

Scenario Thinking and Climate Change Adaptation Planning



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- Scenario thinking: Can we really tell future?
- Scenario and climate change: Everything starts from storyline
- Climate change: Question beyond what will happen?
- Breaking dilemma of climate change adaptation planning: What can we do if we do not know for sure what will happen?
- Journalist and scenario thinking in climate change planning: Imagination is more important than knowledge

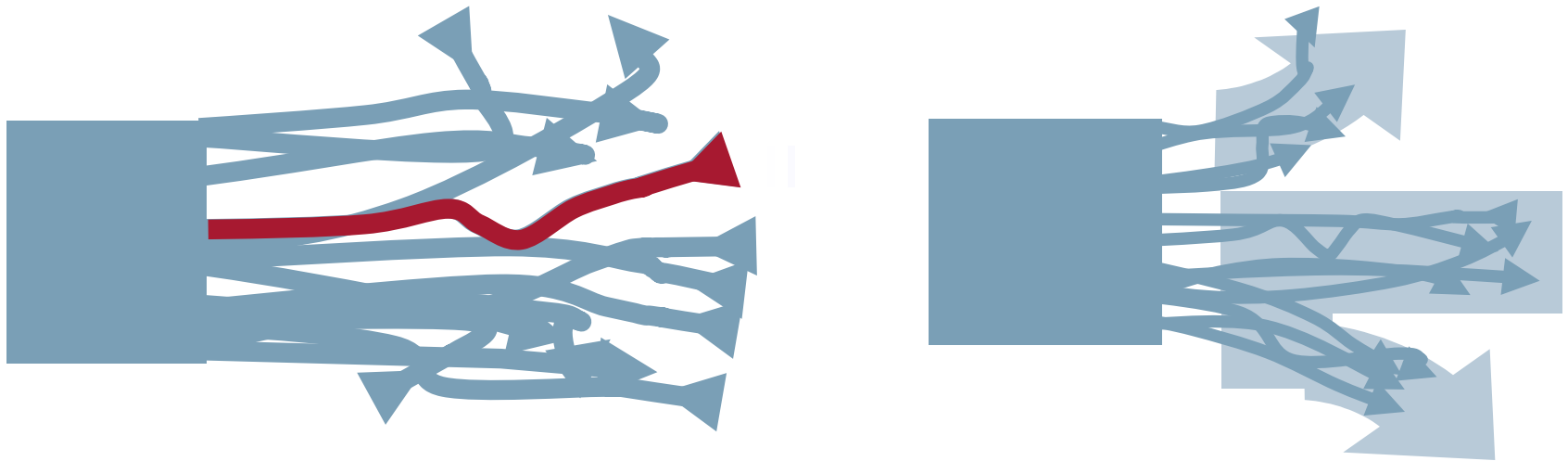


Scenario Thinking: Can we really tell future?

Scenario Thinking: Can we really tell future?

Can we really tell the future?

Life is full of uncertainties – future can be unfolded in many possible ways



Scenario:
a description of possible actions or events in the future

Scenario Thinking: Can we really tell future?

Why scenarios thinking is so important in climate change?

We are looking into the future in a very long timescale – few decades, at least

Climate change is slow and complex process - Study on climate change is based on scenarios

A lot of things can change in many ways over time

Dynamic of social and economic condition is so great that we cannot forecast the future

Trend of the past not necessary able to tell future

Some changes are independent to the past

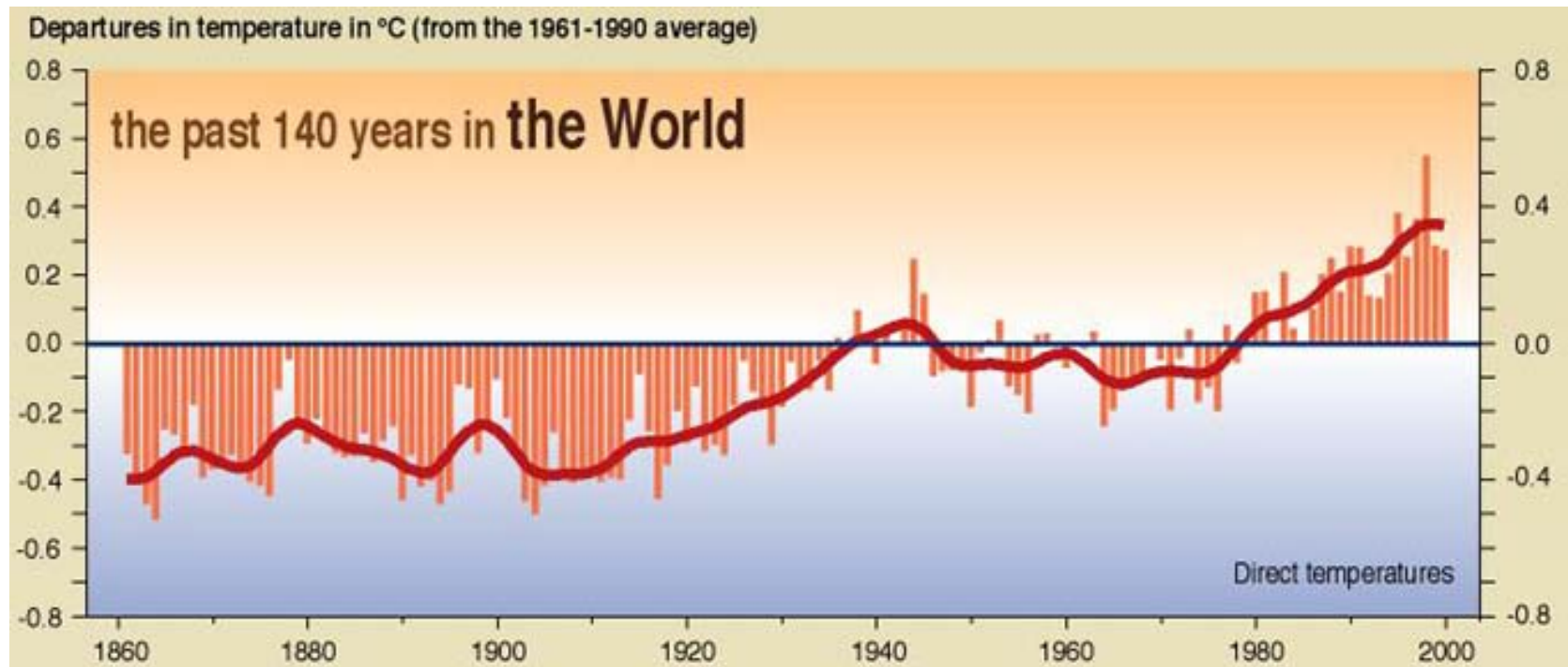


**Scenario and climate change:
Everything starts from storyline**

Scenario and climate change: Everything starts from storyline

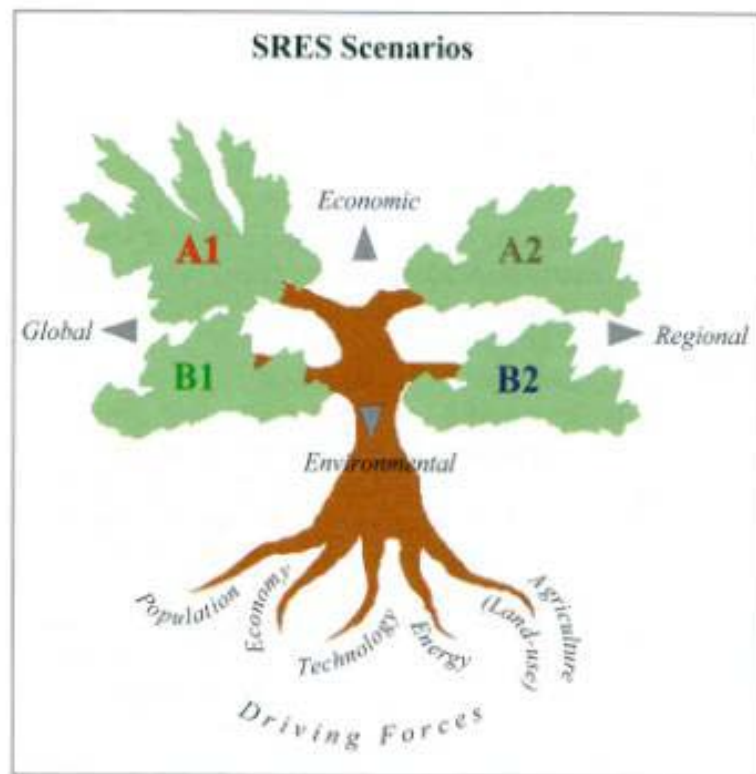
We can observe that climate change has occurred in the 20th century.

How can we know what the future holds



Scenario and climate change: Everything starts from storyline

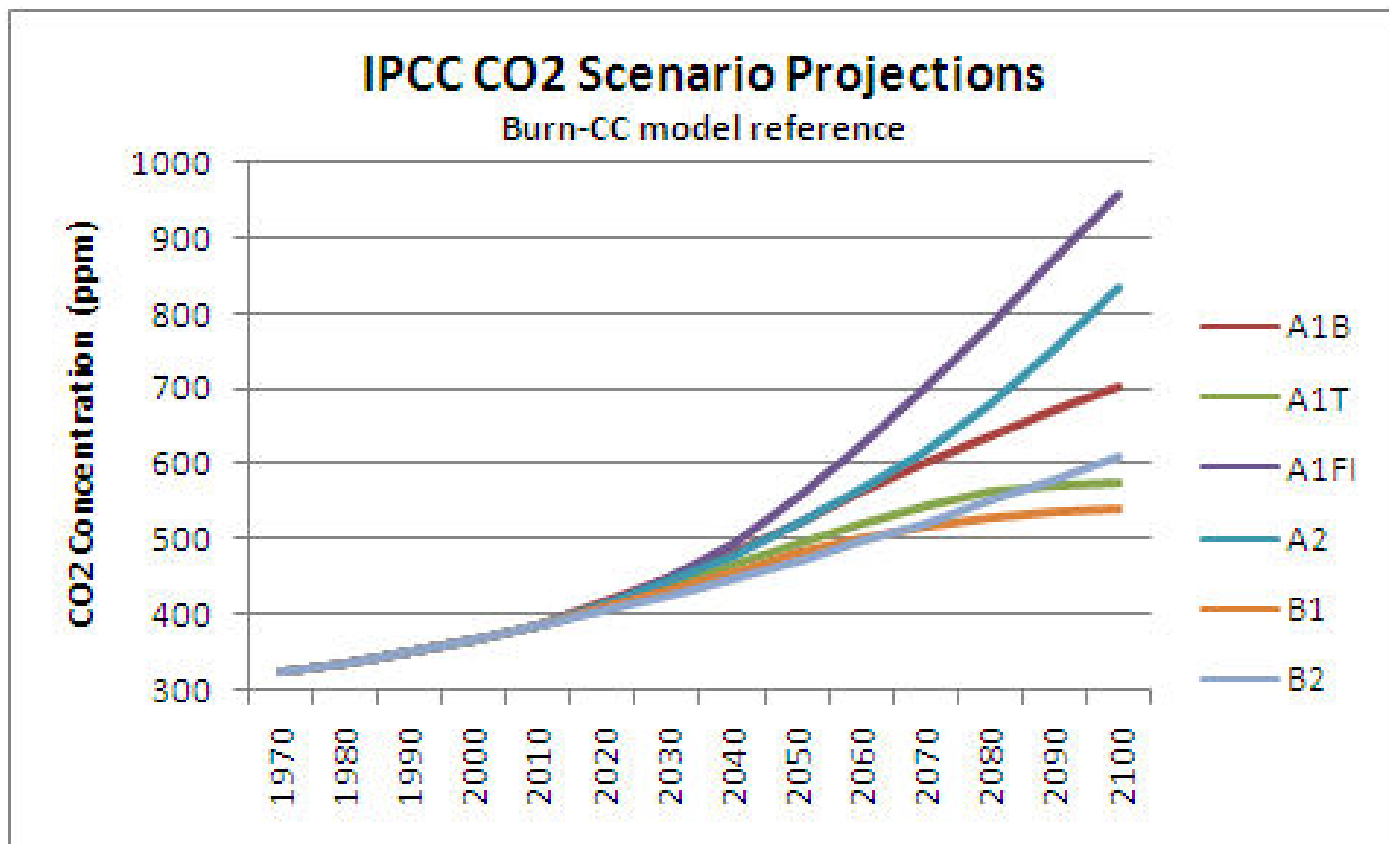
Everything starts from storyline:
 4 IPCC SRES storylines – future society and greenhouse gas emission



Economic emphasis →	
Global integration ↑	A1 storyline <u>World:</u> market-oriented <u>Economy:</u> fastest per capita growth <u>Population:</u> 2050 peak, then decline <u>Governance:</u> strong regional interactions; income convergence <u>Technology:</u> three scenario groups: • A1FI: fossil intensive • A1T: non-fossil energy sources • A1B: balanced across all sources
	A2 storyline <u>World:</u> differentiated <u>Economy:</u> regionally oriented; lowest per capita growth <u>Population:</u> continuously increasing <u>Governance:</u> self-reliance with preservation of local identities <u>Technology:</u> slowest and most fragmented development
Regional emphasis ↓	B1 storyline <u>World:</u> convergent <u>Economy:</u> service and information based; lower growth than A1 <u>Population:</u> same as A1 <u>Governance:</u> global solutions to economic, social and environmental sustainability <u>Technology:</u> clean and resource-efficient
	B2 storyline <u>World:</u> local solutions <u>Economy:</u> intermediate growth <u>Population:</u> continuously increasing at lower rate than A2 <u>Governance:</u> local and regional solutions to environmental protection and social equity <u>Technology:</u> more rapid than A2; less rapid, more diverse than A1/B1
← Environmental emphasis	

Scenario and climate change: Everything starts from storyline

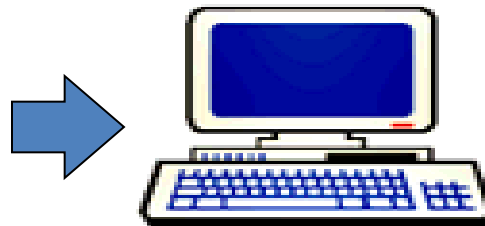
Atmospheric greenhouse gas concentration till end of 21st century:
a clearer view of consequences of future society development under
sets of assumptions



Scenario and climate change: Everything starts from storyline

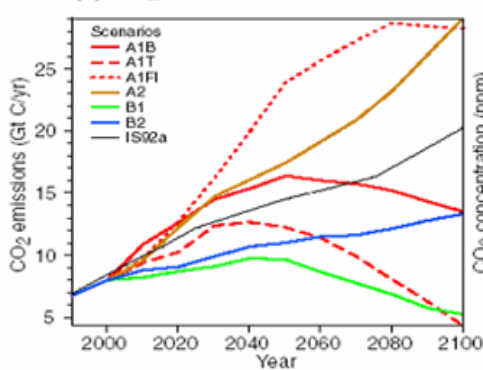
Climate model -
simulation

Future GHG
Scenario

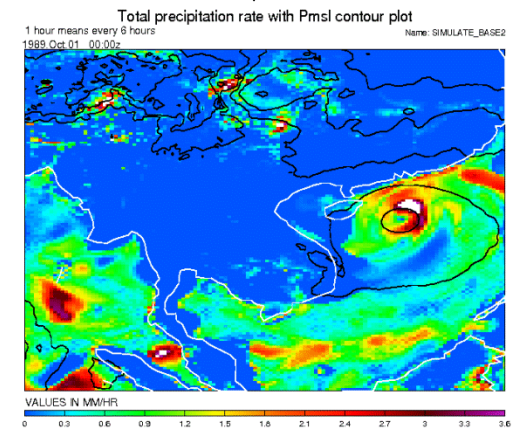
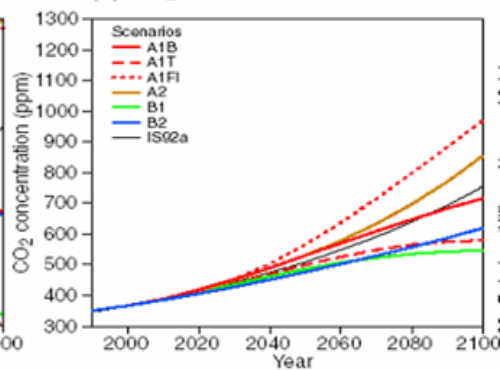


Future climate
Scenarios

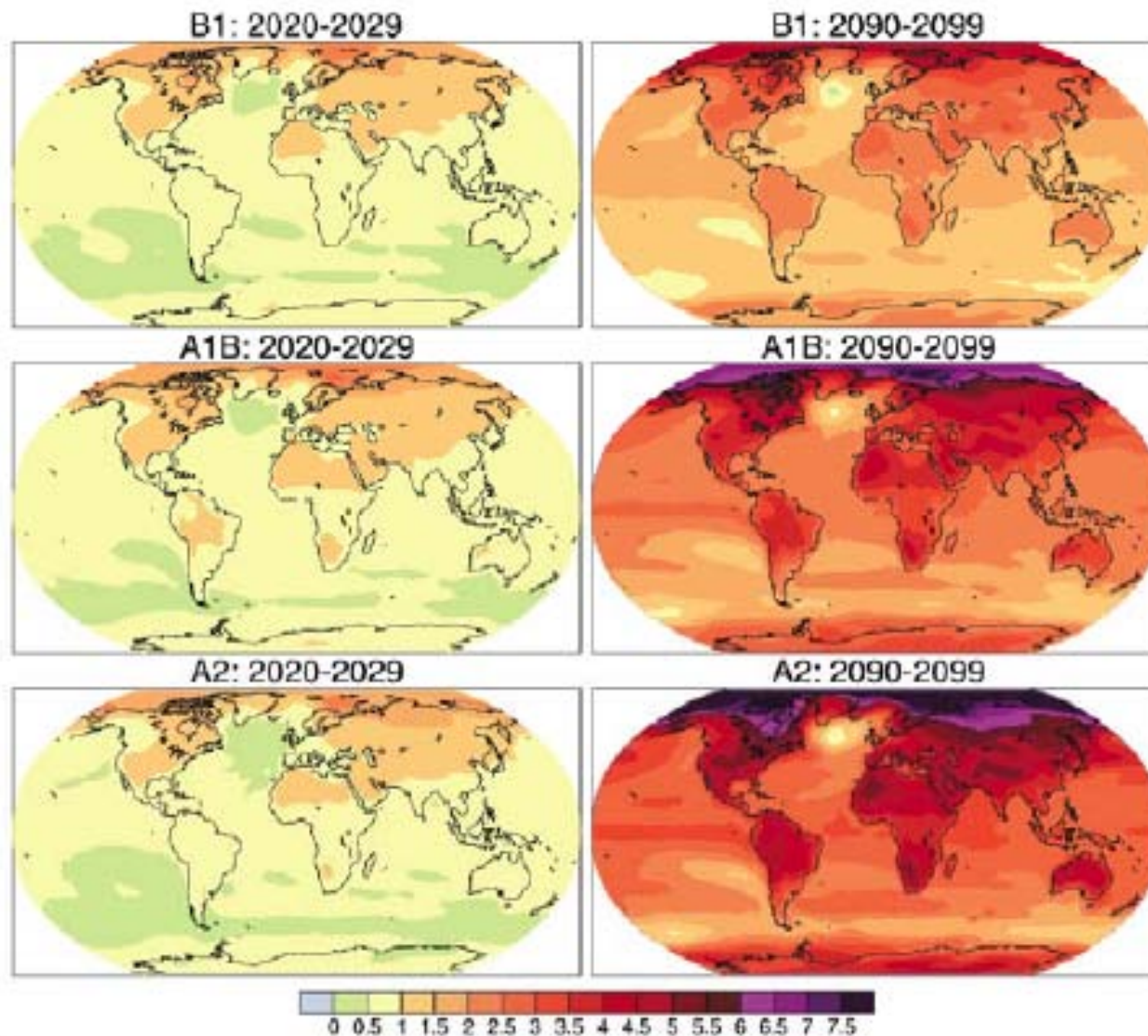
(a) CO₂ emissions



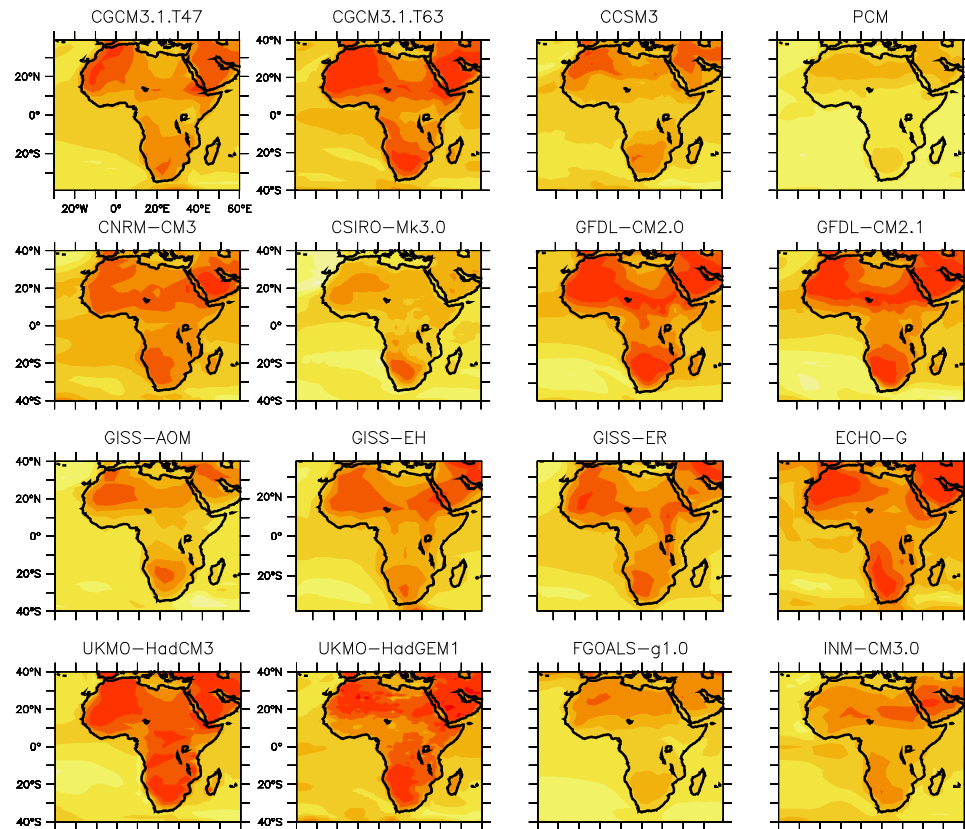
(b) CO₂ concentrations



Scenario and climate change: Everything starts from storyline



Everything starts
from storylines –
different set of
assumptions, do not
expect to get definite
answer



Africa Change at the large scale
Change in annual mean temperature by 2100

Can we really tell the future?

*Courtesy of Isaac Held from
PCMDI AR4 model archive*



Scenario and climate change: Everything starts from storyline

Frequently asked question

Which scenario is best?
Which scenario is most likely?

Irrelevant !

Scenario does not represent future truth !

Scenario and climate change: Everything starts from storyline

Relevant questions about scenarios:

- Which scenario is the riskiest? – worst?
- Which scenario is the driest? Wettest? Hottest? Coldest? By how much?
- Etc.

Focus on how to cover uncertainty of the future - how we may want to manage future risk

Scenarios and future climate change:

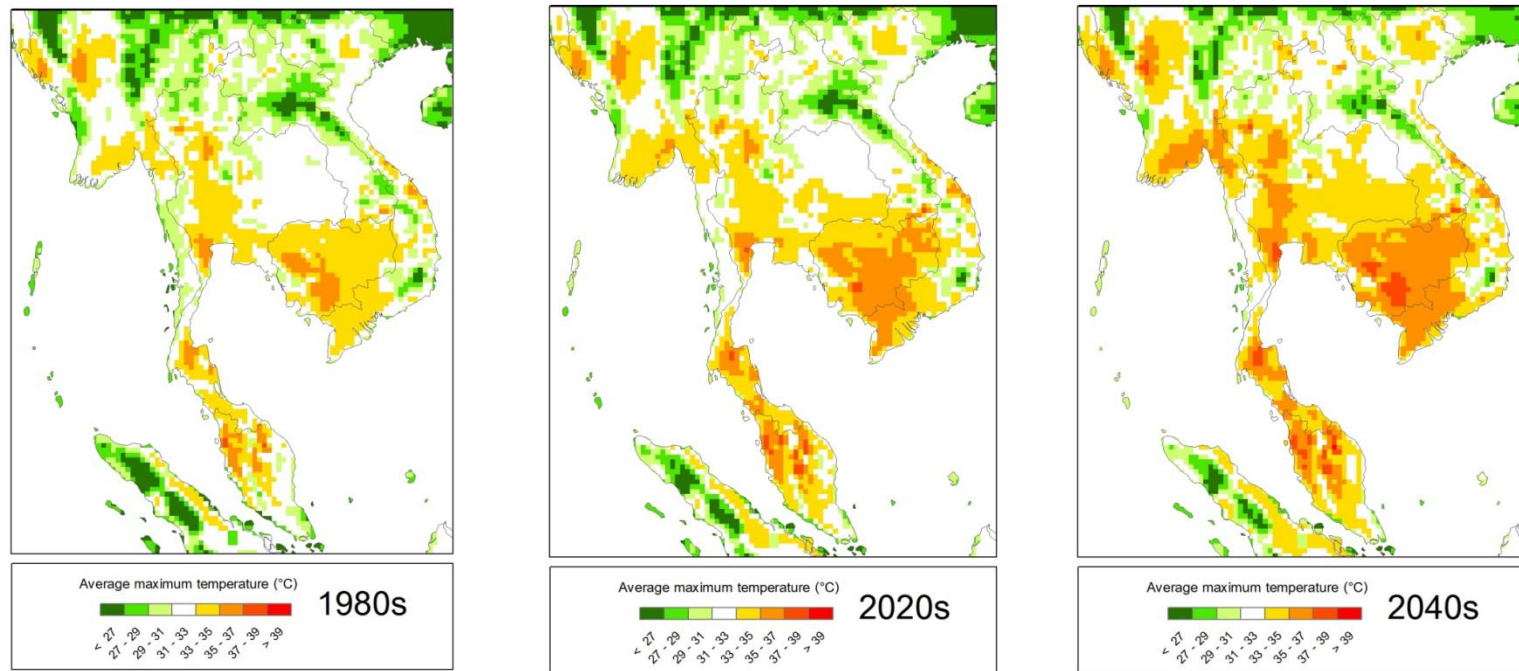
Various plausible futures to test our resilience under
different circumstances

If cannot cope with it, then comes adaptation

Scenario and climate change: Everything starts from storyline

Common misconception about climate scenario

For the fact that we can see precise result of simulation, it does not mean that it is accurate nor represent truth of the future



Example of climate change in the next 10 – 30 years



Climate change: Question beyond what will happen?

Climate change: Question beyond what will happen?

It's story about society: **Climate change vulnerability and adaptation**

- Who are at risk?
- How they are vulnerable?
- What shall they do about it?

Climate change: **A story beyond scientific finding**

- Potential social conflict
- Different way in doing business in the future
- Alternative development / livelihood
- Etc., etc.

Be aware of:

- Climate risk in the future may not be as it was any more;
- The way to cope with risk as it is today may not be a viable option in the future
- Enhancement / innovation is today's task for future change

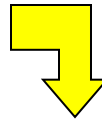
Climate change: Question beyond what will happen?

Scenario Planning

Scenario planning is an approach to develop the test conditions for plausible futures.

Change of mindset

“What will happen to us?”



“What will we do if this or that will happen?”

Bare in mind: Climate is not the only factor that is changing

Change in socio-economic condition is much more dynamic

When think of climate change – remind ourselves of different context



**Breaking dilemma of climate change adaptation planning:
What can we do if we do not know for sure what will
happen?**

Breaking dilemma of climate change adaptation planning

Breaking dilemma in climate change adaptation planning

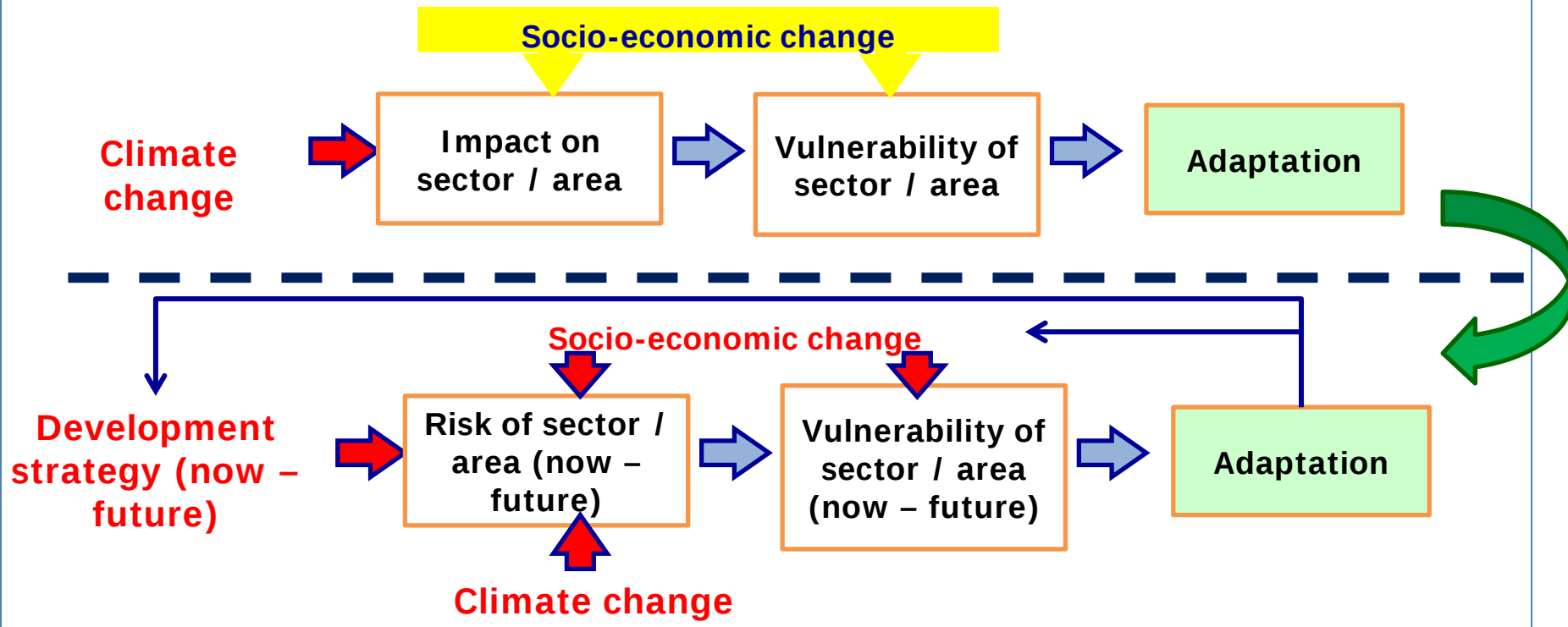
If this plausible future may or may not happen, how can we justify action needed for adaptation?

But how can we be so certain about what will happen in the future?

- Scenario-based study and uncertainty >> shifting from impact-based assessment approach
- Context specific and holistic view >> putting climate change into context – climate change is not an isolate issue
- Adaptation in reality >> linking present and future

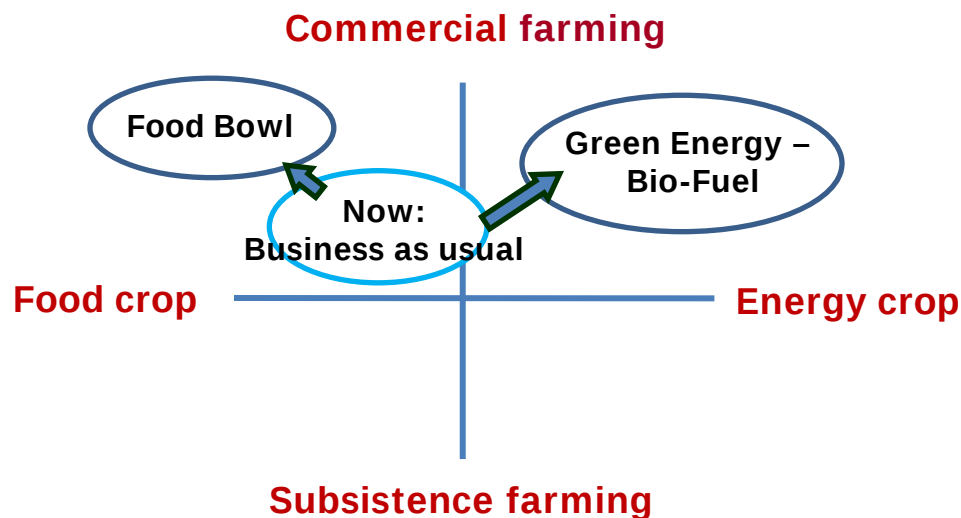
Breaking dilemma of climate change adaptation planning

Altered approach: from impact-based to risk-based assessment



Breaking dilemma of climate change adaptation planning

Different development directions bring different risk under climate change condition: Case study on annual crop production in Chi-Mun River basin



	Future scenario	
	Food Bowl	Green Energy - Biofuel
Wet season / Rainfed rice	↓	↓
Dry Season / Irrigated rice	↑	↑
Sugarcane	→	↑
Cassava	→	↑
Other crops	↓	↓

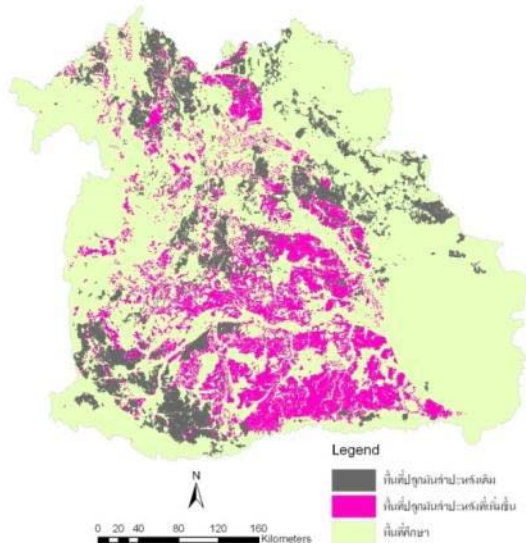
Example: How to put scenario into use in climate change adaptation planning
 Scenarios of the future – not forecast / Plausible change in cropping pattern

Breaking dilemma of climate change adaptation planning

Different crop production area – scenarios of the future

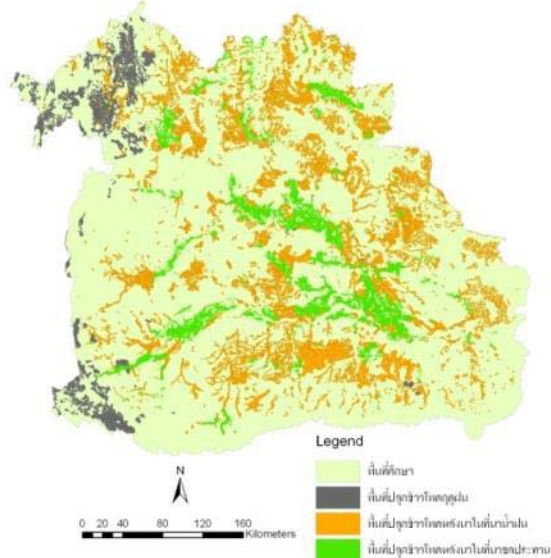
Cassava

S3: พื้นที่ปลูกมันสำปะหลังที่เพิ่มขึ้นจากแนวทางการผลิตพืชพลังงาน



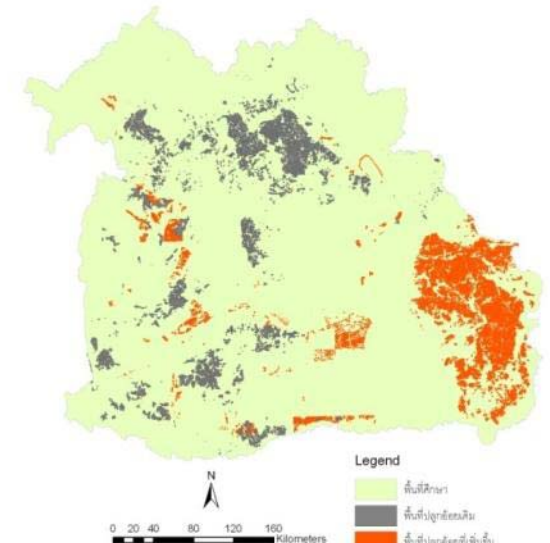
Maize

S3: พื้นที่ปลูกข้าวโพดฤดูฝน และในพื้นที่นาหลังการเก็บเกี่ยวข้าว ตามแนวทางการผลิตพืชพลังงาน ในระยะยาว



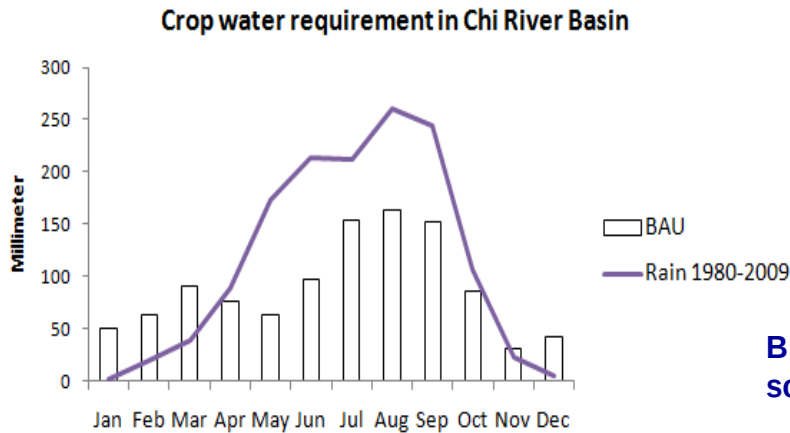
Sugar cane

S3: พื้นที่ปลูกอ้อยที่เพิ่มขึ้นจากแนวทางการผลิตพืชพลังงาน

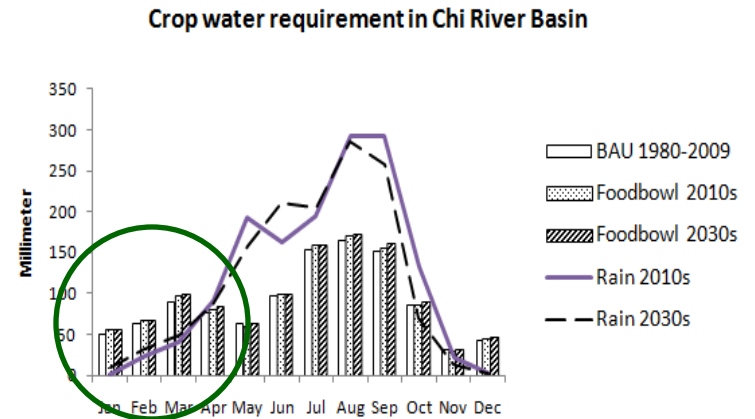


Breaking dilemma of climate change adaptation planning

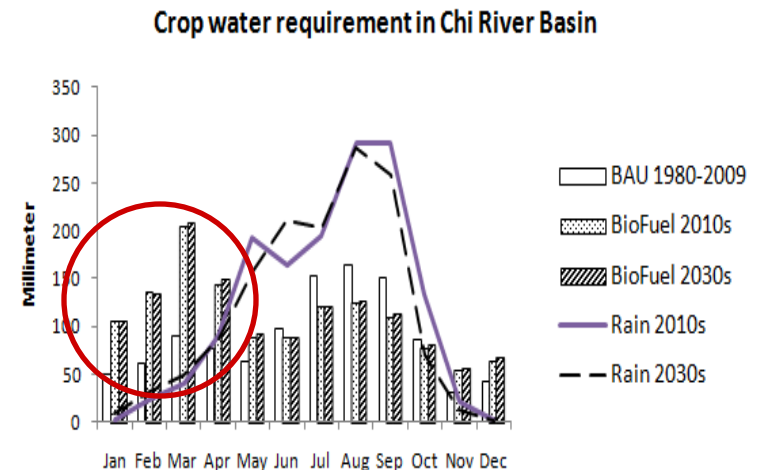
Different cropping pattern in the future make different water demand



Food-bowl scenario



Bio-fuel scenario



Adaptation challenge: How to provide water supply for agriculture? Is it feasible? Does it justify investment?

Breaking dilemma of climate change adaptation planning

Context specific and holistic view

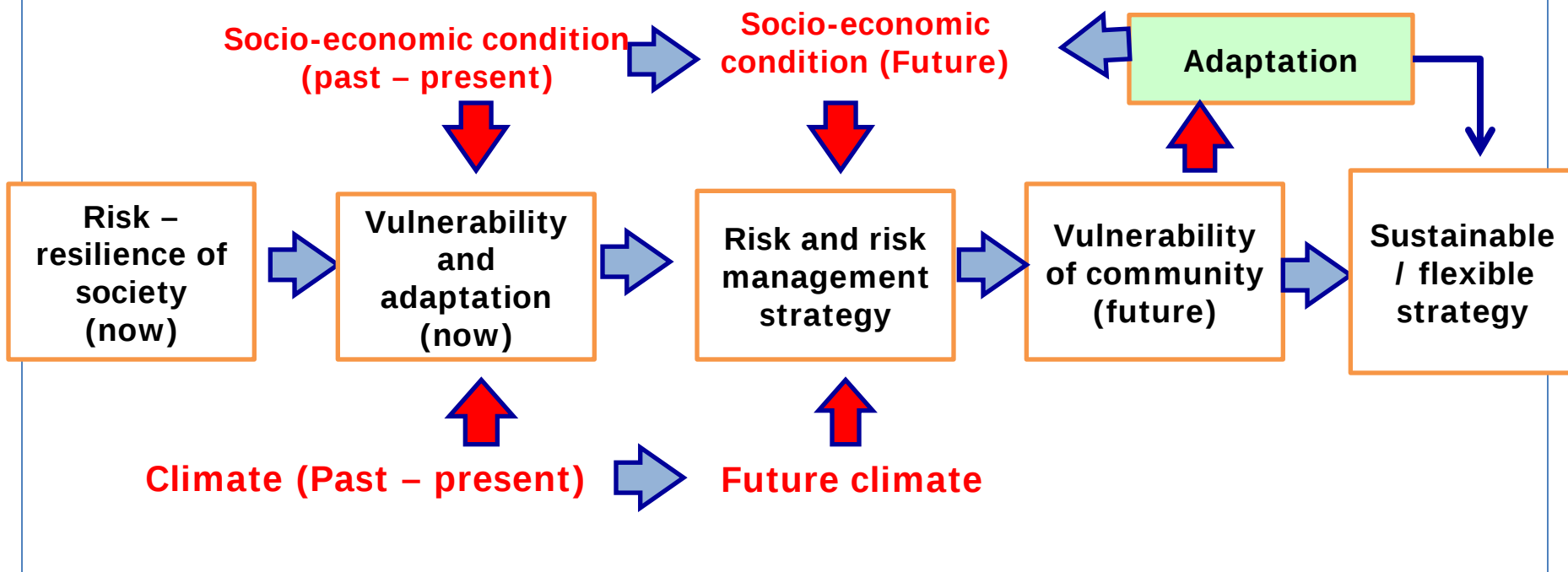
- Fundamental for area-based assessment
- Different sector / area / time >>> **different concerns about climate change** >>> **different responses to cope with risk**
- Interaction / linkage among sectors / sub-sectors / area require holistic view of risk – vulnerability – adaptation
- Scale & unit of assessment dictates nature of risk and response
- Outcome: Sector assessment VS area-based assessment

Example: How to put scenario thinking into use in climate change
adaptation planning

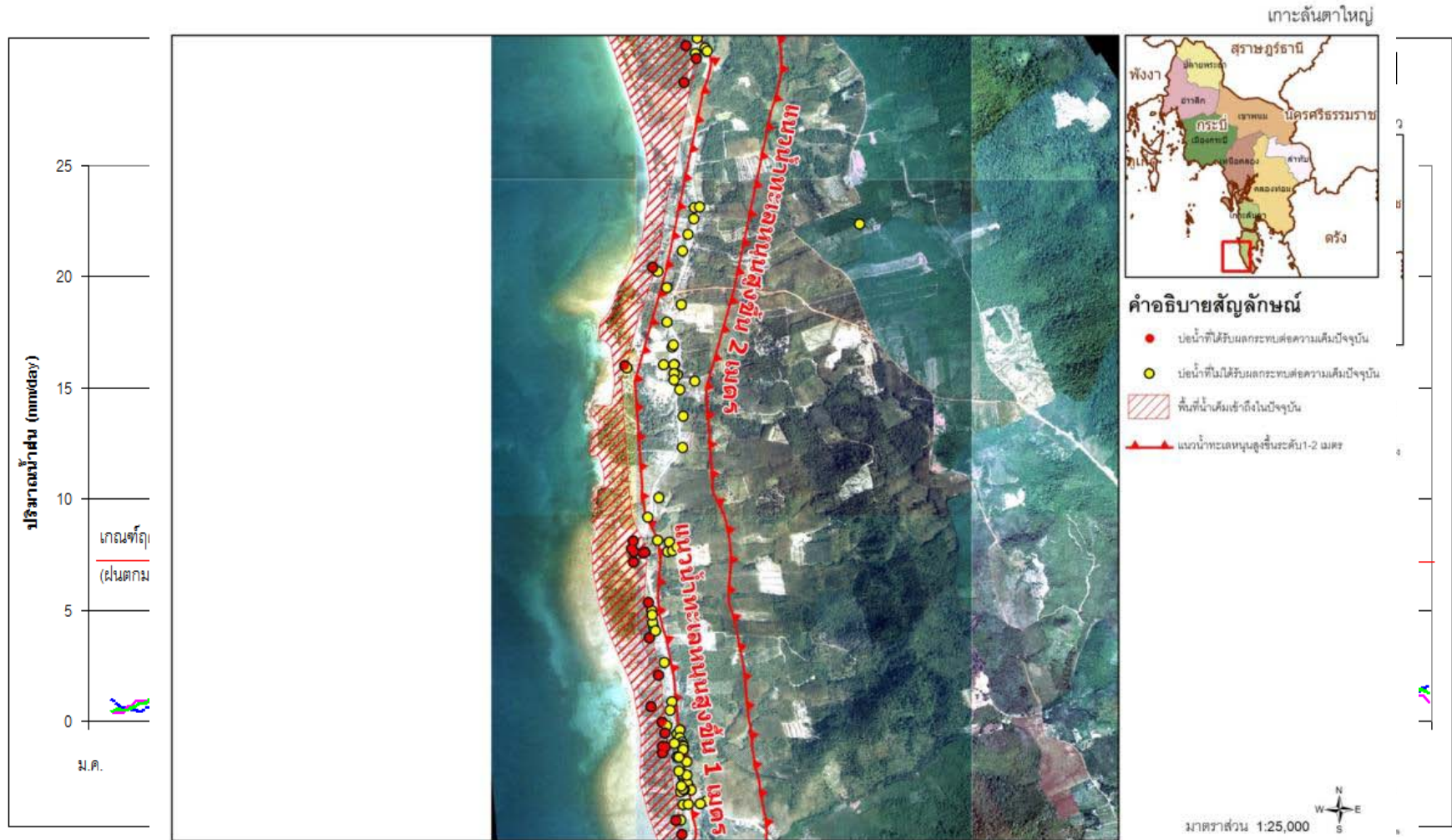
Develop storyline about the study site

Breaking dilemma of climate change adaptation planning

Altered approach: Area-based / Community-based approach

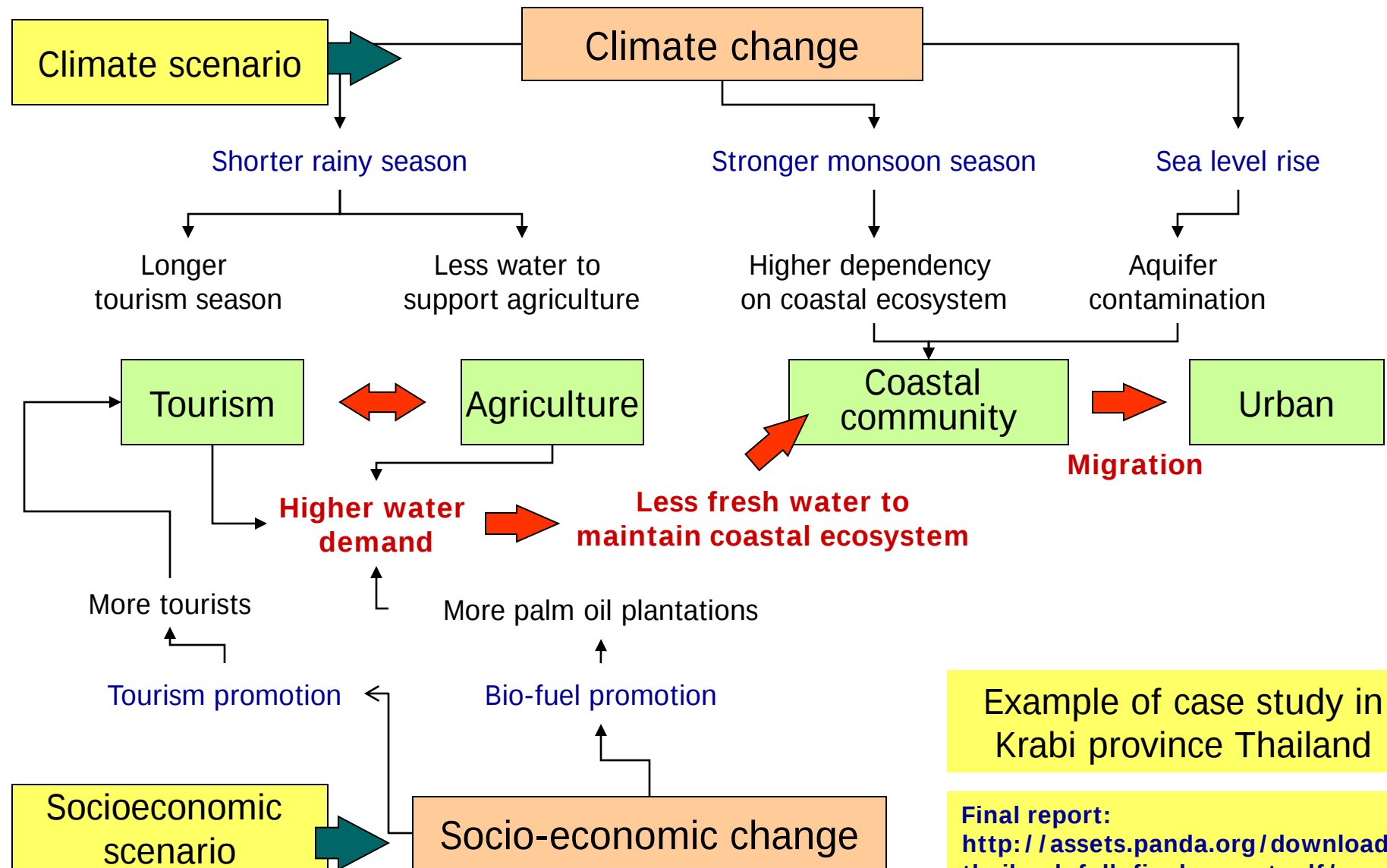


Breaking dilemma of climate change adaptation planning



Example of case study in Krabi province, Thailand

Breaking dilemma of climate change adaptation planning



Example of case study in
Krabi province Thailand

Final report:
http://assets.panda.org/downloads/thailand_full_final_report.pdf/

Breaking dilemma of climate change adaptation planning

Adaptation in reality

- Linkage between present and future
- Aims at increasing resilience, rather than trying to fix problem of the future
- Outcome: More focus on Community-based adaptation (CBA)

Example: How to put scenario thinking into use in climate change
adaptation planning

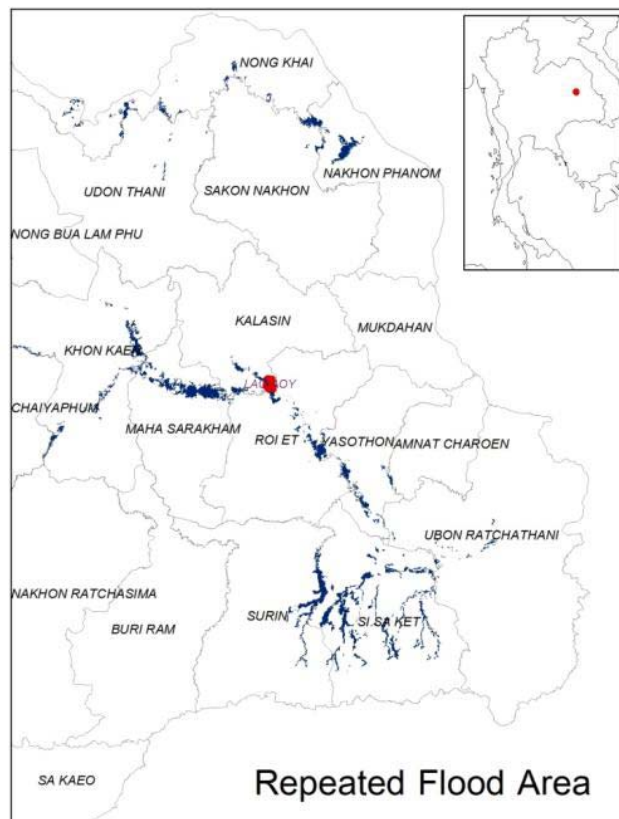
Using scenario to test resilience of development strategy

Breaking dilemma of climate change adaptation planning

Community-based Adaptation

Mainstreaming climate change into development

Case study at Lao-oi District, Kalasin province - Thailand

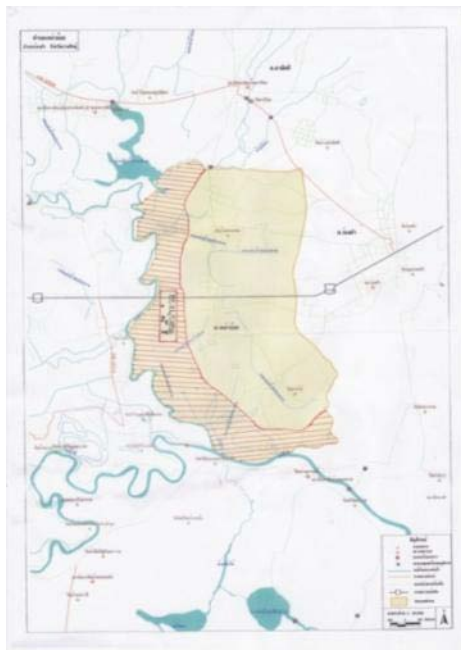


Breaking dilemma of climate change adaptation planning

Current context: wet-season rice / community is located along river

Climate risk – farmer vulnerability

- **Exposure:** Flood before harvest / 7-8 times in a decade
- **Sensitivity:** Rice has low tolerance to flood
- **Coping capacity:** Dry season rice – partially / government compensation / seasonal migration

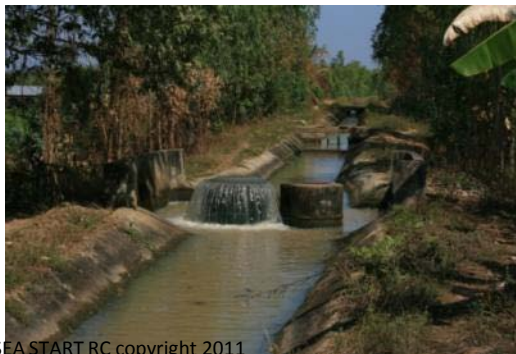


Breaking dilemma of climate change adaptation planning

Strategy - New farming practice - Won't fight with flood – change to dry season rice – use water from main river through pumping station and underground pipe system

Future context: Dry-season rice practice

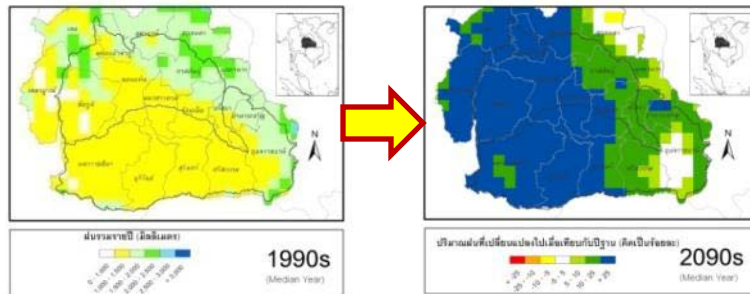
- **Exposure:** Drought / heat
- **Sensitivity:** Rice has low tolerance to drought / heat
- **Coping capacity:** ?



Path leads to dead end?

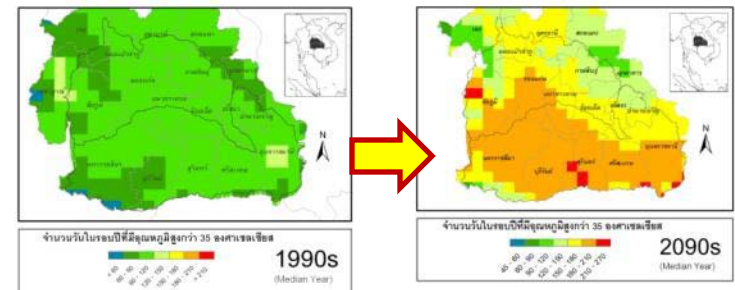
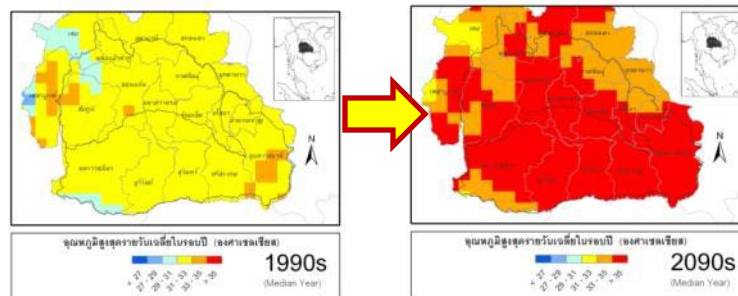
Breaking dilemma of climate change adaptation planning

Warmer and longer summertime – reduced river flow whilst crop water demand could be higher to compensate higher evapotranspiration



Increase rainfall in rainy season suggests higher flood risk

But current response to climate risk may not sustain under warmer and longer summertime in the future



Breaking dilemma of climate change adaptation planning

Adaptation

Alternate source of water resource – harvest water during flood season for dry season agriculture



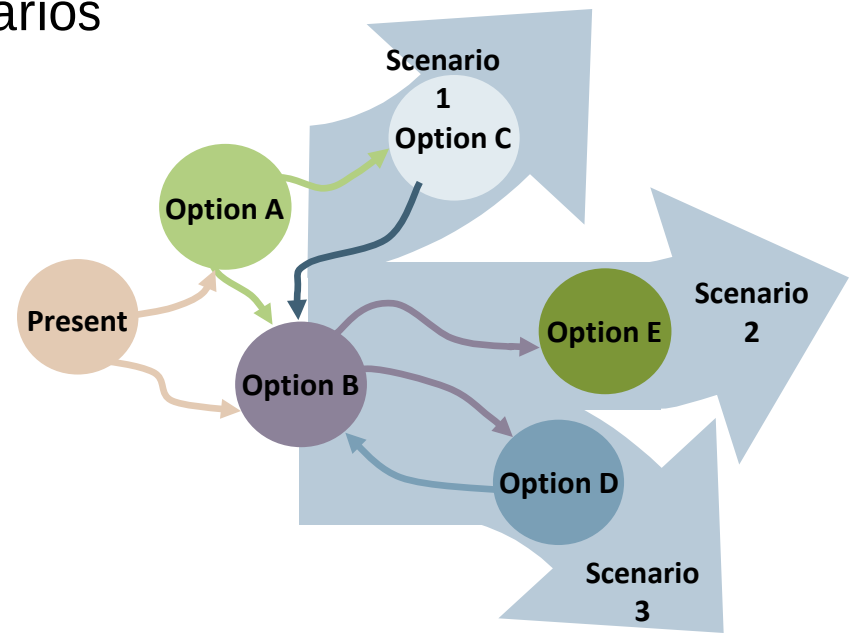


Final point:
**Journalist and scenario thinking in climate change
planning – Imagination is more important than
knowledge**

Journalist and scenario thinking in climate change planning

Journalist as actor in climate change adaptation planning

- At initial point – challenge with question **“What if”**, then gives the problem to scientist / policy maker to work on
- Be part of story development – scenarios planning
 - Look at changing society and provide consequences to form future society context for adaptation planning
- At the end – evaluate consequences of adaptation options under different socio-economic scenarios



Thank you



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