

Vulnerability Assessment

Relevance	
Mitigation	
Resilience	✓
Forests	

Applicable Project Phase(s)	
Ex-ante / prospective	✓
Design	✓
Mid-course	✓
At End	
Ex-post / retrospective	

Other	
Cost	Low
Level of Effort	Low to Medium
Quantitative or Qualitative	Qualitative or Mixed
Special technology needed?	No

What it is

Vulnerability to climate change is the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes.¹ Vulnerability assessment is conducted to assess trends in a population's or geographic area's exposure and vulnerability to climate change.² Some vulnerability assessments cover expected impacts, risks, *and the adaptive capacity* of a region or sector to the effects of climate change. For the purposes of this overview, vulnerability assessment is considered separate from adaptive capacity assessment. A quantitative "top-down" vulnerability assessment may be used in developing climate change adaptation policies at the international, national, sub-national, or sectoral levels. A qualitative or mixed-methods "bottom-up" vulnerability assessment approach can be used to assess the social vulnerability of communities while considering adaptation options at a smaller scale.

Value Added for Climate Change Context

A robust vulnerability assessment will show logical links between development indicators and specific climate risks, so that decision makers and other stakeholders recognize the relationship between climate change, risk, and development indicators.

Suitable Circumstances

Vulnerability assessment is suitable when it is unclear how vulnerable a population (human or other) is to climate change, and whether to invest in building adaptation/resilience based on the extent of vulnerability.³

Relationship to Mitigation, Resilience, and/or Forest Investments

Vulnerability assessment is most often used for development programs generally and, in the context of climate change, for adaptation and resilience⁴ programming; however, it can also be used for forest investments where consideration is given to vulnerable forest communities and ecosystems. It can inform where and how to invest in these kinds of programs. It is not generally related to mitigation projects other than those in the forest sector that have co-benefits related to vulnerable populations (human or otherwise).

Types of Questions this Approach Could Address

- What are current and future climate change threats?
- What are the stressors and underlying processes related to these threats?
- What is the sensitivity to the projected hazards and perturbations? How will sectors/communities/populations be affected by these hazards and perturbations?
- Are there current socio-economic trends that interact with these sensitivities (and run the risk of amplifying them)? How will society be able to cope with and manage these changes?

¹ IPCC's [Working Group II: Impacts, Adaptation and Vulnerability](#).

² "Vulnerability" may be defined in various ways. UNDP and GIZ describe vulnerability as a function of exposure to climate hazards and perturbations, sensitivity, and adaptive capacity (UNDP 2011).

³ [Bünner \(2013\)](#) lists the following reasons for conducting VAs: "Internationally, VAs are often used for comparing vulnerabilities of countries, often in form of vulnerability indicators"; "At national level, VAs support the setting of development priorities and ... preparing Adaptation Strategies [such as] NAPAs"; "VAs on a sectoral level assist in setting strategic targets in development planning. At local level, VAs are used for developing local adaptation strategies or for mainstreaming adaptation into existing district or community plans. They are often the first step to be realized before designing and implementing an adaptation project."

⁴ The term "resilience" here is intended to encompass and go beyond adaptation.

- How do stakeholders conceive of systemic effects of climate change?
- Which vulnerability-decreasing strategies may be used to reduce risk? What is the priority of strategies?

When the Approach can be Implemented

Vulnerability assessments are usually conducted at the ex-ante stage; however they could be conducted later to assess changes in vulnerability over time particularly after building adaptation/resilience capacity.

Limitations

There are multiple uncertainties associated with vulnerability assessments; including uncertainties surrounding when and how climate change will occur, and the large number of other variables (socio economic and other) that can affect a population's vulnerability. Advanced modeling can help to reduce uncertainties but still will have a margin of error that is hard to test against real-world data.

Methods

- Using global or national climate change projections and scaling down to the area of study, “top-down” vulnerability assessment uses such quantitative methods as meta-analysis of indicators, data mining, and empirical modeling to analyze expected climate change, the physical science of climate change, and biophysical vulnerability.
- “Bottom-up” vulnerability assessment uses extant quantitative data to predict effects of climate change. The process of gathering information on communities' vulnerability uses such qualitative methods as participatory rural appraisal (PRA), focus groups, oral histories, cognitive mapping, other participant action tools and social-vulnerability modeling tools.
- CIFOR has modeled methods and tools to evaluate deal the vulnerability of “coupled socio-ecological systems.” These methods combine quantitative modeling of climate change, scaled down to the appropriate local level, with qualitative evaluation of communities' and sectors' vulnerability. (See references and links below.)

Challenges that Might Arise in Climate Change

Challenges may include high levels of uncertainty, lack of access to key stakeholders, and significant investments needs to build a knowledge base and other types of capacities within vulnerable populations.

Where this Approach has been Used

- CIFOR has conducted mixed-method vulnerability assessments of forest ecosystems and forest-dependent communities and sectors in Cameroon, Ghana, and Burkina Faso. (See links below.)
- [GIZ](#) has conducted local-level “bottom-up” vulnerability assessments in at least five countries.
- UK's Climate Change Risk Assessment (CCRA) is conducted every five years to identify the likelihood of 100 major risks from climate change, scale of potential consequences, and urgency to address them. See of website of [UK's Adaptation Sub-Committee](#).
- The [Congo Project](#) used a “top-down” VA approach to evaluate the Congo River Basin's vulnerability.

Where to Learn More

- CARE (2009) [*Climate Vulnerability and Capacity Analysis \(CVCA\): Handbook*](#).
- [Center for International Forestry Research](#) (CIFOR). See in particular, Locatelli, B., et al. (2008) [*Methods and Tools for Assessing the Vulnerability of Forests and People to Climate Change: An introduction*](#) and Nkem, J., et al. (2007) [*Methodological Framework for Vulnerability Assessment of Climate Change Impacts on Forest-Based Development Sectors*](#).