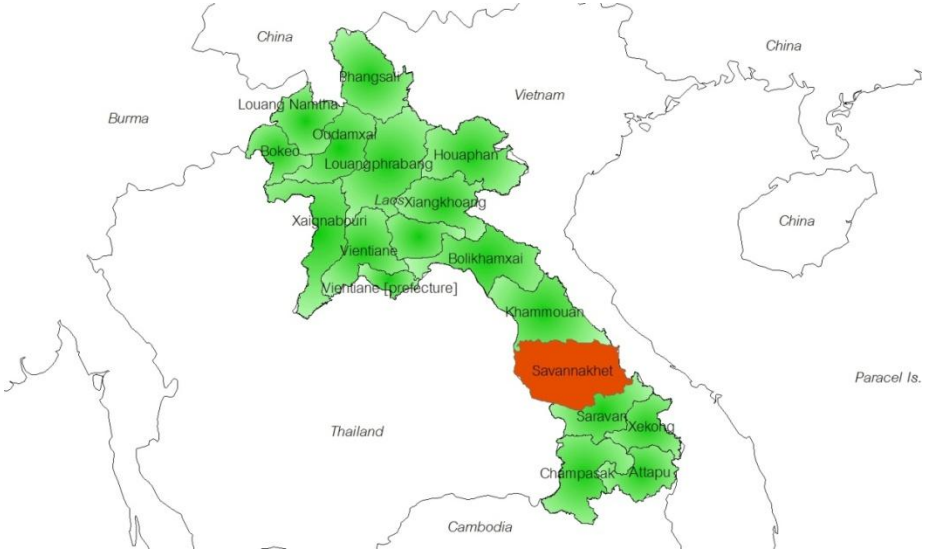
Southeast Asia START Regional Center

IHDP · IGBP · WCRP

Rapid Assessment on Climate Change Risk
CCAI pilot site: Champhone, Savannakhet, Lao PDR



Session 1: Background and introduction to climate change risk assessment

Southeast Asia START Regional Center

Rapid Assessment on Climate Change Risk
CCAI pilot site: Champone, Savannakhet, Lao PDR

Objectives

- Understanding on climate change and risk assessment concept
- Understand climate change scenarios for Lao PDR
- Set indicators for climate risk at the study site
- Practice exercise on using data from climate change scenario in risk assessment
- Practice exercise on using data from future hydrological change in risk assessment
- Prepare risk map for CCAI pilot site

How to conduct climate change risk assessment with limited dataset

Area-based climate change risk assessment for Climate change adaptation

Forewords:

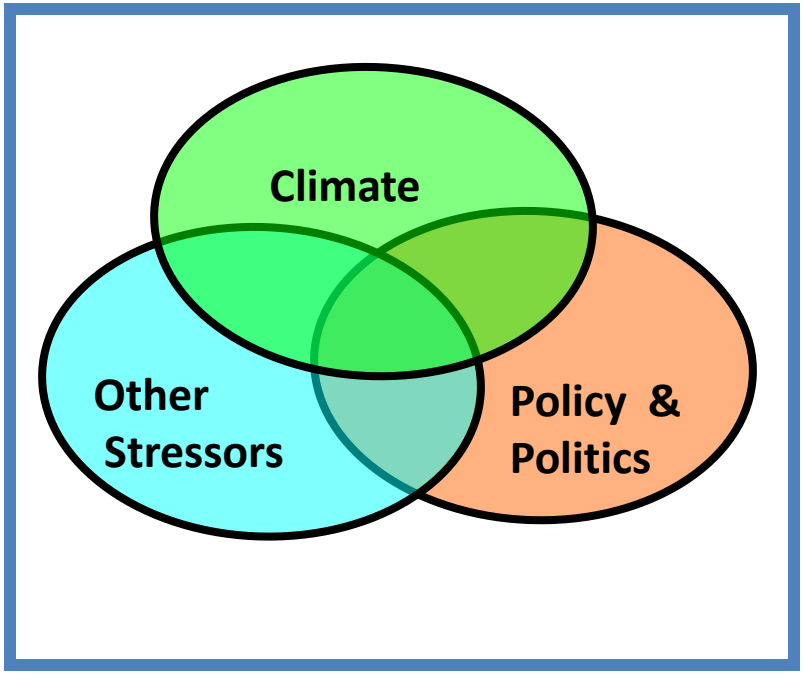
- Conventional climate change impact assessment and adaptation planning is based on sector by sector approach
- Climate change impact, vulnerability and adaptation are place and time specific
- Climate change cannot be taken as isolation issue from other issues in the area
- Adaptation is about the people and society is much more dynamic than change in climate system

Being prepared for climate change : If adaptation is the answer, what is the question?

How should we plan for adaptation?

Issues of concern:

- **Climate is one input among many**
- **Multiple stressors**
- **Multiple Stakeholders**



Milind Kandlikar
Institute for Resources, Environment and Sustainability, University of British Columbia

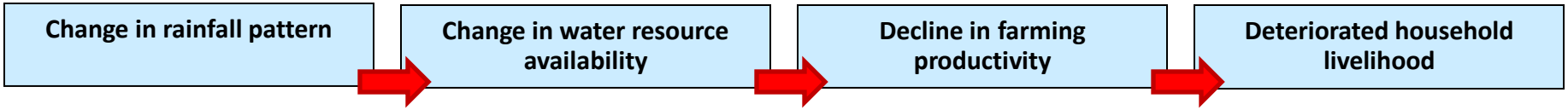
Ambuj Sagar
John F. Kennedy School of Government, Harvard University

Southeast Asia START Regional Center
IHDP · IGBP · WCRP

Synergies Between Ecosystem and Community Livelihood: Climate Change Adaptation in Context of Sustainable Development

Climate change adaptation context:

- Holistic view on climate change adaptation crucial to cope with complexity of the linkage between community livelihood and ecosystem
  - Climate change impact causes chain of consequences – from bio-physical to human livelihood



  - Dependency of community livelihood on ecosystem integrity
  - Response of each sector to change will have consequences on others sectors and systems
  - Multiple aspects of adaptation: infrastructure, alternate livelihood, new practice, institutional arrangement, etc. – not necessary action, but long-term strategy.

Area-based climate change risk assessment for Climate change adaptation

Context:

- Any area consists of various ecosystems and society
- Different systems and sectors expose to climate risk differently
- Different sectors response to climate risk differently
- However, all systems and sectors are interlinked and interact among themselves – physically, socially and economically

Issue of concerns:

- Not only climate change that influence systems and sectors to adapt to change, but also socio-economic change
- Socio-economic change is far more dynamic than climate change and affect interaction among sectors
- Response to changes may result in changing adaptive capacity of the systems and sectors

Key issue: Holistic view over the area

Southeast Asia START Regional Center
IHDP · IGBP · WCRP

Area-based climate change risk assessment for Climate change adaptation

Issues: What and Why?

- What is an "area"?
  - Depends on the focus of assessment
    - Watershed
    - Administrative boundary
    - Economic zone
    - etc.
- Impact of climate change will not be risk until it start affecting the systems and sectors
- Local context make risk different – over space and time

High change not necessary means high impact

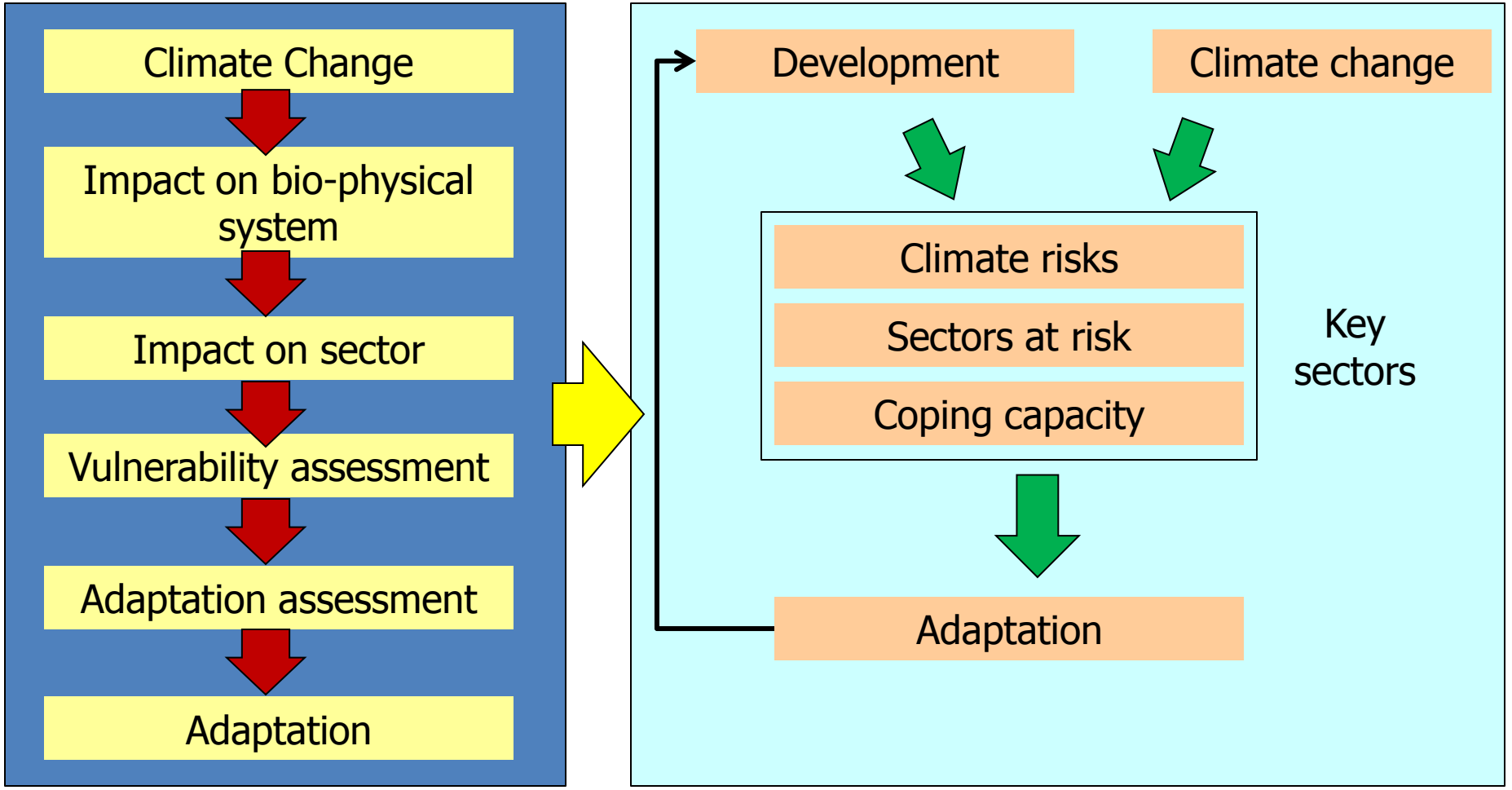
High impact not necessary means high risk

High risk not necessary means high vulnerability

Southeast Asia START Regional Center
IHDP · IGBP · WCRP

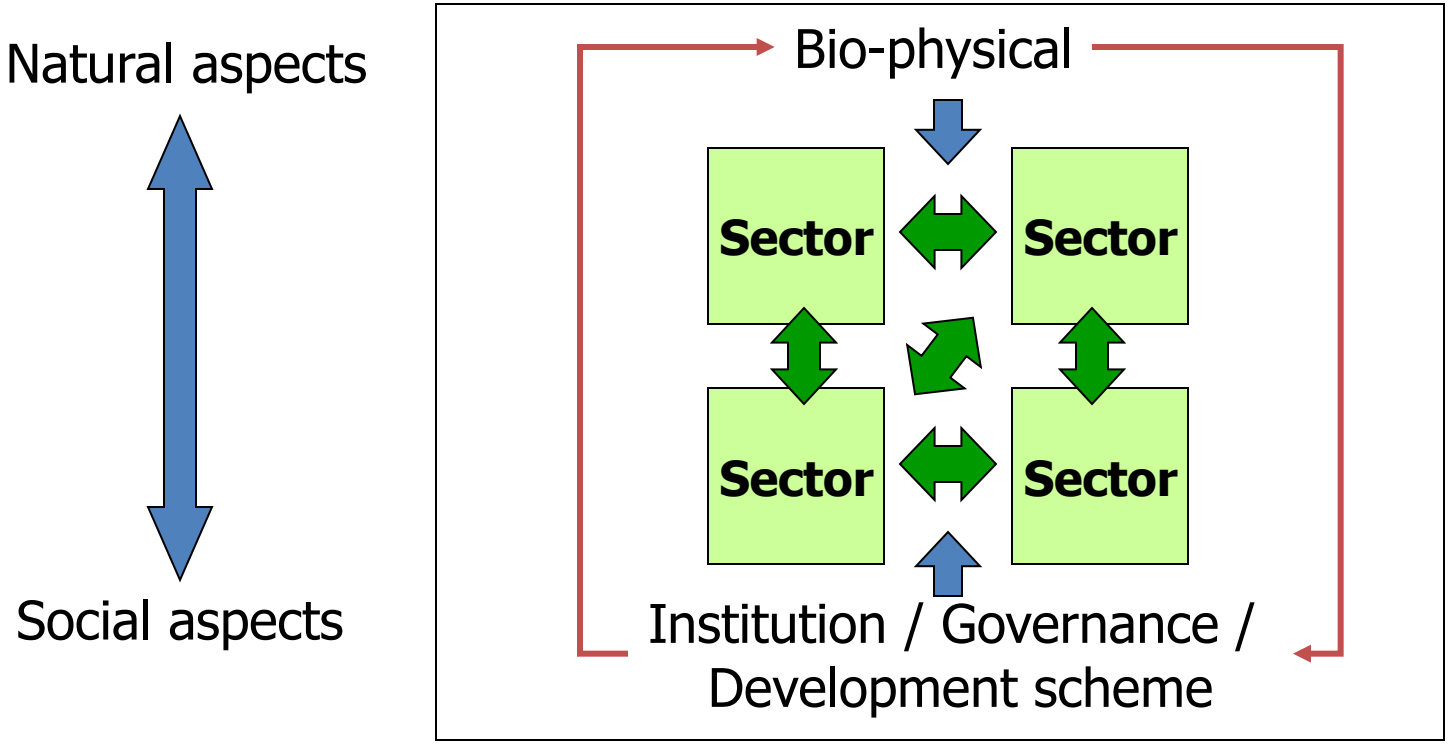
Area-based climate change risk assessment for Climate change adaptation

Framework on climate change adaptation assessment



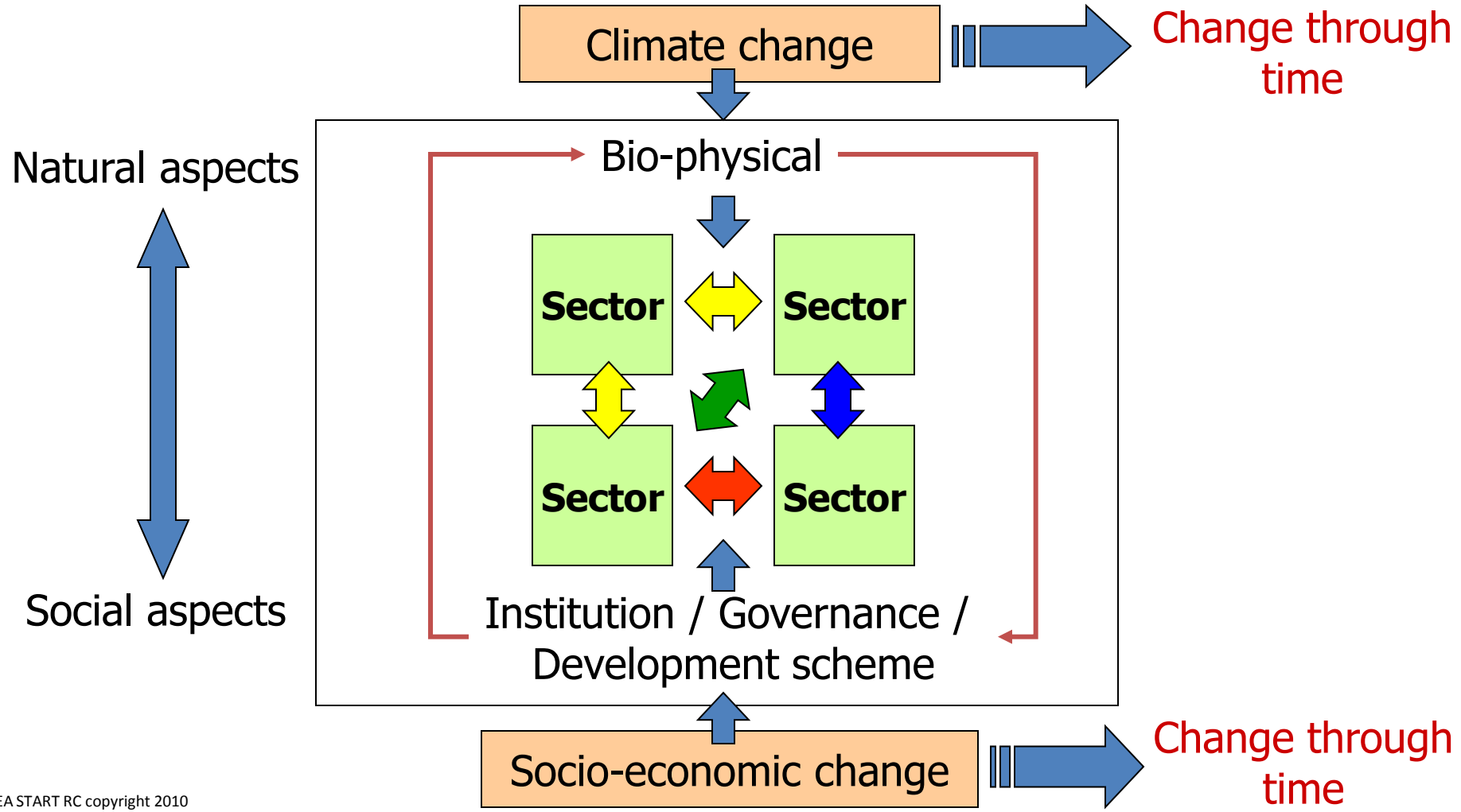
Area-based climate change risk assessment for Climate change adaptation

Holistic view on climate change impact, vulnerability and adaptation:
Area-based approach



Area-based climate change risk assessment for Climate change adaptation

Holistic view on climate change impact, vulnerability and adaptation:
Area-based approach



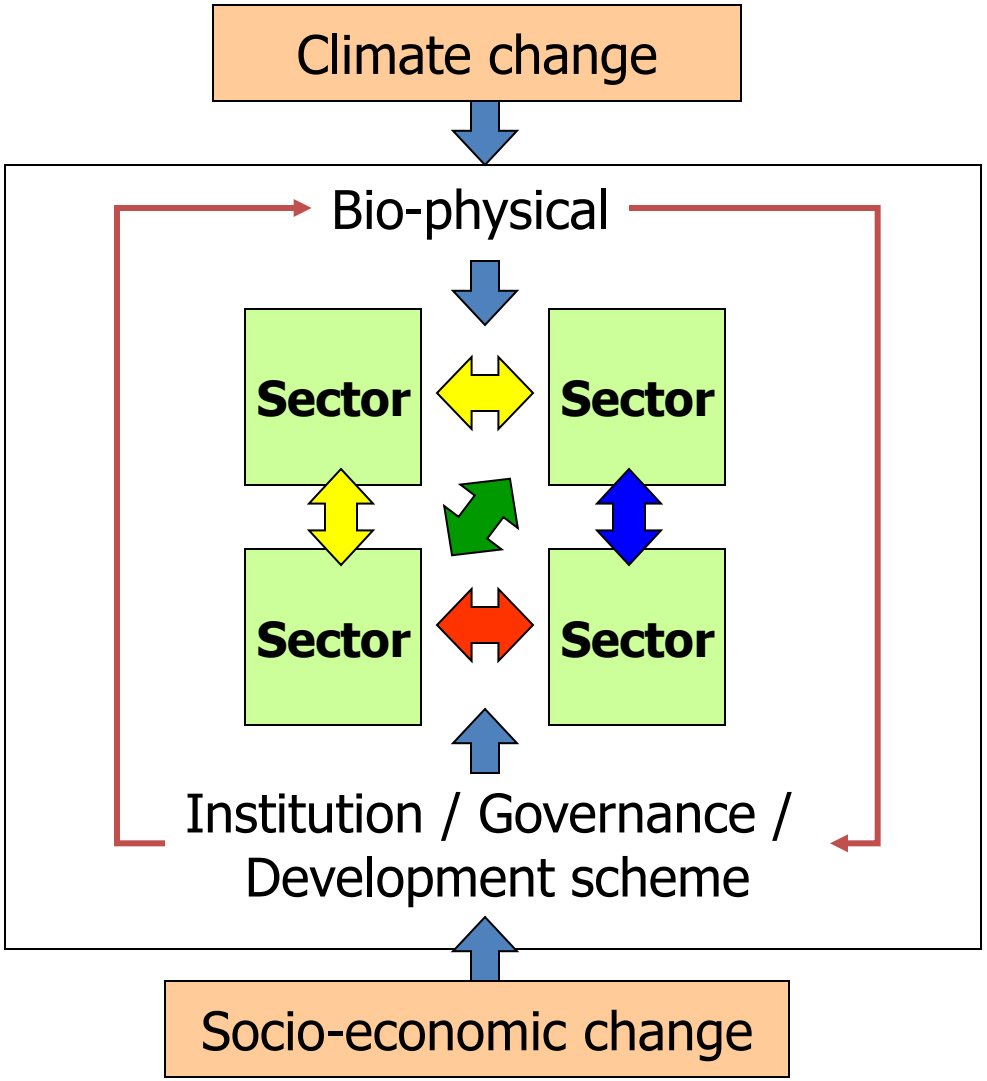
Area-based climate change risk assessment for Climate change adaptation

Shift and change in seasonality / rainfall distribution / etc.

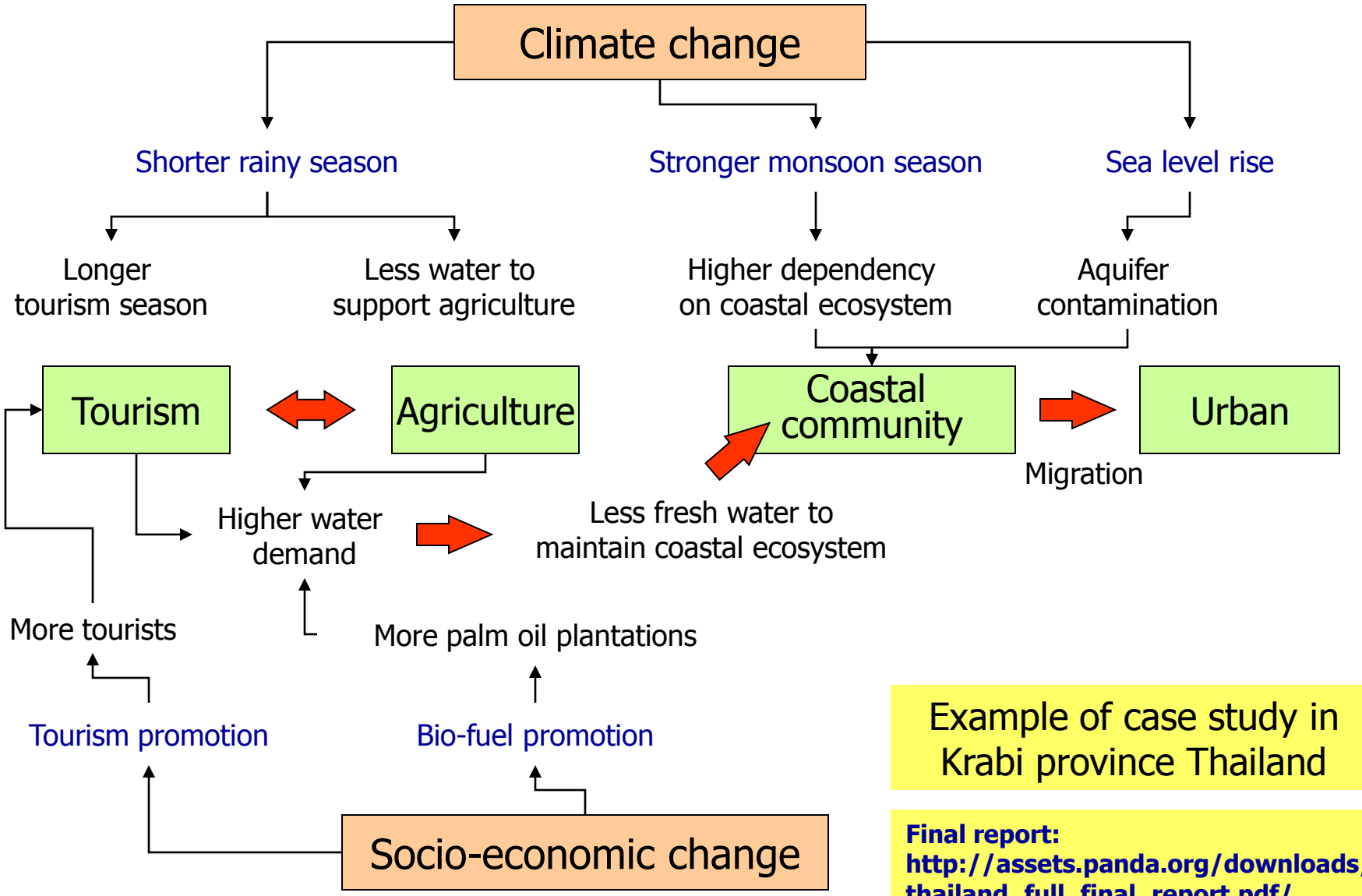
Coastal erosion / water resource / ecosystem integrity / Natural hazard / etc.

Agriculture / Fisheries / Forest ecosystem / Tourism / Urban / Etc.

Water allocation policy / market condition / migration / public infrastructure / etc.



Area-based climate change risk assessment for Climate change adaptation



Example of case study in Krabi province Thailand

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

Example of case study in Mekong River delta

External

- Upstream Dams
- Increasing irrigation land upstream - Cambodia

Internal

- Flood control infrastructure – Long Xuyen Project
- Illegal sand exploitation

Climate change

How climate change will affect?

Stresses

How will these change in the future?

- Less sediment form upstream
- Low Flow (Dry Season)
- Drought (No rain during dry Season)
- Flood
- Bank erosion

Sectors at risk

How will they be more or less at risk?

- Farmer – Own land - Aquaculture
- Farmer – Landless – Capture fishery
- Urban
- Transportation
- Ecosystem

Coping mechanism and capacity

What are coping mechanisms and how well they work?

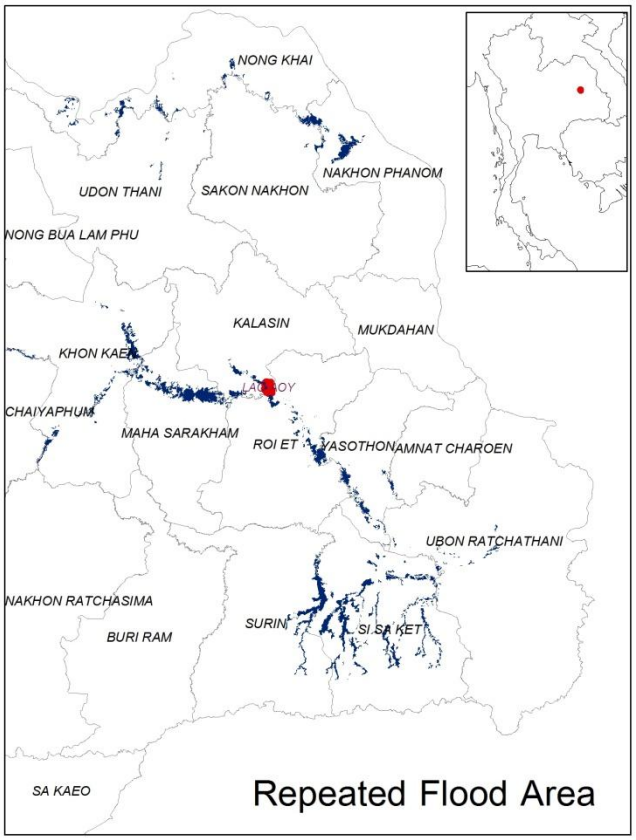
Can they still be effective in the future?

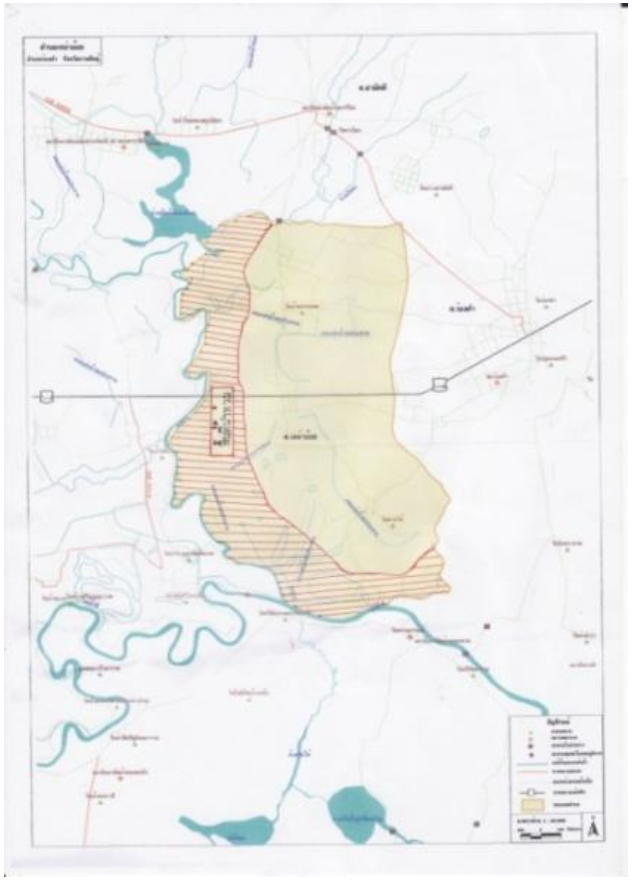
Southeast Asia START Regional Center
IHDP · IGBP · WCRP

Synergies Between Ecosystem and Community Livelihood: Climate Change Adaptation in Context of Sustainable Development

Climate Change Adaptation in Context of Sustainable Development

Case study at Lao-oi, Kalasin province - Thailand



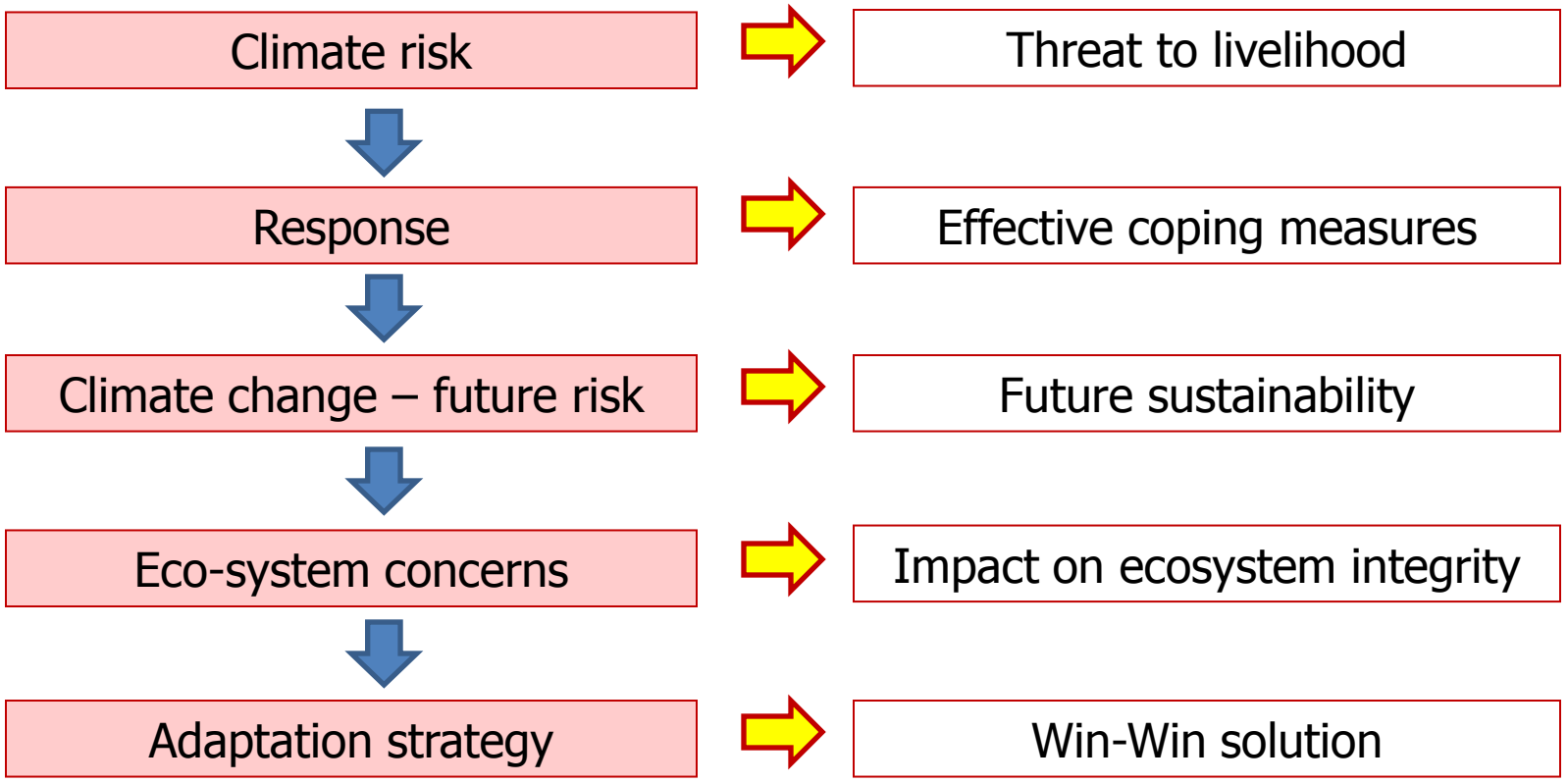


Southeast Asia START Regional Center
IHDP · IGBP · WCRP

Synergies Between Ecosystem and Community Livelihood: Climate Change Adaptation in Context of Sustainable Development

Case study at Lao-oi, Kalasin province - Thailand

Context & issue of concern



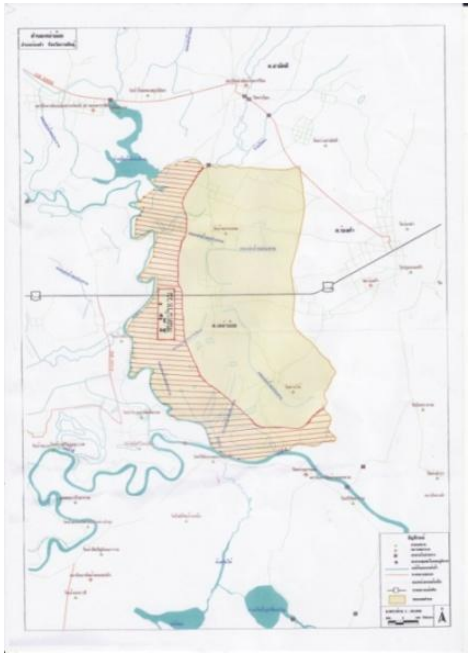
Southeast Asia START Regional Center
IHDP · IGBP · WCRP

Synergies Between Ecosystem and Community Livelihood: Climate Change Adaptation in Context of Sustainable Development

Case study at Lao-oi, Kalasin province - Thailand

Climate risk → Threat to livelihood

Frequent flood – destroy > 2/3 of rice production almost every year



Southeast Asia START Regional Center
IHDP · IGBP · WCRP

Synergies Between Ecosystem and Community Livelihood: Climate Change Adaptation in Context of Sustainable Development

Case study at Lao-oi, Kalasin province - Thailand

Response → Effective coping measures

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




Path leads to dead end?

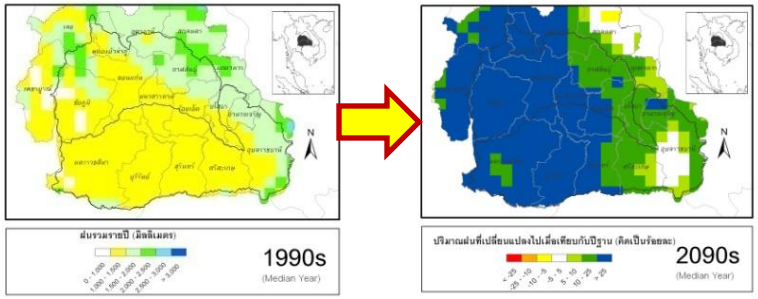
Southeast Asia START Regional Center
IHDP · IGBP · WCRP

Synergies Between Ecosystem and Community Livelihood: Climate Change Adaptation in Context of Sustainable Development

Case study at Lao-oi, Kalasin province - Thailand

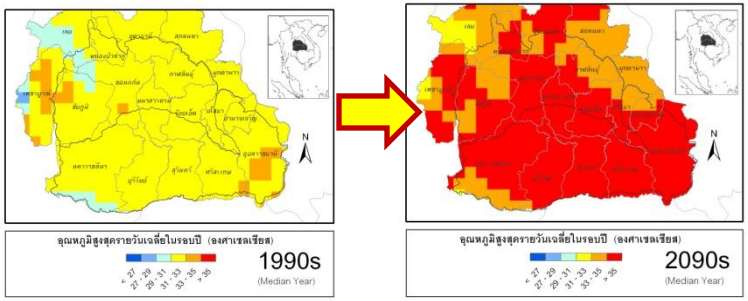
Climate change – future risk → Future sustainability?

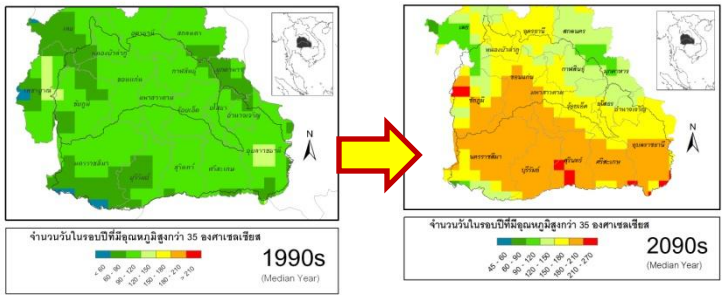
Warmer and longer summertime – reduced river flow whilst crop water demand could be higher to compensate higher evapotranspiration



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





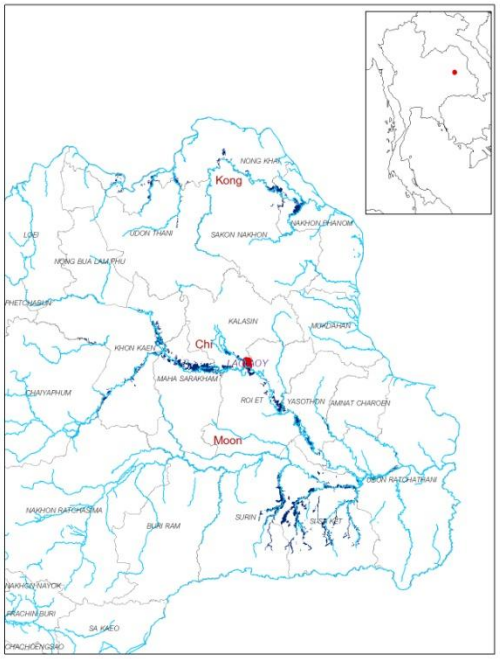
Southeast Asia START Regional Center
IHDP · IGBP · WCRP

Synergies Between Ecosystem and Community Livelihood: Climate Change Adaptation in Context of Sustainable Development

Case study at Lao-oi, Kalasin province - Thailand

Eco-system concerns → Impact on ecosystem integrity

Divert more water from river stream during dry season in the future – higher pressure to environmental flow and downstream ecosystem integrity



Southeast Asia START Regional Center
IHDP · IGBP · WCRP

Synergies Between Ecosystem and Community Livelihood: Climate Change Adaptation in Context of Sustainable Development

Case study at Lao-oi, Kalasin province - Thailand

Adaptation strategy → Win-Win solution

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

Area-based climate change risk assessment for Climate change adaptation

Key concern:

Holistic view on climate change impact, vulnerability and adaptation over space and time.

Avoid trans-boundary effect / mal-adaptation

Build resilience through multiple options

Challenge: How to harmonize adaptations of various sectors in the society?

Win-win solution VS Fair trade-off

Southeast Asia START Regional Center
IHDP · IGBP · WCRP

Area-based climate change risk assessment for Climate change adaptation

Tools and method:

- Mathematical model
- Spatial analysis
- Focus group discussion
- Etc.

Local stakeholder's perspective is key

Southeast Asia START Regional Center
IHDP · IGBP · WCRP

Area-based climate change risk assessment for Climate change adaptation

Final words:

- Climate change adaptation is long-term development strategic planning
- Various aspects of climate change adaptations

Multiple levels of adaptation:
Household / Community / Provincial / National / Regional

Multiple approaches of adaptation:
Individual / Collective

Multiple methods of adaptation:
Engineering / Institutional / Ways of life / etc.

Area-based climate change risk assessment for Climate change adaptation

Some examples of climate change adaptation as development strategy

Bangladesh:

- Community-based practice to survive in changing ecosystem condition – permanent flood (water logging)
- Adaptation at individual and household level – changing ways of life

Source: ACCCA project – http:www.acccaproject.org

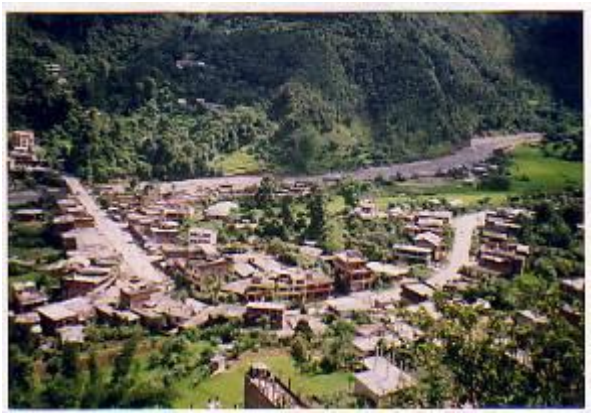
Southeast Asia START Regional Center
IHDP · IGBP · WCRP

Area-based climate change risk assessment for Climate change adaptation

Some examples of climate change adaptation as development strategy

Nepal:

- Micro-finance mechanism through special insurance scheme to cope with increasing flash-flood
- Adaptation through institutional arrangement



Source: ACCCA project – http:www.acccaproject.org

Area-based climate change risk assessment for Climate change adaptation

Some examples of climate change adaptation as development strategy

Mongolia:

- Risk communication at multiple levels
- To build common awareness that leads to policy framework to climate change adaptation
- Adaptation planning through local participatory

Well in the winter-spring pasture of the Ihburd herders' group

Source: ACCCA project – http:www.acccaproject.org

Southeast Asia START Regional Center

IHDP · IGBP · WCRP

Thank you