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Clarity in Complexity

Conference Report:

2008 Berlin Conference on the Human Dimensions of Global Environmental Change

(http://web.fu-berlin.de/ffu/akumwelt/bc2008)

The 2008 Berlin Conference (22-23 February, Freie Universität Berlin) was the latest in a series European Conferences on human dimensions research. These conferences are endorsed by the IHDP (International Human Dimensions Programme on Global Environmental Change) and aim at integrating European research projects in order to assist in shaping a European research area in the field of the human dimensions of global environmental change.

Plenary and semi-plenary presentations are alternated with parallel panel sessions on various topics relating to earth system governance. This year's conference opened with a key note address by **Ottmar Edenhofer**, chief economist at the Potsdam Institute for Climate Impact Research. Edenhofer highlighted two recent landmarks in Climate Change Policy:

- The fourth IPCC report, which left no doubt that climate change is a reality and that it is very likely driven by human activity.

- The Stern Review Report on the Economics of Climate Change, which showed that ambitious emission reductions are both technologically feasible and economically affordable, under the important condition of international cooperation.

In his address, Edenhofer stressed the following points:

> If global mean temperatures rises above 5-6 °C compared to the pre-industrial level, the 'tipping-points' in the earth system will be activated;
> These tipping points include disturbance of the 'biological pump' (the ocean's ability to soak up atmospheric carbon dioxide), the collapse of the Amazonian forest, the change of the Indian monsoon dynamics and the instability of the Greenland and West Antarctic ice shields.
> Notably the role of carbon sinks (oceans, forests, soil) have been widely underestimated. E.g. between 2000 and 2005, 80% of emissions were accounted for by the declining efficiency of carbon sinks.
> To avoid large scale discontinuities, a global deal between industrialised and developing countries is needed.
> A major obstacle in achieving such a deal is that human wealth is historically associated with the accumulation of carbon debt. Therefore, developing countries are reluctant to sacrifice growth for climate protection (so are industrialised countries).
> Hence, the need to avoid trade-offs between climate protection and economic growth.
> Due to increasing oil prices, other options like renewables, but also 'coal to liquid', will become more competitive.
> The increasing coal use will put enormous pressure on international climate policies. Coal reserves are cheap and plentiful in China, India, Russia and the US. These

countries are unlikely to renounce their use. **Edenhofer**: "*Coal will become the biggest ecological problem in the 21st century*".
China and India will become the heaviest emitters in the future, but are also likely to suffer the hardest from climate change.
The time horizon of capital markets is another important risk factor. If capital markets have a long time horizon, learning technologies (renewables) will benefit from this. Capital markets with a short time horizon favour Carbon Capture and Storage.
In order to mitigate the risks of global climate change, we need to implement a carbon tax or an international emissions trading scheme. This would be based on the right for each citizen in the world to emit 2 ton emissions a year until 2050. Developing countries would benefit enormously from such a scheme.
We need to establish an Adaptation Fund to compensate developing countries for climate damages as well as an incentive scheme to avoid deforestation in Africa and South America.
In stead of making money transfers to governments, an international fund should be set up to provide micro-financing in these countries.

Germany's state Secretary for the environment**, Matthias Machnig,** concurred with many of the previous points and recommendations, in particular that China, Russia and India will only cooperate if western countries show responsibility and if we are able to show that emission-reduction can go hand in hand with economic growth.

Machnig pleaded for more market instruments that give environment a price, as well as finance mechanisms and technology transfers to developing countries.

He outlined an ambitious German agenda on climate protection, including a reduction target of 21% for 2012 and of 40% by 2020. In Machnig's view, Europe should become the most innovative region in renewables and resource efficiency: "*Looking at oil and gas prices, the most energy-efficient region will also be the most competitive one*".

The case for energy-efficiency and business-led solutions: Amory Lovins

In a very inspiring (and optimistic) final key note speech of the Conference, **Amory Lovins** (Rocky Mountain Institute) made a very strong case for energy efficiency:

There's a rapidly growing interest among US military and business leaders to get the US off oil. This realignment will drive other actors to invest in energy-efficient solutions. Examples:

- ⇒ Vehicles use 70% of US oil; integrating low mass & drag with advanced propulsion technologies would save up to 2/3 of energy, making cars safer (new carbon-composite crush structures can absorb 6-12 x as much energy as steel) but also simpler and cheaper to produce.
- ⇒ Pumps and fans use half of motor energy; motors use 3/5 of world electricity. Redesigning a standard industrial pumping loop cut its power from 70 to 5,3 KW, mainly by simple interventions like replacing thin, long, crooked pipes by fat, short, straight ones.

Solutions must not await global agreement. Example: Boeing's *787 Dreamliner*, which is 20% more fuel-efficient than comparable modern aircrafts, using 80% advanced composite by volume, 50% by mass.
Compared to traditional public policy instruments (taxes, subsidies and mandates), innovative policy tools like feebates and utility decoupling are more effective and politically attractive. Business coevolving with civil society is more dynamic and adaptive than public policy .

Lovins: *"The incorrect assumption that climate protection will be costly is the biggest obstacle to climate protection".*

This opinion was echoed by various participants in the round table which concluded the conference. As one panel member observed: *"The problem is not technology or the cost of technology, but resistance of governments and vested interests*." **Nick Ashford**: "*The challenge is political and structural, not intellectual".*

Nevertheless, **Nick Ashford** (MIT) challenged Lovins' optimistic view on business coevolving with civil society. Market incentives might push industries towards energy-efficient solutions, but won't be sufficient to solve other problem areas of earth system governance, like biodiversity, environmental degradation and the depletion of water resources. In our present economies, where markets are ruled by producer-created demand, public policies are held hostage by private interests and labour is substituted by capital, the possibilities for civil society to leverage sustainable policies are limited.

According to Ashford, a sustainable approach would need to involve the larger public by creating meaningful jobs, also for unskilled workers, while guaranteeing sufficient purchasing power. It would also require transdisciplinary expertise, "*as system changes cut across problem areas (competitiveness, environment, employment) and therefore also cut across sectors and firm divisions, as well as government departments and missions*".

Earth system governancefrom a practitioner's point of view: the insurance business

If one industry can't afford to overlook the risks of climate change, it's insurance. According to **Christian Schauer,** senior risk engineer at Swiss Re Germany, the last decades have seen a spectacular rise in insured losses due to weather related catastrophes. Human and economic costs have also increased substantially, partly because humans are not responding adequately to climate change and other emergent risks.

For instance, population has grown steadily in coastal areas (e.g. Florida), despite of increasing hurricane activity. After 9/11, cities have continued to grow upwards and downwards: 36 of the 37 highest residential buildings in the world were constructed in the last 3 years. More shopping centres and thoroughfares are built underground, despite of dramatic consequences in the case of fire and floods.

Compared to traditional risks, emergent risks are difficult to identify and assess in monetary terms. They are typically characterised by:

- Unclear cause/effect relationships
- Differing perceptions of the threat involved
- Often long-tail, multiline effects
- A large and unquantifiable worst-case potential

The increased interdependence of risks make them hard to insure, as the key concept of insurance is to separate risks. Many natural and man-made disasters involve energy fallouts and the breaking down of critical infrastructure. The interconnectedness of networks results in cascading social and economic costs, in particular because societal capacity to deal with surprising, non-linear events is limited.

Transdisciplinarity

The need for transdisciplinary approaches is widely acknowledged within the earth system scientific community**. Frank Biermann**, Chair of the 2007 Amsterdam HDGEC-Conference, defined Earth system governance *"as the sum of the formal and informal rule systems and actor-networks at all levels of human society that are set up in order to influence the co-evolution of human and natural systems in a way that secures the sustainable development of human society".* Sustainability science therefore requires integrative forms of research comprising extra-scientific experience and practice.

A participant to the semi-plenary session on transdisciplinarity spoke of the "existential angst" many transdisciplinary researchers experience within academic institutions, as very few integrative processes are facilitated by the scientific community.

"Universities are structured in a way that prevents transdisciplinarity", observed **Lennart Olsson** (Lund University, Sweden) at a sustainability session during the previous conference of Amsterdam in May 2007. In a captivating speech, **Manfred Max-Neef** pointed out that in some universities there are 9.000 disciplines. This means that "if you graduate in one discipline, you don't in 8.999 other disciplines".

According to Olsson, the main reason for academic departmentalization is the current peer review system ("peer reviewers tend to be white, male and over 40"). Understandably, scientists are not willing to give up on what's been the cornerstone of scientific credibility for centuries. Moreover, as **Louise Fresco** (University of Amsterdam) observed, politicians who defend sustainable policies want to be backed with sound peer-reviewed science. This is the heart of the dilemma: the need for sustainability science to transcend academic compartmentalization is hampered by the need for sustainable policies to be backed by peer-reviewed (and compartmentalized) science.

Yet, global environmental assessments generally involve trade-offs between **saliency**, **legitimacy** and **credibility**. For instance, the first IPCC panel included some of the world's best scientists, but none from the third world, and therefore lacked legitimacy in the eyes of developing countries. Stakeholder participation proved to be key to gain support for sustainability assessments and policies.

Another criticism levelled at the conference, especially by non-western researchers, concerned the systemic focus on the interaction between technology, ecology and governance, overlooking **cultural values** and consumption patterns. A land use study conducted in South Kanara, India, showed that a change from joint Hindu family to nuclear family ownership has led to smaller land holdings, urging farmers to sell land, use less machinery, more fertilisers and to change crops (**Mary Abraham et al.**, Amsterdam Conference 2007).

Some conclusions from the various panels on **transdisciplinarity**:

- We are at the **very beginning** of transdisciplinary community building;
- There's a great **plurality**, not one "sustainablility science";
- **Co-leadership** between theorists and practitioners is essential in transdisciplinary processes;
- One of the biggest problems in transdisciplinary processes is the **crossing between the institutional and the practical level**. Scientists are reluctant to participate in

the implementation of projects, wishing to preserve scientific objectivity;

- A specific problem of sustainability science is the big **gap between the research community and civil society**. Civil Society Organisations dispose of a lot of knowledge which doesn't reach researchers. The gap between academia and researchers needs to be bridged;

- Don't determine the process model before you have spoken to the stakeholders. Maybe they talk about a scope which doesn't fit into your model. "*Project leaders tend to ignore information which doesn't suit their models. They should always be **open to the process***." (Jill Jäger, Sustainable Europe Research Institute, Austria);

- *Sustainable development is a dynamic system property, and system innovation is a **non-linear learning process*** (Joske Bunders, Athena Institute, Amsterdam);

- **Homogeneous learning spirals** (learning within a stakeholder group) are sometimes needed for **heterogeneous collaborations** to be effective, especially if there is no collective commitment and questions, views, perspectives are not articulated (Joske Bunders).