"The environmental dimension of human vulnerability – Results from Europe"

Presentation on Monday, 4 September of Dagmar Schröter, Marc Metzger and the ATEAM consortium

Dagmar Schröter presented a method to evaluate the European Union vulnerability face to the global change of the ecosystems services supply. An ecosystem service is a service provided by the ecosystem and participating to the human well-being. Impacts of these changes can be direct (storms, earthquake…) or indirect (decline of the pollination services,...). The vulnerability is measured as the difference between potential impact on the welfare and the response of the society to the problem. The methodology proposed by Dagmar Schröter is 1) to generate multiple scenarios of global change for CO_2, climate, socio-economic, land use and N deposition; 2) to define indicators of the different sector; 3) aggregation of the indicators; 4) design European maps of vulnerability.
The important part of the study is the collection and the validation of the data. This part depends on the dialogue between stakeholders (private sector, NGO and policy maker) and scientists. The scenarios are based on the SRES narrative A1, A2, B1 and B2 where A and B stand for the spatial scale (respectively international and regional) and 1 and 2 for the policy adopted by the stakeholder (respectively environment- and economy-friendly). The area under investigation is the European Union (of 2004) plus Norway and Switzerland.
The next step is to use these scenarios to investigate the evolution of the following sector: agriculture, forestry, carbon storage, water, biodiversity and mountains.

- Thus for agriculture, the scenarios show that grasslands and croplands will decrease. On the contrary the land demand for bioenergy will increase. Some current agriculture area will be too hot and too dry to support agriculture.
- The forestry will increase in the socio-economic scenario and thus supply of wood will increase. But it will be a negative effect of climate change in certain regions of Europe. For instance, the risk of forest fire will increase.
- With the combined effect of landuse change and climate change, the scenarios show that carbon storage will decrease.
- The climate change effect shows, following the scenarios, that between 6 and 44 millions of people will live under severely limited water resources.
- In the mountains, the snow reliability with elevation of a reliable snow cover will rise from 1300 (current) to 1500-1700 m in 2080.
- Finally, biodiversity will increase especially in mountains and Mediterranean regions.

Adaptive capacities, i.e. the broader ability of a system to cope with change-related risks of the regions, and potential impacts of global changes are visually overlayed to assess the vulnerability of ecosystem services in Europe. Finally D. Schröter presented the ATEAM mapping tool, a digital atlas which encompasses about 3200 maps and many more summarising charts. Stakeholders can use this atlas to explore scenarios and run simple queries. In future this tool will probably be further developed by the European Environment Agency. It can be downloaded at www.pik-potsdam.de/ATEAM.

In the end she concluded that

- trends in European drivers differ from global trends (moderate or no population increase, small extent of urbanisation, increase in forest area, decreasing demand for agricultural land).
- for most ecosystem services A1FI produces the biggest negative impacts, and the B scenarios seem preferable.
- the four storylines help to explore, but do not contain our optimal future pathway.

- the Mediterranean and mountainous regions seem most vulnerable within Europe
- the development of adaptation strategies (e.g. reduced water use or soil preservation) can build on our assessment but requires further understanding of the interplay between stakeholders and their environment in the context of local, national, and EU-wide constraints and regulations.

Q: Did you follow up the integration of your results?
A: No. No money was left.

Q: Did you use scenarios of the Millenium Assessment?
A: They did not exist yet.

Q: How did you predict changes in landuse?
A: We used a combined approach based on interviews of stakeholders and predictions of technological changes.

Q: Is the atlas used as a tool?
A: We don't know exactly. Currently it is more useful as a tool for national decision makers. We set up a stakeholder meeting to present the tool. There we were told that it will be developed further but nothing happened. We think further development by the European Environment Agency is very important.

Q: Should there be a flexible management within or between countries?
A: A combination of both would be the best solution. Therefore, in comparison to NATURA 2000 which is very static, our atlas seems to be a good tool.

Q: Is your vulnerability approach a good one?
A: Many other do exist. We found a niche with our ecosystem service approach and did very little shortcuts in natural science. We have to enhance the linkage between social and natural sciences.

Q: Did you integrate small scale vulnerability studies?
A: No unified approach for contribution does exist for Europe. Therefore, our vulnerability study works only on larger scales, i.e. we have problems with stakeholders that operate on the local scale.

Q: Did you quantify uncertainties of your approach?
A: Our intention was not to predict the future. We wanted to implement a tool for discussion what might happen under different scenarios.

Q: Did you only consider impacts at the European scale?
A: Global effects are very important but were not taken into account. This linkage is lacking as for example unemployment in Thuringia is strongly affected by the world market.

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