

# Assessing and Monitoring Climate Vulnerability

## Application and Relevance of Vulnerability Assessments

Reducing vulnerability to climate change is one of the central objectives of German development cooperation. In this context, Vulnerability Assessments (VAs) serve as a tool to identify regions, populations, ecosystems and economic activities that are highly vulnerable to the impacts of climate change. By providing information on climate change hotspots VAs support the allocation of resources and decision-making for adaptation and development planning. Accordingly, VAs gained importance over the past years and are widely used among the adaptation community.

As the volume of adaptation finance increases, the need for instruments that effectively monitor and evaluate (M&E) the progress of adaptation efforts, is growing alike. In this context, VAs serve an additional objective: Repeated VAs contribute to M&E by measuring vulnerability reduction of the system of interest over time. Against this background, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), commissioned the development of a *Climate Change Vulnerability Sourcebook*, which is expected to be finalized in March 2014.

## The Climate Change Vulnerability Sourcebook: What for?

The Sourcebook not only provides guidance for the standardized implementation of VAs in different regional or climatic contexts, but it also comprises a consistent approach on how to operationalize the concept of vulnerability assessments for M&E of adaptation. The detailed guidelines for implementing the framework are structured along eight Modules, which consist of specific tasks that are briefly described in the next section.

The guidelines help the user of the Sourcebook to choose the best methodology for conducting a VA – depending on the VA's specific context (e.g. objectives, scope and given resources). The annex provides additional material, like practical tools, formats, and exemplary results of VAs, based on pilot applications in Mozambique and Bolivia. This strong link to reality-tested results (e.g. in form of sample indicator lists, methodological factsheets and sample impact chains) makes the Sourcebook one step ahead to other approaches or guidelines. Key questions guide through the implementation process, so that it is easily replicable in other partner countries.

## The eight Modules of implementing VAs

As the Sourcebook is still at the development stage, its approach is constantly improved based on the results of the on-going test-applications. Hence, further changes in methods or proceeding are possible.

### 1. Module: Preparing the VA

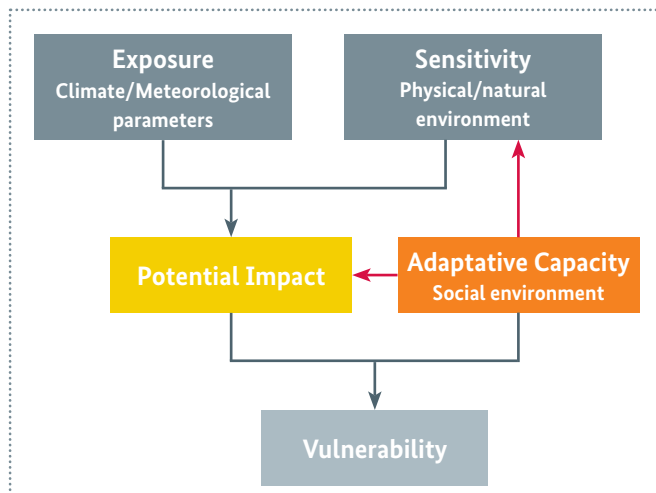
The VA is prepared by analyzing the specific context with regard to its purpose and objectives and the resources available for the assessment. Then, thematic scope, spatial scale (community, sub-national or national) and time-frame (medium-, long-term) of the assessment have to be defined.

### 2. Module: Developing Impact Chains

Impact chains are one of the most important methods of the Sourcebook. They are used to systemize the factors that are assumed to influence the vulnerability of a system and visualize these cause-effect relationships. Hence, context-specific factors, that have an effect on the different vulnerability components (exposure, sensitivity, adaptive capacity), are identified in this module (Figure 1).



Figure 1: The Conceptual Structure of an Impact Chain.



The visualized impact chains help to recognize relevant links between the factors involved and they also give first hints on potential adaptation measures, which either decrease sensitivity or increase adaptive capacity in order to reduce overall vulnerability.

The quantification of vulnerability builds the basis for M&E of adaptation by tracking changes over time. This approach can be applied for project-level M&E, as well as for M&E on the national or other aggregated levels.

Source: adelphi/EURAC 2013

### 3. Module: Selecting Methods to Assess Vulnerability Components

Selected identified vulnerability factors in various impact chains have to be quantified, in order to assess the magnitude of vulnerability. The quantification can, for example, be based on existing data sets or expert opinions, as well as on proxy indicators or relevant models, such as a hydrological model, describing several factors.

### 4. Module: Data Management

The necessary data or information needs to be collected and prepared for the assessment. The process includes data acquisition, data quality checks and data normalization (i.e. the transfer of indicators to a common scale or unit).

### 5. Module: Weighting and Aggregation of Data

The different vulnerability components from the system's impact chain have to be weighed in their influence (equal or small to large) on the magnitude of vulnerability. The identified indicators (Modul 2+3) already have a high value of information by themselves, but to determine the overall magnitude of vulnerability, they have to be aggregated to the different vulnerability components. On that basis, the relationship between them can be quantified:

$$\text{Vulnerability} = \text{Impact (Sensitivity + Exposure) - Adaptive Capacity}$$

### 6. Module: Presentation of VA Outcomes

The VA's results can be presented in different forms of outputs (vulnerability maps, charts, matrices, etc.). Their choice depends on the objective of the VA and the kind of data used for the VA.

### 7. Module: Developing Recommendations for Adaptation

Based on the knowledge gained during the process regarding the developed impact chains and the results of the VA, recommendations for adaptation can be formulated. Depending on the VA's level of detail, concrete adaptation measures or rather intervention areas for adaptation can be defined.

### 8. Module: Applying the Baseline VA for M&E of Adaptation

Module 8 will comprise detailed guidelines for applying the baseline of the VA for the M&E of adaptation. For conducting repetitive VAs correctly, it is important to apply exactly the same approach to identify changes over time.

## Project Partners

### Adelphi Consult GmbH, Berlin

Adelphi Consult is a leading think tank for policy analysis and strategy consulting in the field of global environment and development challenges for policy, business and civil society communities.

### EURAC research, Bozen

EURAC is an innovative research centre focusing on interdisciplinary projects in the research areas of autonomies, mountains, health and technologies in order to provide relevant and sustainable results.

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