Increasing Flood Risk in the Lower Mekong River Region

&

Direction for Future Adaptation

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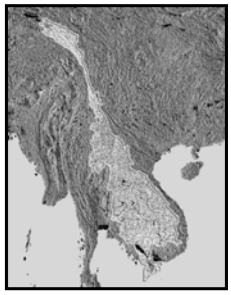
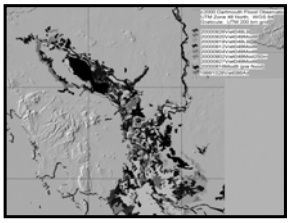
Background

- Part of research study on: **Southeast Asia Regional Vulnerability to Changing Water Resource and Extreme Hydrological Events due to Climate Change**
- This research is part of the Assessments of Impacts and Adaptations to Climate Change (AIACC) initiative.
  - Co-executed by START and TWAS on behalf of UNEP.
  - Funded by the Global Environment Facility (GEF), US Agency for International Development (USAID), Canadian International Development Agency (CIDA), and US Environmental Protection Agency (USEPA).

- Flood in lower Mekong Basin is considered common phenomenon
- However, from time to time, major flood in the Lower Mekong Basin could become major problems.
  - In 2000, more than 800 people died, and the economic damage was assessed at more than 400 million USD.
  - In 2001, more than 300 people died, and the economic damage was assessed at more than 100 million USD.





In the lower Mekong Basin, flooding also brings some benefits.

- Annually, an estimated nine to thirteen million tons of sediments are deposited by floods in the Mekong Delta, and make this land is extremely productive for rice, upland crops, and fruit crops.
- The flood offers a flushing to push away the acidic soil elements, and to reduce the rat population.
- Flooding also provides suitable conditions for fresh water fish development. Annually, approximately 35 million fish hatching are taken from flood water.

Coping with flood:

Local community had to cope with flood for hundreds of years
- Local people does not treat flood as matter of life and death

Local communities well aware that they live in flood risk area
- Flood risk map does not perceived as useful information by local community

Why need further adaptation?



Some of the issues raised at 3rd World Water Forum

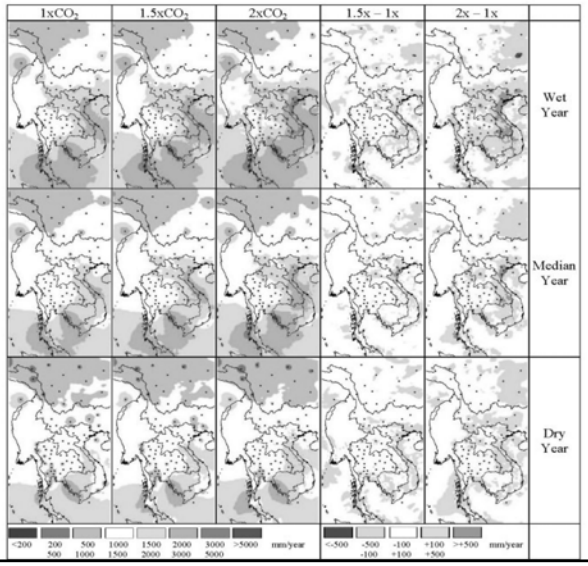
- Did water cycle changed as impact of climate change? To what extent?
- What are impacts of climate change on the hydrological cycle and fresh water resources?
- How to narrow uncertainties of climate and hydrological models on a regional scale?
- What are impacts of climate-water change on agriculture, hydropower, and water supply?

Climate change impacts on the simulated annual rainfall pattern of the SEA region

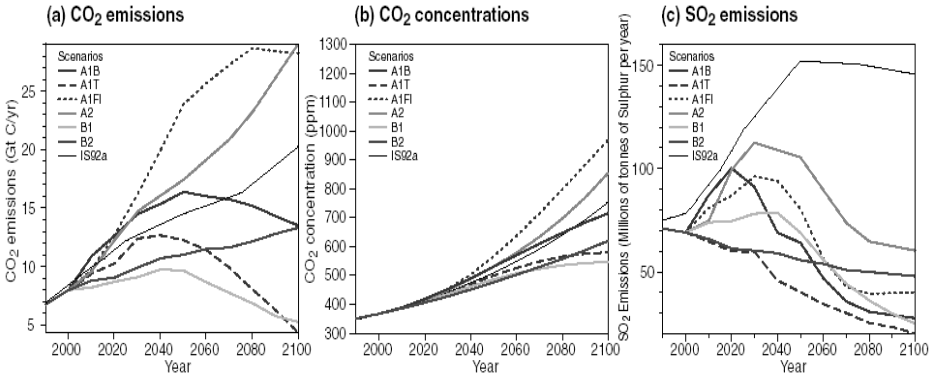
High resolution regional climate scenarios (10x10km)

The simulations forced by elevated atmospheric CO_2 levels from baseline of 360 ppm to 540 ppm and 720 ppm, or about 1.5 and 2 times respectively

1st effort in the region.

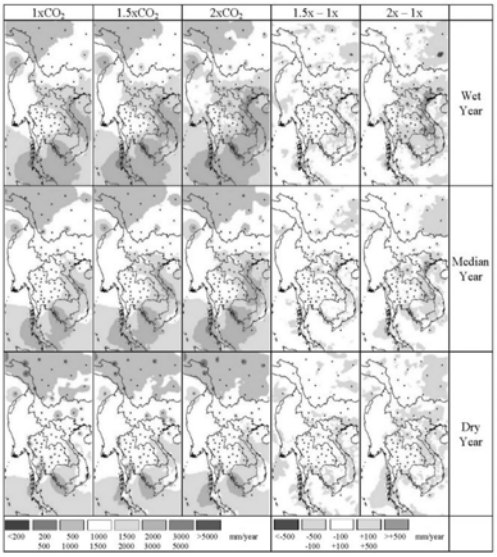


IPCC GHG Scenario



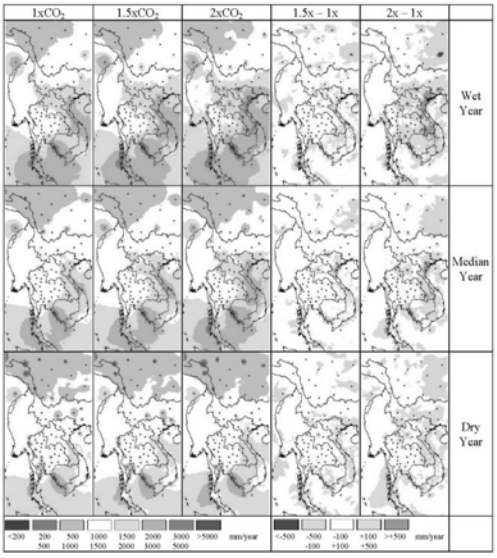
Finding: The areas that appear most sensitive to climate change

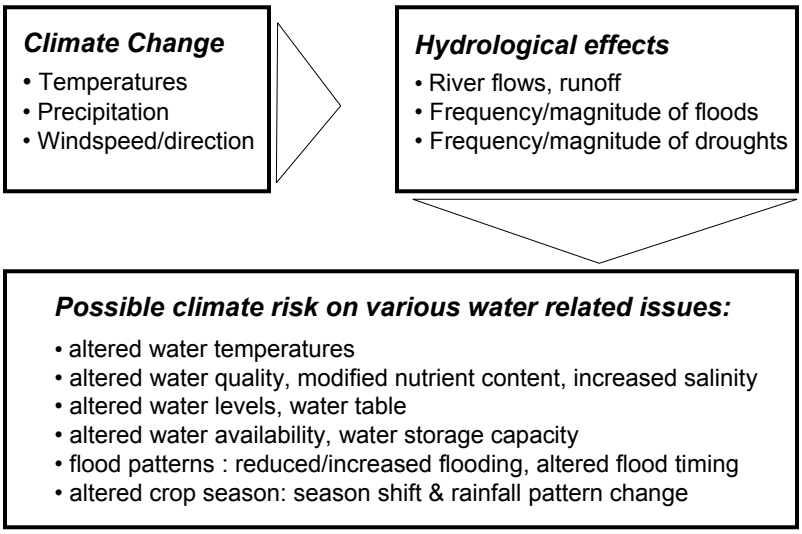
- Southern part of Lao PDR, receives increases in simulated rain to around 4,500 mm/year during the wet years, compared with about 2,500 mm/year for wet years during the baseline decade.
- Most part of Cambodia will have significantly increase in rainfall to around 3,500 mm/year, compare with 2,500 mm/year during the baseline decade.



Finding (con't):

- Red River delta and coastal area - Viet Nam, increase annual rainfall of more than 5,000 mm/year, up from about 2,500 mm/year for the wet years during the baseline decade
- Thai-Malay Peninsula – high fluctuation between wet and dry years in a decade.





Direction toward future adaptation:
Higher frequency and magnitude of flood

- Improved flood warning & seasonal forecast system
  - Ensure accurate forecasting with indicated levels of certainty
  - Support dissemination and understanding of forecasts
  - Develop procedures and instructions for use of forecasts
  - Support collection and transmission of reliable and accurate real time data
- Establish mechanism for access to clean water
- Diverse crop & adjusted crop season & buffer of reserved seed
- Shift in focus on household main source of income – from rice to fishing
- Financial mechanism
- Etc.

Sub-basin assessment study

Case Study Sites: Under preparation

- Thailand: Lower North-eastern part.
- Lao PDR: Sawannaket or Attapeu Province
- Viet Nam: Mekong River Delta.

How higher frequency and magnitude of flood may affect the livelihood of the local community & stakeholders in major rain-fed rice production area in Thailand, Lao PDR and Vietnam (within Mekong River basin)

Conclusion:

- Regional climate change scenarios could be used to trigger and justify the effort to establish some of these mechanisms to support adaptation to climate variability into place on routine operation basis.
- Future assessment on local community will also reveal more strategies on how to adapt to more frequent and higher magnitude of flood in the future, which could be modified and adopted across communities in the lower Mekong River region as well as other watershed in the region.

Thank You