

Approaches to Assessment of Impacts and Vulnerability to Climate Change and Adaptation Options¹

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Though people have already adopted measures to limit the negative effects of climate change, more extensive adaptation is required to reduce vulnerability to climate change. Hence, it is important to assess climate impact and vulnerability as well as the adaptation options employed to increase resilience.

There are generally two types of assessment that can be used to support climate change adaptation:

Climate impact and vulnerability assessment

involves the assessment of key changes in climate, climate change impact on different sectors, and vulnerability of livelihoods for strategic planning. Examples of outputs from the conduct of climate impact vulnerability assessment in agriculture include rainfall pattern, amount and area, frequency, intensity and duration of droughts and floods, soil erosion, and soil nutrient cycle.

Climate change adaptation options assessment deals with the assessment of effectiveness of different options in terms of suitability to a specific context. The

outcome of this assessment can be in terms of improved water availability from soil and water conservation efforts, improved crop yield with new varieties, or a change in farm management.

The assessment of climate change adaptation options builds on climate impact and vulnerability assessment. It examines the extent to which different adaptation measures may achieve adaptation goals. The result of assessment helps practitioners identify effective adaptation options.

Methods to Measure Vulnerability

Methods to measure vulnerability include dose-response models, integrated assessment models, scenario-based approaches, household surveys, case studies, and open-ended interviews. These



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methods can be categorized into experimental, modeling, meta-analysis, survey, and ethnographic.

Two Interpretations of Vulnerability

Moreover, there are two interpretations of vulnerability in the context of climate change.

1. **Outcome vulnerability** refers to the degree to which a system is susceptible to or unable to cope with the adverse effects of climate change. This includes climate variability and extremes and is characterized by the top-down approach.
2. **Contextual vulnerability**, on the contrary, is characterized by the bottom-up approach. In this approach, vulnerability of social and ecological systems is determined by multiple factors and processes, and climate change is treated as one of the threats. This is an emerging concept in climate change work.

Designing Climate Impact and Vulnerability Assessment

Since climate impact and vulnerability assessments support decision-making processes, they should take into account the following key considerations:

- Literature review of the various methodologies available in vulnerability assessment
- Identification of stakeholders such as policy makers and communities
- Assessment of information needs of stakeholders
- Evaluation of role and capacity of stakeholders
- Design of assessments, including agreement of adaptation objectives by stakeholders

In designing an effective vulnerability assessment, establishing the goal and objectives of adaptation is also essential. The description of the goals of adaptation should be a collaborative

endeavor engaging the participation of the different stakeholders.

Essentially, the design of the vulnerability impact assessment is guided by the following questions:

- What is the target sector?
- What is the temporal scale? (*The next few years to a hundred years?*)
- What is the spatial extent? (*National, subnational, local community, or household?*)
- What is the spatial resolution? (*Meters, kilometers, hundreds of kilometers, individuals, households, community, farm, or watershed?*)
- Should simple or complex or more advanced tools be used?

More importantly, Climate Change offices should assist the government at the national and local levels in institutionalizing efforts of assessing vulnerability, impact, and adaptation in the short- and long-term planning issues on disaster risk reduction and climate change adaptation.

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Detailed content can be found in: FAO. 2013. Climate-Smart Agriculture Sourcebook. <http://www.fao.org/climatechange/en/>

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