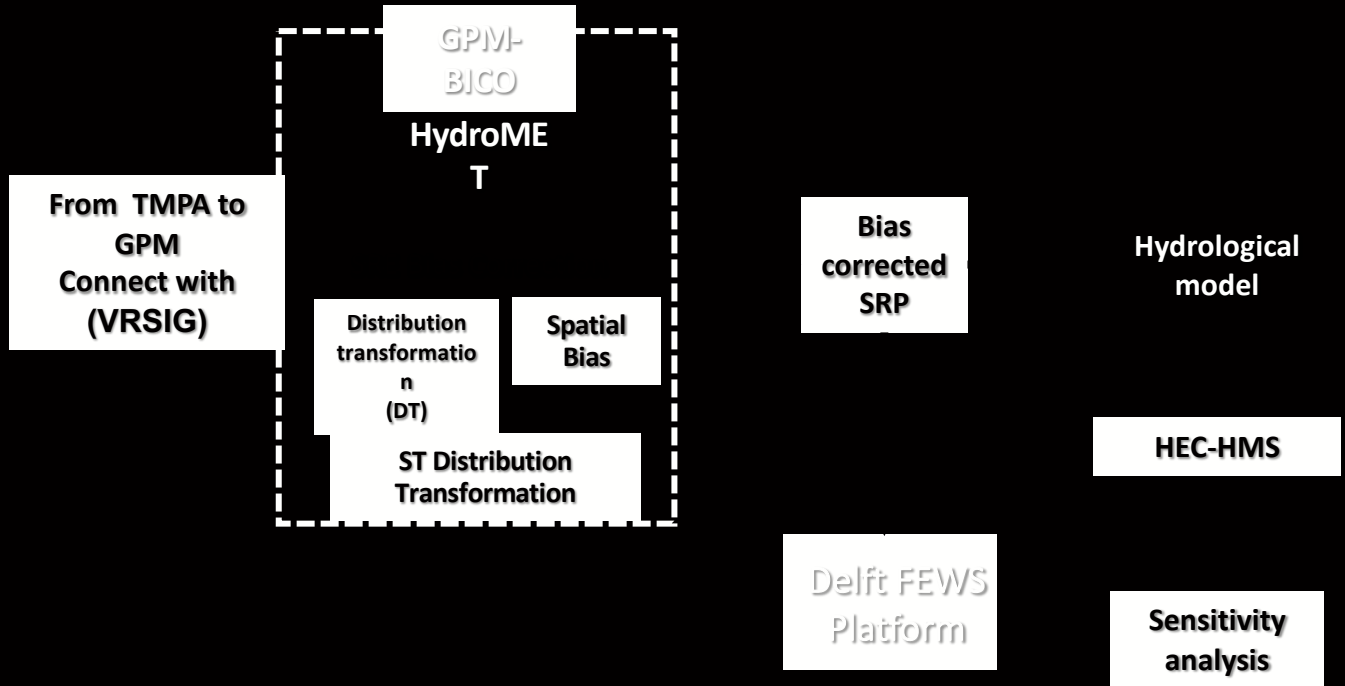
Product	Spatial Res.	Temporal Res.	Data Availability	Latency
TRMM	25km	Daily	1998-2016	-
GPM-IMERGE	10km	30min	2015-date	6 hrs
CMORPH	8 / 25km	30min / Daily	2014-date	6 hrs / 1 day
CHIRPS	5km	daily	1981-date	2 months
GSMaP	10km	Hourly / Daily	2015 - date	4 hrs / 1 day
Jason2/3	---	10 days	2008-date	2 days
Sentinel 3A/3B	---	27 days	2017-date	2 days



Transboundary issues
LACK Hydro information



Virtual Rain Tool Integration Into MRC – Flash Flood Guidance System (MRC-FFGS)



What we do?

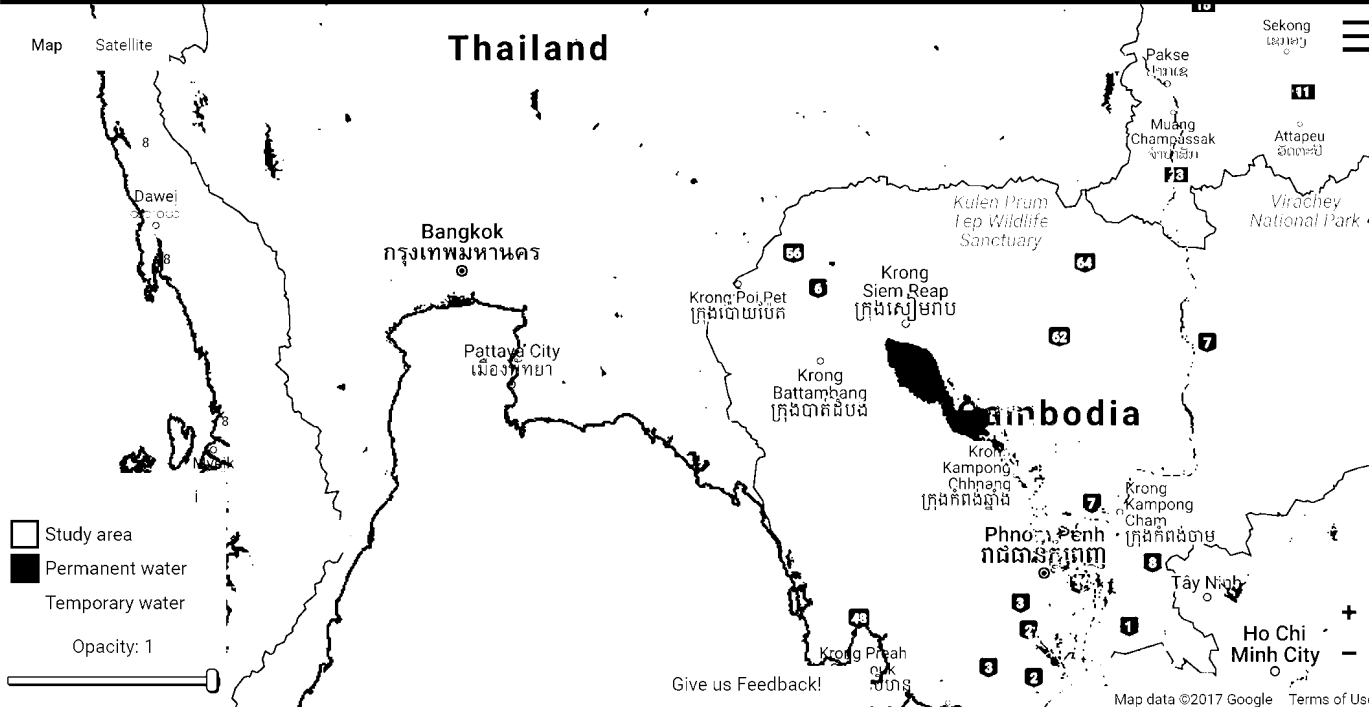
Surface Water Mapping Tool

Landsat 7 and 8
data + MODIS



SERVIK MEKONG

Home About



Transboundary issues
LACK Hydro
information

Risk Assessment

River
morphology
changes



What we do?

Historical Flood Analysis Tool

Risk Assessment

LACK Hydro ground information

Earth Observations and NASA Products Used

- Landsat 5, 7 and 8 data
- Google Earth Engine
- OpenStreetMap
- SRTM Plus (30 m Digital Elevation Model)
- Joint Research Centre (JRC) Global Surface Water dataset

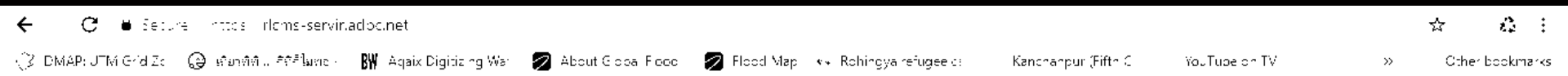
The screenshot displays the 'Historical Flood Analysis Tool' interface. At the top, logos for USAID (with the tagline 'FROM THE AMERICAN PEOPLE'), NASA, and adpc are visible on the left, and 'SERVIR MEKONG' is on the right. The main title 'HISTORICAL FLOOD ANALYSIS TOOL' is centered. Below the title, there is a 'View and Download Data' button. The left sidebar contains several interactive elements: an 'Area Filter' dropdown menu, 'Select Years' (1990 to 2015), 'Select Months' (June to October), 'Select Method for Time Period' (Continuous), and a 'Layer Opacity' slider. The main map area shows a geographical view of Southeast Asia, with labels for Bangladesh, Myanmar (including Meghalaya, Nagaland, Manipur, Tripura, Mizoram, and Shan State), Laos, and Vietnam. A legend titled 'Surface Water Occurrence' is positioned on the left side of the map, featuring a vertical color scale from 1% (dark blue) to 100% (red). The map itself shows a heatmap of surface water occurrence, with higher concentrations in the central and southern regions of the area shown.

What we do?

It is now live!
What is RLCMS Tool?

<https://rlcms-servir.adpc.net/en/landcover/#>

REGIONAL LAND COVER MONITORING SYSTEM



SERVIR MEKONG

LAND COVER PORTAL

METHODS SERVICE APPLICATIONS



The map data shows the landcover data for 2016

The map and the product shows the preliminary result!

Compare Landcover of different years

Download Data/Typology

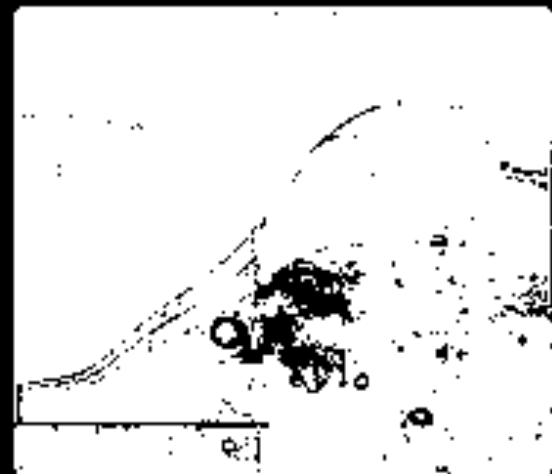
Change Opacity



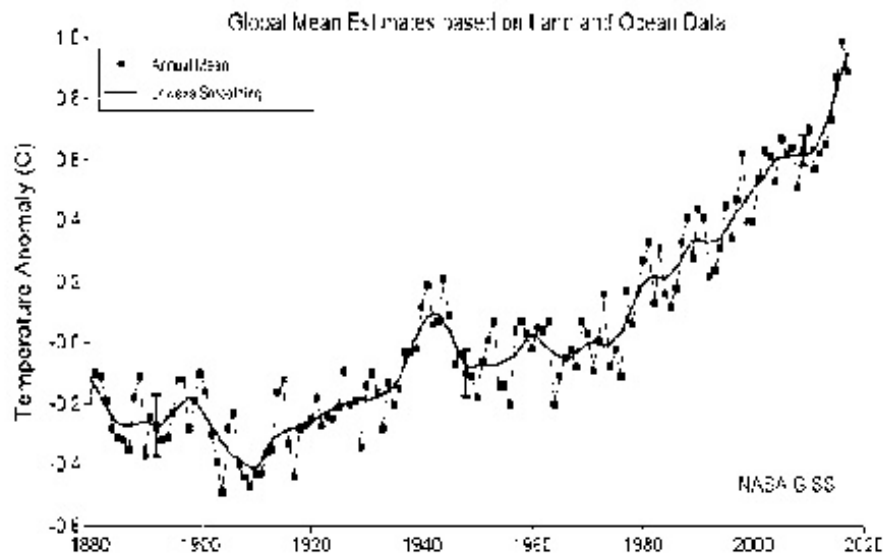
A vertical toolbar for map interaction. It includes a location pin icon, a "Draw or Upload Area" button, an "Administrative Region" button, a "Draw Polygon" button, a "Draw Circle" button, a "Draw Rectangle" button, and an "Upload Area (accepts kmz, kmz and geotiff)" button. There are also "or" labels between some buttons.

Change the assemblage by turning on/off the layers and use as the map.

Global Warming of 1.5°C



Temperature has increased by about 1°C compared to pre-industrial period.



Source NASA



European
Commission

If the current warming rate of about 0.2 °C per decade continues, human-induced warming will exceed 1.5°C between 2030 and 2052.



adpc

UN
**SEDAI
 FRAMEWORK**

**1 Global
 Outcome** **1 Goal**

7 Global Targets

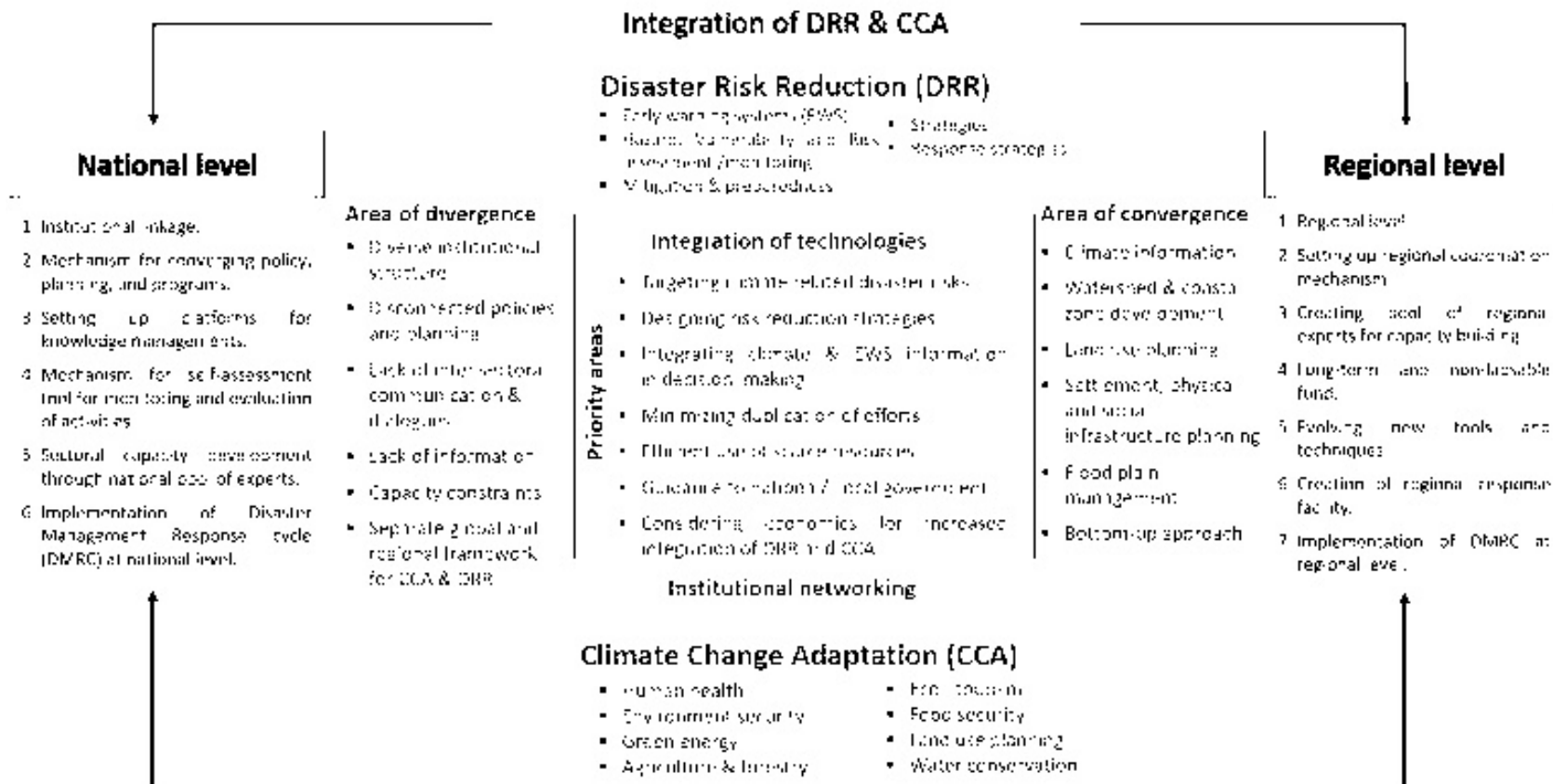
GLOBAL AGENDAS 2015 - 2030

**International
 and Global Pa**

PARIS2015
 AGREEMENT ON CLIMATE CHANGE
 COP21·CMP11



CCA DRR Coherence at Basin Level



Bangladesh Climate Data Portal

http://bmd.wospace.org/team/homex.php)



User Guide Purchase Data Language

Login

Base Layer

- Streets
- Landscape
- Overlays**
 - Districts
 - District Names
 - Station List
 - Grid
 - Query Result
 - A
 - B
 - A-B

Show Chart

Time Series (CSV)

Gridded Min Temperature at ALL province(s) from 2005-JAN to 2005-DEC
Data Range : 17-21 celsius

Data (A)

Type Gridded (Observed) Variable Min Temperature

Districts ALL Resolution 25 KM

Models (for Projected Data Only)

Scenario -- GCM

Statistics Mean Scope

Period From 2005 Jan To 2005 Dec

All Months J F M A M J J A S O N D

Data (B)

Type -- Variable

Districts ALL Resolution 25 KM

Models (for Projected Data Only)

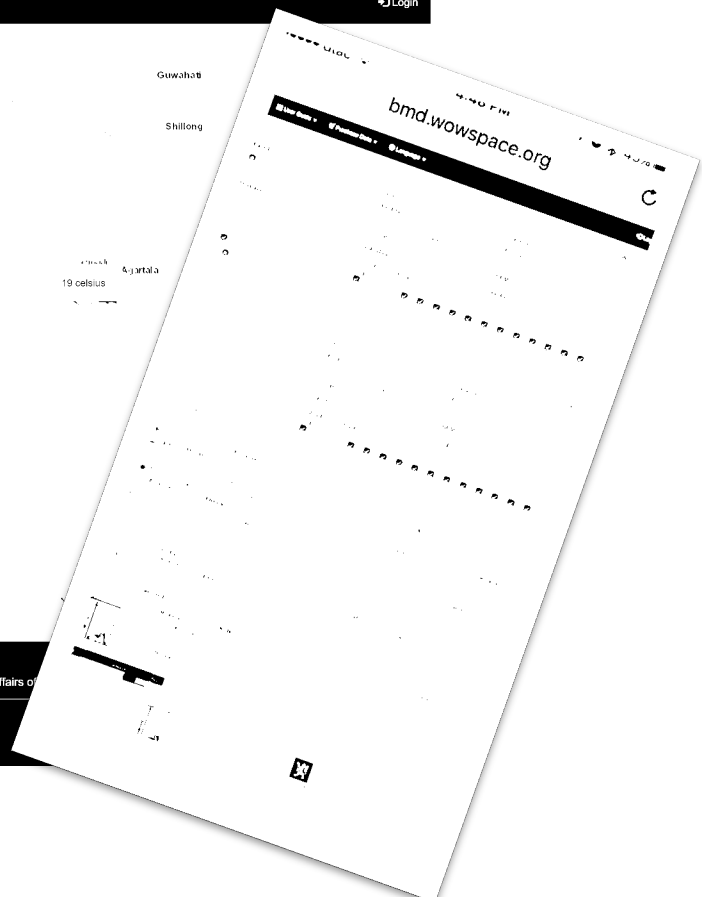
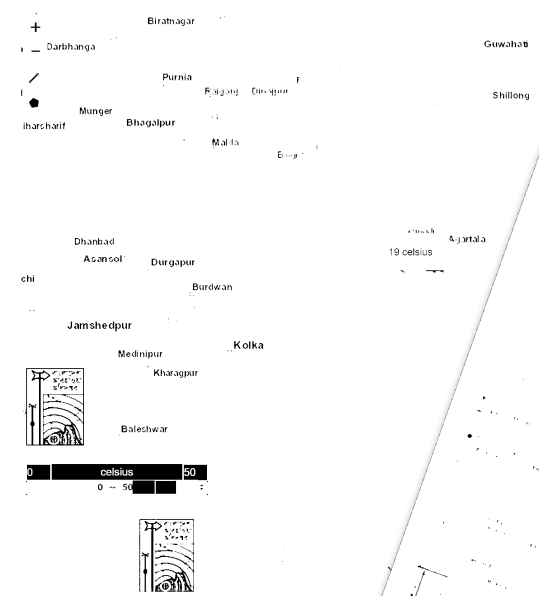
Scenario -- GCM

Statistics -- Scope

Period From -- To

All Months J F M A M J J A S O N D

View



© Bangladesh Meteorological Department, 2017

Bangladesh Climate Data Portal was developed by Asian Disaster Preparedness Center (ADPC), Thailand with the support from the Ministry of Foreign Affairs of

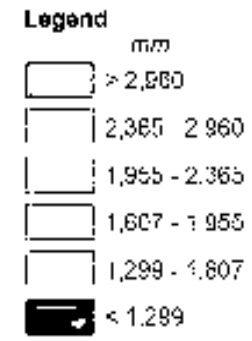
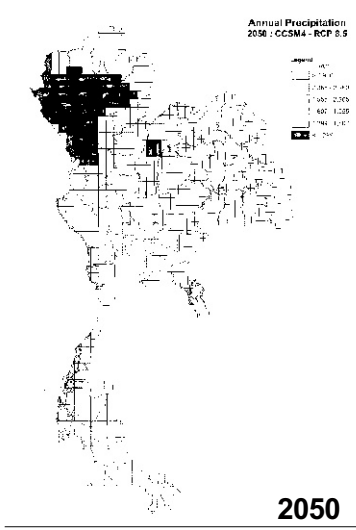
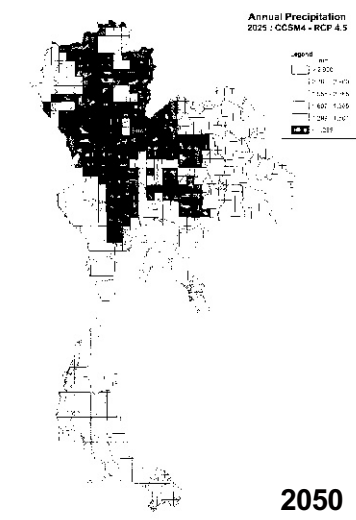
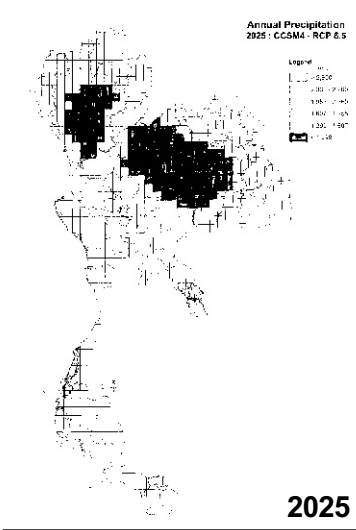
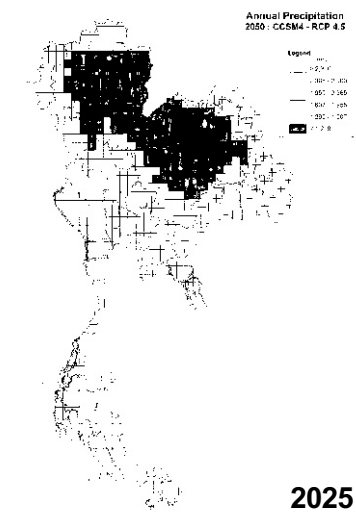
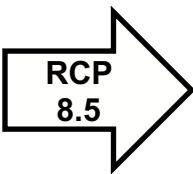
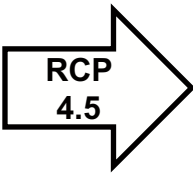
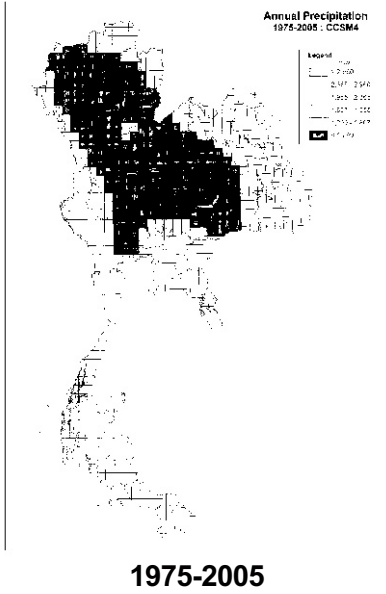
Contact | Feedback | Terms of Use | Credit and Acknowledgement.

Visitors since Nov 2017



Annual Precipitation Thailand

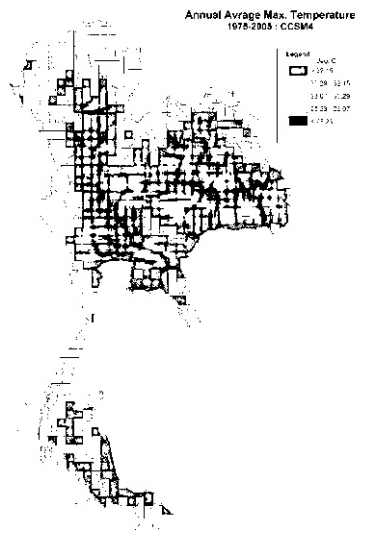
GCM
-
NCAR-
CESM1
(CMIP5)



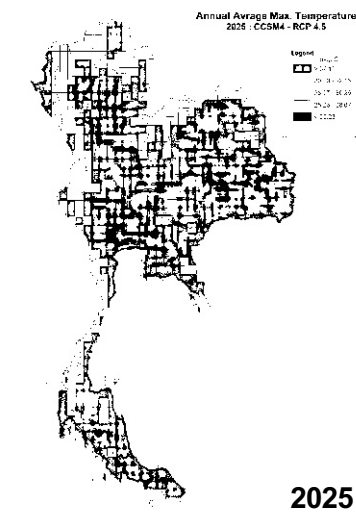
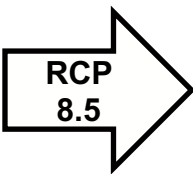
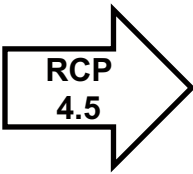


Annual Avg. Max. Temp Thailand

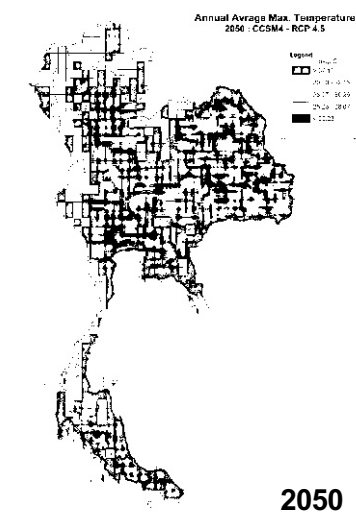
GCM
-
NCAR-
CESM1
(CMIP5)



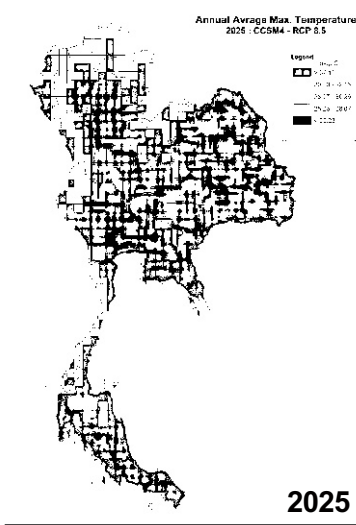
1975-2005



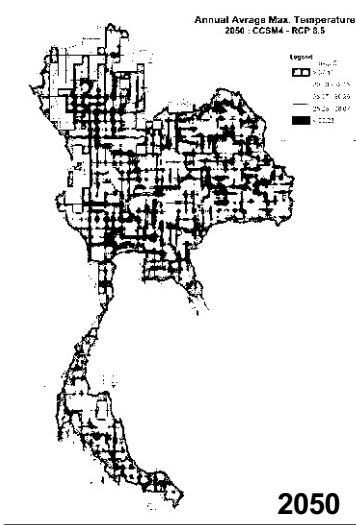
2025



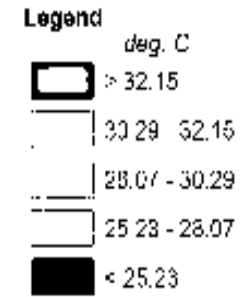
2050



2025



2050





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