Integrating vulnerability indicators from natural and social science
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What are indicators?

Indicators are measures which quantify one or more properties of a system. Indicators are very important in the policy making process Researchers use indicators in their studies. Finally assessment studies bridge research and monitoring by using long-term indicators (as a measure of policy targets). However there are problems with indicators as real data is messy and often chaotic. Criteria of indicators are that they are representative for the attributes they characterize, easy to communicate, acceptable for a broader audience, sensitive to change, reliable track changes, that they are measurable, monitorable, and testable.
The DPSIR framework was very often used to develop indicators although there are problems with the acknowledgement of systemic behavior.

From the objectives of the conventions to indicators

UN-FCCC: "…**dangerous** anthropogenic interference with the climate system…" But what is dangerous? Three issues were emphasized by stating that a certain level should be achieved within a time frame sufficient 1) to allow ecosystems to adapt, 2) ensure that food production is not threatened, and economic development is sustainable. IPCC then developed indicators for these three issues.
CBD: "…conserve biodiversity…sustainable use….fair and equitable sharing of the benefits…" WSSD (World summit on sustainable development). "…to significantly reduce the decline of biodiversity by 2010." The interpretation of "decline" can lead to different targets and thus is basically a politic decision (e.g. the EU interpretation is "The halt of the loss of biodiversity").

"Safe landing" indicators

The science-policy dialogue in FCCC as an example. Possibility to link long term protection goals with short term targets. Long-term goals were set by global models, which lead into a parsimonious model called KAYA identity. Then a series of indicators were developed (e.g. rate of temperature change) which show opportunities for decision making in a very simple way. This model was then used for the KYOTO negotiations.

The IPCC-TAR vulnerability synthesis

One issue was to answer what constitutes "danger"? 5 Reasons for concern about what may be dangerous with regard to temperature increase: unique and threatened systems (coral reefs, alpine ecosystem, small islands, etc.), extreme weather events (droughts, floods, etc.), distribution of impacts (regional differences), aggregate impacts (net positive or negative impact, see below), etc.. The synthesis explicitly used observed changes which could be linked to existing climate change ("fingerprints of climate change").

Aggregated indicators

One way is the vulnerability concept (exposure, sensitivity, adaptive capacity). Adaptive capacity is a function of awareness (equality, knowledge, etc.), ability (technology) and action (flexibility). To find indicators for all the subissues is often pragmatic and mostly top down.