Notes on Dagmar's Introduction to the Vulnerability concept (15-9)

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Introduction to the Vulnerability concept

The general aim of Vulnerability Assessments is to inform decision makers and stakeholders about the options for adapting to the effects of global change. Vulnerability can be defined as the likelihood of a system to experience harm due to exposure to perturbation. A Vulnerability Assessment allows for causal analysis of human-environment systems where regions and scenarios can be compared in a transparent way for both scientists and non-scientists. Success is measured by both scientific validity and usefulness to stakeholders.

It is generally recognized in the Global Change community that Vulnerability (V) is a function of three components: Exposure (E), Sensitivity (S) and Adaptive Capacity (AC). So V=f(E, S, AC). These terms will be defined and explained below.

Exposure: The nature and degree to which human-environment systems are exposed to environmental change.
Exposure consists of multiple stresses, both direct and indirect and, endogenous and exogenous. When quantifying exposure the degree and rate of change and variation as well as severity and frequency of extreme events are important. Examples of drivers of exposure are atmospheric composition, climate change, land-use change, and socio-economic change.

Sensitivity: The degree to which a human-environment system is affected, either adversely or beneficially, by environmental change.
An example of the sensitivity of a human-environment system is a farming-system where yield differs under different exposures. For Vulnerability Assessments it is necessary to assess vulnerability for multiple sectors, e.g. for agriculture, forestry, biodiversity, human health. Ecosystem models can be used to assess sensitivity under global change scenarios.

Adaptive Capacity: The ability to implement planned adaptation measures. Different actors will have a different ability to adapt, based on knowledge, will and power. Quantifying these difference in adaptive capacity is difficult. Within ATEAM a top-down approach is used based on socio-economic indicators. Note: autonomous adaptation by the human-environment system is NOT part of AC, it is mostly included in ecosystem models.

Stakeholder dialogue is important as a reality-check and for social-learning. Stakeholder dialogue will be further discussed in Anne de la Vega's lecture.

The 8 step approach to Vulnerability Assessment

An 8-step approach has been developed for setting up a Vulnerability Assessment. Continuous stakeholder dialogue and an interdisciplinary team of scientists are important requirements. These steps should not necessarily be taken sequentially, but form a useful guideline.

1. Define the study area together with stakeholders.
2. Get to know the place over time. Much that is important does no exist in written from.
3. Hypothesize who is vulnerable to what. Transparency and a clear focus are important.
4. Develop a causal model of vulnerability.
5. Find indicators for the elements of vulnerability
6. Operationalize models of vulnerability
7. Project future vulnerability
8. Communicate vulnerability creatively.