



## Side Event

**Sharing Capacity Building Experiences on Climate Actions in ASEAN**

**7 November 2017, Bonn, Germany**

# **Status of Capacity Building Experience Climate Change in Cambodia**

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**Cambodia**

# OUTLINE OF PRESENTATION

1. Capacity Building Programme-India-ASEAN Region
2. Cambodia Climate Change Alliance (CCCA)

# 1. Capacity Building Programme-India-ASEAN Region

Implementation of CAMBODIA for the Project on Climate Change Projections and Assessment of Impacts; Modelling and Capacity Building Programme-India-ASEAN Region

## **Royal University of Agriculture as National Partner Organisation and the Project Leader will:**

- Conduct the modelling study as outlined in the enclosed Terms of Reference, in coordination with the National Focal Point of the ASEAN Working Group on Climate Change (AWGCC), Project Coordinators and the ASEAN Secretariat;
- Undertake climate change projection modelling and impact assessment for forests and water resource sectors of Cambodia;
- Submit financial report with supporting documents to ASEAN Secretariat.



## *Agenda for “ASEAN – India Green Fund”*

**1) Training Workshop on Climate Change Projections and Assessments of Impacts: Modeling and Capacity Building Programme, 22-28 February 2016, Indian Institute of Science, Bangalore, India.**

### ***Historical Climate Trends and Climate Change Projections for Cambodia***

2) Training Workshop on Impact Modelling of Climate Change on Water Resource and Forestry Sectors, *03 – 08 October 2016*, Bangalore, at Hotel Chancery Pavilion, India

***Output Practical Exercise on ArcSWAT 2009 and SWAT-CUP***

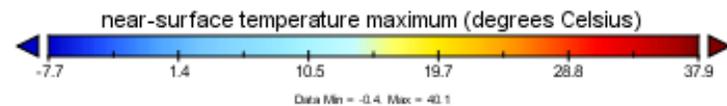
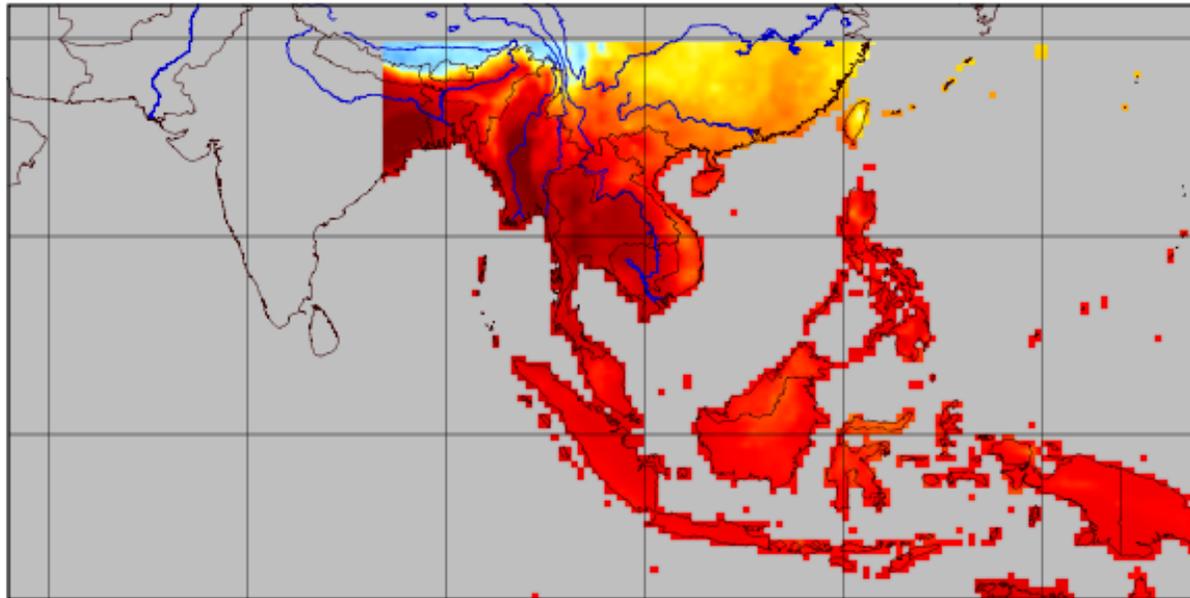
- **Climate Research Unit Time Series (CRU TS3.23)** of data set contain monthly time series of precipitation, daily Tmax and Tmin, cloud cover and other variables covering Earth's land area from 1901 to 2014 with resolution 0.5x0.5 degrees.
- The NASA Earth Exchange Global Daily Downscaled Projections (NEX-GDDP) dataset is downscaled climate scenarios for the globe which GCM runs under the Coupled Model Intercomparison Project Phase 5 (CMIP5) and across two of the four greenhouse gas emissions scenarios as RCPs.
- Downscaled projections for RCP 4.5 and RCP 8.5 from the 21 models and scenarios. Each of the climate projections includes daily maximum temperature, minimum temperature, and precipitation for the periods from 1950 through 2100 with spatial resolution is 0.25 degrees (25 km x 25 km).
- Data Analysis and Visualizing using climate data operator (CDO) and grid analysis and display system. **Panoply** plots geo-referenced and other arrays from netCDF, HDF and GRIB Data and other datasets Viewer.
- The result of map development based on (i) analysis historical climate trend analysis and (ii) climate change projection analysis.

# 1.1 Historical Climate Trend Analysis

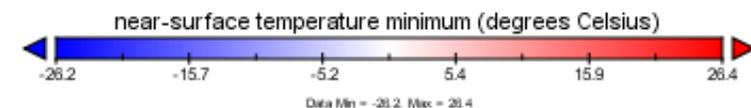
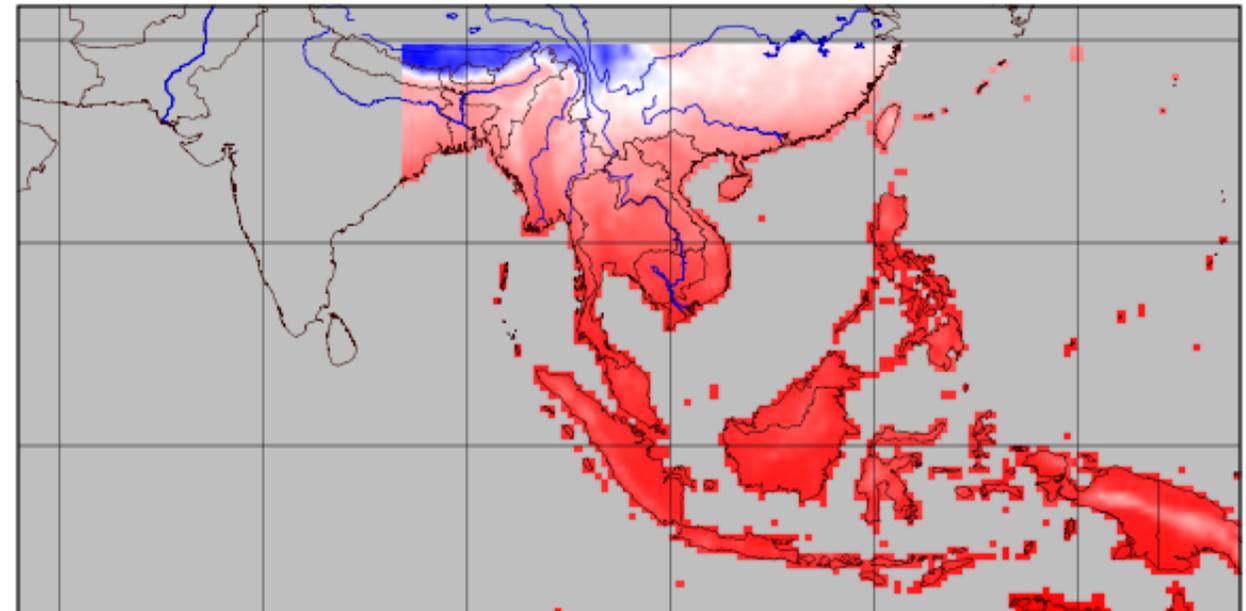
- Maximum and minimum temperature variability for SE Asia and Cambodia
- Rainfall variability for SE Asia and Cambodia

# Spatial Variation in Observed Ave. Tmax and Tmin in cru.1901-2014 of SE Asia

Historical Tmx in cru.tmax.1901.2014.sea

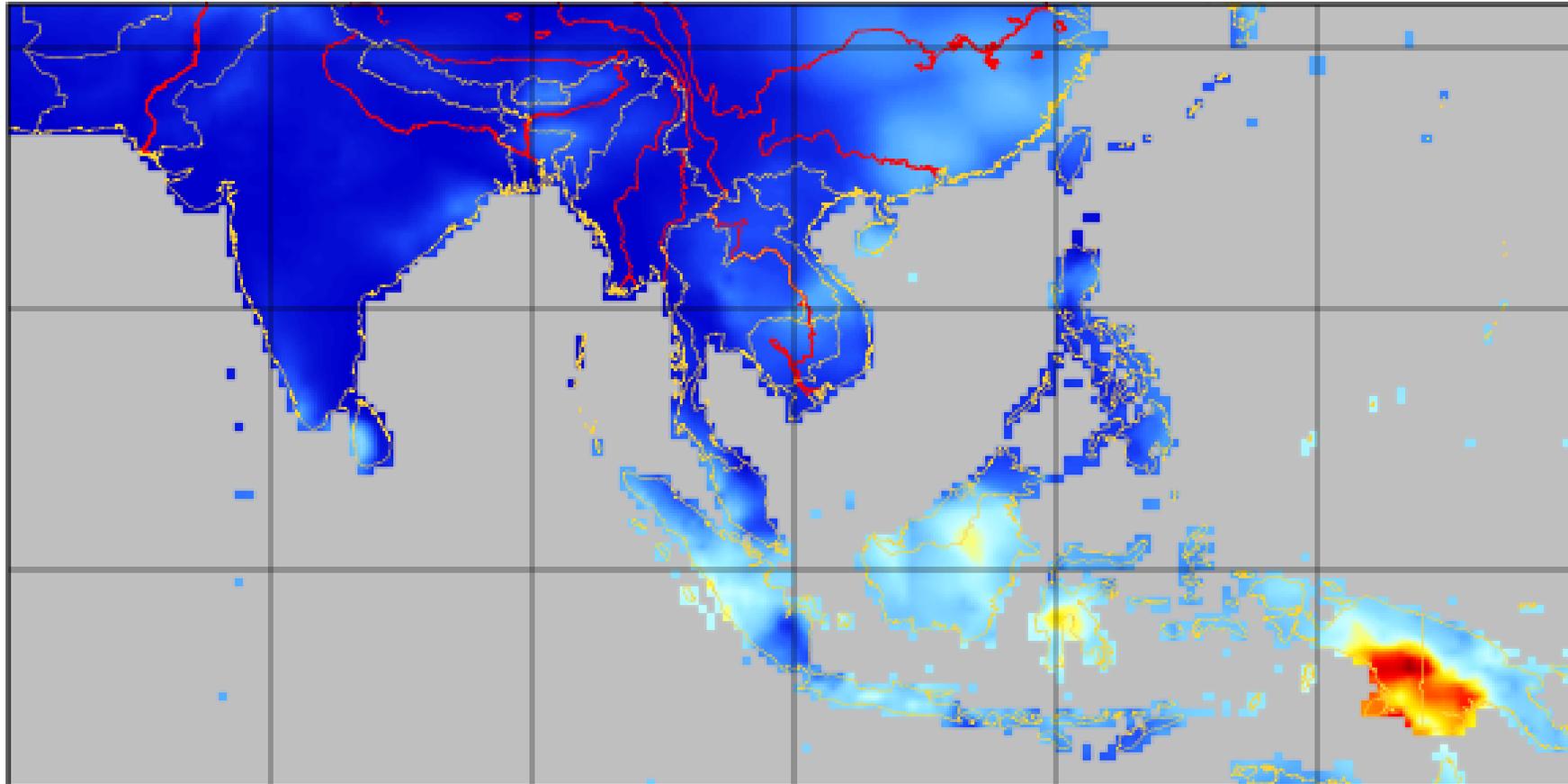


Historical Tmn in cru.tmin.1901.2014.sea

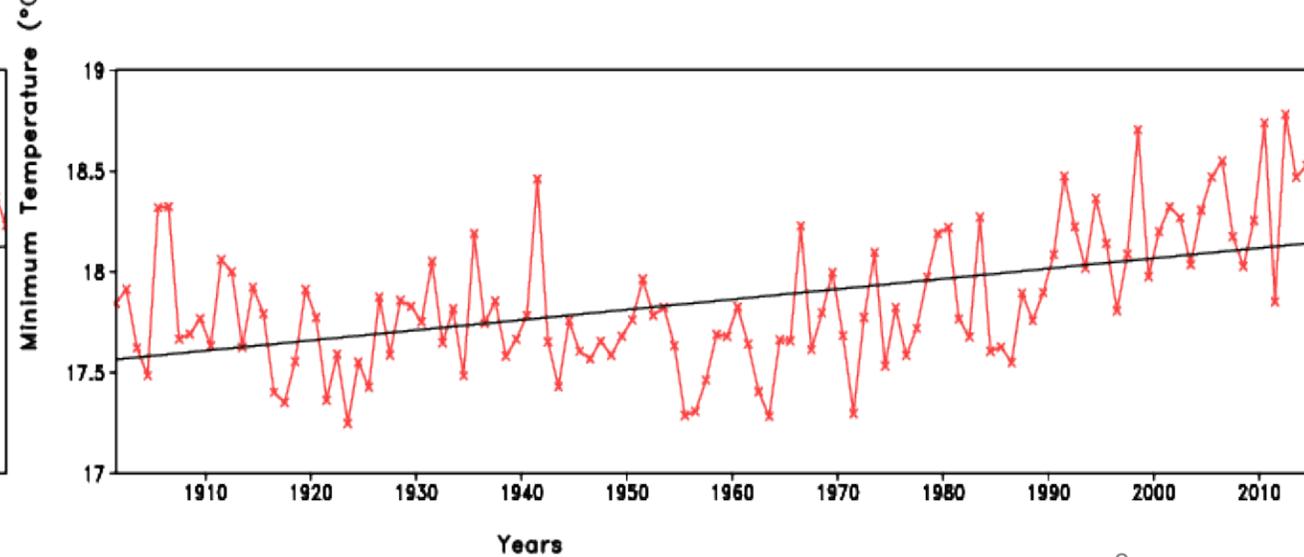
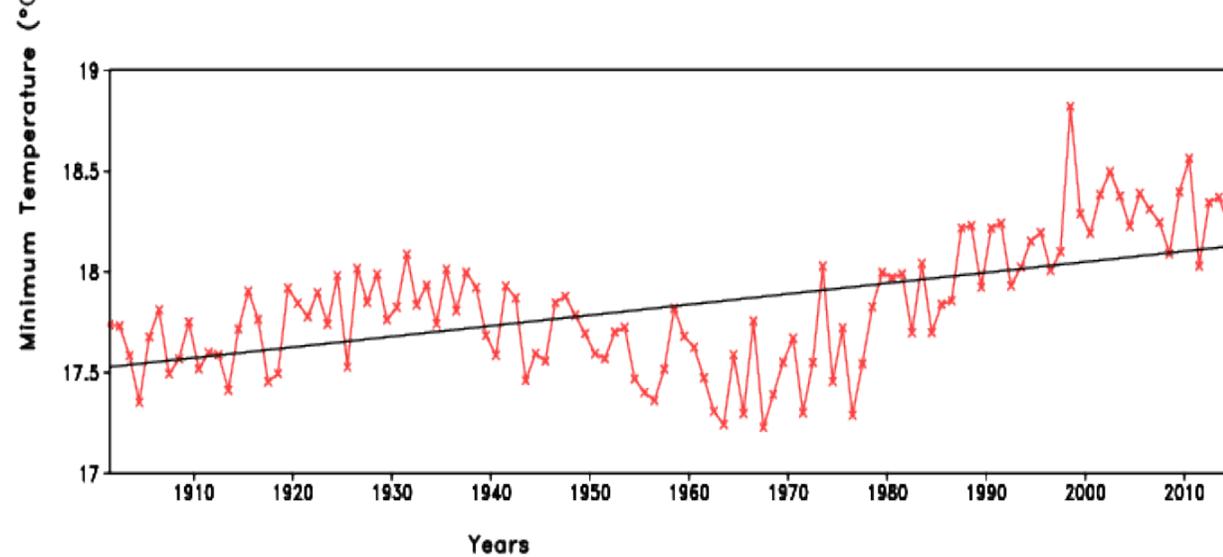
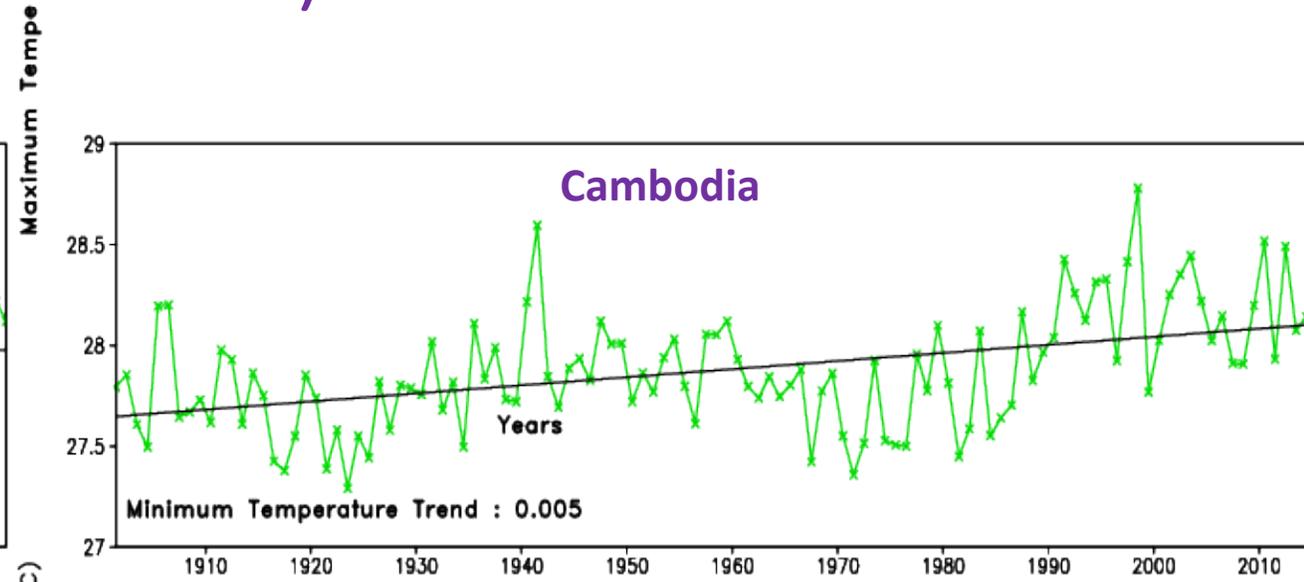
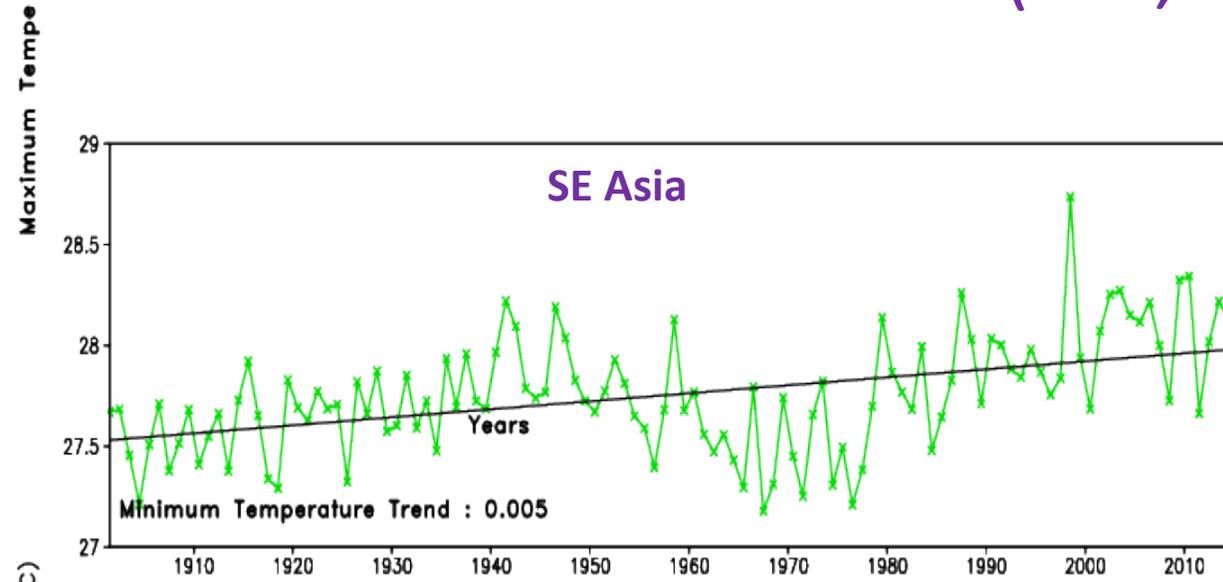


# Spatial Variation in Observed Rainfall in cru.1901-2014 of SE Asia

Historical Precipitation in cru ts3.23.1901-2014, SE

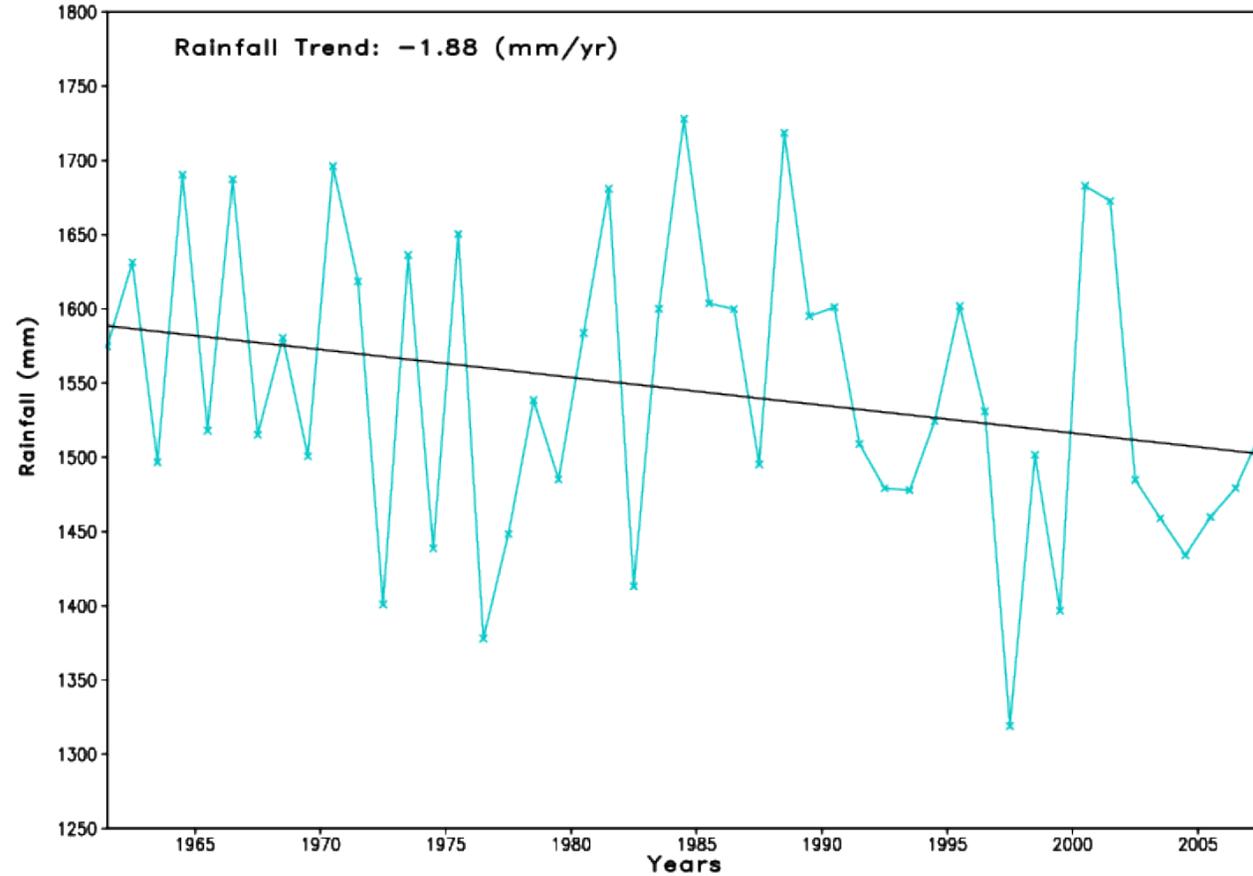


# Observed Mean Annual Tmax and Tmin Trend of SE Asia and Cambodia (CRU, 1901-2014)

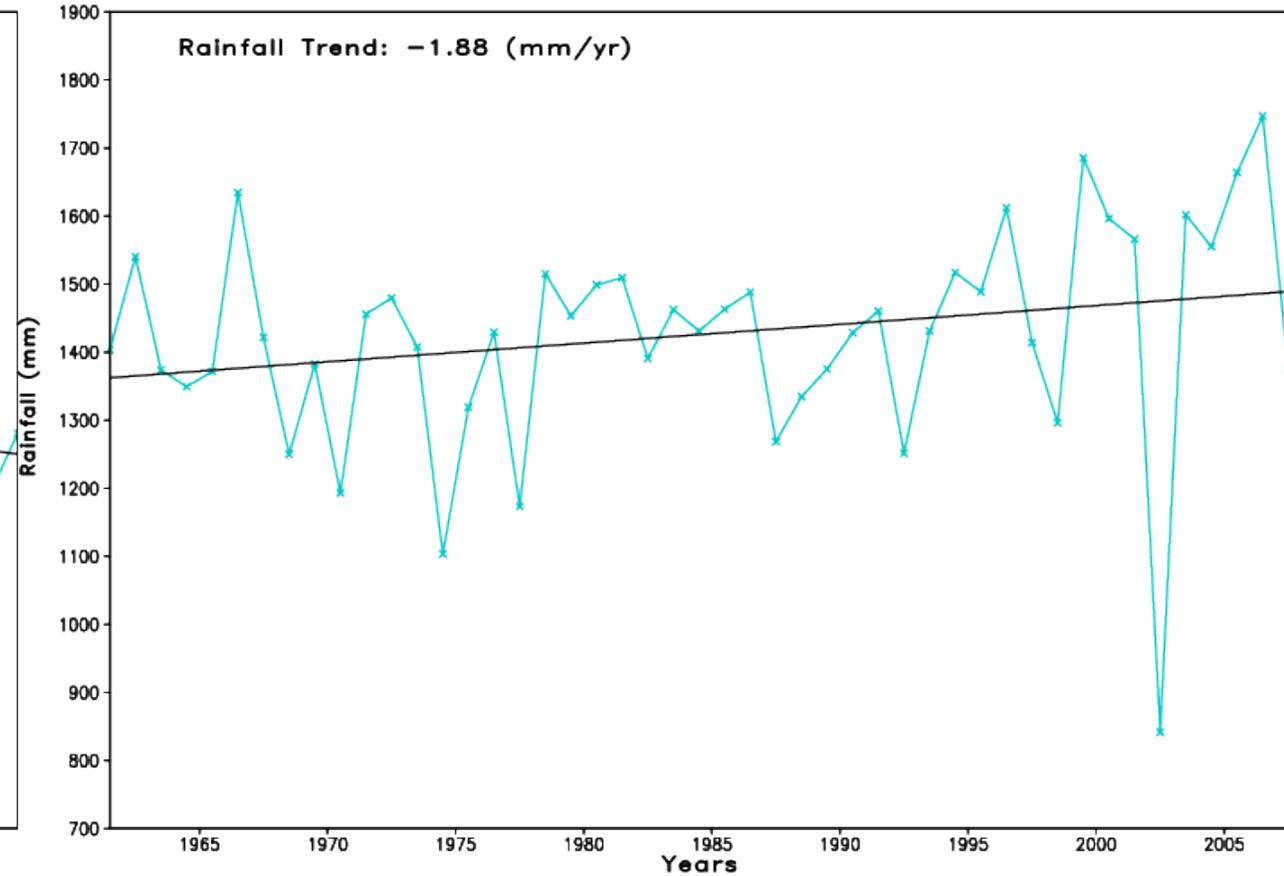


# Observed Mean Annual Rainfall Trend of SE Asia and Cambodia

Observed Annual Rainfall for Southeast Asia  
(Based on APHRODITE Data, 1961–2007)



Observed Annual Rainfall for CAMBODIA  
(Based on APHRODITE Data, 1961–2007)

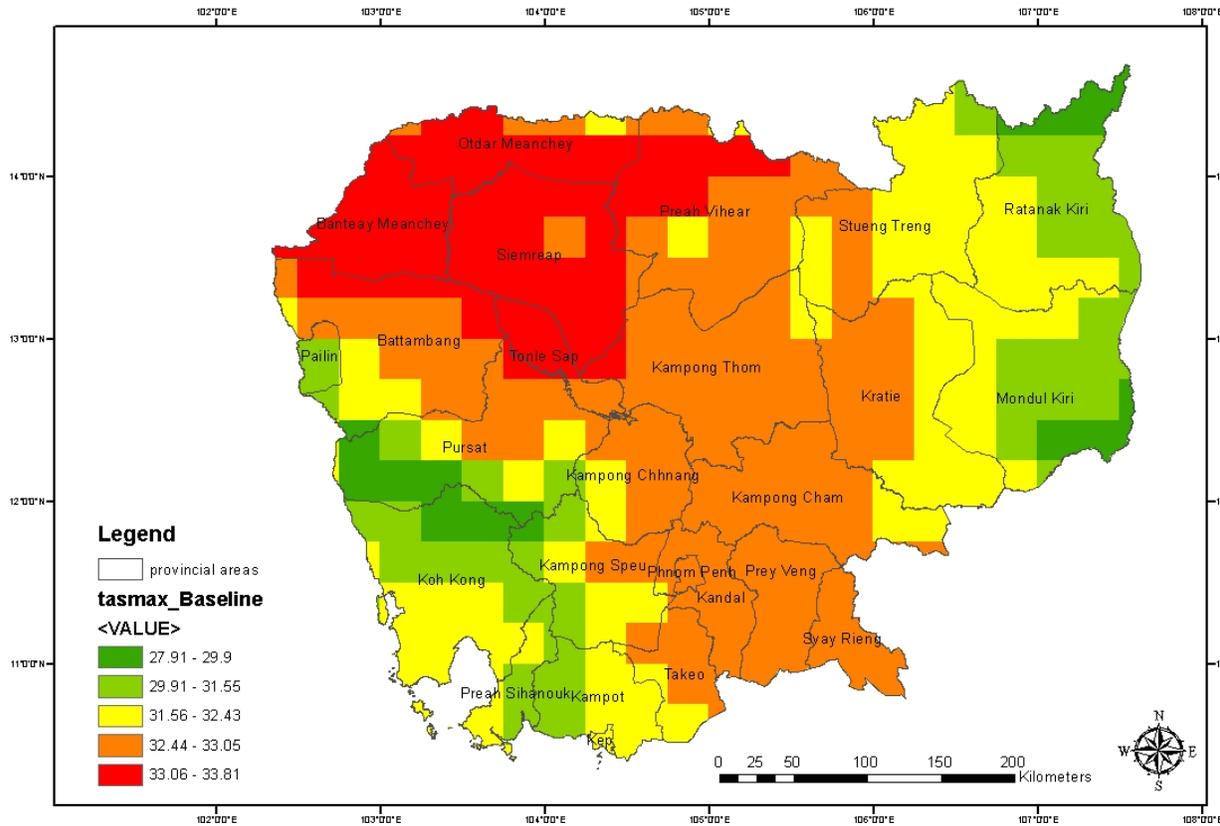


## 1.2 Climate Change Projection Analysis

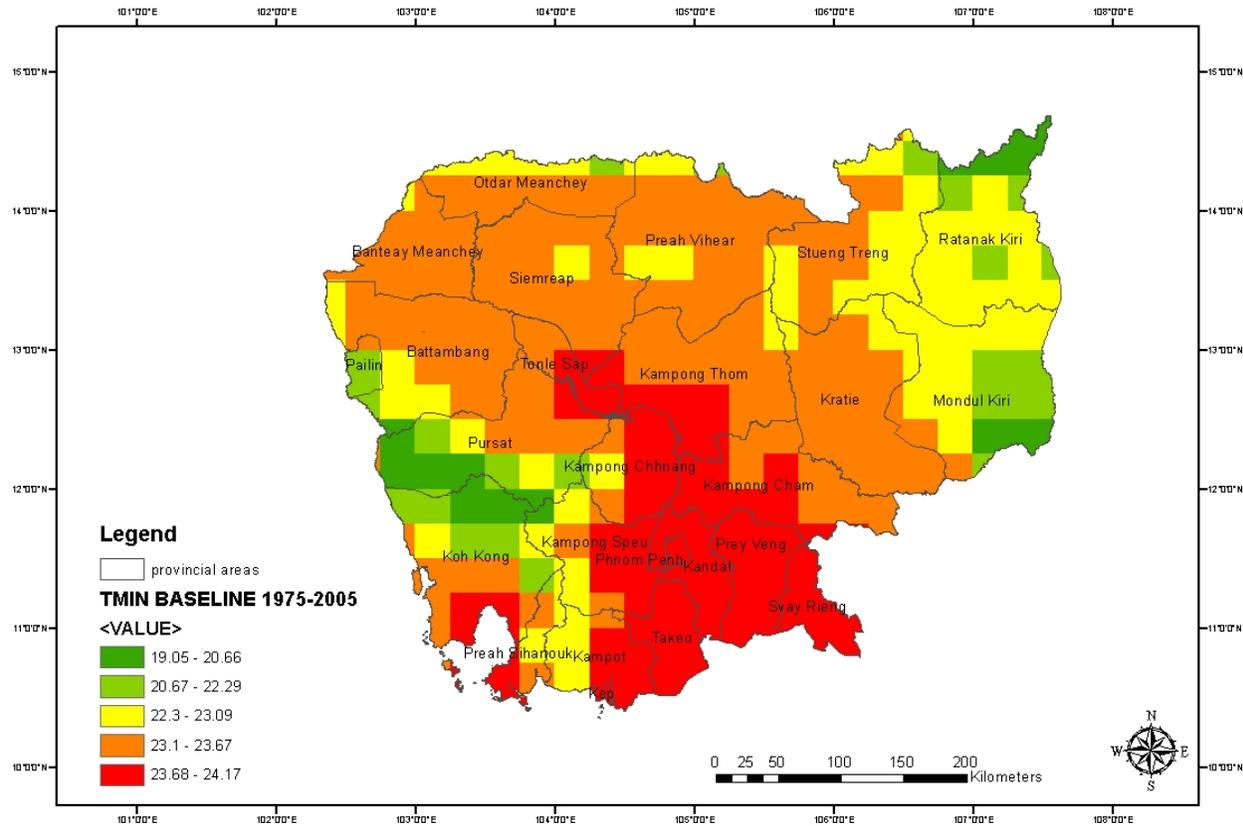
- Maximum and minimum temperature Change for moderate emission scenario (RCP 4.5) and high emission scenario (RCP 8.5)
- Rainfall percent change for moderate emission scenario (RCP 4.5) and high emission scenario (RCP 8.5)

# Baseline Tmax and Tmin from 1975-2005 Based on Multiple Model Ensemble of NASA Data

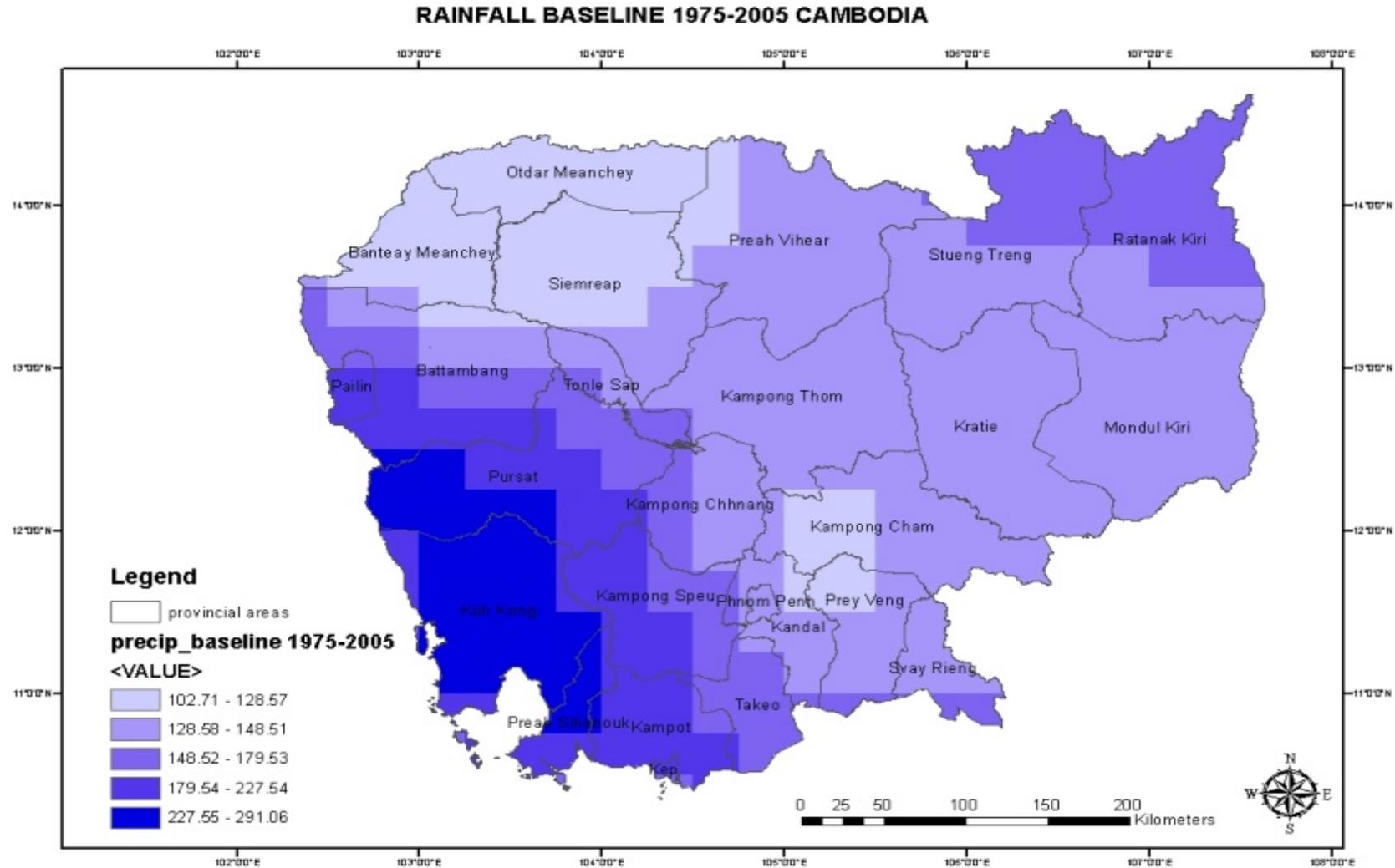
**TMAX BASELINE 1975-2005 CAMBODIA**



**TMIN BASELINE 1975-2005 CAMBODIA**



# Baseline Rainfall from 1975-2005 Based on Multiple Model Ensemble of NASA Data

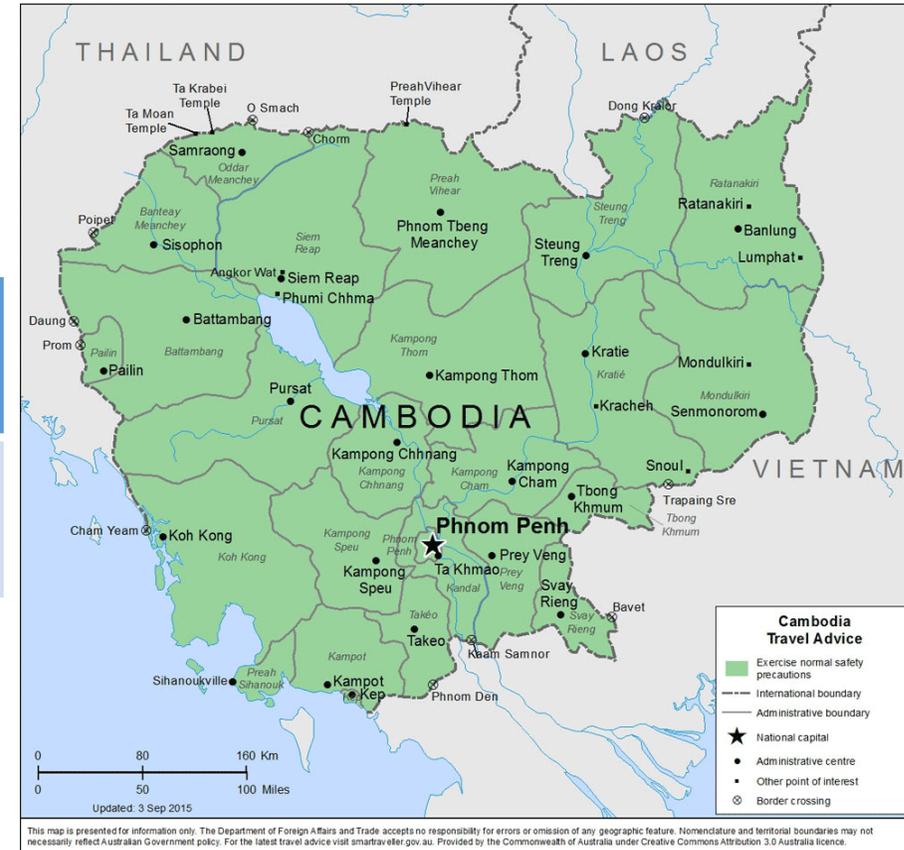


## 1.3 Gaps and Challenges

- Lack of inventories of climate, meteorology data and spatial data of DEM, Land use and soil map (grid format)
- Lack of consistent climate scenarios, and limited cross-sectoral collaboration on climate adaptation programming at national and sub-national levels
- Limited technical and institutional capacity
- Limited understanding about ArcSWAT and analysis

# Model and RCP scenario selected for climate change projection

| Models/Scenarios                 | Scale (50 km x 50 km) | Period for projection            |
|----------------------------------|-----------------------|----------------------------------|
| CMIP5/<br>RCP 4.5 and<br>RCP 8.5 | 25 km x 25 km         | - 2020 to 2050<br>- 2070 to 2099 |



# Way forward

- Impact Assessment on Water Resource
- Hydrological model will select for assessment as such SWAT, WEAP, E-source etc.
- Data input preparation for the model
- Sub-basin will select for the study
- Technical support requirement
- Submit draft report for assessment.

## 2. Cambodia Climate Change Alliance (CCCA)



- RGC disseminated the CCCSP at Third National Forum on Climate Change, Nov. 2013

### **GOALS**

Reducing vulnerability to climate change impacts of people, in particular the most vulnerable, and critical systems (natural and societal)

Shifting towards a green development path by promoting low-carbon development and technologies

Promoting public awareness and participation in climate change response actions

### **VISION**

Cambodia develops towards a green, low-carbon, climate-resilient, equitable, sustainable and knowledge-based society

## *Responding of CC through Strategic Objectives*

- 1) Promote climate resilience through improving food, water and energy security
- 2) Reduce vulnerability of sectors, regions, gender and health to climate change impacts
- 3) Ensure climate resilience of critical ecosystems (Tonle Sap Lake, Mekong River, coastal ecosystems, highlands etc.), biodiversity, protected areas and cultural heritage sites
- 4) Promote low-carbon planning and technologies to support sustainable development of the country
- 5) *Improve capacities, knowledge and awareness for climate change responses***
- 6) Promote adaptive social protection and participatory approaches in reducing loss and damage
- 7) Strengthen institutions and coordination frameworks for national climate change responses
- 8) Strengthen collaboration and active participation in regional and global climate change processes

*Addressing CC at the central level:  
Implementation and Mainstreaming of the sectoral CC Action Plans*

**Ministries/Gov. institutions have developed the CCAPs**

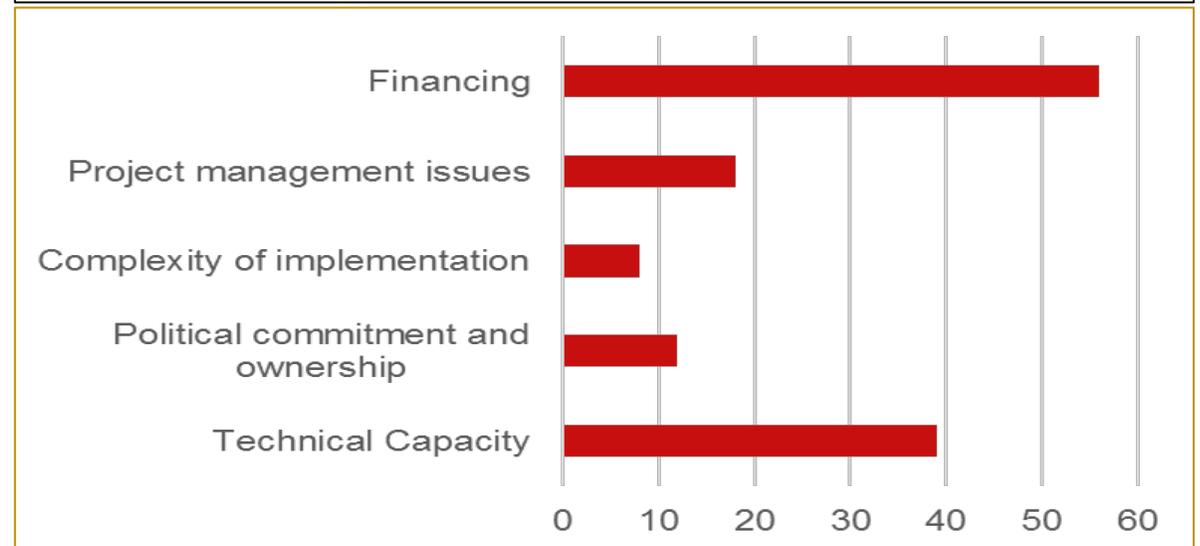
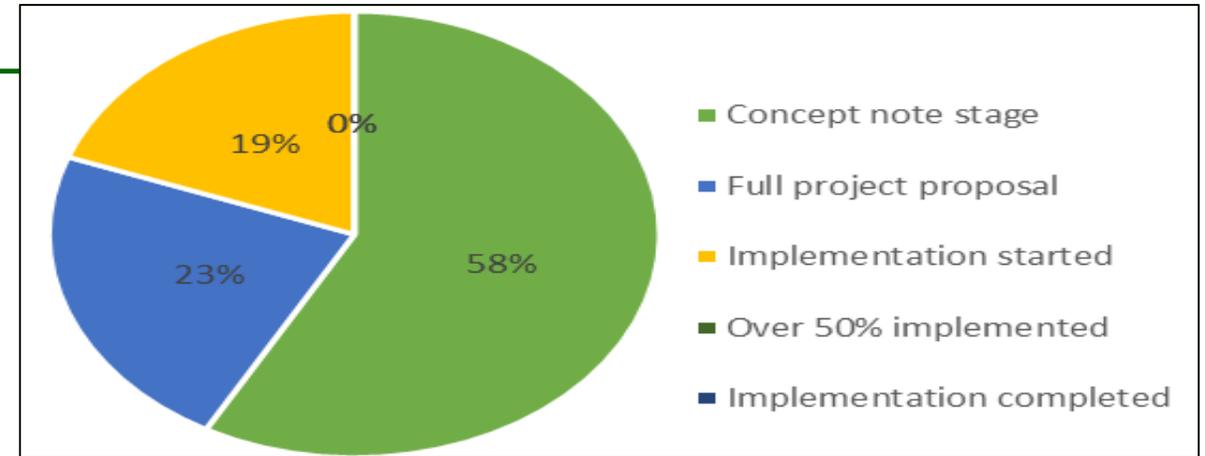
| <b>→ 2014</b> | <b>→ 2015</b>         |
|---------------|-----------------------|
| MAFF          | MoInfo                |
| MoWRAM        | MoT                   |
| MoWA          | MLMUPC                |
| MPWT          | MIH                   |
| MRD           | MME                   |
| MoH           | MoE                   |
| MoEYS         | MPTC (awaiting sign.) |
| NCDM          |                       |

*All CCAPs are retrievable at <http://camclimate.org.kh/en/documents-and-media/library/category/128-climate-change-action-plan.html>*

## Status of CCAP Implementation, Mainstreaming

**Most of the approved CCAPs are now being implemented through various means:**

- National budgeting and planning process
- Dedicated climate change projects usually funded by development partners
- DCC/CCCA's grants to sectors to pilot the implementation of priority CCAP actions.



Survey findings based on responses from 6 out of 14 ministries, done by CCCA in June 2016

# Capacity Development

- Focus on all level of stakeholders
- Produced training, awareness raising materials, online sharing platform
- Education Curriculum for Secondary, High School and University level
- For example: Training to 9 ministries on Climate Change Policy and Public Finance (UNITAR, EFI/MEF, and CCCA)

## *a. Awareness Raising and Capacity Development*

DCC/CCCA has provided trainings on climate change to the all Provincial Department of Climate Change, Junior Staff (of MoE), and University students.



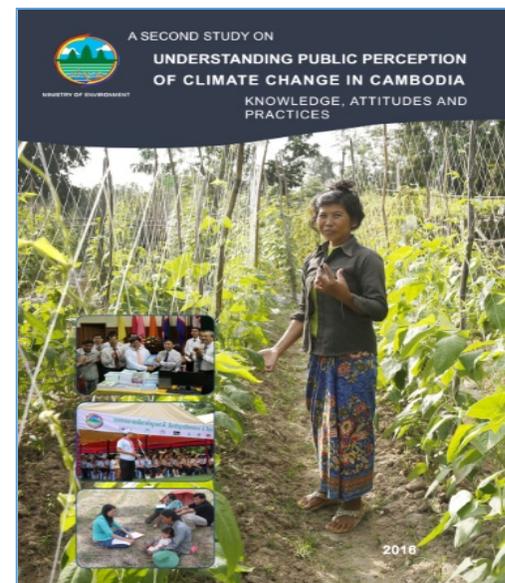
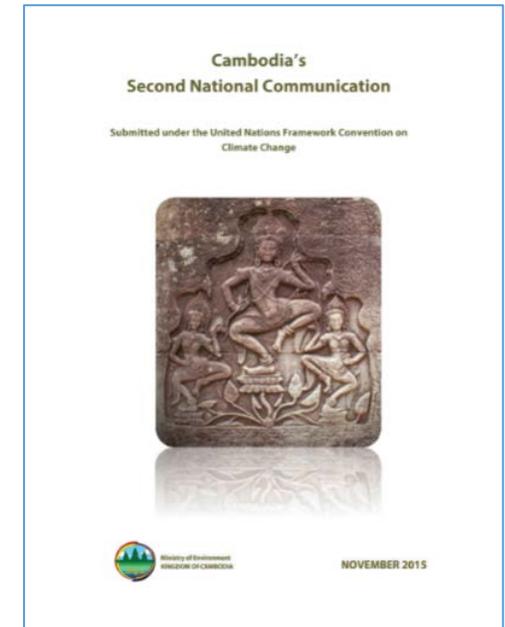
*Mangrove plantations at Kampot, 2016*



Public lecture on climate change giving to Students of Mean Chey University (2016)

## *b. Research & Sciences*

- Cambodia national GHG inventory and Projection
- Second KAP survey was conducted based on scientific methods to understand the public perception of climate change in Cambodia,
- Study on Private Sector Involvement on CC
- Developed Climate Change Scenario
- *Provide research and innovative grants on climate change (selected 8 projects).*





Thank for your attention!