



Second National Forum on Climate Change
Cambodia
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KEY FINDINGS OF THE CAMBODIA'S
SECOND NATIONAL COMMUNICATION

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1. Background Information

- ❑ Cambodia ratified the UNFCCC on 18 Dec. 1995
- ❑ As party to the UNFCCC, it has a commitment to report to the Conference of the Parties on (Article 12 of the UNFCCC):
 - Emissions by sources and removals by sinks of all GHGs
 - National measures to mitigate and adapt to CC
- ❑ This report is officially called "National Communication"
- ❑ Decision 17/CP.8: non-Annex I Parties should take into account their development priorities, objectives and national circumstances
- ❑ As LDC, Cambodia is entitled to full-cost financing for preparing its National Communications (at its discretion)
- ❑ MoE is the Implementing Agency. Total budget: \$405,000 (GEF)

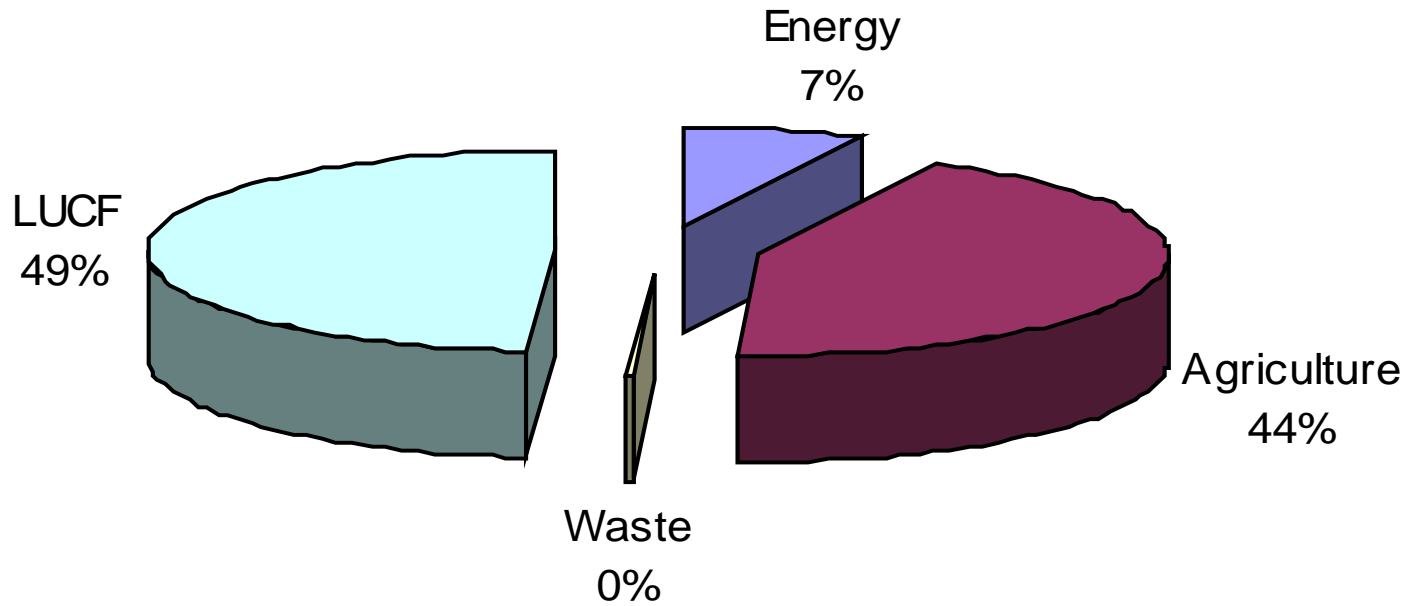
2. National Circumstances

- Political and decision-making structure
- Development priorities
- Geographical characteristics
- Climate
- Population statistics
- Economy, trade
- CC institutional arrangements

3. Nat. GHG Inventory for 2000 (1)

GHG Source and Sink Categories	CO₂ Emissions	CO₂ Removals	CH₄	N₂O	Total , Gg CO₂e.
Energy	2,047.66		55.38	0.75	3,443.14
Agriculture			875.52	8.79	21,110.82
Land Use Change & Forestry	22,858.73	-48,165.86	32.06	0.22	-24,565.67
Waste			10.18	0.05	229.24
Total	24,906.39	-48,165.86	973.14	9.81	217.57

3. Nat. GHG Inventory for 2000 (2)

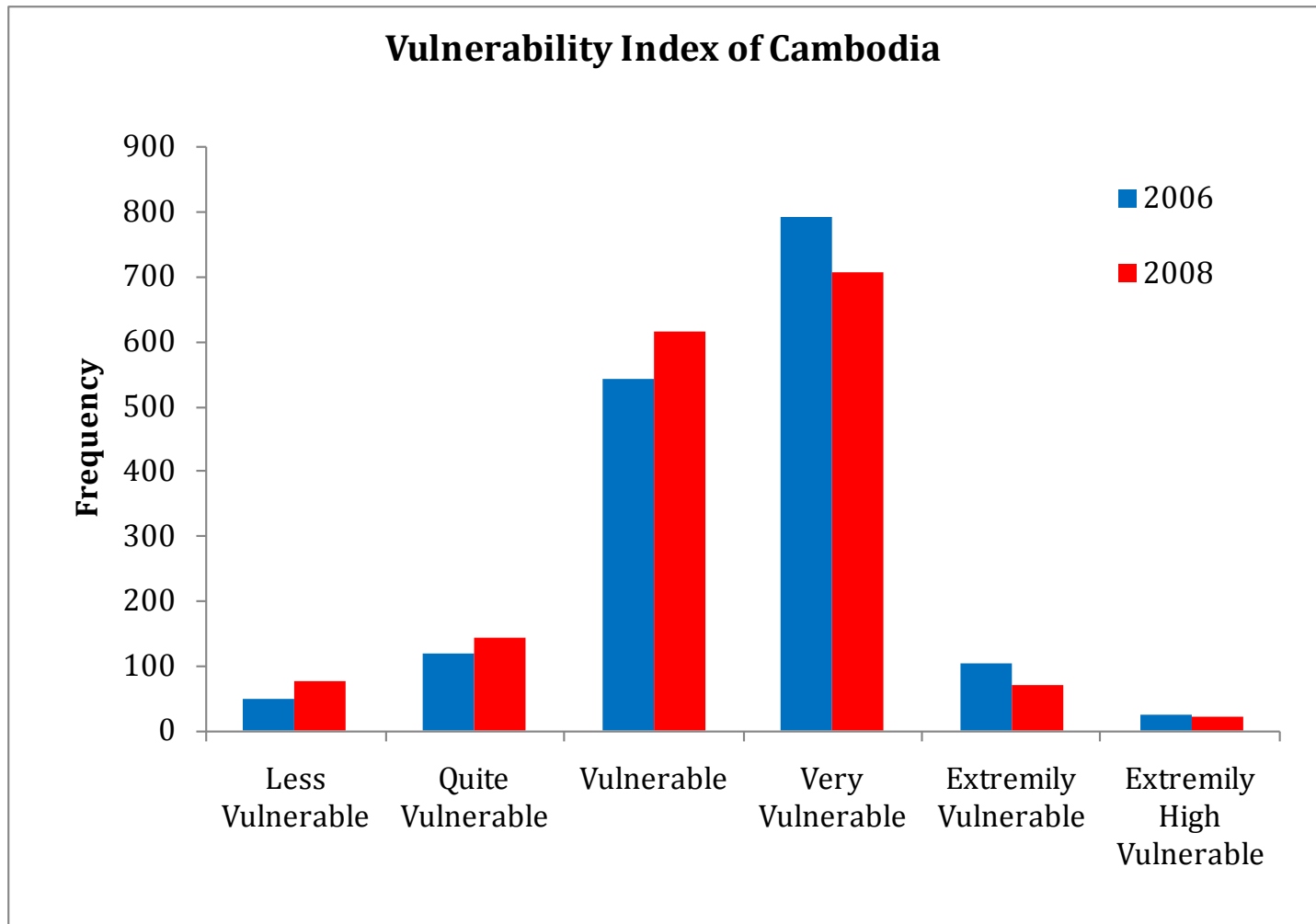


4. Vulnerability and Adaptation Assessment

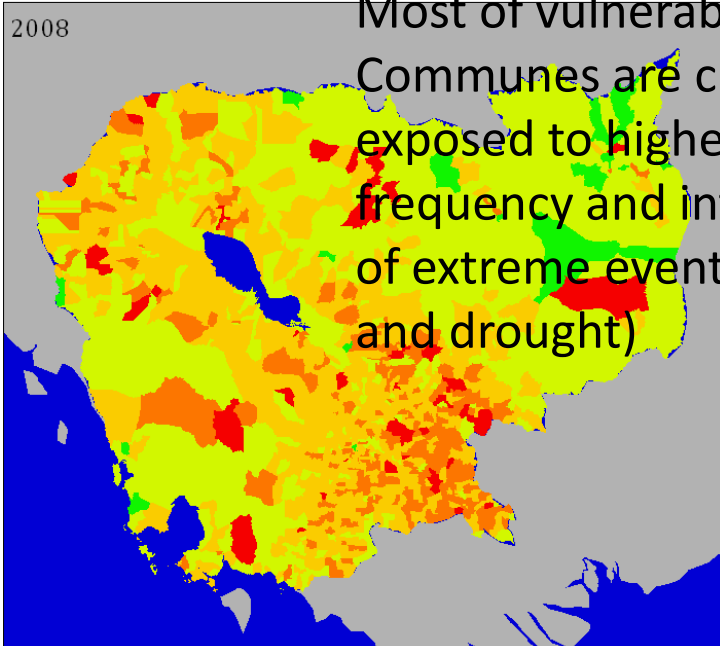
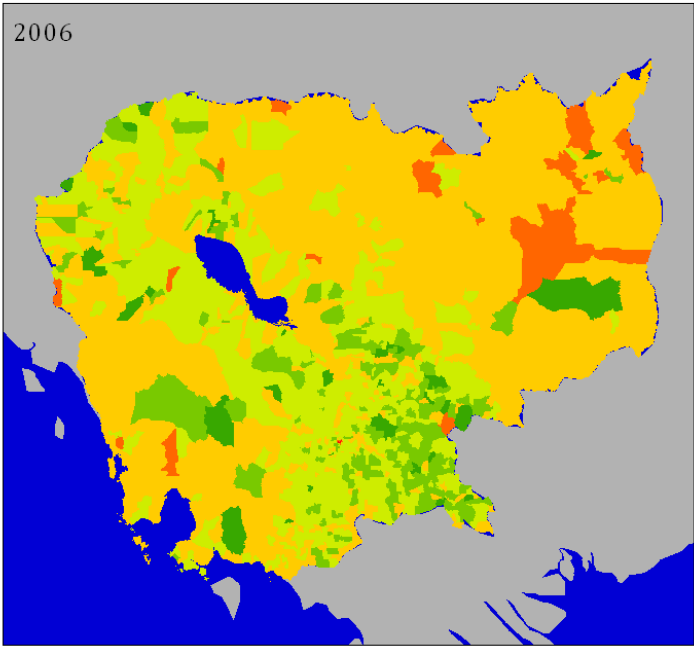
Overview

- ❑ Cambodia is a developing country dependent on agriculture and highly vulnerable to the impact of climate change
- ❑ SNC covers an assessment of **historical and future CC in Cambodia**, **CC vulnerability mapping**, and of **CC impact on key sectors** (agriculture, water resources, forestry, the coastal zone and health) using a regional climate model (PRECIS) in combination with a number of GCM models

Number of Communes According to Vulnerability Category



Distribution of Vulnerability Index by Commune



Most of vulnerable Communes are currently exposed to higher frequency and intensity of extreme events (floods and drought)

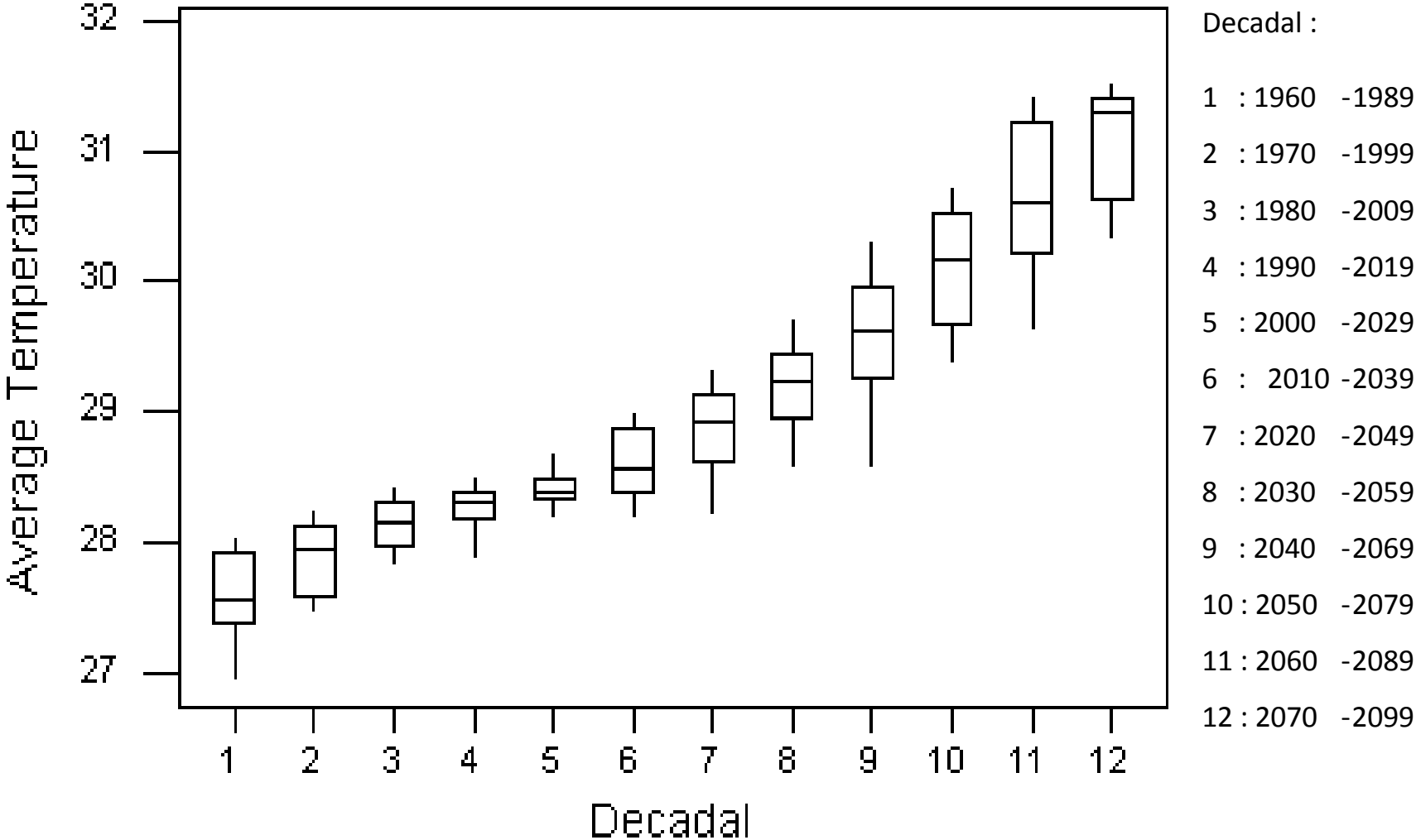
Cambodia

Vulnerability Index

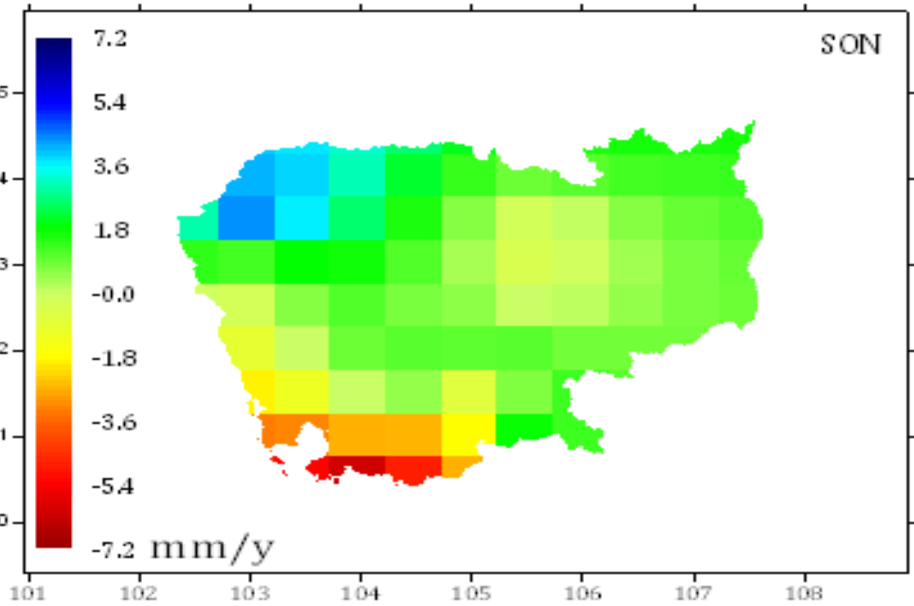
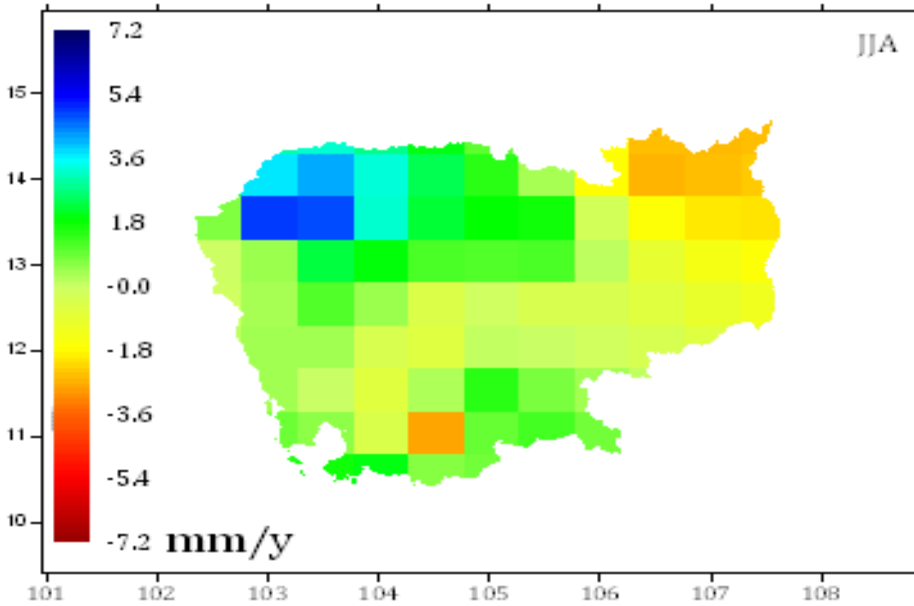
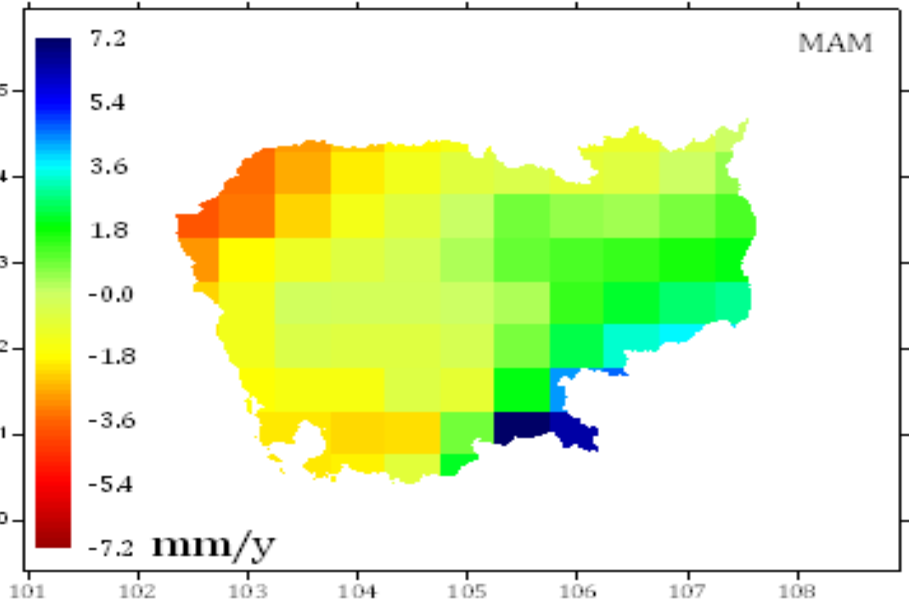
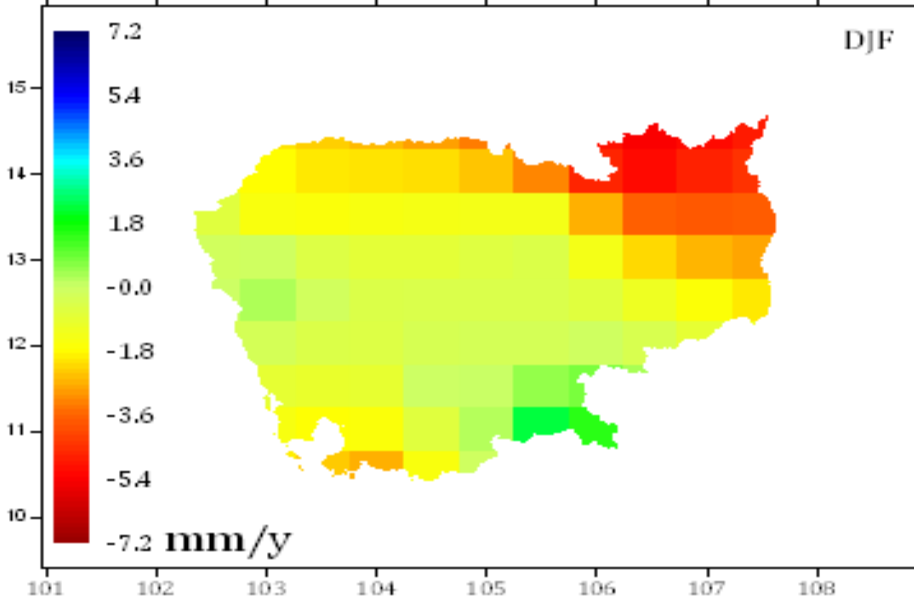
- Less Vulnerable
- Quite Vulnerabel
- Vulnerable
- Very Vulnerable
- Extremily Vulnerable
- Extremily High Vulnerable

1:3,546,291.91

Historical and Future Mean Temperature Over Land Area of Cambodia (based on PRECIS)



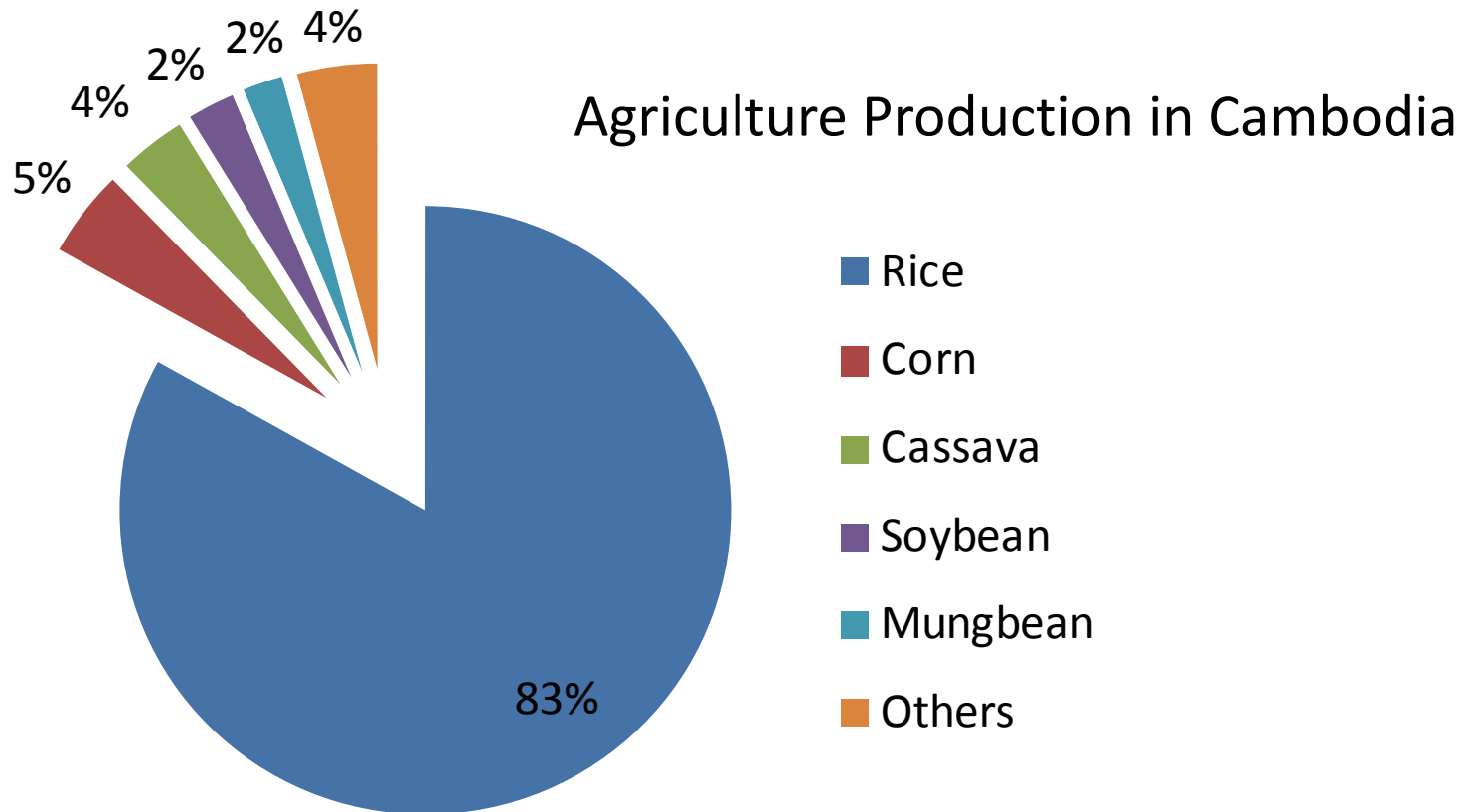
Historical change (trend) of seasonal rainfall in Cambodia (1960-2000)



Key message

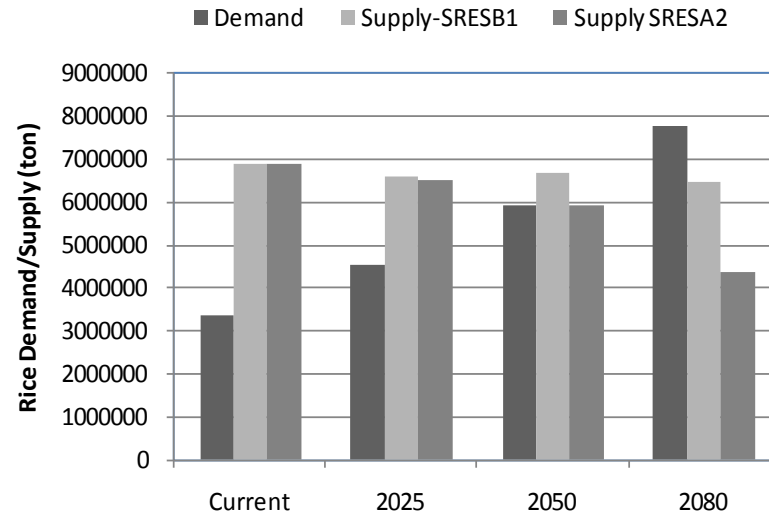
- Based on data 1960-2000, Cambodian climate (rainfall and temperature) has already change, and the future rainfall pattern will continue to change depending on emission scenarios
- Under high emission scenarios (SRESA2)
 - Dry season rainfalls will decrease with high probability and wet season rainfall may increase but with lower probability than the DS rainfall. This suggests that the onset of rainy season may delay in the future
 - Wet season rainfall will decrease until 2025 and then increase again in 2050 and 2080
- Under low emission scenarios (SRESB1)
 - Similar with SRESA2 dry season rainfall will decrease but with lower probability
 - Different with SRESA2, wet season rainfall will increase in 2025 and then decrease again in 2050 and 2080
- Change in rainfall pattern will affect many sectors. Adaptation studies and pilots projects at local levels must be developed and implemented
- Global community achievement in reducing GHG emission will have different implication on Cambodia

Agriculture

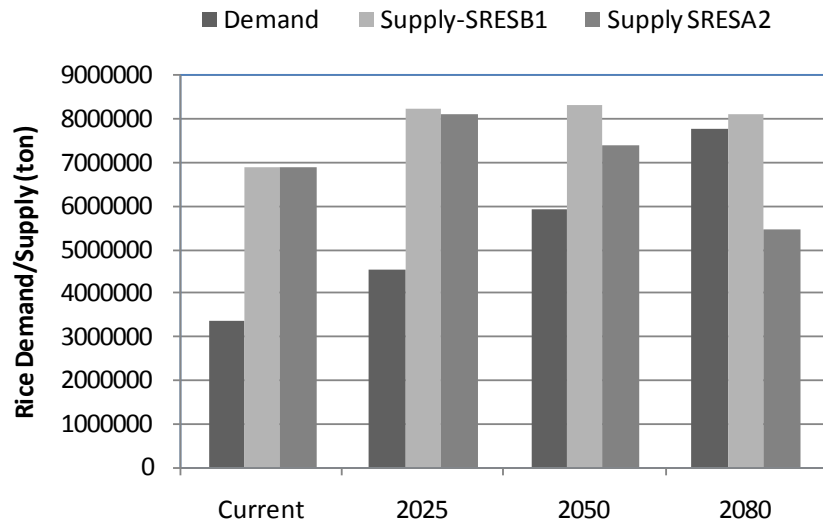


No increased in productivity from current level

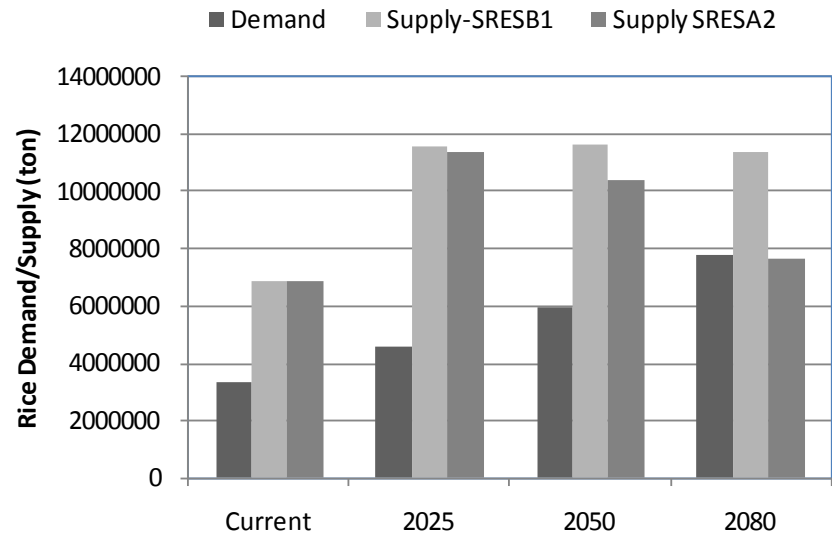
Rice demand and supply projection in Cambodia with increased productivity under two emission scenarios



Crop productivity increased by 25% from current level

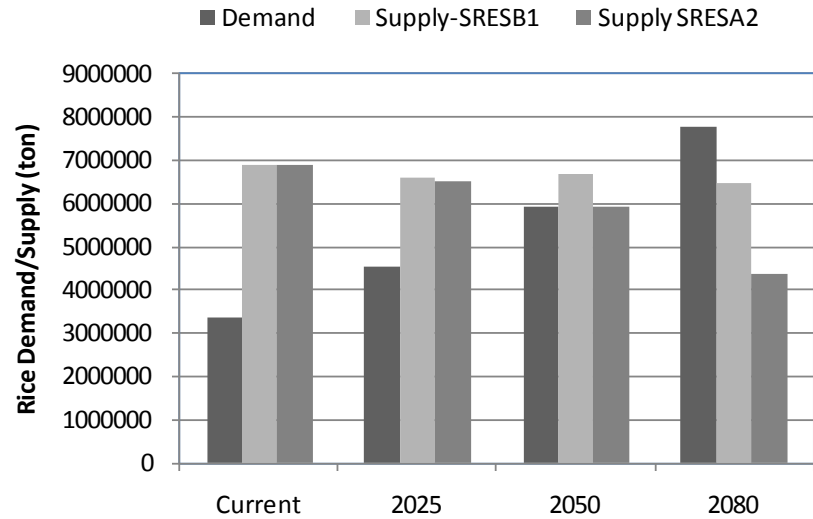


Crop productivity increased by 75% from current level



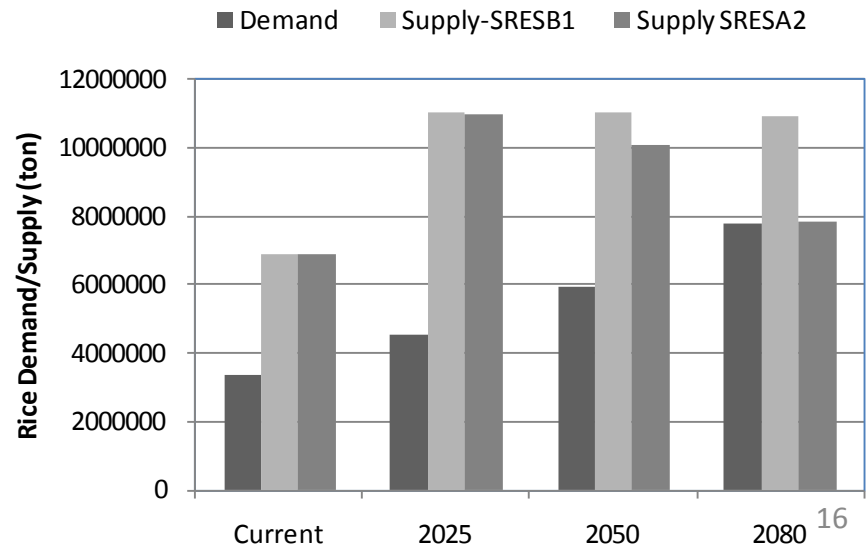
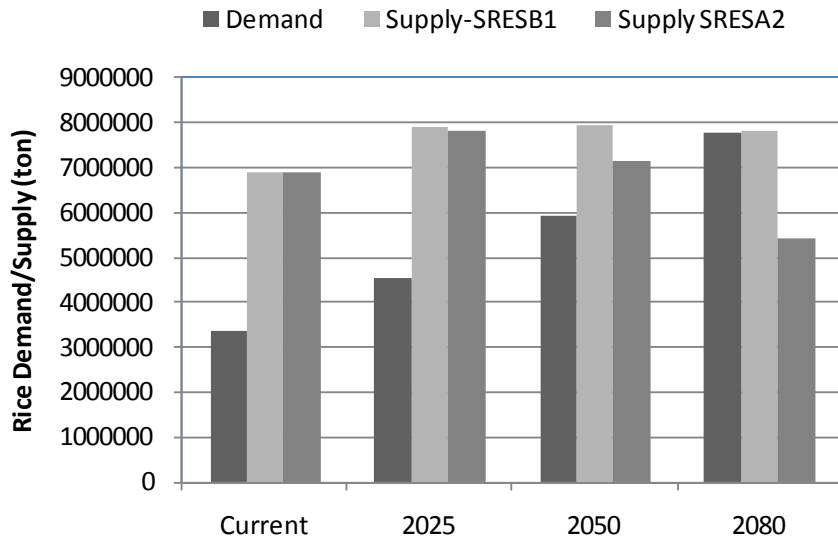
No increased in productivity from current level

Rice demand and supply projection in Cambodia with increased planting index under two emission scenarios



Planting Index increased from 1.15 to 1.30

Planting Index increased from 1.15 to 1.65



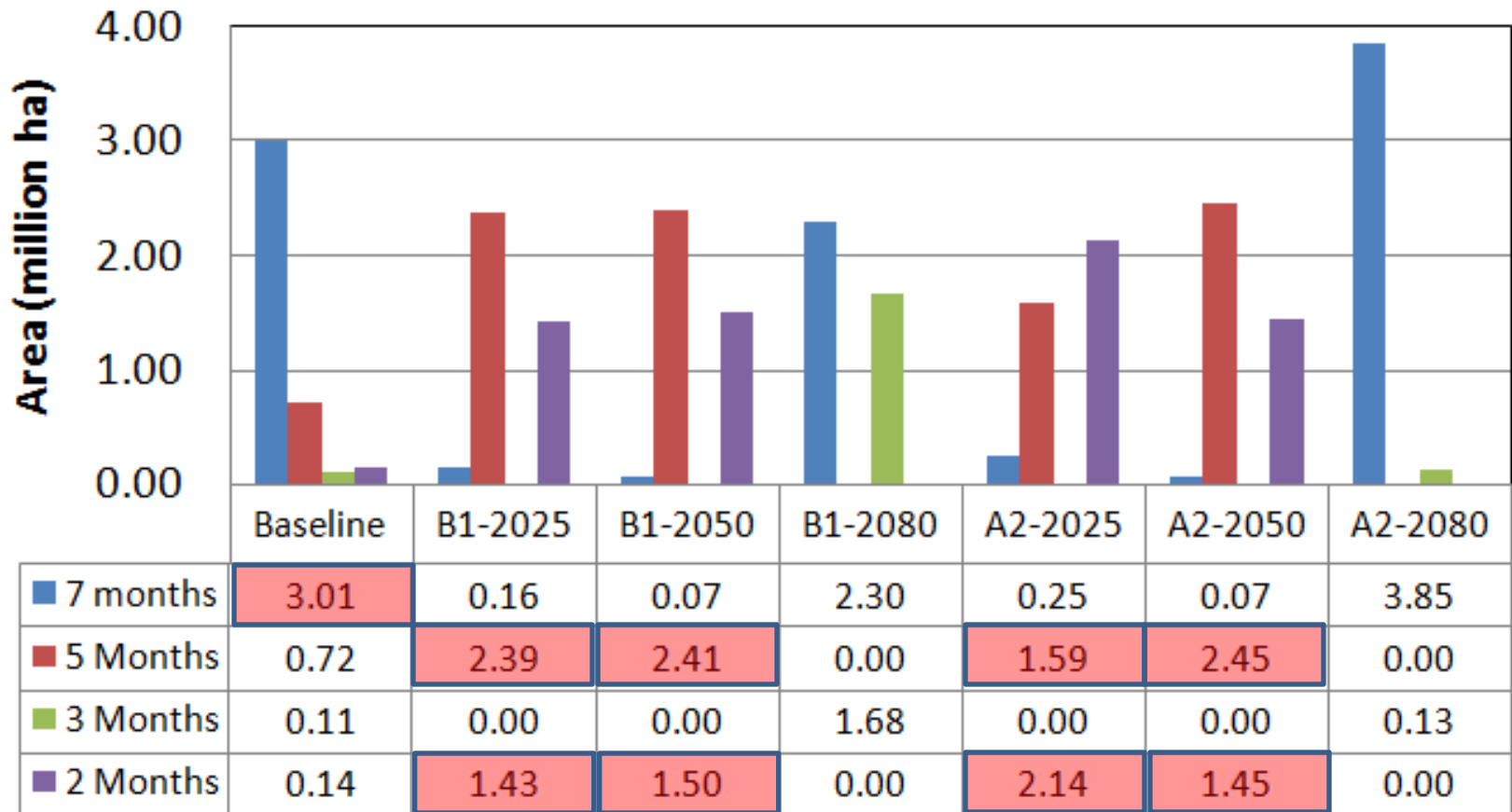
Some Proposed Adaptation Options

1. Increase capacity to use climate info
2. Water use efficiency technologies, SRI
3. Additional income from carbon credit (from biogas for cooking, biomass energy in rice mills, composting, etc.)
4. Institutionalizing the use of climate information in agriculture management and development
5. Prioritizing structural intervention programs (where and when a particular intervention should be in place to minimize the impact of increasing climate risk such as constructing dam, irrigation facilities)
6. Expanding agriculture areas to regions with lower climate risk
7. Creating climate insurance for vulnerable communities
8. Generating more varieties resistant to drought, flood and high salinity
9. Developing and implementing long term research on climate modeling, mitigation and adaptation technologies.

Water Resources

Length of Growing Period under Current and Future Climate in Agriculture Land

Agriculture Lands



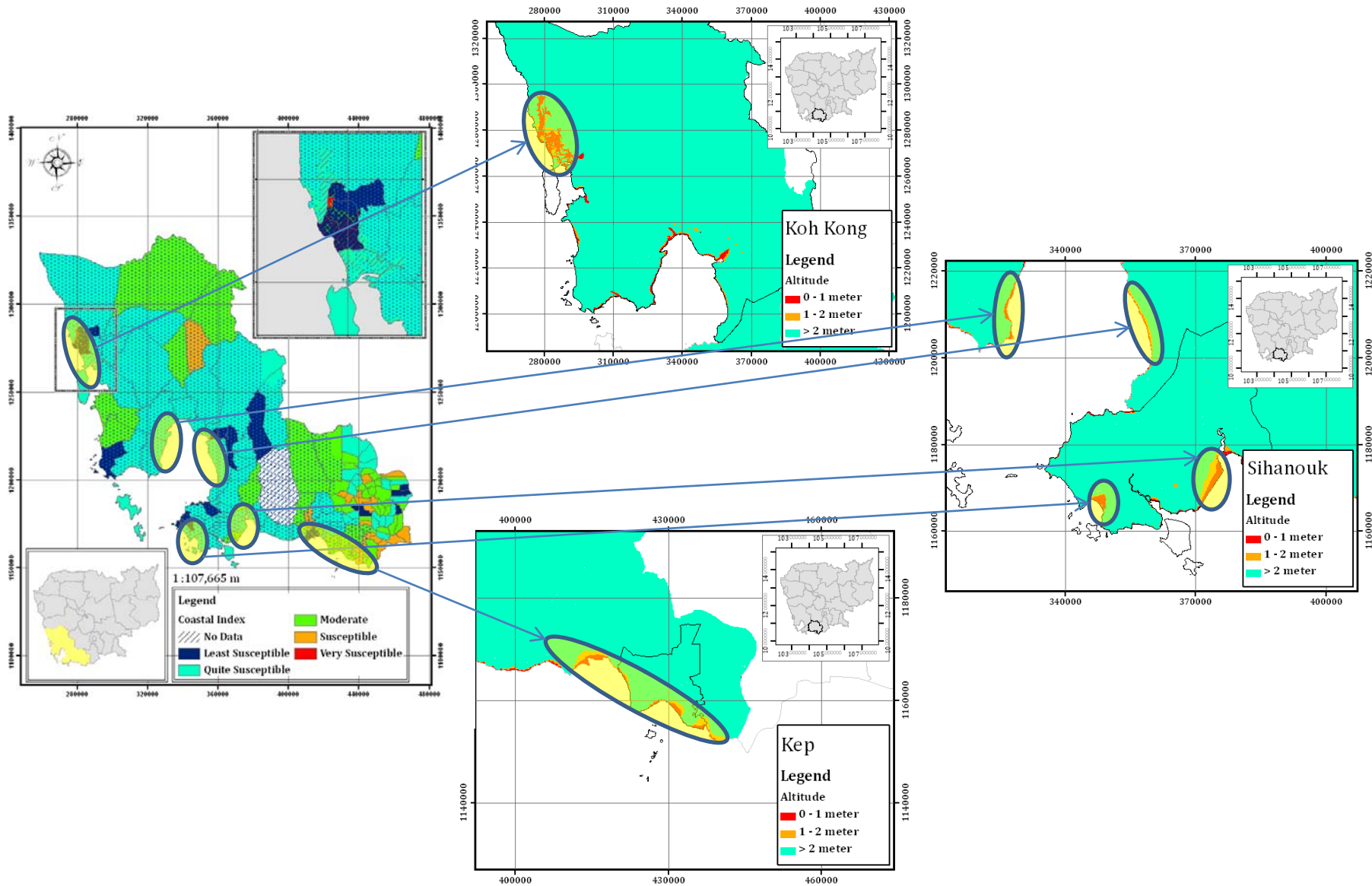
Forest

- ❑ Under the high and low emission scenarios, up to 2050 most lowland forest will be exposed to a longer dry period of between 6 and 8 months or more. However by 2080 soil water conditions will be similar to current conditions
- ❑ Adaptation measures include creation of protected forests in the most vulnerable areas in the northeast and southwest of Cambodia, creation of forest plantations, adoption of sustainable practices by forest concession holders, strengthening of legal and policy frameworks, protected area management plans and effective monitoring systems.

Coastal Zone

- ❑ Rising sea levels will potentially impact coastal systems in a number of ways including **inundation, flood and storm damage, loss of wetlands, erosion, saltwater intrusion, and rising water tables**
- ❑ Kampot and Kep were found to be more susceptible to climate change than other coastal provinces
- ❑ A total area of about 25,000 ha will be permanently inundated by a sea level rise of 1 m, increasing to 38,000 ha at a sea level rise of 2 m
- ❑ Adaptation measures include – factoring in climate change into the **design** of infrastructure, new **building codes, wind breakers** to protect against strong winds and sea level rise

Coastal Area Affected by Sea Level Rise



Health

- ❑ Malaria in Cambodia is found to be significantly correlated with **rainfall and temperature**, with rainfall explaining most of the variability of malaria cases
- ❑ Malaria risk may increase in the future until 2050 particularly in provinces located in the northeast such as Preah Vihear, Stung Treng, Ratanak Kiri and part of Mondul Kiri and Kratie
- ❑ Adaptation measures include those aimed at reducing the number of malaria cases – such as **fogging** and dissemination of **mosquito nets**, and measures aimed at reducing the number of deaths caused by malaria - such improving health treatment and access

5. GHG Mitigation

Energy and Transport (1)

- ❑ Under the baseline **total emissions** for the energy and transport sector increase from 2,632 GgCO₂ eq. in 2000 to 25,549 Gg CO₂ eq. in 2050
- ❑ However, **emissions per capita** remain low relative to neighbouring countries, increasing from 0.2 tCO₂ eq./per/y in 2000 to 1.3 tCO₂ eq./per/y in 2050
- ❑ Fuelwood demand is projected to fall from 49% in 2000 to 13% in 2050
- ❑ **Transport sector** is expected to have the largest increase and share of emissions in 2050 at 10.816 Gg. CO₂ eq., followed by the energy industries (electricity generation) with 8,888 Gg. CO₂ eq.

Energy and Transport (2)

- Potential mitigation options include: energy efficiency measures, hydro, solar power, gasification & cogeneration, electric vehicles, efficient cookstoves, biogas digesters, ceramic water filters, etc.
- The proposed mitigation options in the **energy sector result in the highest reductions** – 17% compared to the baseline, or a 3,877 Gg CO₂ eq. reduction by 2050
- Scenario analysis indicates a potential range in emission savings from 573 to 7,094 Gg. CO₂ eq. The lower bound estimate relates to **short term options financially attractive to the private sector**. The maximum emission reduction of 7,094 Gg. CO₂ eq., a 28% reduction relative the baseline, requires **a mixture of private sector investment, donor financing and Government policy development**.

Agriculture, Forestry and Land Use (AFOLU) (1)

- ❑ Overall, emissions are projected **to increase** from -8,822 GgCO₂e in 2000 to 34,112 in 2050, and consequently the AFOLU sector becomes a net emitter
- ❑ **Emissions per capita remain low** relative to other countries increasing from -0.81 in 2000 to 1.36 tCO₂e/capita in 2050
- ❑ The GHG emissions from the **agricultural sector** is forecast to almost double, increasing from 21,559 GgCO₂e in 2000 to 38,601 GgCO₂e in 2050
- ❑ Within the agriculture sector, emissions from agricultural soils increase the most (2,362 to 6,362 GgCO₂e) followed by livestock (4,872 to 10,018 GgCO₂e) and rice cultivation (14,365 to 22,625 GgCO₂e).

AFOLU (2)

- The LUCF sector remains a **net sink**, however the sink capacity falls from -30,421 GgCO₂e in 2000 to -4,836 GgCO₂e in 2050
- From 2005 onwards the LUCF sector is unable to compensate for the emissions in agriculture and the AFOLU sector becomes a net emitter
- Example of mitigation options: manure management, biogas, fertilizer switch to sulfated fertilizer, drainage in rainy season, compost/bio-slurry, organic input, crop management, agro-forestry, reforestation, REDD+
- If all technically feasible mitigation options are implemented emission can be reduced by 32,521 GgCO₂e in the agriculture sector and net sinks increased by -20,545 GgCO₂e in the LUCF sector
- The largest abatement potential is in the livestock and LUCF sector. It is therefore intended to focus mitigation activities in these sectors
- For all sectors mitigation options are able to halt the trend of increasing emissions except in the agricultural soil sector.

6. Other Information

- The **integration** of CC into strategies, policies and plans is still **limited**, but the RGC recognizes CC as a **priority** (RS 2, NSDP Update) and a number of recent initiatives are supporting this (CCCA, PPCR)
- Cambodia supports **technology transfer** and adequate **financing** as a means of addressing adaptation and mitigation
- Some CC relevant **research** is carried out at selected Gvt Ministries and Cambodia's higher education institutes, but capacity building and financial support are required to develop the research agenda
- There have been some initiatives to raise **CC awareness** however overall public awareness is low, and students, most Government staff and the media have a limited understanding on CC, especially of mitigation & adaptation opportunities
- Initiatives across all levels of education are apparent but limited in terms of their **depth and coverage**
- **Good progress** in and **promising outlook** for CC coordination, mainstreaming, financing, among Gvt agencies, DPs and NGOs

7. Constraints and Gaps, Financial, Technical and Capacity Needs

- ❑ The RGC is committed to addressing the CC challenges but faces many constraints: limited HR; limited awareness; a lack of data, research, analysis, technology, financial resources, policy & strategic plan
- ❑ However, the opportunities for implementing adaptation and mitigation measures are considered to be excellent: increasing CC financing (fast track, Green Climate Fund, GEF, AF, LDCF, Bilateral, private sector, etc.), RGC's commitment to green growth aligns with mitigation, CDM, REDD+

Way Forwards

- Complete all technical reports
- Finalise SNC
- Submit SNC to PM for endorsement
- Submit SNC to CoP (hopefully, CoP-18)

THANK YOU !

