



**METEOROLOGICAL
SERVICE
SINGAPORE**
Centre for Climate Research Singapore

Identifying requirements and good practices for producing climate change projections on regional scales

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Acknowledgements: Chris Gordon, Raizan Rahmat, Elaine Gao

All workshop participants

Background

ASEAN – Association of Southeast Asian Nations

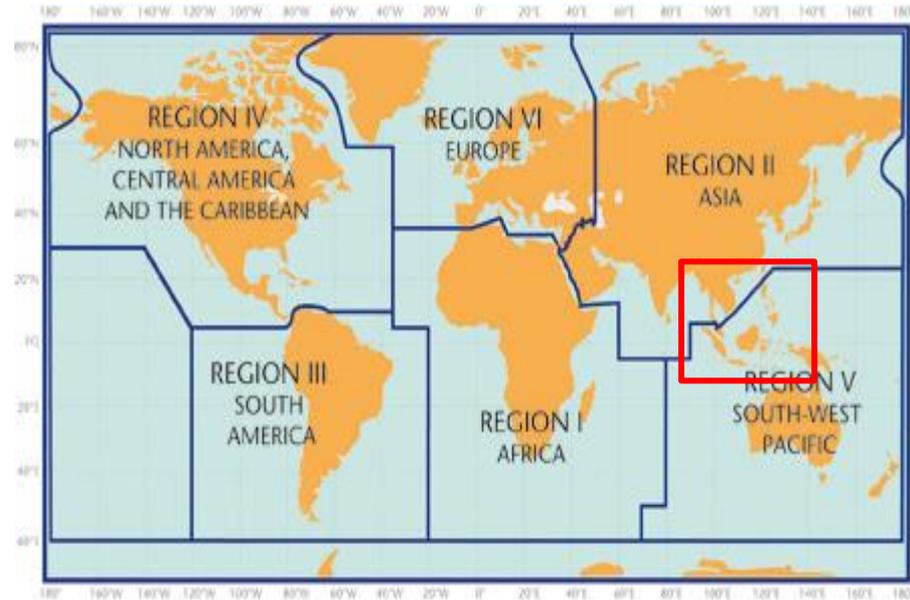
- Ten countries in **two** WMO-regions (II & V):

Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam

Brunei Darussalam, Indonesia, Malaysia, Philippines and Singapore

Rapidly developing densely populated region: vulnerable to climate

- Established RCC-network for SEA (climate services across time-scales)
- Increased production of Climate Change information (too little to too much ...)
- NMHSs (top-down national projections) & Academia (bottom-up CORDEX-SEA)
- Burgeoning VIA community
- Large undertaking → straining limited resources



Subseasonal
Predictions

Seasonal
Predictions

Decadal
Predictions

Climate
Change
Projections



Objectives:

- Compare and contrast the (regional/national) studies for the region
- Recommend *guidelines for best practices* in the generation of scenarios.
- Scoping activity of Climate Projections Function in SEA RCC-Network

Participants:

- IPCC Secretary, regional NMHSs, CORDEX-SEA Chairs and other regional/local university researchers, international: CSIRO & BoM (Australia), UK Met Office
- AHA Centre (disaster risk), ICRISAT (agriculture), Global Water Partnership-SEA & Mekong River Commission (water resources), RIMES, Pacific-Australia CCSAP (community engagers), national decision-makers

Co-funding: Environment and Climate Change Canada, WMO, and ASMC.



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Environment and
Climate Change Canada

Environnement et
Changement climatique Canada

Workshop sessions

National projections &
regional initiatives
(NMHSs/Research Institutes)

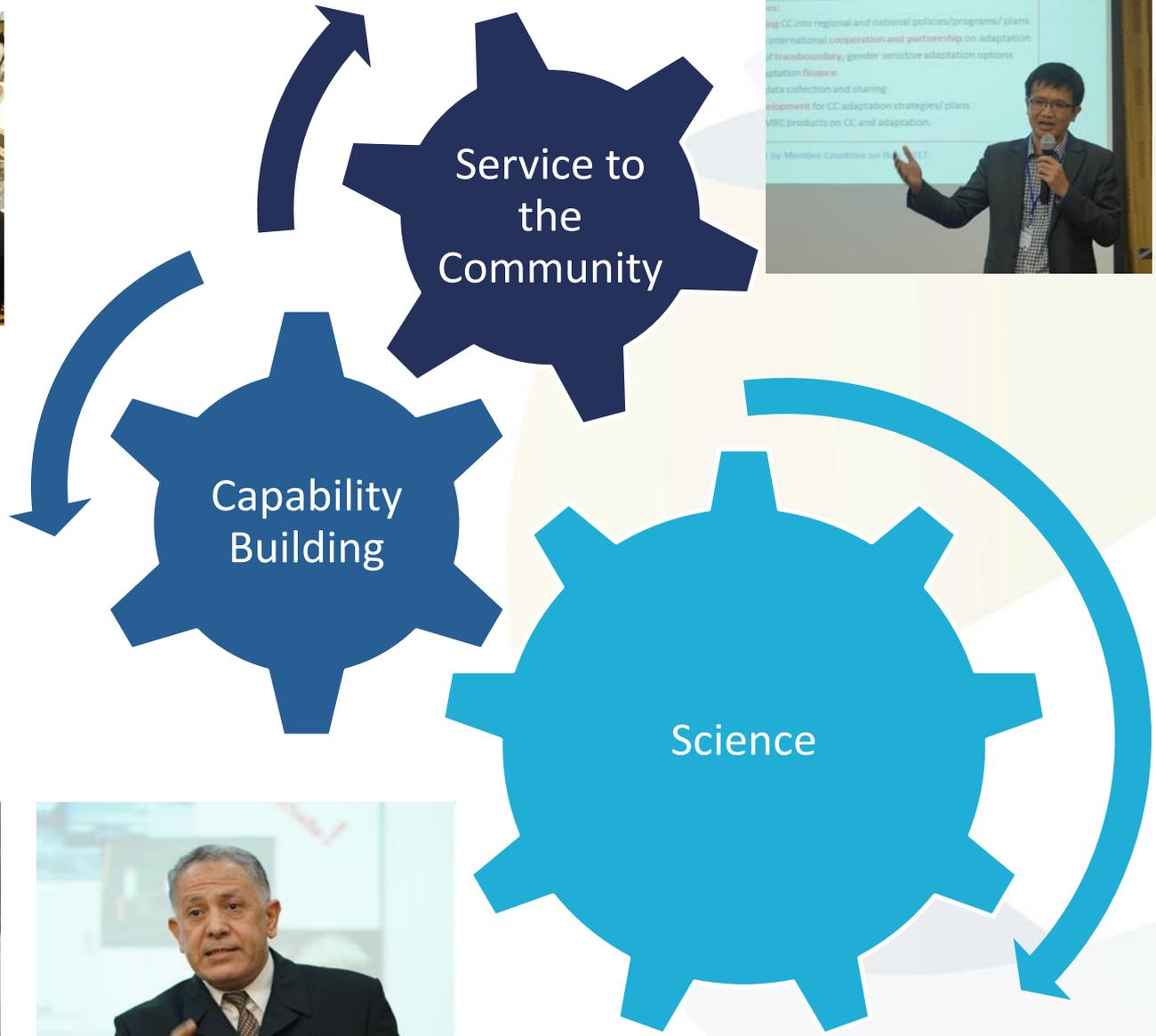
Regional scientific issues
*(ENSO, Monsoon, Sea Level Rise,
Diurnal cycle of Convection)*

End-user perspectives of
climate information
*(requirements, adaptation
planning, resilience)*

Group Discussions

*(science & applications, best
practice guidelines)*

“Do we have consensus on key emerging
issues?”



Emerging recommendations (I)

National projections & regional initiatives

- **Diversity** of approaches → need to **standardize** GCM selection/downscaling (robustness; optimise resources).
- **Uneven** distribution of tech expertise → estb. of regional **scientific authority** (generation & application).
- **Wide spectrum** of user engagement and communication needs → **early** engagement; **regular sharing** of lessons learnt across region.
- Limited communication of scenario and other **uncertainties** → **wider range experiments** to be more encompassing/**synthesizing** contrasting projections.

Regional scientific issues

- Incomplete understanding of **key drivers** (e.g. ENSO, monsoons under CC) → more studies **regional-specific** effects (“whys” beyond the “whats”).
- Lack of understanding of the **sensitivities** of regional projections to model formulation → regional model **intercomparison/process** studies
- Quantifying effects **limited by data** → more **comprehensive data** collection, storage and sharing, portals
- Optimate **spatial resolution?** → balance between computing expense and local details

Emerging recommendations (II)

End-user perspectives of climate information

- Institutions tasked with handling climate information/data are not well equipped → climate scientists to focus on **developing and training of models/indices** with more **practical applications**
- Climate extreme indices are still **generic/non-sector specific** → need to **bridge** the gap
- **Growing number** of regional platforms for climate-based information sharing upstream producers are **not aware of** → consolidate communications platform into a **centralised** regional entity

Bridging science and applications

- Regional coordination effort in promoting end user engagement through developing a **framework**
- User requirement **workshops**
- **Demonstration projects** for bridging science and applications
- **Designated staff/expert** to deal with bridging/application issues
- Innovative **communication tools** (well-designed websites/education materials) to propagate climate information

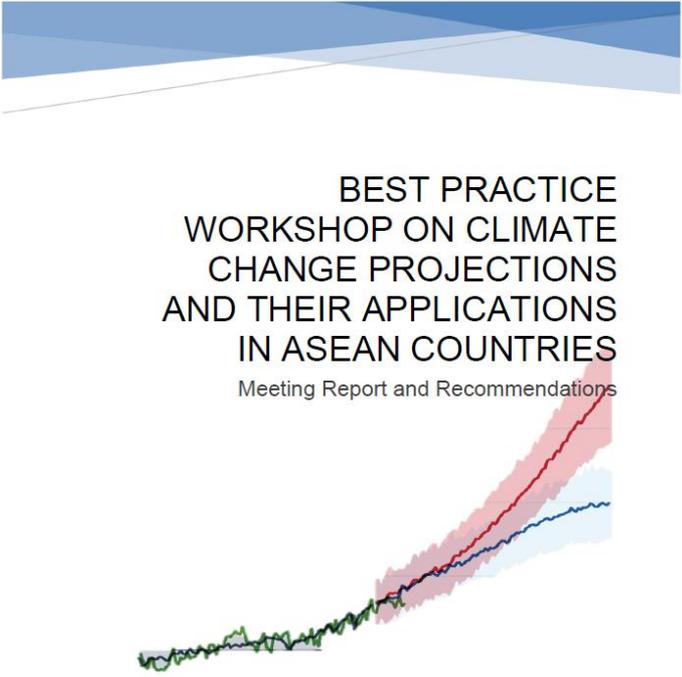
Publications from workshop

Comprehensive report (27 pages)

- Workshop background and objectives
- Short summary of all presentations
 - NMHs, Science challenges, impacts, future dev.
- Consensus from the 3 main discussion sessions
- Recommendations
 - Advancing the science (10)
 - Delivering Climate Change information (2)
 - Interacting with users (3)
 - Regional Integration of the sciences (7)

Publicly available:

- CCRS website: <http://ccrs.weather.gov.sg/wp-content/uploads/2018/10/Climate-Change-Projections-And-Their-Applications-In-ASEAN-Countries.pdf>
- WMO website (+ summary of workshop) : <https://public.wmo.int/en/events/workshops/best-practice-workshop-climate-change-projections-and-their-applications-asean>
- All presentations: <https://drive.google.com/drive/folders/1z6oyyblLakpNOh-eVbkgi-G-QQT3veb1?usp=sharing>



BEST PRACTICE WORKSHOP ON CLIMATE CHANGE PROJECTIONS AND THEIR APPLICATIONS IN ASEAN COUNTRIES

Meeting Report and Recommendations



Centre for Climate Research Singapore
July 2018

Preparation for a new regional workshop

- Date: **25 – 29 March 2019**, Singapore
- **Objectives:**
 - Explore climate extreme of relevance regionally (**ClimPACT**)
 - Evaluate gridded climate product relevant to the regions (satellite, obs., reanalyses)
 - Investigate regional climate processes
- Participants:
 - Regional NMHSs, regional/local university researchers, VIA community
 - International: experts on gridded climate data and extremes
- Co-funding: Environment & Climate Change Canada (WMO) & Singapore government (MSS)
- **Likely outputs:**
 - Update of past regional work on station-based extreme indices (Cheong et al., 2018)
 - Regional update to the HadEX3 database
 - Scientific publications (*may be* on time for the IPCC AR6 cycle)
- **Likely outcomes:**
 - Communal understanding to evaluate regional climate model performances
 - Continuation of the regional **goodwill** on display during the 2018 workshop
 - Basis for integrated climate services across SEA (conjunction with **RCC-network**)