Climate Change Adaptation in Huay Luong Watershed:

Multiple sectors – multiple scales – multiple threats assessment

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SOUTHEAST ASIA START REGIONAL CENTER

Background and principle concept

Watershed-scale climate change risk/vulnerability/adaptation assessment – Multiple sectors – multiple scales - multiple threats

Who/what

- Watershed is a complex system – bio-physical & socioeconomic systems
- Change and/or response of one sector to climate threat will also affect risk and vulnerability of the others

Where

- Risk and vulnerability are not uniform across sectors / area (risk profile & magnitude of vulnerability)

Why

- Different sectors are under different climate threats
- Dynamic of socioeconomic condition will change context and risk profile of the sectors / subsectors / sub-watershed

How

- Not only strategy but also institutional arrangement to mobilize adaptation is required
- Different scales require different policy insert point

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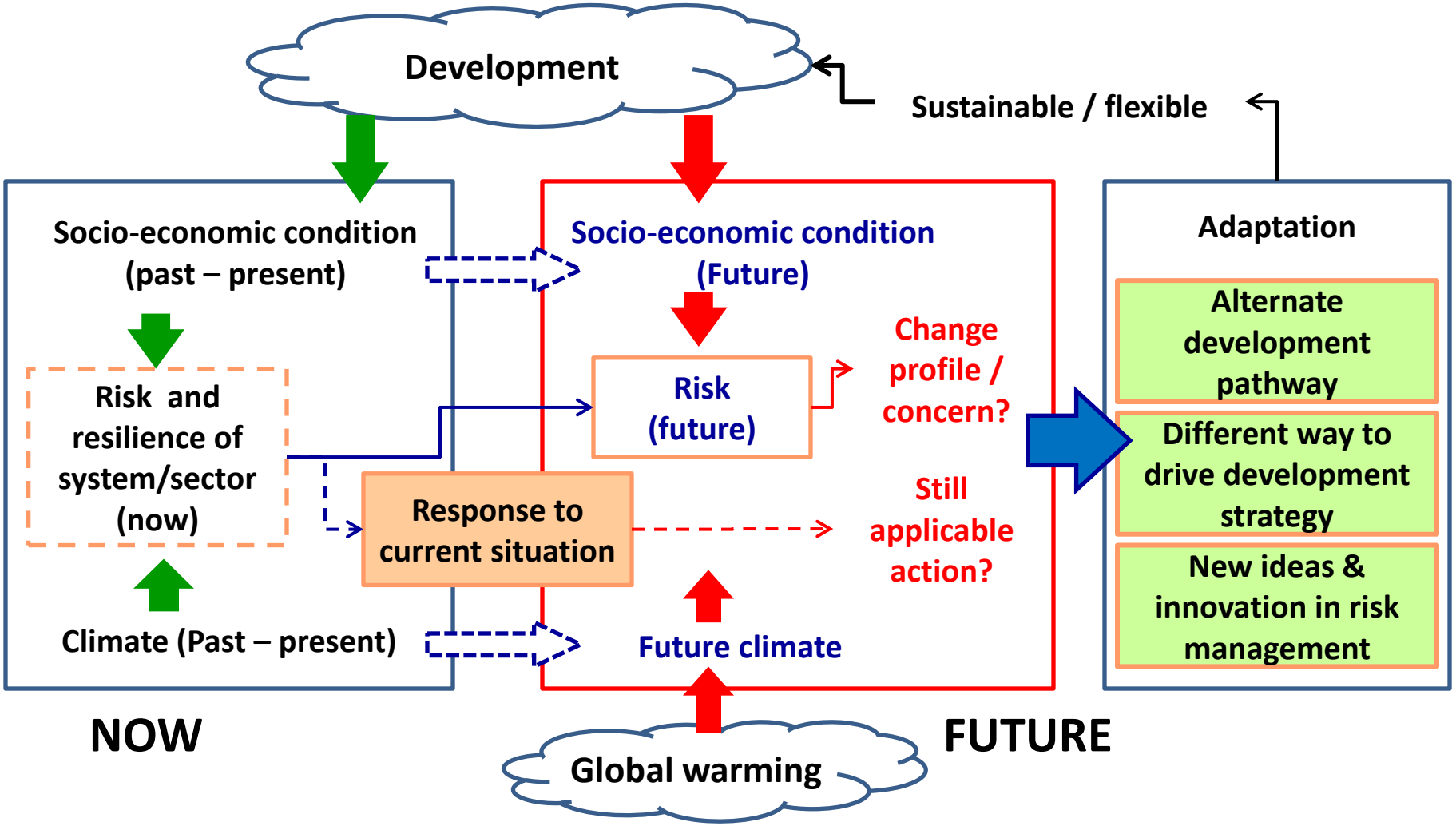
Background and principle concept



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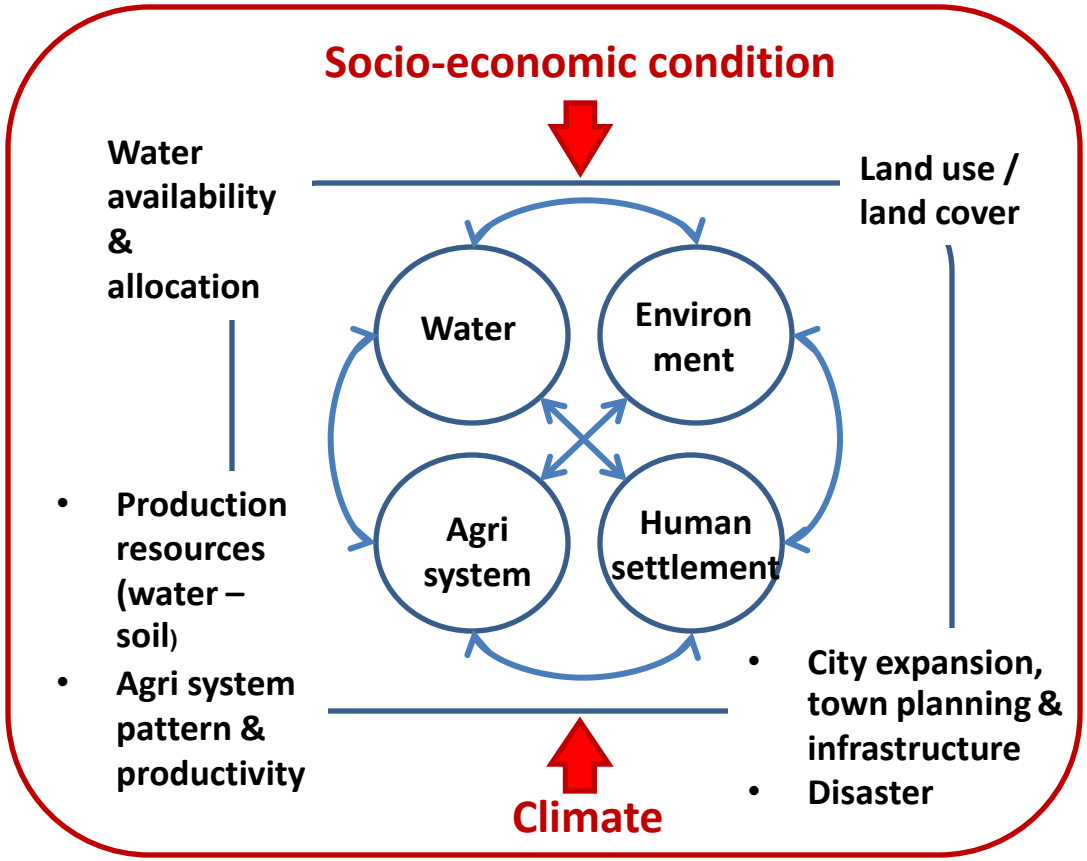
Background and principle concept



NOW → FUTURE

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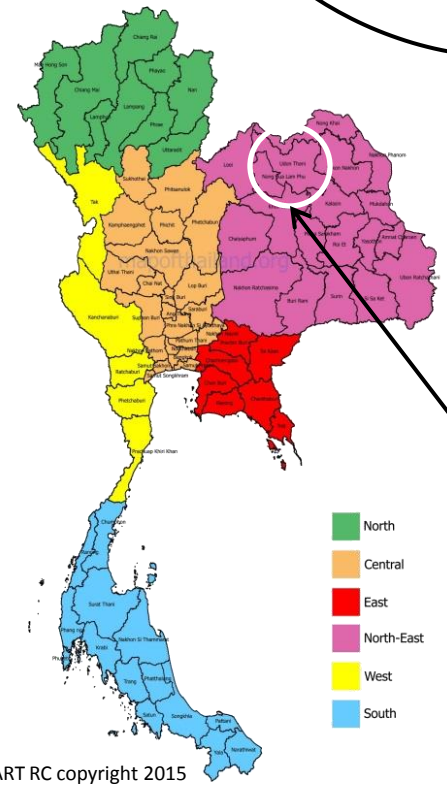
Background and principle

2014	2015-2016	2016-2017
Scoping Exercise	Risk and vulnerability assessment	Adaptation planning

- What are the issues of concern?
- What needs to be assessed?
- How do we address climate change adaptation in this watershed?



Study site: Huay Luang Watershed & Udon Thani province
Area 3,500 km^2 / population >1mil. / large city - mid-size towns - small communities / various agricultural activities / trade and logistics hub / industries

High system dynamic is foreseeable future

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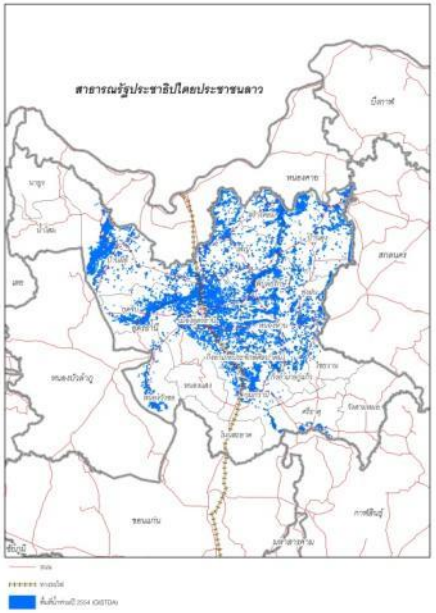
Climate change and concerns on large urban in the future

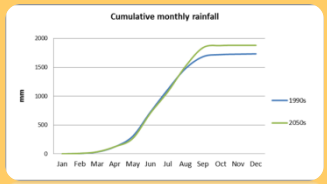
Flood in Udon Thani



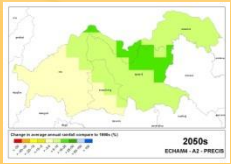
Climate factor

Trend of future climate

Increasing precipitation



Heavy rainfall event



Socioeconomic factor

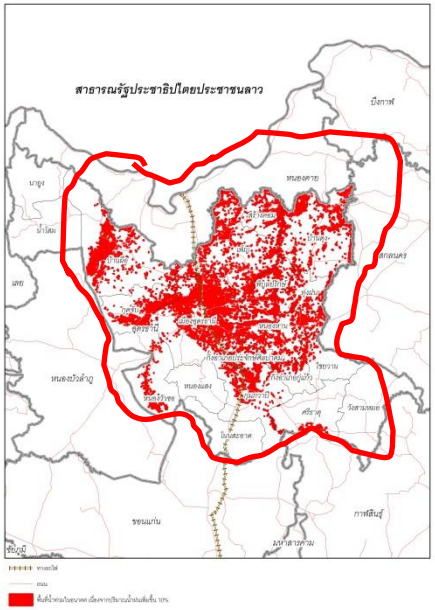
Trend of future change

Infrastructure

Population and urban area

Future concerns

Higher flood risk



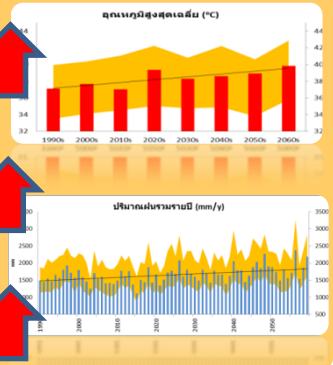
Suitability of land use pattern / town planning and infrastructure / housing and other settlements in the future

Climate change and concerns on agriculture in the future (productivity & agro-eco zone suitability)

Agriculture concern: Crop loss from climate variability – unsuitable farming condition

Climate factor | **Trend of future climate**

- Longer and warmer summer
- Precipitation during rainy season
- Fluctuation in climate pattern



Socioeconomic factor | **Trend of change**

- New crop & change in crop pattern
- Bio-fuel policy

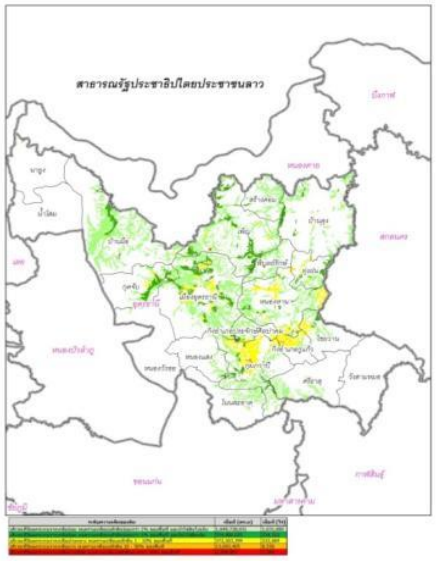
Future concerns

- Agro-eco zone suitability
- Extreme weather event and crop production
- Pest

- Zoning and climate suitability / Cropping pattern – crop management and climate suitability
- Risk management in farming

Climate change and concerns on agriculture in the future (productivity & agro-eco zone suitability)

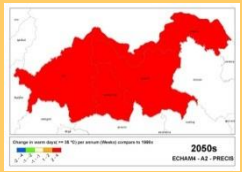
Saline soil area



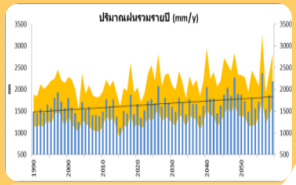
Climate factor

Trend of future climate

Longer and warmer summer



Fluctuation of precipitation



Socioeconomic factor

Trend of change

Change and shift in crop pattern

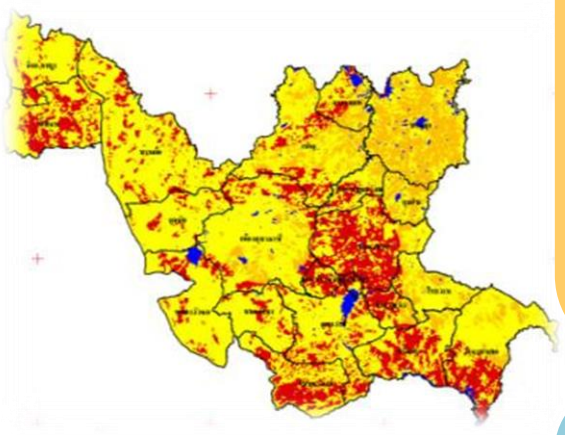
Future concern

Expansion of saline soil area and severity

- Proper agricultural mix that match the future production resources (soil & water)

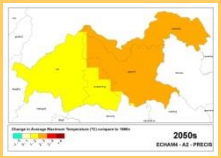
Climate change and concerns on water resource management in the future

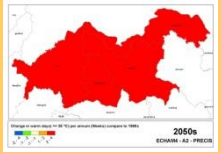
Drought area



Climate factor / Trend of future climate

- Longer and warmer summer
- Average annual precipitation
- Fluctuation in seasonal pattern and inter-annual variation

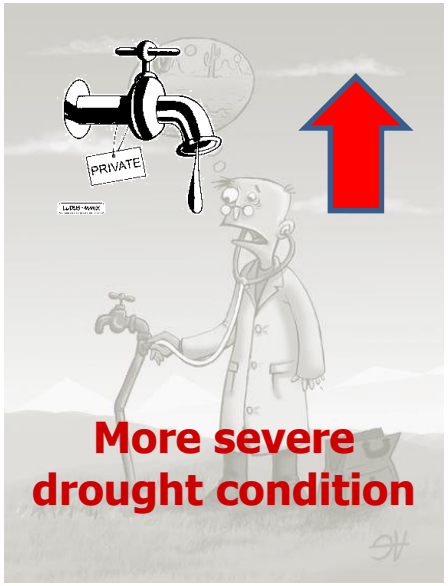




Socioeconomic factor / Trend of change

- Water demand in every sector
- Water demand in dry season – agri sector

Future concerns



More complicate water resource management – among sectors / between seasons
New water usage pattern to match water availability in the future

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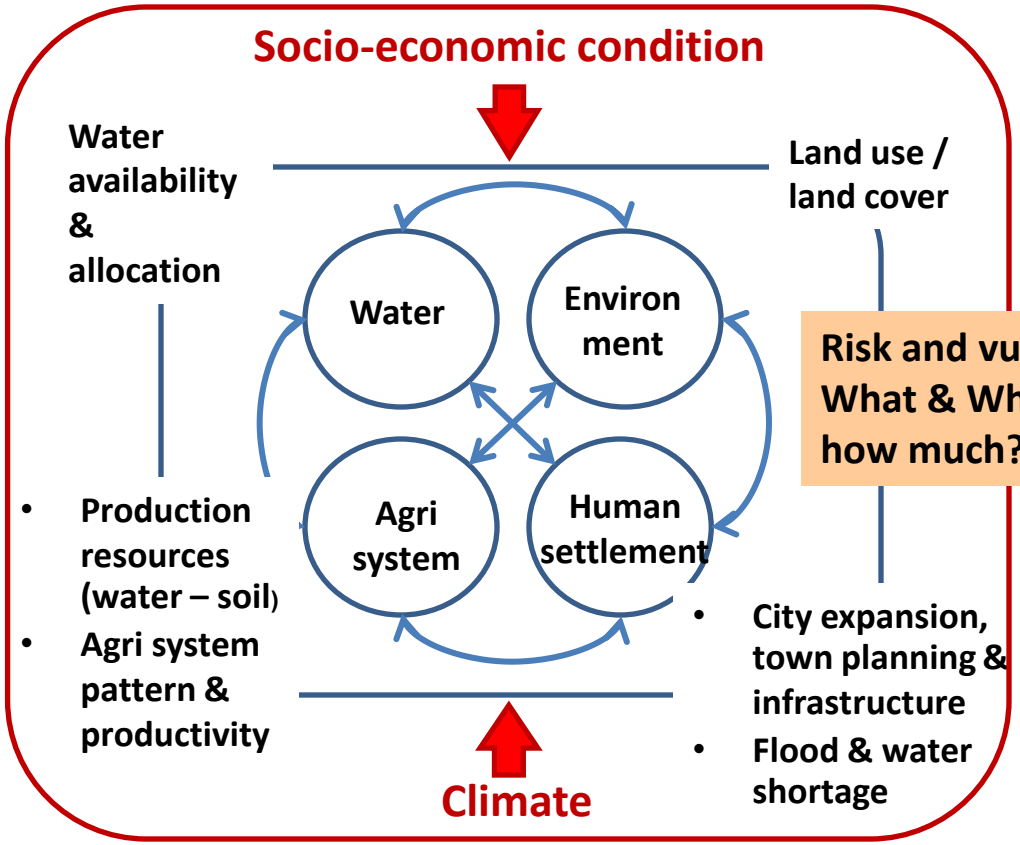
Risk and vulnerability assessment

- Change in watershed run-off / water balance – water deficit
- Change in reservoir reserve

- Change in saline soil and underground water
- Risk of agri. System in different agro-eco zones



- Production resources (water – soil)
- Agri system pattern & productivity

- City expansion, town planning & infrastructure
- Flood & water shortage

- Change in land use pattern

Risk and vulnerability
What & Who – how & why – how much?

- Risk of community / city to climate & non-climate stresses and coping capacity
- Institutional gaps in risk management

NOW → **FUTURE**

Climate change adaptation

Climate change adaptation in Huay Luong Watershed:

Development strategy that steers social & economic transformation for higher resilience to future climate

- **Resilience settlement**
  - Town planning for Udon Thani – proper land use/infrastucture with future flood/water shortage situation under consideration
  - Institutional arrangement for town planning across multiple political & administrative boundaries
- **Robust agriculture system**
  - Agricultural zoning that match future available resources – soil & water
  - Mixed crops pattern that aims to stabilize productivity under fluctuation of year-to-year climate variability and trend of climate change
- **Sustainable water resource management**
  - Strategy to procure and allocate water that meet future demand under fluctuation of year-to-year climate variability and trend of climate change

Thanks

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