



AN INTERNATIONAL INDIAN SUMMER

BY ULA LÖW



Photo: Ula Löw

► About 370 GEC researchers met between 16 and 18 October in Montréal, Canada, at the Wyndham Hotel for the 5th Open Meeting of the Human Dimensions of Global Environmental Change Research Community. The participants represented various fields of study such as political science, sociology, geography, psychology or ecology. A lot of them had met before – at the Open Meeting in Rio in 2001 maybe or at one of the IHDP sponsored workshops. There was a spirit of joyful reunion throughout the conference. At the same time one could spot many new faces – young academics from North and South alike, who in spite of the initially confusing premises of the hotel conference rooms and halls, eagerly linked up with each other and with the wider community present.

Participants who had arrived a bit earlier attended the welcome reception in the honourable halls of the McGill Faculty Club and a public lecture held by Barbara Göbel, Executive Director of IHDP, on Wednesday evening. The Montréal based McGill School of Environment hosted this Open Meeting, while the IHDP, the Inter-American Institute for Global Change Research (IAI) and the Center for International Earth Science Information Network (CIESIN) were its international sponsors.

On Thursday the meeting had its official start with an opening ceremony in the Grand Salon of the Wyndham Hotel. Afterwards the first of altogether seven plenary sessions on issues such as Vulnerability, Sustainable Development and Governance followed. Distinguished keynote speakers included Vaclav Smil, Roberto Guimaraes, Cynthia Rosenzweig and Roger Kasperson.

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OPEN MEETING 2003 SPECIAL

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EDITORIAL

The biannual „Open Meeting of the Human Dimensions of Global Environmental Change Research Community” has become a vital instrument for building up international, interdisciplinary networks and for developing human dimensions research further. After previous meetings in the USA (1995), Austria (1997), Japan (1999) and Brazil (2001), the 5th Open Meeting took place from October, 16-18 at the Wyndham Hotel in Montréal, Canada.

The program of the 5th Open Meeting was very broad and encompassed 56 Panels and six plenary talks. Participants came from around fifty countries. The panel themes ranged from issues of Vulnerability, Resilience and Adaptation, Sustainable Development, Governance and Institutional Dimensions of Global Environmental Change and Industrial Transformations to questions of Land Use and Land Cover Change, Urbanisation, Coastal Systems, Water, Human Health, Population and Poverty.

With this present issue of UPDATE we want to provide you with a flavour of the Open Meeting. By no means can we claim to give a representative overview of the thematic, theoretical and methodological diversity of the research presented at the Open Meeting. However, the interviews in this issue will help to explain the Open Meeting's role and give an insight into its history.

The IHDP Secretariat would like to thank the co-chairs of the International Scientific Planning Committee of the Open Meeting, Peter Brown (McGill University) and Marc Levy (CIESIN). We would also like to express our gratitude to the local host, the McGill University, and to all the funding organisations without whose support this event never could have taken place. And last but not least we want to thank the many researchers, who often had to travel from long distances to come to Montréal, for presenting the results of their work, being open for discussions and for providing their enthusiasm in order to contribute to our collective endeavour, the strengthening of the research community working in the field of human dimensions of global environmental change.

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BARBARA GÖBEL
IHDP Executive Director

Between plenary and panel sessions, coffee breaks were held in the conference lobby, which at the same time housed the poster sessions. It was a good place and time for discussing and networking. The posters as well as the exhibition stalls in the adjacent room received due attention. A banquet dinner was held for all conference participants on Friday evening. The braver ones joined in with a Native Indian dance group during their performance of communal dances.

The heart of the conference were the panel sessions held throughout the three days. They started after the morning plenary sessions and then again after the early afternoon plenary sessions. Each day about 18 panel sessions took place with four to five papers held at each – this sums up to approximately 80 to 85 papers per day! A vast offer to choose from at times proved difficult for the meeting participants. Should one rather attend the panel on civil society movements or the one on multilevel governance, go to ‘Sustainable Compact City’ or follow the presentations on how to induce transitions towards sustainability? The panel sessions were held in smaller conference rooms with melodic names such as Anjou or Picardie. The majority of panel sessions were well attended, several even overcrowded – the rooms proved too small. Lively discussions sprung up in spite of a strict time schedule. Although manifold in their variety, the panels could be grouped into a few main themes: vulnerability/adaptability, governance and institutions, sustainable development and transitions, methods, urbanisation as well as land, coast and water issues.

A number of side events, several of which were organised by IHDP, were also held. One outstanding side event was the Open Forum on the Implementation of the Global Carbon Project where the GCP Science and Implementation Plan was presented to the wider human dimensions research community. Another interesting event was the presentation of the new strategic plan of the US Climate Change Science Program. The Young Human Dimensions Researchers had a successful get-together as had the IHDP National Committees. Also, the Scientific Steering Committees of the three IHDP core projects GECHS, IDGEC and IT met either before or after the conference.

The shopping mall set-up seemed odd to a number of participants. From hotel room to conference premises and even during lunch breaks (usually held in the food mall), there was little natural daylight, much less fresh air, to be enjoyed. Due to the tight conference schedule there was hardly a chance to leave this well climatized artificial world. A world that makes sense if one considers the harsh Canadian winters of up to –40 degrees Celsius! Yet in October the climate was mild. Those who managed to extend their stay enjoyed a beautiful city and, of course, the bright red, orange and yellow colours of a typical Canadian autumn – the Indian Summer.

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A SHORT HISTORY OF THE OPEN MEETINGS

Interview with Oran Young

Q: Can you tell me about the first Open Meeting?

The first Open Meeting was actually stimulated by an organisation of the U.S. called the Social Sciences Research Council. At the time that was a sort of private foundation initiative and besides that we also had the work of the National Academy of Sciences. So the SSRC group thought, well, we need some kind of a mechanism to be integrative, to bring together a whole variety of people that were interested in the Human Dimensions of Global Change. Initially, for obvious reasons, this was an effort to bring together the people in the U.S., and the first meeting was in Durham, North Carolina (1995, Duke University). But people said, let's make this open for people from other countries. And there was remarkable response! People came from all sorts of other countries and that made it obvious that this was something that ought to be much more transnational or international. And also the success of the first meeting was such that, we all said, well, we'll all do this again.

Q: How did the Open Meetings develop further?

The first meeting was as I said surprisingly successful and people said we ought to do this again from time to time. At that point this idea of a committee to work in between the Open Meetings to plan the next meeting actually got started. At that time the Human Dimensions programme, the predecessor to IHDP, was very weak. It was not in a position to play an effective role in this process, so this independent committee system grew up which of course still exists today.

The next meeting was in Laxenburg, Austria, at IIASA (International Institute for Applied Systems Analysis). As this should be an international activity, the next stage was to move to Europe after having been in North America.

At that time the meeting was largely interdisciplinary within the Social Sciences. There was an even bigger crowd at the Laxenburg meeting, so this was a snowball that was rolling quite quickly. It obviously had a momentum at that point in the sense that we should go forward. That was the stage in which, I recall, Jill Jaeger became involved. She at the time was Associate or Deputy Director at IASA, so she was instrumental in organising the meeting there and then agreed to play a key role on the committee to plan the next meeting. We chose Asia for the next meeting in 1999. That coincided with the creation of IGES (Institute for Global Environmental Strategies), an organisation which became prominent in Japan. This was the reason we went to Shonan Village, Japan. IGES offered to be the host in the 1999 meeting.

Q: Can you describe the scientific developments that went on between the Open Meetings and then were presented at these meetings?

Well it was always highly interdisciplinary within the social scientists and I think it stemmed from the fact that the

Social Sciences Research Council Committee and the US National Academy of Sciences Committee were very constructed to be broadly interdisciplinary within the social sciences.



Oran Young

Therefore it was natural more or less from the beginning— I don't see any significant evolution in those terms, this was more or less the principle or the premise that we started on. The real evolution that came about was to try and build stronger bridges to the natural sciences. That still has a long way to go but you can see it in the last couple of meetings of the Open Sciences Community as something that's starting to happen. In Rio in 2001 for example, we had an Open Meeting on the planning stage of the Global Carbon Project where there was some real natural sciences input. Here in this meeting you can see some of it. Not enough, but that's kind of the direction that we're pushing.

Q: What were your impressions of this meeting?

Well, this meeting I think had some interesting features. There's clearly a sense in which the rising public concern about climate change is very much reflected in increased interest of the scientific community. They're thinking about climate change although I'm afraid not with great optimism with regard to the results. The other thing I can see in this meeting is a clear reflection of some of the main themes of the IHDP. As I've listened to several of the plenary presentations the links have been quite clear. I don't think that's necessarily due to some policy decision that has been taken but I think it reflects a kind of convergence or evolution of some common perspectives and priorities within the larger community.

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AN IHDP SUCCESS STORY

Interview with Patricia Romero Lankao

Q: *Can you talk about how you got involved in the IHDP process?*

The first time I participated with IHDP was in its first workshop organised for young scientists in 1998 in Bonn, Germany. I saw a Call for Proposal in one of the offices here at the Metropolitan University (Mexico City) and decided to send my proposal on water issues in Mexico City, and it was accepted – that was really exciting! In the Bonn workshop I had the chance to get a broader perspective of environmental issues – I realised that our local environmental problems were driven by global environmental and social issues. For instance, our problems with climate variability and change are driven by the emission of CO₂ gases. But I didn't have that picture before, I was really only focused on urban issues in Mexico City. It was a kind of shock because we always realize in Latin America that the research agenda is designed by the North and in that way we always think they should also consider what our problems are and what our demands and requirements are. But nevertheless it's always good to open our minds to what's happening in the world on the global scale.

Q: *How did the process go on from there?*

Pier Vellinga was starting to develop his research agenda on Industrial Transformation and the project's coordinators were organising regional workshops. They invited me to attend their regional workshop in Brazil in 1998. That was the second chance I had to participate. They opened the doors for us young researchers from the South and tried to involve us in what they were working on – not just do this workshop and then say goodbye and see you never again – no, they actually wanted to network with us! I was really excited about this – let me tell you what happens to us in Latin America. We always define ourselves in terms of the West. I see three reactions to this confrontation. Some people embrace the West (or North) and say they live in such a nice way and we have to be like them. I think that's not good because we are very different. Another position is to say no, I do not want to know anything about the West. We are Mexicans. And they're right because we have been really dominated and exploited by the North. There is a middle position and I'm in that one. We ask what you have in the West that makes you so powerful and attractive. Well, the West has attractive things to offer, democracy, the idea of citizenship, of human rights. We do not have these. Our challenge is to say, ok you have these attractive things but you also have your problems. This idea that economic growth is all that matters is one example. We in the South should avoid this, we should try to reframe this notion. But we also should look at what Latin America or Asia or Africa has to offer to the world. That's the challenge. I'm working on that and the contact with IHDP has helped me a lot. I hope I also helped them a



Photo: Ulla Loew

Patricia Romero Lankao

lot in terms of interchange, of telling them: Wait, things are not the way you think they are. Or to tell people in Latin America: stop, there are also some critical people there, sensitive to the problems of the world. That is what happened to me with IHDP.

Q: *A real IHDP success story*

Indeed. An important part of my career has been made there, through IHDP. I'm a sociologist by training but from the very beginning, I was interested in environmental issues.

Q: *How did you combine these two fields?*

It's challenging. If you want to be serious and contribute to the understanding of those issues you will have to maintain your identity – in my case as a sociologist. But at the same time you also have to be able to move in this border region of sociology, economy, ecology, geography and biology. And you have to try to make links and find out how sociology can contribute to the understanding of, for instance, water issues. How can we choose the contributions of hydrology and ecology and where are the connections? So you always have to be in this border area. That certainly is a challenge because science has been developed in terms of separate compartments, in terms of specialised areas and each has its own language and its own way of approaching the world. Somehow they are incommensurable, you cannot compare them. Although you are talking about the same issue, you are approaching that issue in different ways, and from different perspectives. So the challenge is a challenge of language, of communication, of understanding and of really trying to change those paradigms – we cannot continue working in that separate way. I have been working on the edge, on this border, and that has been very challenging for me. It's very exciting.

The other thing is, when you work on environmental issues you cannot just focus on scientific issues but you are always in the science-policy interface. That is also exciting. Sometimes you come up with the greatest ideas of how to solve e.g. a water-related problem. Technically you know how to deal with it but the problem is not only technical. It has to do with vested interests, with past dependencies. There is already a tradition of how to deal with water, how to convey water, what to do with it, and you cannot change that so easily. When you try to work with politicians you start to realize how difficult it is. One of those challenges is to not lose your identity as a scientist, to try to continue to be serious and coherent but also to try to develop politically relevant science. So, I have been working in those areas – water issues, carbon issues, urbanisation – in really broad terms, in those border areas

Q: Montreal was a stock taking process – can you describe this process for yourself? Where should we be heading?

IHDP has developed core projects that are well established and provide important findings and contributions to the Human Dimensions of Global Change. That is certainly a success! I think IHDP has to move to promote joint projects like the Carbon Project, and strengthen its position within the Earth System Science Partnership. The natural science oriented Global Change Programmes in this partnership, e.g. IGBP or WCRP, may have their view on human dimensions, but it's quite reductive – it's not our perspective.

Although IHDP had been able to really open its groups and its projects to people from developing countries, I think that from both sides we still need to sit together and talk about our common problems as well as our specific problems in terms of science and in terms of environmental issues. How can we work together for us to proceed forward? I think that one very important step in this regard is to work with national and regional committees of IHDP. These committees should bring their regional perspectives into the scientific discussion and into the core projects' research. That is not yet really established. We still have the agenda which has been designed and driven by the North. I'm not saying that this is bad but we have to make that a broader process.

The experience in Montreal was really exciting. However I think we have to change the format and the way in which we organise these Open Meetings. We need to work with components of this meeting such as training workshops, meetings for the core and joint projects – and the researchers presenting their papers should also be involved in those projects. We do not need those plenary sessions anymore. We cannot continue with the same approach, it is not healthy.

Q: Was there an outstanding event or presentation for you in Montreal?

The Global Carbon Project meeting was a good idea. We really achieved a lot and there was a lot of interest in that meeting but we couldn't establish a dialogue with the attendants – partly, I think, because of that room. Our project had a very promising start because in the group we were able to

sit together and try to understand each other's scientific input and that is really a hard process. I for example may know about sociology but needed things like carbon sequestration explained to me. There is a lot of sense of communication and trust within the group. Let's hope that that works for the long term.

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FINANCIAL SPONSORS OF THE OPEN MEETING

- Asia Pacific Network for Global Change Research (APN)
- Environment Canada
- German Federal Ministry for Education, Science and Research (BMBF)
- Human Dimensions of Global Change Speciality Group Association of American Geographers (AAG)
- Institute for Global Environmental Strategies (IGES)
- Inter-American Institute for Global Change Research (IAI)
- International Human Dimensions Programme on Global Environmental Change (IHDP)
- International Institute for Sustainable Development (IISD)
- McGill School of Environment, McGill University
- Office of Global Programs (OGP) at the U.S. National Oceanic and Atmospheric Administration (NOAA)
- Pratt & Whitney
- Social Science and Humanities Research Council of Canada (SSHRC)
- Socioeconomic Data and Applications Center (SEDAC) at the U.S. National Aeronautics and Space Administration (NASA)
- U.S. Federal Geographic Data Committee (FDGC)
- U.S. National Science Foundation

YOUNG RESEARCHERS FOR THE REGION

Interview with Marcella Ohira Schwarz (IAI)

Q: *What was the rationale behind co-sponsoring this meeting?*

IAI is interested in fostering research in global environmental change issues. Our science agenda is very broad and it includes a number of important scientific themes. One of them are the human dimensions of global change. Therefore we are very interested in activities like Open Meetings, research projects, capacity building and everything that can encourage the further development of human dimensions in global change. In particular we are interested in identifying young researchers from the countries of the IAI, especially from Latin America, and to link them to our activities, our research projects, our capacity building and training activities. We don't have many social scientists involved in IAI networks but we believe it's important that they are engaged with our communities. And this is an opportunity. We got involved in the Open Meetings and had a very active role in the Rio meeting two years ago and now again in Canada. We hope to get involved again in future meetings, again to help identify Latin Americans to encourage overall development of human dimensions research. We also want to develop institutional and scientific partnerships and that the other organisations and research centres recognise our role and our activities. So that's our major interest in the Open Meeting.

We have also participated as a member of the International Scientific Planning Committee, the ISPC, in both Rio (2001) and Montreal. We were able to provide some financial resources that went to funding the Latin American participants. We believe the support is important and it's a combined effort from several agencies. I know IHDP has put in resources, as well as the Asia Pacific Network for Global Change Research (APN), the National Science Foundation and the Government of Canada. So this is the work we want to do, always work in partnership whether that is scientific, programmatic, institutional or financial. And we had some influence over the development of the programme.

Q: *Can you talk about the process of identifying young researchers?*

We first try to identify who they are, based on their applications and the papers they're submitting. We then try to provide them with financial support to come to the meeting so that they can develop their initial networks here, find out who is doing what in human dimensions and get acquainted with new research. One issue that we're trying to solve – there is not a simple answer to that – is how to keep them involved, how do you provide them with opportunities to continue engagement? This is one thing that we're trying to address in the planning of the future Open Meetings.



Photo: Ula Loew

Marcella Ohira Schwarz

In the past, after the Rio meeting we tried to have some kind of follow-up activity for the young researchers from our region. We have tried to launch Calls for Proposals every year although that is not always secure because of funding issues. So people that we identify here and that become part of our listserver or our newsletter mailing list learn about these opportunities. With their own research ideas and in connection with other people they've met in these Open Meetings, they are able to submit a proposal to carry out their research in a collaborative fashion and in a multiregional and multidisciplinary way. That's the kind of proposal we would be very interested in. We had a few successful cases where we had young Latin American scientists submitting proposals and being successfully awarded grants, so that's one indicator that this is producing some good results. But I still think there is a lot more to do. Our wish is that we will be able to launch more opportunities. One way to do this is through IAI alone, the other way would be collaboration with other organisations. We want better networks and more human dimensions science and research in the Latin American region.



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ALL INTERVIEWS BY ULA LOEW

TRANSITION IN ENVIRONMENTAL GOVERNANCE IN ASIA

Implications at Local and International Level

COMPILED BY GUEYE KAMAL

► For several decades, the Asia-Pacific region has been characterised by a centralised model of development policy – the so-called developmental state – under which Asian countries have experienced rapid economic development. Modern environmental governance systems in Asia have thus emerged on the basis of a centralised model of policy making and institution building. While governments have devoted tremendous efforts in setting up strong and effective institutions for the environment, centred on establishing national agencies and ministries, there was no commensurate effort towards trans-national and local institutions and mechanisms of environmental governance up until recently. This pattern of development has been gradually, and in some countries drastically changed, resulting in the emergence of policy processes and actors at sub-national and supra-national level. The twin socio-economic and political forces of globalisation and decentralisation have been instrumental in this process. Globalisation and decentralisation have brought into play new processes and actors that directly impact on the environment and the way it is managed.

The panel on *Transition in Environmental Governance in Asia: Policy Implications at the Local and International Level*, hosted by the Institute for Global Environmental Strategies (IGES) in Japan, was held during the 2003 IHDP Open Meeting to review the significance of this evolution in the structure and mechanisms of environmental governance in Asia. Four papers were presented at the panel.

The first presentation by **Yohei Harashima** examined the impacts of globalisation and decentralisation on the institutional dimension of environmental policy in East Asia. Harashima observed that traditionally in Asia, environmental problems such as natural resource depletion, industrial pollution, and deterioration of the living environment successively spread from one country and sub-region to others in a cascading pattern, as income levels increased. Then, following the environmental Kuznets' curve which posits an inverted-U relationship between environmental quality factors and per capita income, environmental quality initially worsened, eventually reached a peak, before improving as per capita income continued to increase. The recent experience of Asian countries is indicating a changing pattern whereby various types of environmental problems arise simultaneously in countries with lower national income. In addition, environmental quality fails to improve even as per capita income increases. Therefore environmental improvement can no longer account only for the effect of economic growth.

The second paper by **Gueye Kamal** looked at the emerging landscape of environmental actors and processes in the context of globalisation and decentralisation. The paper examined the state-centered environmental policy-making system in its aspects of centralised environmental institutions, environmental protection through regulation and the

inter-state approach to environmental protection. These pillars of centralised environmental governance are being altered by processes of globalisation and decentralisation as they induce mechanisms of decision-making and resources management upstream and downstream of the central state. In addition, both globalisation and decentralisation are leading to a plurality of environmental actors, increasingly bringing into the governance arena civil society, local governments, non-governmental organisations, multinational enterprises and international organisations. These developments have resulted in a multiple-level structure of governance along with new instruments of governance such as partnership initiatives and voluntary commitments, which are not solely associated with state prerogatives. These instruments of governance are multi-stakeholder in their approach, bringing together different environmental actors with complementary forms of input. However it appears that the pace of development of this emerging web of actors and processes is well beyond the process of reform in mechanisms of policy coordination and monitoring from a centralised one to a multiple-dimensional one.

The third presentation by **Ko Nomura** was based on an opinion survey of major environmental actors in Asia, with special reference to the impact of the 2002 World Summit on Sustainable Development in Asia. The survey was addressed at professionals in the environmental area including national governments, local governments, NGOs, businesses, international organisations, and academic and research institutions. Environmental actors surveyed identified in order of importance water, poverty, energy, education/awareness/capacity building, waste management, and good governance as key priorities for the Asia-Pacific region. Significant differences appear according to the sub-region considered: in South and Southeast Asia poverty; in Northeast Asia energy (while energy is ranked 7th in South Asia and 9th in Southeast Asia); in Southeast Asia education/awareness/capacity building, waste management, good governance and forestry. Water was seen as a priority in all sub-regions. Again, differences are noticeable according to the category of actors: for NGOs education/awareness/capacity building were viewed as important at grassroots level. Local governments viewed waste management, energy and good governance as most important issues, emphasising the need for capacity building of local governments as a result of decentralisation. Water and poverty were considered priorities by all categories of actors.

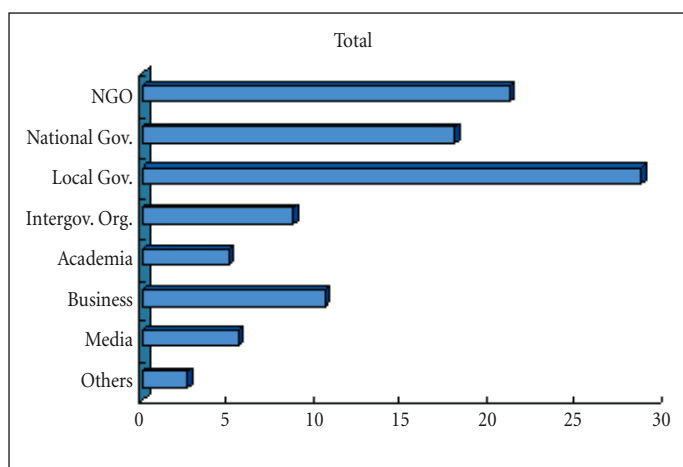
The survey revealed that considerable differences exist between national and local governments in priority setting. This underscores the need for coordination in order to optimise the efforts of the different actors. Asian environmental actors consider that local governments and NGOs will play an increasingly important role in the future. Therefore, the approach of partnership initiatives launched at the WSSD

would be an appropriate form of collaboration. The survey indicated that the WSSD contributed to raising public awareness about sustainable development. However it did not result in significant changes in national policies. The survey also indicated that for promoting partnerships among various stakeholders, enhancing human resources (including capacity building) is more important than the increase of financial resources, especially in South and Southeast Asia.

With respect to problems, there are considerable differences in priorities for each actor and region, which points to the need for mutual understanding and coordination for enhancing partnership. With regard to actors, there has been a recognition of the increase in the importance of non-state actors: partnerships between state/non-state actors is important to enhance environmental governance in Asia. With regard to processes, there is a gap between international discourse and local activities in Asia: how to fill in the gap is a key to enhance inter-level partnership. Finally addressing issues of undemocratic government and the lack of mutual trust are key challenges for enhancing partnerships.

Emerging actors in environmental governance in Asia

(Numbers in the axis reflect percentage of total)



The fourth presentation by **Ancha Srinivasan** addressed the question of local assessments of vulnerability and adaptive capacity and its implications for designing rational climate policies in Asia. Reviewing the main uses and concerns with current methods of V&A assessment, Srinivasan observed the following pitfalls: the resolution of global climate models is too small and the timescale too long to include local climate variability; inadequate effort to involve primary stakeholders, especially in developing countries, in global and regional assessments; non-market sectors (human health, biodiversity, etc.) are very important at local level but they are not adequately considered in global and regional V&A assessments; adaptation to global challenges is often site-specific which is not reflected in most assessments developed at regional and global levels; relative complexity

and the high degree of uncertainty that surround V&A assessment and inadequate interest among developing country researchers. While an adequate integration of local variables into V&A assessments is required, there is the question of how to increase the reliability and policy-relevance of local assessments. This would involve *inter alia* developing, a composite vulnerability index using a multi-criteria approach, ground-truthing and operationalisation of the vulnerability index. For the purpose of developing a model of local V&A assessment, which integrated local and traditional knowledge, a case study in Bangladesh was conducted using both anthropological and scientific methodologies. This study considered the following: perceptions of local people on climate change events and key indicators of their vulnerability; main coping strategies and frequency of strategy use; potential for facilitating further adaptation through policy and technology choices, and institutional arrangements.

The study reveals that in Manikganj region, floods are perceived as a part of life and as an unavoidable disaster. Indigenous survival strategies still remain the most reliable and sustainable forms of disaster response. Coping options included de-silting, raising embankments, flood shelters (structural) and creating awareness, providing alternate jobs, poverty alleviation, warehouse to store food and fodder as well as abolition of leasing systems (non-structural). In the case of sea level rise, the men in Shyamnagar region perceived salinity build-up due to current sea level rises as an advantage for improving the income levels due to a shift from paddy to shrimp cultivation. Salinity increase is already artificially encouraged by both local (sea water inundation for shrimp farming) and distant choices (water diversion upstream in dry season). Women, however, reported difficulties mainly in obtaining fresh water for drinking. The case study suggests that first generation „top-down” assessments of vulnerability and adaptive capacity based on scenario-based global climate models do not adequately consider local climate variability and concerns of local key stakeholders. Adaptation options are often site-specific; hence V&A assessments must build on bottom-up participatory approaches. Local or indigenous knowledge on adaptation to climate extremes in various sectors is considerable and relevant for local policy making. Finally integration of local knowledge in adaptation plans is crucial to develop effective and pragmatic climate policies.



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THE IMPORTANCE OF POLICY INTERLINKAGE POSED BY

the CFC Substitutes Issue: Verifying the Effectiveness of Global Environmental Regimes

By YASUKO MATSUMOTO

► **Coordinating policy interlinkage among different** global environmental problems is becoming increasingly vital to obviate policy tradeoffs and maximise the conservation effect. The problem of the potent greenhouse gases hydrofluorocarbons (HFCs), which are substitutes for ozone depleting substances such as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), is an instance in which the policy contradictions between two global environmental regimes, i.e., the Montreal Protocol and the United Nations Framework Convention on Climate Change (UNFCCC), assumed more concrete form in the context of pressing circumstances where countries must implement their commitments under the Kyoto Protocol. From the perspective of policy interlinkage and in order to identify the problem, this paper reviews efforts on HFCs under those agreements and the domestic initiatives of countries with a major involvement in the HFC issue. The course of events in the expansion of HFC use in the world market reveals that policy inefficiency resulted because the policy interlinkage perspective had not been incorporated into international agreements in a timely and adequate manner.

DISCUSSIONS AND INITIATIVES UNDER THE MONTREAL PROTOCOL AND THE UNFCCC

No clear political signal had been sent to the world market from either of those regimes until adoption of the Kyoto Protocol in 1997, which also covers HFCs.

Under the ozone regime HFCs have been encouraged as the primary replacements for CFCs and HCFCs mainly by the technological assessment panel and the financial mechanism for developing countries.

Under the climate regime, there had been no specific discussion on HFCs in negotiations until Kyoto Protocol negotiations began in August 1995. The interlinkage issue made its first official appearance on the agenda in 1998.

US-EUROPE COMPARISON: RESPONSE TIMING AND CLARIFYING POLICY ORIENTATION

Basically, the US and northern European countries have approached this issue differently from the beginning, although all had recognised the issue of policy interlinkage in the policy-making process. In northern European countries the introduction of non-halocarbon (not-in-kind: NIK) replacements made relatively fast headway in the market because of pressure on the market by an international NGO and a policy orientation by governments that was generally aimed at discouraging or reducing HFC use, while NIK alternatives have not made much progress in the US, whose policy emphasised end-of-pipe controls.

CAUSES OF INCREASED HFC USE

The main conceivable causes for the expansion of and the sharp increase in HFC use are as follows: a) Even after policy interlinkage between the two regimes became scientifically obvious because of the 1989 UNEP and 1990 IPCC reports, which listed the high Global Warming Potentials of HFCs, the parties were not able to reach an agreement to soon begin work on redefining environmental targets; b) ozone regime effectiveness was heavily dependent on cooperation by fluorocarbon makers owing to the perception that global warming was a matter of secondary importance, and this might have delayed aggressive efforts for NIK technologies; c) the UNFCCC approach of regulating only the emissions of HFCs, not their production or use, is one factor that has induced governments to make their policies concentrate on end-of-pipe controls, and discouraged incentives to deter expanding applications or increased use.

CONCLUSION

The use of HFCs has been internationally encouraged as a policy without thorough and adequate examination, from the perspective of policy interlinkage, of whether HFCs were the best overall solution to both problems. In order to developing a consistent set of principles especially for fund and technology transfers under both regimes, an international discussion on the role of HFCs in integrated environmental policy is urgently needed.

The choice of technologies to transfer to developing countries could very well define the scope of their future policies to a large extent. For example, Clean Development Mechanism (CDM) projects under the Kyoto Protocol might pull developing countries' policies towards putting an emphasis on HFC recovery from equipment instead of conversion to NIK alternatives. And the current lack of a ceiling on production volume is likely to sustain the tendency towards increased HFC production and use.

S. Oberthür (2001) proposes linking the funding mechanisms of the two regimes, and minimising HFC use in developing countries by switching them to NIK at the outset, then making further improvements such as bettering energy efficiency under the CDM. This approach may improve the effectiveness of the involved regimes. It should be aggressively pursued in designing policies, both internationally and domestically.

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REFERENCES to this article are included in the author's presentation at

<http://sedac.ciesin.columbia.edu/openmtg/docs/matsumoto.pdf>

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IMPROVING SCIENTIFIC ASSESSMENT OF CARBON SINKS

By Atsushi Ishii

► After Kyoto, in 1997, we have entered a world where science of carbon sinks has inevitable political implications for future assessments and for implementation of sink accounting and activities under the Kyoto Protocol. The emerging scientific community of carbon sinks cannot escape from this. The growing political significance of sinks may increase research budgets available to the community. At the same time, the society as the donor would require the community to fulfill greater social accountability for its research on carbon sinks, which means that the community sooner or later must face again the same contested boundary between science and politics as experienced in the making of the IPCC Special Report of Land-Use, Land-Use Change and Forestry (SRLUCF).

Without stabilising the boundary, a fruitful long-term cooperation between scientists and policymakers would not be realised. When scientists are involved in policymaking, they have crucial interests to avoid immoderate responsibility and to maintain their scientific credibility especially to their peer scientists, which cannot be attained without a stabilised cognitive boundary between science and politics.

In domestic politics, the boundary could be formalised by legal or administrative order with statutory and enforcing power. However, the international society is not armed with such institutional settings which threaten the sovereign rights of the states. The case of scientific assessment on Critical Loads (CLs) of acidification in Europe clearly shows that the feature of robustness plays the most important role for a successful international scientific assessment with a stabilised boundary between science and politics. Robust scientific assessment means that it is acknowledged as more credible and less vulnerable to deconstruction. The lessons from the CLs case tell us that there are numerous features that need to be incorporated for a robust carbon sink assessment for the future climate regime:

SHIFT THE FOCUS FROM PARTIAL CARBON ACCOUNTING TO FULL CARBON ACCOUNTING

To address the aforementioned interests of the scientists, the assessment subject should be shifted from Partial Carbon Accounting as in the SRLUCF to Full Carbon Accounting (FCA). It can be advocated as an 'intrinsic property of nature' because of its comprehensive treatment of carbon sinks as part of the global carbon cycle, and can rather be argued as 'value-free' because it calculates the existing physical mass of a certain carbon stock. As the case of CLs, these features satisfy the traditional norms of academic science, which PCA is unable to satisfy. For policymakers, FCA has direct policy merits to the climate regime such as facilitating detection and measurement of reliable net emission reduction to the atmosphere. Therefore there is enormous potential for FCA to simultaneously address different interests and concerns of both scientists and policymakers, hence to become a robust assessment subject. This may facilitate participation of relevant scientists, and obtaining scientific consensus among them on its use within the Protocol.

However, shifting the focus of carbon sink assessments to FCA does not mean that the official accounting method under the Proto-

col should also use it. There should be apposite distance between the assessment subject and the official accounting method, if the boundaries are to be stabilised. Otherwise, the scientific community will become too much entangled in politics, hence the scientific community will lose their scientific credibility and be subject to immoderate responsibilities.

IMPORTANT INSTITUTIONAL FEATURES

- Future carbon sink assessment may have to be supplemented by international research cooperation programmes on those problems associated with carbon sink activities, such as loss of biodiversity and conflict with indigenous people. There may be a growing number of governmental or independent research on those problems in the coming years, but it may be difficult to exert influence on proponent countries' policies of carbon sinks unless it is coordinated under the umbrella of a legitimate international cooperative framework; and,
- The SRLUCF was criticised that the participation in the assessment process was dominated by the proponent countries. In order to repair and mediate this criticism, participation in these research programmes should be open to any participating country in the negotiations. This supplants an opportunity for the developing countries to enhance their scientific capacity to investigate forestry-related issues. The lack of such capacity was one of the reasons for low participation of developing countries in the assessment process of the SRLUCF.

The scientific community of carbon sinks should not try to avoid nor ignore the growing tentional relationship between carbon science and climate politics but to manage it by scientific assessments with robust assessment subjects and apposite institutional settings. Whether this is going to be successful has enormous implications for the Post-2012 climate regime, which is not yet sufficiently considered in literature.

▼ REFERENCES to this article are included on the Open Meeting 2003 website at

<http://sedac.ciesin.columbia.edu/openmtg/docs/ishii.pdf>

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ENERGY SECTOR REFORMS AND RURAL ENERGY IN INDIA – WILL THE RURAL POOR BENEFIT?

Reaching the unreached | BY SHIRISH SINHA

► **Energy access has far reaching implications for economic, environmental and social development of rural areas.** Lack of access to sufficient and sustainable supplies of energy affects majority of the rural population in India. Some 77 million rural households do not have access to electricity; twice these numbers remain dependent on biomass fuels to cook their daily meals. Without efficient, reliable, affordable, clean energy, people are undermined in their efforts to engage effectively in productive activities or to improve their quality of life. India faces two crucial – and related – issues in the rural energy sector. The first is the energy use pattern, which is characterised by widespread use of inefficient traditional energy carriers, posing economic, environmental and health threats; and uneven distribution and use of modern energy carriers such as electricity and liquefied petroleum gas (LPG), raising issues of economic growth, equity and quality of life. The second is the energy sector reforms policies initiated as a universal solution to the problems of the energy sector, posing concern regarding the poverty impacts of the energy sector reforms, especially in making modern energy carriers accessible, affordable and widely adopted.

Starting from the early 1990s, a set of institutional reforms – including unbundling, corporatisation and privatisation of ownership, and introduction of competition in the generation and distribution sector – were initiated in India. Energy reforms represents a paradigm shift from the existing state owned utilities and public policies, founded on the assumption that markets and market principles will improve access to modern energy carriers more effectively than the government being in the business of delivering the energy services. Energy reform policies emphasises on markets and ability to pay, and regards public support and subsidies as sources of social and economic distortion. In other words, energy reforms are driven by commodity policy: putting a ‘market-value’ on energy and selling energy at its ‘true’ price.

Valuing energy and putting a market value on energy are two different issues. No one values electricity more: than those un-electrified rural households, or women and children who walk long distances to fetch biomass fuels and water, even after more than five decades of developmental programmes. No one values it less: than the traders who siphon off subsidized kerosene oil and black-market it; the urban and high income rural households, who feel deprived of their savings if energy subsidies are reduced by a small fraction; or the political groups whose interference in energy pricing and policy render the sector inefficient and ineffective. So, will putting a ‘market-value’ on energy as envisaged in the energy reforms policy, help in alleviating lack of access to modern energy by the low capacity end users? The research study’s central tenet is to under-

stand how the future attempts at energy sector reform policies will be adapted to achieve the multiple objectives of: improving the economic efficiency of energy supply, and improving low capacity end users’ access to modern energy services.

The evidence from the three case studies undertaken in India show that the non-utilisation of modern energy carriers by low capacity end users is not so much due to poor availability but because people do not have the means to purchase modern energy carriers at market prices. In other words, people lack the adaptive capacity, largely due to vulnerabilities of economic opportunities involved in and due to institutional inflexibility. Income from available economic opportunities is not sufficient to invest in modern energy carriers. It is not the upfront cost, but the recurring expenditure, which is a barrier and limits the shift. Financial mechanisms can mitigate upfront cost, but not the recurring expenditure.

So far the evidence from the study shows that the early phase of energy reforms has largely failed the low capacity end users,

Low capacity end users

The research uses the term low-capacity end users rather than ‘rural poor’ to encompass the rural population: with limited access (under-served) or no access (un-served) to modern energy carriers.

and its impact on access to energy in rural areas may inevitably and irreparably lead to more social inequality. The experience is mixed; in case of electricity, it has negatively affected access to electricity; whereas, in petroleum fuels, opening of markets has improved

the availability. Availability is not the sufficient condition; ability to adapt and use it regularly is necessary. In order to improve energy access, the need for subsidisation in some form will remain for a foreseeable future. Elements of reforms policies exclude the associated social and public benefits, which are critical for rural development and improving quality of life. The policies are already resulting in ‘cherry picking’ and ‘social dumping’ of the low capacity end users, and if appropriate measures are not adopted the inequality in access are inevitable. There is an urgent need to re-assess the energy sector reforms policy by making it a ‘pro-poor’ or ‘people-centered’ policy. This people-perception has largely been missing in the enunciation of reforms. By arguing for subsidies and incentives, and a people-centred approach, it needs to be stressed that these are not the social components of reforms, but the issues that need to be allowed to transform the very nature of the reforms. In any case, an institutional change brought about for limited purposes often influences other changes.

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ARE VULNERABILITY AND ADAPTABILITY TWO SIDES OF THE SAME COIN?

A critical view of climate impacts research

By ANE SCHJOLDEN

► In the fields where one tries to understand the impacts of climate change there seem to be two main ways to assess this problem: One is to identify vulnerability and the other is to study adaptability.

- By focusing on vulnerability, it is considered possible to identify strategies for minimising the impacts of climate change. Increasing adaptive capacity is one such strategy. The Third Assessment Report (TAR) of the IPCC calls for further development of methods and tools for vulnerability assessments, particularly conceptual models and applications of the evolution of vulnerability on the time scale of climate change. (TAR ch. authors, 2001, p. 115).
- At the same time (in another chapter of the TAR), there has been a call for enhanced integration of information about adaptability in order to provide quantitative information about potential impacts and distribution of vulnerability

This easily leads to a circular argumentation, or a „chicken-and-egg” situation: is high vulnerability the reason for low adaptability or is low adaptability the reason for high vulnerability (what has been there first)? Some would say that this is merely a question of semantics, but we would disagree. Depending on which way you go, either determining vulnerability based on adaptability OR determining adaptability based on vulnerability, there are implications for *how the issue of climate change is addressed among and within nations, regions, and groups*. If adaptability determines vulnerability, then climate change can readily be addressed by identifying, financing, and implementing a series of adaptation measures. From this perspective we can, in a sense, adapt our way out of the climate problem. However, if vulnerability determines adaptability, then addressing the issue of climate change involves the larger and arguably more difficult task of preparing society to confront a *wider array of stresses*, including increased climatic variability and uncertainty.

So we want to argue that even though there is a growing tendency to conflate the two terms and refer to them collec-

tively, reflected in a „vulnerability cum adaptation” literature, this is problematic as it further masks assumptions about causal direction, which has important ramifications for both research and policies. These two different approaches have also been referred to as vulnerability as either the starting point or the end point of analysis in an article by Kelly and Adger in *Climatic Change 2000*. For our presentation we decided to review definitions of vulnerability and adaptability and consider the relationship between them according to the two perspectives. We chose two very different countries, Norway and Mozambique, to illustrate key points related to the two approaches and to discuss implications for climate change impacts and responses. The two countries are subject of two ongoing vulnerability studies at CICERO.

Vulnerability

- The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes.
- A function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity. (TAR, p.7)

Adaptability/Adaptive Capacity

- The ability, competency, or capacity of a system to adapt to (to alter to better suit) climatic stimuli. (Smit et al., 2001, p. 894)
- Enhancement of adaptive capacity represents a practical means of coping with changes and uncertainties in climate, including variability and extremes. (Smit et al., 2001, p. 881)
- Addresses the issue of whether or not the adaptation can be realized under existing social, economic, cultural, institutional and political conditions

Adaptive Capacity can include both the ability to cope or react in the short term to adverse effects, as well as adjust in the longer term to climatic changes.

The relationship between vulnerability and adaptability: the two approaches

1. Adaptability → Vulnerability (‘End point’ analysis)
 - Adaptability as an independent variable or presumed cause of vulnerability as the dependent variable
 - Vulnerability as a residual or outcome of climate impacts after adaptations have occurred
2. Vulnerability → Adaptability (‘Starting point’ analysis, Kelly and Adger’s second approach, 2000)
 - Vulnerability as the independent variable used to analyse climate change impacts and to explain adaptability
 - Assessments of vulnerability not dependent on predictions of adaptive behaviour

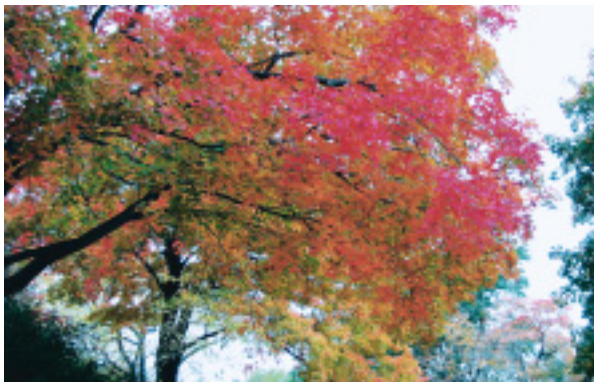


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Vieux Montréal

THE ADAPTABILITY → VULNERABILITY APPROACH

The „quick fixes”

- Adaptations reduce the impacts and costs of climate change, reduce the sensitivity of systems and thus vulnerability
 - Economic assessments of the costs of climate change versus costs of adaptation
 - Enhance adaptive capacity, for example
 - Increasing robustness of infrastructural designs
 - Improving social awareness and preparedness.
- In the same way that adaptation involves adjustments that reduce vulnerability enhancement of adaptive capacity can also reduce vulnerability
- If vulnerability can be minimised through adaptation, we have essentially adapted ourselves out of the climate change problem.
 - The *Adaptability* → *Vulnerability* approach invokes science to guide policy decisions

Challenges

- Hard to calculate the benefits of adaptation as well as the climate-related damage costs
 - Uncertainty: „not only are impacts of climate change themselves uncertain, but they will occur in a future world that is complex and uncertain as well.”
 - Adaptation responses to climatic changes will likely be delayed on the order of decades
 - Benefits of adaptation cannot be calculated based on cost of implementation alone, but must include the costs of raising adaptive capacity (Klein)
 - Adaptation studies often assume optimal adaptation or no adaptation at all and do not capture how responses are shaped (Schneider et al. 2000; Parson et al 2003)
- Disregards the politically sensitive factors that underlie current vulnerability and shape future vulnerability
 - income inequality
 - gender discrimination
 - other social and economic conditions

Smit et al 2000 argue that the *ad hoc* treatment of adaptation in impact assessment tends to rely on assumptions and focus on technological and structural measures.

THE VULNERABILITY → ADAPTABILITY APPROACH

- This approach focuses on social vulnerability
- Vulnerability as independent or causal variable
 - Seeks to untangle the complex web of factors that influence the ability to secure welfare and livelihoods and to cope with external stresses
 - *People* as managers of *risk*
 - Focuses on the *social and environmental constraints* to efforts to securing entitlements, basic needs, and livelihoods
 - Identify vulnerable groups
 - Distinguish what makes people vulnerable
 - Analysis of their situation forms an important part of the next step, that of identifying how vulnerability can be reduced

There are many reasons why groups such as women, the elderly, children, the disabled, refugees, and pastoralists are vulnerable, and their strategies to deal with these reasons are diverse (Chambers, 1989).

Challenges

- Definitional challenges:
 - What constitute ‘adverse effects’
 - Level of analysis: The „who” question. There have been diverse approaches that include the individual, the household, community or population groups
 - Difficulty of developing indicators for something that is unquantifiable, context-specific, and not easily aggregated
- Highlights the importance of equity considerations in vulnerability assessments



Photo: Siri Eriksen

Vulnerability to Climate Change: Mozambique

THE APPROACHES EXEMPLIFIED

Does adaptability cause vulnerability?

Table 1 is an example of how one can try to define vulnerability by assessing the adaptive capacity of, in this case, countries.

Table 1: Determinants of adaptive capacity, data from Human Development Index

Measure	Indicator	Norway	Mozambique
Range of available technological options for adaptation	PC in use per 100 people	50.8	0.4
Availability of resources	GDP/cap.	36815	200
Distribution of resources / wealth across the population	Gini-koeff.	25.8	39.6
Social capital, including property rights	Adult literacy	100	54.8

Other indicators or determinants may be:

- The structure of critical institutions and decision-making
- Human capital, including education and personal security
- The system's access to risk spreading processes
- The ability of decision-makers to manage information
- The public's perceived attribution of the source of stress (Yohe and Tol, 2002, p. 26).

Based on this type of analysis one reaches a very straight forward conclusion: Norway has a high adaptive capacity and is therefore not vulnerable, but Mozambique has a very low adaptive capacity and is therefore highly vulnerable.

There are more variations to the picture that need to be captured.

Does vulnerability cause adaptability?

- The table is not the end of the analysis
- We should rather ask questions like: Who is vulnerable within the countries, and why?
- What are the processes through which Norway scores better than Mozambique (the causes of vulnerability)?

Norway: Who is vulnerable, and why?

- Vulnerable to what? What are the values that Norway wants to protect? What adverse effects are relevant to the Norwegian population?
- Regional differentiation: The SAMSTEMT vulnerability analysis (Aandahl et al) shows that there are large variations in vulnerability in Norway. In particular, district municipalities with a low diversity of economic activities, and in particular dependent on climate sensitive natural resource based activities, are vulnerable. The factors that contribute to vulnerability is outmigration, lower income, aging population

Mozambique: Who is vulnerable and why

- Most vulnerable: Those with
 - disadvantageous access to the market
 - little capital to invest in production
 - few sources of income apart from subsistence
 - Women, labor poor households, education-poor households

Causes of vulnerability:

- Skewed access to resources – the vulnerable have a poor position in the political economy
- Government support, investments and international aid prioritises politically and economically important areas (and accessible areas)
- Technical assistance and investments do not reach the most vulnerable; they reach the larger scale, often commercial farmers, who can afford the required inputs

Conclusions

- Table 1 has often been the end of analysis, showing that Norway has a higher adaptability than Mozambique
- Contrasting approaches lead to very different types of findings and recommendations
- But where do we go from here?
- The analysis using contrasting approaches demonstrated that:
 - Norway: need to redefine vulnerability in a way that is meaningful in order to identify appropriate adaptation options and how they can be put into place
 - Mozambique: need to address vulnerability in a way that is context-specific
- Need for transparency of approaches so that the focus of investigation and types of policy approaches are apparent

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Norway: Vulnerability to Climate Change?

THE EVE OF TRANSITION – THE IT SESSIONS

BY ANNA J. WIECZOREK AND BOELIE ELZEN

INTRODUCTION

► **Research on Industrial Transformation is concerned** with exploration of alternative development trajectories that have a significantly smaller burden on the environment. It is based on the assumption that in order to deal with the global environmental problems in a way that is sustainable for society and the environment, major transformations of the production and consumption systems are necessary (Vellinga 2001). Since launching the IT Science Plan in early 2000, a number of research initiatives have been developed in that field worldwide and many of them were supported by the IHDP IT programme. The aim of these activities has been firstly to better understand the complex society – environment interaction and the process of socio-technological transformations; and secondly to better understand the different messages that Industrial Transformation carries throughout the world.

The road towards sustainability through the decoupling of economic development from its environmental burden, however, has proved to pose many challenges. Many areas of human needs have to be addressed such as food, fresh water, health, shelter, mobility, energy, to name a few. And there are many dimensions, on which sustainability needs to be achieved, including e.g. technical, socio-economic, cultural or spatial aspects. Achieving sustainability in the broad sense therefore appears to require a dazzling multitude of changes. It requires an encompassing set of transformations that have been referred to by analysts from different disciplinary backgrounds using a variety of concepts. *System innovation, regime transformation, industrial transformation, technological transition, socio-economic paradigm shift* are some of the best known (Elzen 2003).

Despite this variety of concepts and lack of established definition of a transformation, there is a set of characteristic features of this phenomenon that scientists do agree about:

- Transformation is a major but gradual and long-term change in the way societal functions are fulfilled.
- Technological change is crucial in bringing about the change but has to be inherently coupled with a high level socio-cultural and institutional change.
- Transformations involve a wide range of actors, including firms, consumers, NGOs, knowledge producers and governments.
- They are not caused by a change in a single factor but are the result of the interplay of many factors and actors that influence each other. On the other hand they may also have their own trajectories of development.

The four sessions organised by the IT project at the Open Meeting of the Human Dimensions Research Community in Montreal proved that there already exists a substantial knowledge base about socio-technical changes, their drivers, geographical differences, historical patterns and options for transition management. On the other hand the types of comments and questions posed during the meeting proved that



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this knowledge base has to be further developed to be of a greater scientific soundness and of better policy usefulness. The aim of the four IT sessions was to discuss the current knowledge about transformations and transitions in an international and multidisciplinary arena. All the sessions have been linked with each other and were built around the following dimensions:

1. Understanding transitions
2. Using this understanding to inform policies and strategies to realise transitions
3. Presentation of the Dutch knowledge network on system innovation
4. Understanding geographical and cultural differences

UNDERSTANDING TRANSITIONS

Transitions are extremely complicated processes, which makes transition research a very intricate type of endeavor. When analysing transition processes from an innovation perspective, it is important to make a distinction between radical and incremental forms of innovation. Even though this distinction in itself is problematic, it can help to clarify the notion of transition.

Innovation studies have shown that most innovations tend to be of an incremental nature. New technologies developed and brought to market are typically variants of existing technologies. They can be used by customers with little or no extra instruction or training, using existing infrastructures and allowing customers to use it in a way they always did, possibly with some extra features valued by the user. With successive generations of technology, a pattern thus emerges of gradual technical change with relatively little change in terms of the societal embedding of this technology. In inno-

vation studies the concept of 'technological trajectory' is used to describe such a path of development. (Dosi 1982)

At the same time radical alternatives to such a trajectory are developed but because of a variety of reasons they have a hard time breaking through. One of the reasons, for instance, is that existing production processes are tuned towards existing technologies and systems. Radical alternatives may then require huge write-offs and new investments. Still, history shows that radical transformations or transitions do occur. For instance, the development of motorised road transport about a century ago and its broad penetration in society led to unprecedented changes although the barriers to such a transformation in the early part of the 20th century were enormous. More recently such transitions did occur, for instance in connection with the development of micro-computers, information technology and the worldwide web. Also here barriers were enormous. Anyone who 25 years ago would have predicted that within two decades the majority of households were going to buy thousands of euros worth of computer equipment would have met broad skepticism if not worse.

Thus the historical analysis of innovation leads to the conclusion that most innovation tends to be of an incremental nature but broad transitions do occur. Taking into account the fact that these transitions have not been planned, there was no consensual vision about where societies could transform to: either in more or less sustainable directions. The main challenge for research then is to gain a better understanding of the dynamics of transitions in such a way that it also suggests possibilities to induce and stimulate the occurrence of transitions. It also seems likely that similar transitions, taking place on mainly environmental grounds, will have different characteristics, may be more costly and therefore more difficult to implement (van de Kerkhof & Wieczorek 2003).

INDUCING TRANSITIONS

Since we see the understanding of transitions within the framework of seeking ways to achieve sustainability the important follow-on issue is how such insights can be used for *transition policy or transition management*, as it is sometimes called. The complexity of transition processes implies a warning that such policies cannot be based on simple steering philosophies. Such policies will need to take into account interaction

between different stakeholders, and need to leave room for learning and feedback. Possibly, such policies will need to combine existing policy instruments with some new approaches and assessment methods to identify their optimal mix in specific circumstances. Despite this complexity, we have seen various examples of scholars taking up the challenge to identify specific elements of such policies, identifying promises as well as limitations. It is extremely useful that such ideas are discussed in the multidisciplinary circles to try and identify some common themes that can serve as a stepping stone for more focused further work. Themes to address include:

- What kinds of interventions can governmental agencies most effectively make to induce, stimulate and 'guide' transitions? This will probably differ for different phases in transitions.
- What are the roles and how to handle interests of the variety of stakeholders, the public and private sectors in such processes; how do we redefine the public / private divide so that the space for transitions is enlarged.
- How to overcome barriers that hinder novelties (production, regulation, user preferences, infrastructure, investment needs, uncertainties)?
- When does experimentation stop and selection start?
- What are the time horizon and indicators of a successful transition? What if it fails?
- How to involve consumers and influence their behaviour in the current non-sustainable world (globalisation, consumerism, deregulation, individualisation)?
- How to integrate with transitional policy agendas?

THE DUTCH KNOWLEDGE NETWORK ON SYSTEM INNOVATIONS

In the Netherlands, transition management has been launched as a new way to address complex societal issues related to sustainability. By definition they cannot be managed in a top-down manner in terms of command-and-control and will also not be guided toward sustainability by liberalised market-strategies. Transition management has been defined as an anticipatory form of multi-level governance that uses collective, normative visions as a starting point for formulating long-term, collective innovation strategies. In the result of these developments a new research network has been established that consists of about 50 researchers from a variety of scientific disciplines that deal with transitions and system innovations: the Dutch Knowledge Network on System Innovations: transitions towards a Sustainable Society (KSI). Economists, historians, system experts, governance experts, technology experts, political scientists and behavioral scientists have joined forces and have together with the National Initiative on Sustainable Development (NIDO) produced an ambitious multi-, inter- and trans-disciplinary research program. In order to provide the KSI-infrastructure with an international dimension, the KSI-network explicitly sought for a strong linkage with the IHDP-IT program. The session presenting the KSI network provided such an opportunity and aimed at clarifying the concepts of transitions and transition management by providing the theoretical foundation of these concepts as well as by discussing practical applications (Rotmans et al 2003).



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UNDERSTANDING GEOGRAPHICAL DIFFERENCES

When studying historical transformations with the aim to fuel the policy process and envisage pathways towards sustainability, it is of utmost importance to take account of regional differences. This is not only due to various levels of economic development, but also because of different climatic conditions and topography and often very different cultural and socio-political patterns.

For example, the challenge for the OECD countries is to continue economic development while reducing environmental burden (de-coupling or de-linking). But for the South Asian region a single challenge cannot be defined since differences among and within the countries in terms of production and consumption are too large to allow for such a simplification. The rapid change to natural gas buses in New Delhi or growth of kilowatts produced by decentralised renewable energy systems like wind mills or solar power could serve as good examples of change for many more *saturated* OECD countries. But at the same time, the South Asian region is home to the largest number of poor and nearly half of the two billion people without access to energy in the world live just in that part of the world (Wieczorek and Vellinga 2003).

The industrialising East Asian mega-cities undergo a rapid transformation due to massive economic growth in last few decades. This growth has been accompanied by increases in per capita income and significant declines in poverty and child mortality but also by tremendous increases in air and water pollution, resource degradation and escalating energy use. It has been widely recognised that this is due to failures of policies and weaknesses of institutions. On the other hand the evidence showed that incremental improvements in environmental regulatory policy were often overridden by the scale effects of increased production, consumption and resource use. Given this urban-industrial growth, the challenge for this region is therefore to shift to patterns of economic development that are significantly less energy, resource and pollution intensive (Angel 2000).

SUMMING UP

Industrial Transformation carries different messages through the world. The differing perspectives on transformation and global environmental change research should therefore be viewed as a function of both geographic and economic factors. Theoretical research on transitions still faces many challenges and the knowledge base about harnessing the socio-technical change to the process of purposive transition towards sustainability has to be further developed. Even though transition research is still in its infancy, insights developed thus far do allow making policy suggestions that can inspire current attempts to define and implement various forms of transition policy. The challenge to realise transitions towards sustainability in a variety of domains can only be fruitfully tackled when near-future attempts to induce them are carried out in close interaction with work on furthering the understanding of the dynamics of transitions.

The International Project Office of IT would like to thank all speakers, chairs and participants of the IT sessions for the lively discussions. We hope to continue this dialog at the next OM in 2005.

Contributors to the IT sessions: Leena Srivastava, Shobhakar Dhakal, Harry Aiking, Boelie Elzen, Frank Geels, Marleen van de Kerkhof, Jan-Peter Voss, Rene Kemp, Ulrik Joergensen, Pier Vellinga, Mahesh Patankar, Ken Green, John Grin, Jan Rotmans, Caroline van Leenders, Derk Loorbach, Nina Poussenkova.



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Photo: Ulla Loew

MANAGING THE DIRECTION OF SOCIETAL CHANGE

Sustainable development in practice

BY CAROLINE VAN LEENDERS

► For sustainable development fundamental changes in society are necessary changes that can only be brought about by joining forces. For firms, public services, and authorities alike, these transitions mean engaging in a development trajectory in co-ordination with their stakeholders, in which processes, product portfolios, management practices and decision processes are adjusted to meet the demands of the new society (Triple P) and the 'new' consumer. NIDO, the Dutch National Initiative for Sustainable Development, facilitates these collaboration processes between all stakeholders in order to meet the challenge of transitions for sustainable development in practice.

THE CHALLENGE

If future generations are to have the same options to satisfy their needs as our current generation has now, mechanisms ensuring this have to be built into our current practice. This is stressed in the fourth National Environmental Policy Plan (NMP4). The NMP4 mentions transitions to a sustainable energy system, a sustainable use of natural resources and a sustainable agriculture. Scientific and technological innovations are vital to make these transitions possible. But technological innovations alone are not sufficient. To achieve real sustainability a more widespread social transition process is necessary. This requires a complex and fundamental process of changes in the community structure. The NMP4 calls these 'transitions' or 'system-innovations for sustainability'.

The changes required for the transition to a sustainable society can only be brought about if the process meets certain aspects such as the involvement of different actors or 'multi-actor' (i.e. firms, NGOs, government, knowledge institutes), multi-scale (i.e. local, regional, national) and multi-level (changes should happen on micro-, meso- and macro-level). It thus means joining forces, analysing the system, setting an ambition and engaging in a dialogue. It has to be a social learning process in which the roles of all parties concerned co-develop. This is the challenge of sustainable development.

NIDO: BRINGING PARTIES TOGETHER

NIDO was initiated by the government in 1999 to facilitate transition processes in practice by bringing various parties together towards concerted action. NIDO is positioned as an independent organisation, with no other interest than the progress towards sustainable development. NIDO involves industry, government, science, and societal organisations in collaborative processes to realise the implementation of sustainable practices. Areas presently addressed by NIDO include CSR (corporate social responsibility), logistics, sustainable product marketing, water management and sustainable outsourcing.



Photo: Ulla Loew

Intermediate organisations like NIDO help to get these processes off the ground. In the processes that NIDO supervises, depending on the definition of the problem and the environment, different relevant parties are brought together. Parties join forces in initiatives championed by individual players, such as firms or civil service organisations. They are stimulated to find new solutions through new forms of co-operation and dialogue. Science and technology supply important ingredients for these new solutions; knowledge and transfer of knowledge are always an important element in these processes. The combined energy of parties involved in these projects also help to define the desired role of societal institutions.

NIDO also serves as a structural interface between fundamental knowledge development, competence development and real-life experimentation and thus catalyses the transition towards a sustainable (Dutch) society and provides high quality (knowledge) support for policymaking and business.

The initial results of this approach indicate that NIDO's facilitation successfully deals with the complexity of the issue and that it leads to structural implementation of sustainable practices in business processes; all parties involved in processes supervised by NIDO gradually learn to effectively meet the challenge of sustainable development.

The main challenges for the practitioners guiding the NIDO programmes involve:

- The utilisation of scientific transition knowledge to execute their own tasks more effectively, and to develop competences of all players involved
- The effective dealing with the context of each individual player: frames of reference, stakeholder influences, use of language, routines, (organisational) cultures
- The transfer of ownership of the transition to structural players

- The establishment of synergy between the individual transition and the overall transition towards a sustainable society

The activities of the practitioners can be described by three 'phases':

1. Analysis: identify opportunities and involve essential societal players
2. Intervention: organise reflection, learning, alignment and continuity of effort between these players
3. Output: ensure output for individual players as well as helpful contextual change

THE OUTPUT

NIDO's activities/programmes deliver output for individual players (micro-level) as well as for their contexts (meso-level). These two realms should change simultaneously (multi-level) to make a system innovation reality. For the individual players this means they will gain:

- New visions and strategies for the future
- A change of criteria for decision making (involving triple P and multiple scale levels and time scales)

For example: in the programme 'Marketing opportunities for sustainable consumer products' niche players learn new marketing strategies (from 'technical to emotional marketing') and major brand companies learn how to work together with NGOs and how to implement the results of a multi-stakeholder dialogue in the decision-making process. Another example comes from the programme 'From financial to sustainable profit', where two projects on CSR were formulated; one with strategic managers and one with communication managers. They met monthly to discuss the progress and problems of their internal projects on CSR and found out what CSR implies for their company (sector-specific) and how to organise internal communication on CSR.

Outcomes on contextual level are found in many different NIDO-programmes. Examples:

- New (commercial and/or public) value propositions
→ New values of water in the city in the programme 'Values of Water' or new guidelines for reporting on CSR
- Novel organisational arrangements and collaborations
→ Set-up of a regional working group of companies on logistics in the programme 'Bundling for sustainability'
- Value chain restructuring
→ The new programme 'CSR in an international context' targets the structure of the value chain in trade between developed and developing countries
- Alternative use of space and other resources
→ Containers used as temporary land in the harbour of Rotterdam in the programme 'Sustainable outsourcing'
- Combination of functions
→ The value of existing buildings in the programme 'Sustainable urban regeneration'
- Development and implementation of new technologies
→ Customer oriented implementation of domotics in the programme 'Sustainable housing for the elderly'
- New formal/informal routines, rules and institutions
→ See the examples before

On meta- or macro-level NIDO extracts meaning by reflecting (with scientists) on experiences, hereby making use of and expanding scientific knowledge. Outcomes:

- Transition management
→ a scientific description of the competencies necessary for transition management
- Fundamental research
→ new insights, concepts, models and theories
- Practice-oriented research
→ new instruments and concepts for practical use
- Research supporting real-life experimentation
→ direct knowledge support in context
- Real-life experimentation
→ reflected experience and competence development
- Dynamic mutual influence between activities and actors (scientists and practitioners)
→ dynamic, non-linear, knowledge generation process

With regard to real-life experimentation the observation is that transitions towards a more sustainable society involve an *aligned* effort of a *diversity* of societal players, e.g. business, civil service, public service, (local) authorities, consumers, citizens, scientists, NGOs.

CONCLUSIONS

NIDO takes its starting point by taking stock of what science knows about transition processes and moves forward by organising conditions under which shared learning takes place across companies and other players in order to understand the complex learning challenges which are posed by sustainability. For this 'action research' NIDO works 'cross-organisationally' and 'cross-sectorly'. Participants join voluntarily and the programmes develop in an interactive and reflexive process, making use of distinctive tools (e.g. dialogue). Structures, practices and methodologies emerge gradually.



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PANEL SUMMARY: HOW TO IMPROVE THE EMPIRICAL BASE FOR INTEGRATED GLOBAL CHANGE RESEARCH?

BY HERMANN LOTZE-CAMPEN

► **The understanding of global change processes and the design of efficient adaptation and mitigation measures are major tasks for an emerging sustainability science. An appropriate empirical base for integrated global change research would comprise long time series of key variables describing society-nature interactions. However, currently available monitoring systems are often restricted to a specific disciplinary background. In the panel we assessed the current status of sustainability monitoring, defined existing gaps, and explored future options for improved knowledge generation.**

Fritz Reusswig (Potsdam Institute for Climate Impact Research PIK, Germany) introduced the idea of a “Geoscope – a tool for sustainability impact assessment”. The world community has developed powerful monitoring and reporting initiatives for the natural systems. However we still lack an analogue at the social systems part. The Sustainability Geoscope provides a vision of a site- and region-specific monitoring tool for guiding transitions towards sustainability. Numbers and narratives have to come together in different regional and social contexts. Remote sensing data and in-situ information on society-nature interactions should be integrated into theory-based models. A Sustainability Geoscope would gradually generate a publicly accessible database on selected sites all around the globe. Existing data should be used wherever available. Partners involved would provide site-specific expertise and monitoring facilities. A multitude of methods for data gathering and evaluation would be applied, and careful attention should be given to common protocol standards, database management, and public communication.

Thomas Parris (ISciences LLC, USA) reviewed the status of „Measuring Sustainable Development”. Much work has been devoted to developing quantitative indicators of sustainable development. The emphasis on sustainability indicators has multiple motivations: decision-making, advocacy, consensus-building, and research. A dozen prominent examples were assessed and compared with regard to motivation, definition of sustainable development, salience, credibility, and legitimacy. Technical characteristics of data selection, scale, units of analysis, and aggregation methods were also considered. There are no indicator sets that are universally accepted and backed by compelling theory, rigorous data collection, and analysis. This is due to the ambiguity of sustainable development, the plurality of purpose in measuring it, and the confusion of terminology, data, and methods. Reducing such confusion would require an analytical framework that clearly distinguishes among goals, indicators, targets, trends, driving forces, and policy responses.

Dale Rothman (Macauley Institute, UK) gave an overview of “Modelling Sustainable Development”. Models force us to make our assumptions about the most important indicators and their relationships explicit, hopefully allowing for clearer communication and critique. Models should be seen as limited “heuristic tools” rather than “truth machines”. They allow us to ask why a system is behaving the way it is and what its behaviour might be in the future. Formal models can have several purposes: organise our understanding about a system; test hypotheses about our understanding; test the effect of changes in important parameters. Formal models can play an important role in helping us to think about scientific and policy issues related to sustainability, particular in conjunction with indicator sets. We need not restrict ourselves to quantitative models and should draw upon the specific talents of people and their available tools.

Brent Yarnal (Penn State University, USA) discussed “Infrastructure to Support the Sustainability Geoscope Concept” and how the Human-Environment Regional Observatory (HERO) project is building that infrastructure. To achieve sustainable development, scientists must monitor local human-environment interactions. This requires three important infrastructure components: (1) research protocols, i.e. guidelines that specify how scientists should apply a methodology to a particular problem and that are flexible, dynamic, and standardised; (2) communication among researchers, i.e. sharing of data, methods, and ideas. This can be achieved through a collaboratory, i.e. a web-based environment aimed at fostering remote collaboration, including video conferencing, electronic Delphi tools, shared notebooks and databases, interactive maps and graphs; (3) a network of scientists to adopt research protocols and collaboratories. Local-area research sites already exist worldwide. They function independently, collecting unique data in unique ways, thus making cross-site comparison impossible. An international network of researchers is crucial to have a consistent, verifiable, and comparable record of local sustainability over time and space.

Background papers and presentations from this panel are available at the Geoscope website.

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In Montreal the title “Architect of the Geoscope” has been awarded for the first time. Brent Yarnal won a prize for his essay on “Infrastructure for Sustainability Monitoring”.

KNOWLEDGE ON GLOBAL ENVIRONMENTAL CHANGE WITHIN SOCIAL PRAXIS: WHAT DO WE KNOW?

HARALD HEINRICHS, MAXWELL T. BOYKOFF, MARLEEN VAN DE KERKHOF,
DÖRTHE KRÖMCKER, VILJA VARHO, JAN-PETER VOSS

► **The Montreal Conference was an impressive demonstration of the body of knowledge produced by the global environmental change community during the past ten years.** One could find conceptual and empirical knowledge on a broad range of global change issues. This success story in mind, it is not surprising that the question, what society is doing with this valuable knowledge was asked in many conversations at the conference. Most prominently, Barbara Göbel raised the issue that we need to know more about the social processing of knowledge. And in fact: papers and posters on the social contexts of global change expertise like science-policy-interface, science and public communication or science and private sector were quite few. Discussing this 'phenomenon' amongst some younger researchers, we presumed that more researchers may be interested in a research perspective on the production and integration of global environmental change knowledge within social praxis. With this letter we want to get in contact with like-minded people to foster this research perspective.

Knowledge – understood as models of reality – is cognitively and socially constructed and therefore always context-related. For example, disciplinary scientific claims are primarily valid (and true) in their specific scientific community; policy-oriented (scientific) knowledge has to be seen with regard to decision-making processes, and local knowledge is related to the situations in specific time-spatial surroundings. Based on the given pluralist stocks of knowledge, human beings interpret phenomena depending on the context of their involvement with their social-material world, and their (inter)actions are guided by these interpretations, e.g.: How are issues like climate change, its causes, consequences, mitigation and adaptation framed in regard to different cultural and social contexts?

The traditional idea of objective, value-free knowledge, which is per se superior to non-scientific stocks of knowledge, has been questioned by sociologists and historians of science. Nowadays different forms of knowledge can be seen as complementary. Especially the idea of 'co-produced', integrative knowledge, in which scientific and non-scientific knowledge come together, is seen as important with regard to transitions towards sustainability. Understanding better the way of production, communication and integration of diverse knowledge within different contexts, as well as the involved beliefs, value orientations and interests, may help to improve knowledge discourses on global environmental change issues.

To our opinion the research perspective should focus on three topics:

Production of knowledge: analysis of inter- and transdisciplinary research processes. What kind of criteria do we have – and do we need – to assess these processes? How can a better understanding of these processes help to improve context-sensitive, problem- and solution-oriented knowledge production?

Communication of knowledge: analysis of knowledge-oriented communication processes between global change researchers, decision-makers, the media, the private sector, NGOs and citizens. How are global environmental change issues communicated within and between advisory systems, mass media, civil society, and the broader public?

Integration of knowledge: analysis of the integration of global environmental change knowledge

into individual and collective decision-making. How is this knowledge integrated into social praxis? What are the factors and mechanisms determining the selection and (re-)contextualisation of GEC-knowledge with regard to human agency.

Finally, across the three topics: analysis of the interdependencies between knowledge and values, interests and basic beliefs regarding global environmental change.

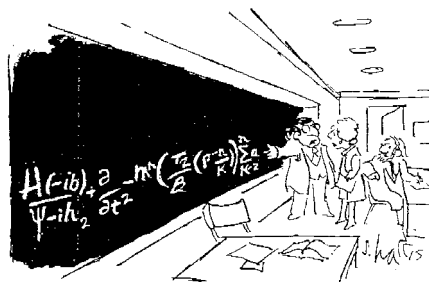
Obviously, these few questions just indicate some aspects of reflexive global change knowledge that we believe are worthwhile to look at in the context of GEC-research. We are aware of the fact that some work on knowledge and institutions is done by the core project 'Institutional Dimensions of Global Environmental Change'. However, we think that it makes sense to focus more specifically on the production and integration of Global Change Research within social praxis. We are also aware of the fact that a lot of work regarding these topics has been done in other communities, such as social studies of science, science communication etc. But we as researchers working in the area of global environmental change and sustainability believe that we should adapt those studies to the specific needs of our research area. We invite every researcher to contact us, and to exchange ideas and perspectives in order to strengthen this research perspective. To what extent we will succeed depends on all of us.

▼

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But this is the simplified version for the general public.

THE PLENARY SESSIONS

► In her public lecture at the McGill University, **Barbara Göbel**, Executive Director of IHDP, noted that global change research has shown that in terms of some key environmental parameters, the Earth system has moved well outside the range of the natural variability. It is currently operating in a no-analogue state. Human activities are significantly influencing Earth's environment. They have multiple effects which interact at different scales. Global change research has underlined that these changes cannot be understood in terms of a simple cause-effect patterns. The global change programs have been less successful in communicating the consequences this has for the production of scientific knowledge. Traditionally societies, in particular political decision makers, expect from scientists that they organise and reduce complexity and provide tools to control it. In the frame of global change research we basically have to communicate uncertainties.

Another particularity of global change research is that it is a paradigmatic case for international, interdisciplinary research with a close cooperation between social and natural sciences. It also underlines the organisational challenges of this type of research. The network structure of the international global change programs builds up on the development of mutual trust. Negotiations of common interests are, however, embedded in landscapes of power. The perspectives of the South and transition countries should play a more significant role in the agenda-setting. Göbel mentioned several other challenges for human dimensions research on global change. More effective integrative research designs have to be developed not only from an epistemological but also from an organisational point of view. Research insights have to be re-framed into development contexts, dialogues established between scientists and different stakeholders and scientific knowledge must be translated into action. More mediators and knowledge brokers are needed for these processes.

On Thursday morning, the plenary sessions started with a session on *Poverty, Environment and Development*. **David Runnals**, President of the International Institute of Sustainable Development (IISD), provided the audience with some historical context for the poverty alleviation debate, pointing out the evolution of attitudes and perceptions of poverty and environment. As a result, the definition of poverty has become more multidimensional and now includes determinants such as health and human dignity. Ecosystem services and determinants of well-being have to be respected and multidimensional solutions are required. Different countries use ecosystems in different ways. Strategies need to respect these differences and be based on stakeholder input.

Patricia Romero Lankao, Professor at the Metropolitan Autonomous University of Mexico City, observed that the link between poverty and the environment is context specific. Migration can result in regeneration of landscapes but also in a loss of genetic diversity as agricultural livelihoods are abandoned. She then pointed out that Southern poverty has been fostered by colonisation and the exploitation



Photo: Ulla Loew

Karen O'Brien

of Southern resources by the North. Furthermore, it is the production and consumption habits of the North (as well as those of a rich minority elite of the South) that contribute to environmental degradation. Structural problems underlie the South's inability to increase wealth and welfare of its people. At the same time there is bad governance, rampant corruption and the tendency of Mexico's rich to look to the North rather than integrate a development framework..

At the plenary session on *Patterns of Development and Sustainability*, **Mohan Munasinghe** of the Munasinghe Development Institute in Sri Lanka, noted that while the international community has adopted measures to address the many poverty challenges worldwide, there has been no change, but rather regression and "a stabilisation of expectations of international organisations." He presented the framework of "sustainomics" which can work towards the goal of identifying and rectifying unsustainable actions. It is represented by a triangle with social, economic and environmental vertices with many linkages and interrelationships. The three-dimensional aspect of sustainomics contributes to an understanding of poverty issues where traditional poverty definitions have failed. Munasinghe also pointed out that now, climate change has become integral to sustainable development whereas this was not the case with the former viewpoint. At the social and economic policy level, he observed how important it is to devolve power and strengthen support services. He also remarked that the issue of scale in consumption is very important and is in conflict with poverty alleviation.

After entertaining the audience with a sustainable development version of "Let it be", **Barry Smit**, who holds the Canada Research Chair on Global Environmental Change at the University of Guelph, noted that the practical approach of sustainomics could be used to assess projects or policies. At the same time, however, it relied too heavily on economic indicators. The often difficult conversion of environmental

and social indicators into economic ones “may not always be sensible”. In this way, monetary figures have been assigned to Samoan village burial-grounds, for instance, and the IPCC has even derived a value for human life. Was this necessary? Smit continued his discussion with an example of deforestation and poverty, noting that although there was continued livelihood, there was no sustainable development. A spaghetti diagram of various factors involved in deforestation could serve as a tool for analysis. He commented that analytical methods often fall short in terms of practical strategies and frameworks at the regional and local levels. In discussion with the audience, Smit asked, “Why do we have to have a theory for it before we can take action?” He gave the example of the Free Trade Agreement which is in place despite lack of a supporting theory.

At the plenary session *Governance of Natural Resource Issues*, the Executive Director of The Energy and Resources Institute (TERI) in India, Leena Srivastava, spoke about natural resource governance in her country. She outlined the three important elements of governance: efficient structures, access to resources, and a legal framework. Other key issues include the rights of stakeholders, implications on livelihoods and conflicts and power struggles. She gave one example of a case study in Northern India where a Joint Forest Management committee was established in response to cooperation between the Forest Department and the hill communities. Those communities lived below subsistence; there was free goat grazing and illegal withdrawal of firewood. Initial program incentives gave way to more sustainable livelihoods and landscapes. This successful program was replicated across India. Srivastava also talked about India’s water availability problem and the various approaches in addressing it including an integrated watershed management approach and a community design approach. Water availability involves not only questions of governance but also of efficient use, pricing and farmer education in irrigation practices. A participatory water management program evolved with 13 state Water User Associations. Although a positive development, Srivastava states that problems remain: Government is happy to unload all responsibilities on WAUs, for instance, or the power relationships represented within the



Photo: Ula Loew

Barry Smit

WAUs. Also, she observed that scarcity and bad quality of water affect women most (as does lack of firewood) – they are most vulnerable to ecosystem change, yet to increase their membership in the Water User Associations as well as in the Forestry Management Committees remains a challenge. Srivastava then went on to talk about privatisation of water in urban areas, and about air pollution and renewable energies. Available technologies, she commented, are often neither affordable nor adapted to the local context. As the state distances itself from provision of services via privatisation, there has to be a continued relationship between government and private sector in a system of shared goals.

Leslie King, Dean of Environment at the University of Manitoba, addressed institutional dimensions and their impact on the work outlined by Srivastava. She commented on the need to govern for access and sustainability, and for transparency and accountability. How is good governance obtained and how will it affect global and local systems? Furthermore, how is a research agenda designed around the good governance of natural resources? Noting that her institute addresses some of these issues, King outlined the research areas of the institute: causality, performance, and design. The latter clearly has implications for designing institutions that respond to environmental change.

King compared the work of TERI and IDGEC, noting many similarities and shared issues. For example, the extent to which local institutions and communities are constrained by activities of international or national institutions is key for both organisations. All three of IDGEC’s analytical themes—fit, interplay, and scale—are at work in Srivastava’s projects.

Despite many problems and challenges, King noted that a consistent language and network have been created. Currently, the institute is developing three flagship projects, including one on carbon management activities. She then pointed to questions that will define IDGEC’s future research direction including vulnerability of communities, the way institutions assist in adaptation, and a continued look at institutional dynamics and their impact on power relationships and gender equity.

Roberto Guimaraes, from the Sustainable Development Division of the United Nations Economic Commission for Latin America and the Caribbean, was the first speaker to



Photo: Ula Loew

address the audience in the plenary session *Governance of Pollution Issues*. The Rio Summit 1992 laid the foundations for multilateral environmental agreements on sustainable development, he said. However, restrictions to development aid, such as the proposal of substituting aid for trade, also emerged and most of the principles of sustainable development are still considered by many countries as a restriction to growth. Guimaraes indicted corporate globalisation and competition for retarding the capacity and willingness of nation-states to carry out measures of sound environmental management. The pressures of policy convergence mean that measures will only be taken if they are in step with primary competitors, with the net results that markets become the primary drivers of changes in environmental performance. Thus the main threat to governance comes from trade regimes that are dominated by business interests that fail to comply with environmental regulations, and moreover, operate under a veil of secrecy weighted in favour of maintaining the corporate status quo.

Guimaraes warned that policy decisions on environmental governance, and who pays for the environmental costs—state or society—are urgently needed. He concluded by suggesting a number of human dimensions avenues that need more research such as Tobin's tax proposal.

One of the major changes since the Rio Summit, said **Eduardo Viola**, Professor of Political Science at the University of Brasilia, has been the impact of the acceleration of the information technology revolution. Since the mid-1990s, there has been growing confidence in the capacity of technology to solve the problems that technology created, even as the technological gap among societies increased dramatically. Viola challenged the extent to which public participation would actually be a driving force for improving the governance of pollution. "More important than public participation is institutional quality to ensure effective governance," he said.

In Viola's view, governance of pollution issues has three dimensions: basic sanitation (national, sub-national), industrial pollution (national, regional, transboundary), and carbon emissions (global). This approach reveals the very complex and highly heterogeneous nature of governance of pollution, where there are major advances in some places, but not in others. Governance is largely dependent on institutional resolve to promote cleaner, more productive processes.

In conclusion, Viola noted that while environmentalism has become a successful mainstream movement in developed countries and some emerging countries, the ideas of "radical environmentalism"—the ones that question material prosperity, free market economics, and support the preservation of most of the remaining global biodiversity—have faded.

Vaclav Smil, Distinguished Professor of Geography at the University of Manitoba, was the first speaker at the plenary session on *Climate Change and Agriculture*. Vaclav Smil described the unknowns of climate change and agriculture. In a simple system a rise in greenhouse gases equates to a rise in temperature but such predictions are not as simple in a complex system. In fact, there has been an uncoupling of the relationship between CO₂ and temperature throughout geological history.

Given the different temperature and precipitation variables in relation to CO₂ concentrations, the possible scenarios that could result are endless. Slight increases in temperatures will not be catastrophic for conventionally grown crops—these changes are expected. "Problems arise when you factor in the distribution of precipitation," he said, citing the example of China where climate change could intensify the poor distribution of precipitation. On the other hand, climate change may result in more equally distributed rainfall. In essence, models are good for the big picture but are less reliable for finer small-scale scenarios. Smil left the audience with the question of how GMOs might impact this already uncertain picture. Noting the tremendous potential of GMOs, he concluded that despite its critics, the technology is unstoppable and its direction unimaginable.

Cynthia Rosenzweig, Research Scientist at NASA's Goddard Institute of Space Studies in the US, pointed to the importance of recognising what is known. For example, despite all the complexities of the systems involved, it is now possible to predict a divergence of vulnerabilities between



Photo: Ula Loew

developing and developed countries. High temperatures were expected to have negative impacts in developed countries, but instead yields will be at much greater risk in lower latitudes, a prediction affirmed by many studies of rural communities and agricultural systems. This, Rosenzweig noted, was the first great contribution of social science to the field of climate change. The second is the notion that adaptation is integral to climate change research. The corollary, however, is that adaptation is not always possible, complete, or simple, as witnessed by the inability of current cultivators to reverse the effects of climate change. The social science perspective brings tremendous insight about the drivers of human adaptations.

On the biophysical side, climate-induced changes are going to be heterogeneous, positive or negative, and will be changing through time. However, these impacts are of uncertain magnitudes and distribution. While climate change models cannot determine what will happen in one region,

they can relate changes in seasonability and intensification of hydrological regimes, for example. Furthermore, changes in agro-ecosystems will not follow a simple path as has already been illustrated by the rapid, unpredicted expansion of pests. Rosenzweig envisioned a bridging between the two streams of climate change research. A model is needed to connect the groups—the seasonal to inter-annual, the decadal to centurial—that focuses on stakeholders, adaptation, and policy makers.

Another divide exists between scientists working on adaptation and those on mitigation. Rosenzweig said that tremendous opportunity exists for agriculture to contribute to mitigation in terms of carbon.

At the session *Vulnerability to Climate Change*, **Karen O'Brien** observed two differing interpretations of the term 'vulnerability': As a means of defining the extent of the climate change problem on one hand; as a basis for identifying how to respond to climate change on the other hand. Adaptation, which is crucial in both cases, refers to actual adjustments or changes in ecological, social or economic systems in response to actual or expected climatic impacts. It refers also to the potential of adaptation. Some regions, ecosystems or social groups may be less able to cope with potential adaptations than others.

There is a 'chicken and egg' question in climate change research: does vulnerability shape adaptability or vice versa? "This has important policy implications, especially as adaptation inches its way up in international climate change policy negotiations", said O'Brien.

Who is vulnerable to climate change, why, and what can be done about it? A common set of indicators reflecting some universal understanding of vulnerability is necessary for reaching a global perspective. Context is vital to the vulnerability framework. Climate change is taking place within the context of multiple stressors, including HIV/AIDS, conflict, and economic globalisation. Also different places imply different contexts of vulnerability.

Climate change and the Kyoto Protocol have not created the same popular movements as, for example, the WTO negotiations. Even among the most vulnerable populations, climate change is not usually a prioritised concern. This is perplexing "since both climate change and globalisation involve issues of equity, accountability, responsibility, livelihood and self-determination."

In his commentary, **Roger Kasperson**, Executive Director of the Stockholm Environment Institute, noted that while a great deal of progress has been made to address climate change, the research community needs to make a major push to communicate vital information to decision makers and practitioners. Vulnerability analysis must be broad and holistic. He also noted that some of the same driving forces that are shaping multiple sources of stress are shaping vulnerability. It is important for the research community to continue building a knowledge base of highly integrated local studies, while trying to understand global syndromes of climate change, he said. This knowledge needs to be integrated into a macro knowledge base.

Kasperson identified some major holes in the evolving research program on vulnerability. Attempts to analyse vul-



Photo: Ulla Löw

nerability are sabotaged by time and space displacements. "We're remarkably successful in spatially exporting damage to future and distant populations—placing vulnerabilities on people in distance places, and jeopardising the future through the activities that we do," he remarked. Moreover, the importance of values as a significant driver of both vulnerability and environmental change has been underrated.

He identified five areas where the human dimensions community can make pressing near-term contributions to international policy processes: assemble accumulated knowledge in a rigorous meta-analysis; be alert to "policy windows," when issues of climate change can be promoted; urgently raise public awareness on global environmental change; establish priorities, criteria, indicators, indexes, and mapping methodologies; create models and prototypes of resilience-building activities in communities, regions and among the highly-vulnerable populations of the world; and develop priority systems, such as for funding adaptation and emergency systems.

In the *Closing Plenary*, **Peter Brown**, Director of the McGill School of Environment, called for a vision of a civilisation that we can be proud of. Global climate change is an artefact of human failure and the lack of vision, he said. **Roger Kasperson** demanded that the human dimensions research community take a vanguard and leadership role in creating a new kind of science that is holistic and value-centred, rather than value-free. The community should collaborate on near-term policy interventions to show "that we can really make a difference." **Alejandro Leon** demanded that research findings on vulnerability get communicated back to the local communities and to policy makers in developing countries. He also called for increased participation of scientific communities in the South. **Richard Klein** emphasised the importance of global and national studies for policy makers. He asked for a greater participation from economists. It was also suggested that policy makers and consultants could play a role in the future Open Meetings.

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This report was compiled by Sylvia Welke from Infolink, Ottawa, Canada and by Ulla Löw, from IHDP in Bonn, Germany; loew.ihdp@uni-bonn.de;

IHDP NATIONAL COMMITTEES AND CONTACT POINTS

A Major Strength for the Human Dimensions Research Community

BY DEBRA MEYER WEFERING

► **Nine IHDP National Committee Chairs and sixteen National Contact Points**, representing all major regions, came together in Montreal to follow the theme of the Open Meeting itself, 'Taking Stock and Moving Forward'. The first half of the day was spent in open discussion of human dimension research activities and progress at the regional level as well as to discuss areas of regional collaboration in which National Committees could work together on common themes. The second half of the day allowed representatives to split into two working groups to discuss issues of concern at the national and regional level and find means to work more closely together in the future. The working groups were selected to balance North/South input. Representatives from key regional (IAI, APN, START) and research (PERN, SCENIC) networks played an active role in promoting an integrative approach to international collaboration in HD research.

The lead objectives of this meeting were to assist all IHDP National Committees in 'moving forward' in playing a more active role in the IHDP Global Change Community and to build up partnerships at the regional level.

Representatives expressed and thoroughly discussed views on major issues that cut across international boundaries:

- increasing opportunities for young scientists;
- lack of funding opportunities;
- communicating research information;
- North/South and South/South collaboration on common research themes;
- strengthening the link between the HD research community and decision-making;
- translating research into action;
- collaborative research between natural and social scientists;
- promoting international cooperation and international research networks; and
- increasing capacity building efforts.

The global network of social scientists represented in its National Committees and National Contact Points is one of IHDP's leading strengths and driving forces of research activities. In order to support research in our field, IHDP places high priority on balancing representation of all regions of the world.

To-date, fifty-six nations are actively linked to our research community. IHDP has twenty-five National Committees (eleven are Global Change Committees with representation from all four GEC Programmes) and thirty-one National Contact Points. Out of the fifty-six countries, about half are located in developing countries and ten are positioned in Central and Eastern Europe.

List of IHDP National Committees* and National Contact Points

Argentina	Fiji	Norway*
Australia	Finland	Pakistan
Austria	France*	Philippines*
Bangladesh	Georgia	Poland
Belarus	Germany*	Portugal*
Bolivia*	Greece	Romania*
Botswana*	Hungary	Russia
Brazil*	India*	Senegal*
Bulgaria	Indonesia*	Slovak Republic
Cameroon	Japan*	South Africa*
Canada	Kenya*	Sweden*
Chile	Laos	Switzerland*
China	Latvia	Taiwan*
Cote d'Ivoire*	Mauritius*	Tanzania
Czech Republic	Mexico	Turkey
Italy	Nepal*	Uganda
Ecuador	Netherlands*	USA*
Egypt	New Zealand	Vietnam*
Ethiopia	Nigeria*	

National Committees and National Contact Points are an invaluable resource to IHDP. Not only do they bring together leading scientists to work on human dimensions-related issues in their countries or regions, they play a leading role in naming participants to IHDP core and joint science projects as well as influence the identification of research themes for the Programme as a whole.

If you would like to become involved, do not hesitate to contact your national representative or the IHDP Secretariat. Further details can be found on the IHDP website (<http://www.ihdp.org>) which is updated regularly.

The IHDP Secretariat is currently developing an updated Directory of IHDP National Committees and National Contact Points to include all contact details as well as information on key research areas of interest at the national and regional level. Summary statements and opportunities for cooperation will also be included for select regional and research networks. Publication is planned for early 2004.



DEBRA MEYER WEFERING is an International Science Project Coordinator at the IHDP Secretariat and Liaison to IHDP National Committees and National Contact Points as well as to the Seed Grant Initiative; Wefering.ihdp@uni-bonn.de

IN BRIEF

➤➤➤ **Heike Schröder** is the new Executive Director of the Institutional Dimensions of Global Environmental Change Programme (IDGEC), one of IHDP's core projects, based in Santa Barbara. She replaces **Syma Ebbin** who has remained in New England but retained her affiliation with IDGEC as a Research Fellow.



Heike Schröder

Heike has just finished her Ph.D. in political science (title: Japanese politics of climate change) in Berlin in September 2003. She has joined IDGEC in November and climate policy issues will continue to play a role in her future research agenda.

➤➤➤ **At the IHDP Synthesis Meeting in Montreal**, a thorough scientific stock-taking process got started. This will lead to a mid-term review, largely based on the present scientific achievements of the IHDP core projects in relation to the cross cutting themes of IHDP. This review will serve to frame IHDP's contribution to global change research in a clear and coherent way. The discussions on synthesis and the cross cutting issues were continued at the Officers & Project Leaders Meeting in Cuernavaca, Mexico (3–4 December 2003).

Fourth International Human Dimensions Workshop (IHDW) Globalisation, Global Environmental Change and Food Systems: Intersections and Interactions



October 24 – November 6, 2004



IHDP (International Human Dimensions Programme on Global Environmental Change) and IAI (Inter-American Institute for Global Change Research) would like to announce the fourth bi-annual International Human Dimensions Workshop, to be held from October 24 – November 6, 2004 at the Mesoamerican Institute of the National University of Costa Rica in Nicoya.

This capacity building workshop aims at the systematic promotion of young scientists from developing countries and countries in transition, initiating their future integration into IHDP and IAI networks and project communities.

The fourth International Human Dimensions workshop will focus on intersecting and interacting processes of globalization/globalisation and global environmental change, and the implications for food systems. Globalization-Globalisation is shaping economic, social, institutional and cultural changes that influence food systems in a myriad of ways. These changes are transforming the production and storage of food, the movement and trade of food, access to food, the reality and perceptions about food safety, and consumption patterns. At the same time, global environmental change is altering the physical and social conditions that underpin terrestrial and marine food systems.

The transformation of food systems in a globalizing world has environmental and social impacts that are likely to interact synergistically with global environmental change. The goal of the workshop is to identify some of these critical interactions and consider the implications for both environment and society, particularly in areas characterized either by poverty and food insecurity or by growing per capita incomes and rapidly changing demands for food.

Please visit our webpage (www.ihdp.org) for more details or contact Maarit Thiem at thiem.ihdp@uni-bonn.de

MEETING CALENDAR

▶▶▶▶ 20 – 22 January

International Workshop on Global Change, Sustainable Development and Environmental Management in Central Asia

Tashkent, Uzbekistan

For more information please contact
svetlana.nikulina@envp.uzsci.net

▶▶▶▶ 24 – 26 March

**2nd International SPOT-VEGETATION Users Conference
Antwerp, Belgium**

Information: <http://www.geo.ucl.ac.be/LUCC/lucc.html>

▶▶▶▶ 29–30 March

**International Sustainable Development Research
Conference**

Hulme Hall, University of Manchester, UK

Evolutions in Environmental Policy and Governance

Information: <http://www.erpenvironment.org/>

▶▶▶▶ 26–28 April

**The Food 21 Symposium – Towards Sustainable
Production and Consumption**

Uppsala, Sweden

Information: <http://www-conference.slu.se/food2004/>

▶▶▶▶ 2–6 May

World Fisheries Congress

Vancouver, Canada

Information:

<http://www.worldfisheries2004.org/home.htm>

▶▶▶▶ 3–21 May

**Advanced Institute on Vulnerability to Global
Environmental Change**

IIASA, Laxenburg, Austria

Registration closed – Information: <http://www.start.org>

▶▶▶▶ 10–14 May

**Second World Conference and Technology Exhibition on
Biomass for Energy, Industry and Climate Protection
Rome, Italy**

Information: <http://www.conference-biomass.com>

▶▶▶▶ 17–19 May

Towards Sustainable Protein Supply Chains

Wageningen, The Netherlands

Information: <http://www.wau.nl/vlag/protein2020/>

▶▶▶▶ 23–25 May

Innovation, Sustainability and Policy

Kloster Seeon, Germany

Information: <http://www.riv-netzwerk.de/kloster-seeon/>

PUBLICATIONS | NEW BOOKS

Environment Across Cultures

By Eckart Ehlers and Carl F. Gethmann
(Eds)

Springer Verlag, Berlin, Oct. 2003;
216 pages; cloth ISBN 3-540-40384-1

Disparate perceptions and conceptual frameworks of environment and the relationship between humans and nature often lead to confusion, constraints on co-operation and collaboration and even conflict when society tries to deal with today's urgent and complex environmental research and policy challenges. Such disparities in perception and „world view“ are driven by many factors. They include differences in culture, religion, ethical frameworks, scientific methodologies and approaches, disciplines, political, social and philosophical traditions, life styles and consumption patterns as well as alternative economic paradigms. Distribution of poverty or wealth between north and south may thus be seen as consequence of the above mentioned disparities, which is a challenge for its universal reasoned evaluation. This volume discusses a wide range of factors influencing „Environment Across Cultures“ with a view to identifying ways and means to better understand, reflect and manage such disparities within future global environmental research and policy agendas for bridging the gap between ecology and economy as well as between societies. The book is based upon the results of a scientific symposium on this topic and covers the following sections: Cross Cultural Perception of Environment; Ethics and Nature; Environment, Sustainability and Society. Corresponding contributions were made by well-known scientific authors representing different cultural spheres in accordance with the inter-cultural approach of this effort.



How Institutions Change

Perspectives on Social Learning in Global and Local Environmental Contexts

With a foreword by Oran Young

By Heiko Breit, Anita Engels, Timothy Moss, Markus Troja (Eds)
Leske + Budrich, Opladen, 2003; 380 pages; 35,00 EUR
ISBN 3-8100-3858-X.

This edited collection examines ways in which environmental institutions change from a number of disciplinary perspectives and in a variety of political, social and cultural settings. It explores different types of institutions shaping resource use, the diverse ways in which they can change or be redesigned and the conditions that can help or hinder the emergence of institutions favourable to sustainable development. A line of argument is developed throughout the book, looking first at policy-driven examples of institutional change, then broadening the perspective to examine the relationship between institutions and social practice, and subsequently demonstrating how environmentally beneficial processes of social learning can be encouraged. It is the principal product of a task force on institutional dimensions of global environmental change funded by the German Research Council (DFG) within its Priority Programme „Global Environmental Change – Social and Behavioural Dimensions“.

