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Impact Assessment Studies & Regional Climate Change Scenarios Data Requirements in Vietnam. A CPIS Project as an example

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Outline

- Climate Change Impact Assessment study in Vietnam
- An Example: CPIS Project
- Regional Climate Change Scenarios Data Requirements for Impact Assessment
- Summary

Climate Change Impact Assessment study in Vietnam





Study on the Impacts of Climate Change

- Climate change will lead to changes in (will impact on) geophysical, biological and socio-economic systems
- But the manifestation of CC impacts may not always be revealed:
 - The same impact (force): Some objects can be affected (consequences), but other might not be
- To assess CC impacts, it is appropriate to use the concept of vulnerability
- "Vulnerability to CC is the degree to which these systems are susceptible to, and unable to cope with, adverse impacts"

Vulnerability

V = f(E, S, AC) = Function of (Exposure, Sensitivity, and Adaptive Capacity)

Exposure (E) \rightarrow Sensitivity (S) \rightarrow Values

(To impacts)

Adaptive Capacity (AC) (Inherent and by Human intervention)

- Exposure: Extrinsic Atmospheric changes
- Sensitivity: Intrinsic How it can change in response to exposure
- Values: What we care about; what can be lost; etc
- Adaptive Capacity: Natural and via human intervention

 $\mathbf{E} \mathbf{x} \mathbf{S} / \mathbf{A}\mathbf{C} = \mathbf{V}$

Vulnerability

V = f(PI, AC) = Function of (Potential Impact, and Adaptive Capacity)



Potential Impact – Adaptive Capacity = Vulnerability

Steps of Vulnerability Assessment

- Identify values
- Assess Exposure
- Evaluate the sensitivity of identified values

Potential Impact

- Evaluate and Categorize Vulnerability
- Set Priorities for Adaptive Responses
- Critique the Assessment

An Example: CPIS Project

Climate Change-Induced Water Disaster and Participatory Information System for Vulnerability Reduction in North Central Vietnam (CPIS) (2012-2015, Funded by Danida)

Objectives

- To assess impacts of Climate Change (CC) on Water Disaster (WD) and consequently on aquaculture and agriculture in the Nghe An, Ha Tinh and Quang Binh (NHQ) regions
- To develop an integrative working model of scientists, policy/decision makers and local community representatives for indigenous and scientific knowledge integration
- To establish a Participatory Information System for scientific research, decision making processes and local community needs in Vulnerability Reduction and to support the capacity of local authorities and communities in applying the technology



To develop human resources for applied research in the field of CC adaptation

Approaches

- Using a multi-scale approach, in addition to the content that will be deployed on the provincial level scale, the project will point out three districts of the three provinces as pilot research sites
- The communes in each district are selected for more detailed studies and sociological surveys (at village level) on the basis of representativeness for Coastal and Low Land Areas (CLLA) in terms of combination of livelihoods, WD impacts and coping strategies









Awareness of local community on Natural Disasters



Frequency (%) of local people in Vo Ninh know about the occurrence of Natural Disaster

Impacts of Water Disasters on Agriculture



Frequency (%) of local people in Vo Ninh found the Impacts of WD on Agriculture

Vulnerability Assessment

To assess the vulnerability we have to evaluate: V = f(E, S, AC) OR V = f(PI, AC)

- AC should be evaluated based on:
 - Human and Natural Capital
 - Physical and Social Capital
 - Capital Finance
- But ...
- How to quantify: *E*, *S*, *AC*, **OR** *PI*, *AC* ?
- These are ongoing ...

Regional Climate Change Scenarios Data Requirements for Impact Assessment (future impacts)

Vulnerability

V = f(E, S, AC) = Function of (Exposure, Sensitivity, and Adaptive Capacity)

Exposure (E) → Sensitivity (S) → Values (To impacts)

Adaptive Capacity (AC) (Inherent and by Human intervention)

- Exposure: Extrinsic Atmospheric changes
- Sensitivity: Intrinsic How it can change in response to exposure
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- Adaptive Capacity: Natural and via human intervention

$\mathbf{E} \mathbf{x} \mathbf{S} / \mathbf{AC} = \mathbf{V}$

Assess the Future Impacts

- To Identify the Exposures (Atmospheric changes):
 - Temperature and Rainfall, including extreme values
 - Heavy rainfall events
 - Cold Surges, Cold Spells
 - Heat wave, Hot Spells
 - Drought
 - Radiation
 - etc 🛞

Data Requirements

- Future Climate Projection
 - With High Resolution in both Time and Space
 - SRES, RCP scenarios
 - GCM data
 - Ownscaling Outputs from RCMs
- Simplify for end-users (Scoring)
- How many members (RCM's Outputs) we need?
- As much as possible!
- Why?







More models will reduce the uncertainty and get more confidence





- Due to the limitation of computer resources, it is difficult for developing countries to run all cases
- Regional Network is needed !

Expectation from SEARCI's Activity

- If 5 countries can run the model for climate projection
- Suppose that each country run 5 selected scenarios with
 4 physical options or 4 models (5 x 4 =20 members)
- The total is 5 countries x 20 members = 100 members
- These data will be shared and all countries in the region will be benefit

100 members: Better !



Summary

- For assessment of Climate Change Impacts, it is appropriate to use the concept of vulnerability
- For assessing vulnerability to Climate Change, it is necessary to identify the Exposure and its degree associated with Values (i.e what we care about)
- Future Climate Projection Data are required for this purpose
- To reduce the uncertanty and increase the confidence level in the results, we need as much outputs of Regional Climate Projections as possible.





Wish our International Team – SEARCI, successful collaboration.



Thank you very much.