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Scientific Capacity Building & Enhancement for Sustainable Development in Developing Countries

6th Biennial International Human Dimensions Workshop (IHDW) on Global Change Research: A Series of Capacity Building Training Seminars

Final Report for APN CAPaBLE Project:
CBA2008-11NSY-Bai-Rechkemmer

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Workshop (IHDW) on Global Change Research:
A Series of Capacity Building Training Seminars**

CBA2008-11NSY-Bai-Rechkemmer
Final Report submitted to APN

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Overview of project work and outcomes

Non-technical summary

The IHDW, now in its sixth round, has become a well-recognized international event. 72 scholars chosen out of over 140 applicants were invited to participate in the International Human Dimensions Workshop (IHDW) in New Delhi from 11-16 October 2008. The training workshops offered a unique opportunity for the promotion of young and mid-career scientists from all regions of the world, particularly those from developing countries and emerging economies.

Participants from 32 different countries took part in five well attended training seminars covering topics that have been identified as some of the most prominent research areas in the human dimensions of global environmental change: Urban Health, Sustainability through Systems Innovation, Sustainable Adaptation to Climate Change, Ecosystems Services, and Adaptive Water Management. During the workshops participants were able to learn from well-known researchers and interact intensively with the other. Additionally the participants had the chance to interact with members of the IHDP Scientific Committee, who were meeting at the same time in New Delhi, in a "Meet the Senior" session on the last morning. In addition, participants had the chance to join for a public lecture given by Elinor Ostrom, this years Nobel Prize winner for economics.

The success of the workshop is undeniable, both as a established serious of IHDP and its 6th version that took place in New-Delhi. Through discussions, group-work, case studies, collective meetings, presentations, and interaction, the participants went home prepared to engage in global change research as individuals, as well as to spread their knowledge in order to support and grow the scientific communities in their home countries. Some participants joint the global community again for the IHDP Open Meeting 2009 as well as other events such as the synthesis conference of the GECHS project or for the Earth System Governance conference, Amsterdam 2009. Other follow ups are taking place in online discussion forums or within concrete scientific work related to themes of the human dimensions of global environmental change. Hence, these workshops are no one-off events but well integrated into IHDP's work and processes.

Objectives

The scientific and policy aims of this workshop were:

- 1) to enhance awareness and understanding of the human dimensions of GEC, particularly within the social sciences research community;
- 2) to establish new or strengthened contacts and networks between researchers working in the field;
- 3) to facilitate the participants' own efforts to develop national and regional research programmes and activities related to the HDGEC;
- 4) to increase the international visibility of the importance of HDGEC;
- 5) to promote communication between policy and scientific communities and to identify policy needs and priorities related to further development of IHDP science agendas and activities;
- 6) to promote the use of scientific information into the policy and decision making planning process.

Amount received and number years supported

The Grant awarded to this project was: US\$ 40,000 for Year1, 2008-2009.

Work undertaken

As in past years, the 6th IHDW brought together researchers from various scientific disciplines and backgrounds interested in HDGEC research. To implement logistically various innovative ideas as well as to ensure the high scientific level, the IHDP Secretariat has set up an internal IHDW team headed by the IHDP Programme Officer for Capacity Development. Regular Secretariat staff was supported by an

intern hired exclusively for the purpose of the IHDW team support.

The team has selected potential seminar conveners all stemming from IHDP's core and joint projects. It has set up and implemented the international review panel and has, of course, implemented logistical issues with the local partners in New Delhi. A special challenge was to coordinate with different local partners as the five workshops were implemented in a decentralized manner in New-Delhi. Furthermore, IHDW participants were provided with visa and flight-booking support and the IHDP Secretariat communications team has prepared information materials about IHDW (including graphic design) and disseminated announcement within the IHDP community.

Results

The five training seminars have been successfully held in India as originally planned, and IHDP was able to meet the set timeline. IHDP furthermore succeeded in encouraging young and mid career researchers from developing countries and emerging economies to take part in the 6th International Human Dimensions Workshop. More than 80% of the participants represented continents of Asia, Africa and South America. This was made possible thanks to the contributions of sponsors such as APN. Also gender ratio of the IHDP participants has fulfilled expectations with 42.5% of female trainees.

Scientifically, the workshops corresponded to interesting overall developments within IHDP's project portfolio. With the seminars focusing on industrial transformation and on human security, two projects designed the scientific agenda that come to an end. Therefore, these projects are both in the position to present findings of their work, but they are also keen to reach out to younger colleagues as the question comes to the core where to go next. Contrarily, the new joint project on human health and the new initiative on knowledge, learning and societal change just started their work and used their workshops as true community building efforts. Finally, the workshop on water was done in collaboration with the UN-Water office UNW-DPC, manifesting, inter alia, the new links of the IHDP Secretariat with the UN system. By involving its projects in workshop design and implementation, IHDP has found a very effective "division of labour" and, more important, provides workshop participants with the opportunity of being trained in cutting-edge research as well as by leading scientists of the community.

Relevance to the APN CAPaBLE Programme and its Objectives

The IHDW series held in India covers all three of APN's criteria for CAPaBLE proposals: scientific capacity development, science-policy interfacing, and awareness raising in a developing country of the Asia-Pacific. The topics being covered in the workshops clearly reflect the general themes identified in the APN Science Agenda, and directly relate to three out of the four themes, namely climate, ecosystems, use of resources (water/energy/materials) and pathways for sustainable development. As just said, spearheaded by IHDP's scientific projects, participants get in touch with leading scholars in the field and get well connected to the international community.

All workshops in their design aimed at making the link between science and decision-making in the presentations and discussions. Beyond the agenda, the composition of the participants also demonstrated that IHDP takes serious the science-policy linkage. Among the participants and lecturers were not only affiliates of diverse universities, but also members of different NGOs and institutions like the WWF-Pakistan, the Egyptian Ministry for the Environment, the Global Citizens NGO Mongolia, CARE International, or WHO Regional Office for South East Asia; to mention a few. Some workshops organized field trips to confront scientific findings with "reality" and all participants had the chance to interact with the Scientific Committee of IHDP where science-policy issues are discussed, too.

Self evaluation

The training was very successful in bringing together a range of diverse scholars from around the world dealing Global Environmental Change issues. The selection process was able to identify promising scholars, who very enthusiastically participated in the discussions and were eager to learn more about the work undertaken in the International Global Change Community. Since the size of the seminars groups was rather small (about 15 scholars each), the participants were able to build strong connections and were eager to keep up contact through discussion groups etc. The participants were able to have regionally focused discussions, which will help with the further development of the national and regional research agendas. However, the strongest asset of IHDP's IHDW seminars has to be seen in the fact that leading scholars from the IHDP network conduct these workshops, actively looking for "new members" of their network. Hence, these seminars can be the starting point for a successful international career and in fact many former IHDW participants are nowadays either members of scientific steering committees of IHDP's projects or even members of the scientific committee of the Programme. Furthermore, some became (lead) authors of major assessments such as the IPCC and therefore it's fair to conclude that IHDP's work in the field of capacity building, in collaboration with its partner Programmes, is crucial for these international assessments and other initiatives.

Unfortunately, the Open Meeting had to be postponed to 2009 and relocated to Bonn so that the original concept of bringing the IHDW scholars to Open Meeting did not work out as planned. Due to funding constraints IHDP was not be able to bring all IHDW participants to the Open Meeting to Bonn. But in the scholarship scheme for the Open Meeting, the (best) participants of the IHDW 2008 have received special attention and finally 33 of them attended finally Open Meeting, where they took part in several post-IHDW special sessions. At the Open Meeting, the scholars have presented the outcomes of the workshops in a comprehensive way as well as how they were able to integrate it into their work since then. Additionally, a lunch gathering of young HD researchers took place at the Open Meeting, where the former IHDW participants have exchanged their experience and integrate with other young members of IHDP network.

IHDP has learned from the previous IHDW and decided to be flexible if it comes to some parameters. This time, for example, the length was reduced to a series of intensive short parallel workshops over 4 days. In order to be able to provide the highest possible number of researchers with the high quality seminars, the participants to the 6th IHDW took part in one of five parallel workshops meeting. In addition, joint morning panels and evening gatherings were organized, too. This structure allowed invitation of 72 participants in comparison to 41 in the year 2006, covering a broad range of human dimensions topics.

Potential for further work related to IHDW

Over the past 10 years, the "IHDW" has established itself as a successful method and venue for training up-and-coming scientists from all over the world, integrating them into current and future international research networks dealing with global change issues. IHDP has demonstrated its ability in carrying out such events and has created a path for a long-term and sustainable investment in order to broaden its network and particularly to reach out to scientists from the developing world.

IHDP supports the development of networks of (young) researchers who are active in the field of Global Environmental Change. The following options are either implemented already or under consideration:

- *YHDR listserver*: The listserver would inform its members about upcoming workshops, conferences and specifically about events/announcements interesting for young researchers.
- *Database*: information on young researchers including their scientific careers, fields of expertise and interest, list of publications and contact details.

- *IHDP Newsletter*: A special section in the IHDP newsletter UPDATE has been discussed in which young researchers can present their research.
- *Link up young researchers with IHDP National Committees*: IHDP could help to set up contact between the young researchers and the National Committees.
- *Mentor Programme*: The idea is that groups of young researchers, who have formed research groups in order to put together research proposals, could approach IHDP to find mentors for closer collaboration. Well-known senior scientists could be identified by IHDP and function as a mentor for the group. This is already being implemented, but often on an ad-hoc basis.
- *Inventory of Funding Opportunities for Young Researchers*: IHDP is planning to put together an inventory of funding opportunities listing institutions, awards, and calls which are directed towards younger scientists.
- *Alumni section of the IHDP website*: IHDP Secretariat is also considering establishment of an Alumni Section (possibly as a part of a separate Capacity Development Portal) on the IHDP Website for the IHDW participants and Secretariat's Resident/Visiting scholars, including contact details and career updates from the scholars themselves. This feedback would also help IHDP to track the alumni's scientific career and to document the impact of capacity development efforts.

Publications

IHDP produced an extra issue of the IHDP newsletter Update on the IHDW in New Delhi that included a comprehensive introduction to the IHDW seminars (http://www.ihdp.unu.edu/article/IHDP_Update_Extra_2008_-_IHDW?menu=60), a short workshop report has been produced after the end of the IHDWs (<http://www.ihdp.unu.edu/file/IHDW/IHDW+Report?menu=53>), and an article about the 6th IHDW has been featured on-line at the IHDP website (<http://www.ihdp.unu.edu/article/559>).

Furthermore, the IHDP UPDATE on the Open Meeting 2009 contains contributions related to the IHDW seminars (<http://www.ihdp.unu.edu/category/46?menu=60>), and the IHDP UPDATE related to the GECHS synthesis conference is directly linked to the seminar at the IHDW (<http://www.ihdp.unu.edu/category/47?menu=61>).

Other publications of direct relevance to or supported by the 6th IHDW:

- *F. Berkhout, D. Angel, A.J. Wiczorek*, "Sustainability transitions in developing Asia: Are alternative development pathways likely?", in: *Technological Forecasting and Social Change (special Issue)*, p. , vol. 76(2), (2009)
- *Wiczorek, A.J. and Berkhout, F.*, "Transitions to sustainability as societal innovations", (2008). Book, Published, Editor(s): *Boersema, J. & Reijnders, L.*, Collection: *Principles of Environmental Sciences, Bibliography: Springer*
- *Eriksen, SH; Watson, HK*, "The sustainability of southern African savannas", *ENVIRONMENTAL SCIENCE & POLICY*, p. 1, vol. 12, (2009)
- *Leichenko, R. and O'Brien, K. L.*, "Environmental Change and Globalization: Double Exposures.", (2008). Book, Published Bibliography: *Oxford University Press*

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Technical Report

Preface

Through its well known IHDW “brand”, the series of capacity building workshops in October in New Delhi has showcased once more the importance of systemised trainings in the overall Capacity Development Strategy, as laid out in and stressed by the IHDP Strategic Plan 2007 – 2015.

Over the course of a decade, the IHDW format has been well established as a successful mode of coming into contact with, training and retaining young researchers in the in new and upcoming research topic and networks of the IHDP – specifically promoting and enriching contact between these researchers and IHDP/ESSP projects. (96 words)

1. Introduction

The International Human Dimensions Workshops (IHDW) are next to the Open Meetings the second large IHDP activity, which, now in its sixth round, has become a well-recognized international event. More than 200 young scientists have been trained in the biennial courses since 1998 on various issues of human dimensions research. Courses were often used by IHDP’s project to highlight their work or to build up their community. Hence, real “win-win-win-situations” between participant’s interests, project’s needs, and Programme’s overall mandates ensured that these courses were cutting-edge in scientific term, very often real “fun” in social terms, and highly successful in terms of sustainability of the contacts build and results produced. With this training series, IHDP has been a pioneer among the global environmental change programs concerning capacity development of its younger scholars, more often than not carried out in collaboration with START and always generously supported by its funders such as APN. Aimed at training the “future generations” of human dimensions researchers, the IHDW is activity planned and carried out by the IHDP as a whole that takes place approx. every other year. While the Secretariat covers the bulk of the organizational work including fundraising, the content of the training seminars is driven by IHDP’s projects.

Until the IHDP Strategic Plan 2007-2015, capacity building was a general and somehow self-explanatory mandate for the IHDP, since the human dimensions community had to be built and established on “equal footing” with IHDP’s natural science related partner Programmes. Since this was done successfully, as the IHDP external review commissioned by ICSU concluded in 2006, too, the new capacity building approach tries to be both more targeted (e.g. where to invest best) and comprehensive (e.g. training of scholars and other stakeholders) as described in the IHDP Strategic Plan 2007-2015. This 6th IHDW was the first one under its overall guidance.

The training workshops offer a unique opportunity for the promotion of young and mid-career scientists from all regions of the world, particularly those from developing countries and countries with emerging economies. With the workshop for the second time in a row held in the Asia-Pacific region, special importance is assigned to this crucial region for causes of as well as solution to global environmental change phenomena, which goes together with having APN as a solid and well-established partner for meeting these challenges from a GEC research angle.

One overarching goal of the IHDW is to provide a platform for exchange between both established researchers and the younger ones. Highly gifted and active participants thus get closer to IHDP’s projects and are often invited to attend other

meetings or join in collective endeavours. In 2008, the IHDW seminars were used both by GECHS and IT to talk about their syntheses and future directions as well as by new initiatives such as KLSC, which carried out a workshop on ecosystems. As said before, for some participants, this has been the start for a highly successful career in GEC research.

To ensure continuity and success of these Workshops, several training seminars re-convened at the IHDP Open Meeting 2009 six months later in Bonn, Germany. Several other activities ranging from major conferences such as the GECHS synthesis conference and the Earth System Governance project conference to individually formed collaborations ensure that IHDW's are no one-off events for the participants. Thanks to these follow-up activities, the participants were able to further build strong connections and keep up contacts as well as to become part of the global network of IHDP and its partners.

2. Methodology

The IHDWs focus on methodological issues related to research questions on the human dimensions of global environmental change, with topics linked both to IHDP core projects and joint Earth System Science projects. Not only do these seminars make an effort to develop concrete skills and provide state-of-the-art knowledge about the topics in question, but they also strive to enhance collaboration and networking between the young researchers and the broader global environmental change research community.

Since there is much emphasis these days on "integrative" science, it should be stressed that the IHDW have always been conducive for bringing younger researchers in touch with key themes and addressed by GEC research that builds on a variety of methods and disciplines. While integration between natural and social sciences comes first and foremost to mind if one talks about "integration", it can also be highlighted that the "human dimensions" as such present a very integrative and not a disciplinary approach, too. Hence, to attract first and foremost (but not exclusively) the best social scientists to join IHDP is correctly identified as the overarching goal of the IHDP Strategic Plan 2007-2015, in order to build a sound community of scholars meeting the integration challenge. As the focus of attention in GEC research is shifting these days increasingly to (policy) responses, a strong human dimensions community is paramount for the success of GEC research and training is needed to integrate the different streams of research successfully.

The aim of this capacity building activity (6th IHDW) was to attract participants who show a strong interest in areas related to the human dimensions in general and the themes of the five workshops in 2008 in particular, along with research and policy experience and the ability to communicate effectively. A double-blind process (not looking at nationality, regional background or financial needs at first glance) was used to select participants to the IHDW through a serious and rigorous selection process. IHDW participants had to submit a full proposal to the IHDP Open Meeting 2009, originally planned for 2008, in order to be further considered for the IHDW, and also had to demonstrate significant knowledge or experience in the workshop to which s/he applies.

For the 2008 IHDW selected applicants must have:

- (researchers): had completed their last degree (either M.A., M.Sc., or Ph.D.) within the past 5 years;
- (policy and decision-makers): had at least 3 years of working experience in policy planning or being involved in developing projects related to the themes of the 6th IHDW;
- had affiliation with an institution in a developing country or one in Asia in general (except graduate students);

- currently been working in the field of human dimensions of global environmental change (both social and natural scientists as well as representatives from NGOs, the policy community, and the private sector);
- had proficiency in oral and written English and fundamental computer skills.

The trainers were responsible for setting the syllabus, criteria for selection to their workshop, as well as selecting the applicants and the training itself. Trainers made an in-kind contribution from their institute to support the attendance of trainers to the workshops. The IHDP Secretariat had provided logistical arrangements, fundraising and support for the selection/ communication process. The workshops were hosted by J. Nehru University School of Environmental Studies and School of International Sciences, the UN Office and The Institute of Economic Growth.

In general, the workshops provided participants with the opportunity to present and discuss their work with “peers”. Often PhD or post-doc research projects at an advanced stage are presented and substantial improvements made after it has been discussed within the international group of participants. The contributions provided by the trainers are crucial for the scientific quality of the work conducted as it is for networking in a more general sense. As this IHDW was held in India and strongly focused on regional issues of global change, the five workshop themes paid special attention to priorities arising in developing Asia-Pacific countries, with some focus on India as the host country.

Hence, in addition to “integrative approaches” and a new focus on “response options”, IHDP science addresses a third current major shift in the overall research landscape successfully since years: a strong focus on regional approaches (that is for example coming with the current focus on adaptation). At a very general level, it goes without saying that “one size does not fit all” in most areas of human dimensions research. One major step forward in this respect is to apply a regional approach to GEC research, which highlights, on the one hand the growing importance of regional networks such as APN or IAI and the other hand the specific methodological challenges for regional studies within GEC research as addressed, for example, within the GECAFS project of the GEC Programmes (some of its works was also funded by APN).

*A **Brief Summary** of the five parallel training seminars that took place from 11 to 16 October, 2008:*

I. The Human Dimension of Health and Global Environmental Change: Global Change and Urban Health

Headed by: The Global Environmental Change and Human Health Project (GECHH)
Hosted by: Jawaharlal University JNU, School of Environmental Studies

Focusing on the issue of urban health, this seminar provided a comprehensive overview on the complex field of global change and human health. The seminar aimed to identify and discuss efficient and sustainable inter-sectoral adaptation pathways for urban health challenges resulting from global change and had a strong focus on Asia. Furthermore, due to the early-stage of the health project, this seminar was used to build a community in order to strengthen the human dimensions of this project under the ESSP umbrella.

II. Transitions to Sustainability through System Innovation

Headed by: The IHDP-IT (Industrial Transformation) project
Hosted by: Jawaharlal University JNU, School of International Studies

This workshop explored alternative development pathways that have a significantly lower burden on the environment. In particular, it dealt with the ways in which unsustainable but powerful, well established and stable socio-technical systems that

fulfil human needs such as food, energy supply, mobility and health care can be replaced by alternative systems with considerably lower environmental footprints over the longer term. The workshop built upon recent insights from research on transitions and system innovations, which could roughly be divided into (i) our increasing understanding of transitions to sustainability and (ii) using this knowledge to making policy suggestions. A focus of IHDP-IT in the recent years has been on “developing Asia”. The aim of this workshop was therefore to give participants practical experience in applying theoretical and analytical tools to better understand the way in which transitions unfold and to use this knowledge to develop policies that help bring about sustainability under various geographical and economic conditions. As this project comes to an end in 2010, the workshop was already a “transition activity” itself.

III. Sustainable Adaptation to Climate Change

Headed by: TERI (The Energy and Resources Institute), India

IHDP-GECHS (Global Environmental Change and Human Security) project

Hosted by: Jawaharlal University JNU, School of Environmental Studies

This training seminar focused on the concept of sustainable adaptation to climate change as a means of enhancing human security. Participants were challenged to think about responses to climate change from a broad perspective, recognising that adaptation measures could, at the same time, be effective in reducing both greenhouse gas emissions and poverty. The concept of sustainable adaptation was discussed from this perspective, with an emphasis on the relationship between adaptation and development, including how poverty reduction strategies could have either positive or negative influences on vulnerability to climate change. The role of social and technological innovations for development was part of this discussion, focusing on the example of how renewable energy technologies could contribute to increased adaptive capacity and sustainable adaptation. The seminar considered potential strategies to increase human security, including the benefits of integral approaches that take the role of diverse values, worldviews and stages of human development into account in responding to climate change. As it is the case for IHDP-IT, GECHS comes to an end in 2010 and this seminar was both synthesizing and transitioning event.

IV. From Research to Social Change: The Case of Ecosystem Services

Headed by: new IHDP initiative entitled “Knowledge and Social Learning for Behavioural Change to Sustainability” (KLSC).

Hosted by: The Institute of Economic Growth

This workshop was directed at learning about the process of moving from research to social change in the case of ecosystem services and their contribution to human well-being. In the workshop, participants examined and discussed the role of research in setting the agenda for change, the ad-hoc, policy, and institutional mechanisms for engaging communities in the research content and implications, and the incentives and barriers to evolve change through research. Using the concept of ecosystem services, the focus of his seminar was on the role knowledge plays (e.g. the framing of problems or the role of scientific vs. transition knowledge) and on the function of “learning” at different levels of aggregation (e.g. from individual to collective) as kind of “intervening variable” for (societal) change.

V. Capacity Development in Adaptive Water Management

Headed by: NeWater, Global Water Project (GWSP) and UN Water Decade Programme for Capacity Development UNW-DPC

Hosted by: The UN New Delhi Office

The training seminar offered a teaching programme including individually downloadable modules with annotated presentations, exercises, discussion questions, relevant literature, links to databases and tools, aimed at capacity

building in adaptive water management, which is so essential in addressing global environmental change often beyond the “pure water sector”. Increasingly, instructors of water management, environmental management and natural resource management are interested in introducing adaptive water management in their teaching curricula, especially as the focus of attention shifts more towards adaptation. The teaching programme has thus been developed for instructors interested in including adaptive water management in their curricula.

3. Results & Discussion

I. The Human Dimensions of Health and Global Environmental Change, Global Change & Urban Health

Presentations given by trainers as well as participants addressed some of the most important issues in this field of research. While participants presented very much their individual research proposal/agenda and worked hard to improve them during and after the seminar, some overarching findings of this seminar should be briefly introduced.

The process of urbanization entails radical changes in social organization, family relations, housing conditions, transport choices, recreational opportunities, dietary patterns, occupational environments, transmission of disease agents, and access to educational and health services. The rapid urbanisation process experienced by the majority of developing countries during the last few decades has resulted in fundamental changes to the environment as well as to the social structure and is affected by and at the same time contributes to Global Change (Global Environmental Change and Human Health, 2007). While Global Change affects all urban areas in one way or the other, in many of the million-plus cities, the pace of urbanization has by far exceeded the growth of the necessary infrastructure and services, overtaking the city administration’s ability and resources to cope appropriately with these problems (Krafft, Ziemann, 2006).

Direct and indirect health effects

The influence of Global Change on the determinants of urban health can be direct or indirect. Injuries caused by extreme events and health implications of heat waves resulting from global warming or skin cancer due to stratospheric ozone depletion are examples of more direct causal links. However, most of the causal relationships are neither simple nor immediate and result from the degradation of ecosystems altering food systems or leading to the (re-) emergence of infectious diseases such as SARS or H5N1 Avian Influenza (Global Environmental Change and Human Health, 2007).

Urban poor are most vulnerable

The most vulnerable group in the urban setting is the urban poor. It is poverty rather than mere income inequality that drives poor health and mortality (Deaton, 2006). Multiple factors contribute to a higher vulnerability of the urban poor and to lower health status. Socio-economic barriers such as low income, irregular employment, gender inequality and inequity, language or religion/cultural background limit or even prevent access to health services. Poor housing and environmental conditions limit access to safe drinking water or sanitation facilities. The lack of environmental and health education reduces the ability to make timely and informed decisions on promoting health, preventing morbidity, identifying symptoms or on seeking appropriate care (World Bank, 2004). Though health indicators have persistently been better for urban populations than for rural, recent figures for India indicate that the health status for the urban poor is as bad or even worse compared to their rural counterparts (World Bank, 2002).

Local action as global response

Urban health involves a multitude of actors with different interests such as city administration, public and private-for-profit health service providers, research institutions, non-governmental organisations, regional/national governments, or international aid organisations. The urban construct is very complex, one city is different of another and, especially in million-plus cities, there are huge intra-urban differences. This calls for comprehensive evidence-based small-scale initiatives with a manageable size that take into account the specific local conditions such as the WHO Settings Approach. The role of urban authorities needs to change from providing services to coordinating intersectoral initiatives involving the different actors from science, policy, practice and the public.

II. Transitions to Sustainability through Systems Innovation

Presentations given by trainers as well as participants addressed some of the most important issues in this field of research. While participants presented very much their individual research proposal/agenda and worked hard to improve them during and after the seminar, some overarching findings of this seminar should be briefly introduced. At the IHDW Workshop on Transitions to Sustainability through Systems Innovation held in New Delhi a group of young scholars analysed socio-technical transitions in a range of sectors and regions of the world.

Cars fuelled with sustainably-produced hydrogen, carbon-neutral buildings, large-scale hydroponic agriculture, solar-powered factories may still seem a little exotic today. But they are examples of the sorts of radically-alternative technologies that could play a major role in future, if economic activity around the world is to become more sustainable. Issues like this were explored during this seminar.

We know a lot about these technologies already. Technically and in terms of their environmental benefits, they seem very promising. The research challenge is to understand how these technologies will become more widely diffused, so that they come to stand at the heart of more sustainable social and economic systems in the future. Large-scale socio-technical transitions of this sort have become an important theme in scientific and policy debate over the past decade, mainly as a result of major global environmental challenges like climate change. The fundamental issue in this case is how to transform fossil fuel-based and high carbon-emitting energy systems into renewable-based and low carbon-emitting systems – in other words how to precipitate and guide a new low-carbon industrial revolution.

Understanding transitions – the system innovation perspective

Socio-technical transitions are complex, long-term processes. One analytical and heuristic tool to trace and understand such processes is the multi-level perspective (MLP, Geels, 2002). The *socio-technical regime* forms the meso-level in the multi-level perspective. It consists of three interlinked dimensions: i) network of actors and social groups; ii) formal, normative and cognitive rules that guide the activities of actors; and iii) material and technical elements. Existing socio-technical regimes are characterised by path dependence and lock-in, resulting from a range of stabilising mechanisms: incumbent actors have vested interests; social networks represent 'organizational capital'; regulations and standards stabilise regimes; cognitive routines blind actors to developments outside their focus; and existing machines and infrastructures stabilise through sunk investments and technical complementarities between components.

Niches form the micro-level. They are a locus where novelties emerge. This may occur in small market niches or technological niches, where resources are provided by public subsidies (Raven, 2005). Niches act as 'incubation rooms', shielding new

technologies from mainstream market selection. Such protection is needed because new technologies are initially often costly and not well-attuned to user demand. Protection comes from small networks of actors who are willing to invest in the development of new technologies. Important niche-internal processes are building of social networks, learning processes and articulation of expectations to guide learning processes.

The macro-level is the *socio-technical landscape*, which forms an exogenous environment that changes slowly and influences niches and regime dynamics. The relationship between the three levels is a nested hierarchy. Pioneers and innovators always work on novelties, but these usually remain restricted to niches (e.g. small projects). New technologies have a hard time to break through, because the existing regime is stabilised and entrenched. Historical studies have shown that transitions only come about when developments at all three levels link up and reinforce each other.

Extending the debate on transitions to rapidly-developing countries

Much of this debate has taken place in industrialised countries, especially in Europe. But we also recognise that transformative economic, technological and institutional changes are happening in rapidly urbanising and developing Asia, with unprecedented implications for global sustainability (Rock and Angel, 2005). The Industrial Transformation project of IHDP (IHDP-IT), with support of the Dutch Knowledge Network on System Innovation (KSI), has therefore focused its attention over the past two years on connecting scientific debates about transitions and sustainability with scholarship on social, economic and institutional change in Asia and the seminar taking place in India provided a great opportunity to continue this work. They have been interested to learn what ongoing transformational changes - taking place in a distinctive period of globalization – could tell us about system change, but also to explore whether trajectories of development in rapidly-industrialising countries could follow different, more sustainable pathways. This process has included two international workshops, the first of which took place in Chiang Mai in July 2006 and has resulted in a special issue of *Technological Forecasting and Social Change* (Berkhout et al, 2009, forthcoming). Three important findings stand out from this work. First, in a second wave of environmental governance reform, most Asian countries have adopted far-reaching commitments to the principles of sustainable development (Angel, 2009 forthcoming). Second, these principles have in many cases found practical expression in a huge variety of public and private small-scale 'sustainability experiments', across a wide variety of sectors, including transport, the built environment and food and agriculture. Third, there is empirical evidence that global production networks have, in many cases, had positive impacts on the resource efficiency and pollution intensity of industrial production in Asia (Rock, 2009 forthcoming). Despite this, the underlying trends are away from sustainability (Bai et al, TFSC, 2009), because of the difficulties with the scaling up of the good practices and the scaling down of policy intentions.

III. Sustainable Adaptation to climate change

The Global Environmental Change and Human Security (GECHS) project has organized an International Human Dimensions Workshop (IHDW) in collaboration with TERI on the theme "Sustainable Adaptation to Climate Change". A total of twenty-two highly qualified researchers and practitioners from around the world have been selected to participate in this workshop to explore what constitutes sustainable adaptation and how human security can be enhanced through climate adaptation. Presentations given by trainers as well as participants addressed some of the most important issues in this field of research. While participants presented very much their individual research proposal/agenda and worked hard to improve them during and after the seminar, some overarching findings of this seminar

should be briefly introduced.

The growing demand for knowledge and guidance on climate change adaptation poses challenges to researchers, practitioners, and policy makers. There is widespread attention to the role of climate factors in social and economic development and in poverty reduction strategies, and it is increasingly recognized that climate change adaptations can potentially serve as effective measures to reduce greenhouse gas emissions and increase human security. The relationships among climate change adaptation, development, and human security are, however, not straightforward, and theoretical results can be diffuse and difficult to translate into concrete actions and strategies. For example, much of the research on the linkages between poverty and vulnerability to climate variability and change concludes that climate adaptation measures must be context-specific and comprehensive, addressing a broad range of factors and scales. Yet most researchers, practitioners and policymakers understand that climate change is not the only change that is affecting households and communities in developed and developing countries. There are many other ongoing environmental and societal changes that influence the capacity of households and communities to respond to stresses and shocks, and hence a very dynamic context influences the outcomes of climate change.

Climate change adaptation has been closely associated with social and technological innovations, and it is becoming clear that renewable energy technologies are necessary for increased adaptive capacity and sustainable adaptation to climate change. Questions remain regarding what types of factors need to be addressed at local, regional, and global levels in order to make climate adaptation and alternative energy pathways possible, and what kinds of activities and measures for climate adaptation should be emphasized. It is also becoming clear that not every adaptation to climate change will benefit social-ecological systems in the long run, and many may have negative effects in the short run. For example, water desalination plants may be favoured as a potential adaptation to climate change, but the salty brine waste may have impacts on local ecosystems, including marine flora and fauna, and hence livelihoods. Those adaptations that provide benefits to a particular sector or group while creating negative consequences for others can create new types of social, economic, and environmental problems. Identifying adaptation measures that are sustainable can contribute to poverty reduction and alternative development pathways that enhance human security, both for present and future generations.

The human dimensions community is investigating the consequences of adaptation responses to climate change, developing new insights on the linkages between poverty reduction strategies and vulnerability reduction measures, as well as on the actual and potential role of decentralized renewable energy supplies for sustainable adaptation. As climate change adaptation becomes a part of many political and institutional agendas, there is an urgent need to consider adaptations that not only reduce the impacts of climate change, but also contribute to sustainable development and human security. Furthermore, GECHS has been among the first GEC projects exploring the GEC-development-nexus, a gap in research that was identified already a while ago, but hardly addressed so far.

IV. From Research to Social Change: The Case of Ecosystem Services

Presentations given by trainers as well as participants addressed some of the most important issues in this field of research. While participants presented very much their individual research proposal/agenda and worked hard to improve them during and after the seminar, some overarching findings of this seminar should be briefly introduced.

In order to evolve a sustainable global society that benefits all, both present and

future, the world's people must become and remain active participants in building it. At the core of a new initiative at IHDP is the premise that this can only happen if a large fraction of our human society changes its behaviour to adopt more sustainable practices. To enact this behavioural change across the world's communities and institutions will require a collaborative process of producing and communicating knowledge and active learning. This process must engage all people in their multiple roles as individuals, as part of communities, and as members of organizations. At the same time, scientists and policy makers need to take responsibility for learning from, understanding, and responding to their community's knowledge, concerns, and needs in light of the conditions and requirements of the global social, ecological, and economic system. This process, taking place simultaneously at the grass-roots level and at the policy-making level, offers the possibility to move societies to sustainability, but will it actually result in behavioural changes on the necessary temporal and physical scale?

Understanding the complex interactions between the production and communication of knowledge, individual and social learning, and attitudinal and behavioural change is the arena of a new IHDP initiative entitled, "Knowledge Learning, and Societal Change" (KLSC). The KLSC initiative has convened in New Delhi a workshop on "From Research to Social Action: the case of ecosystem services."

The case of Ecosystem Services

While impending climate change is indeed on the mental horizon of stakeholders all over the world, we are far from implementing or even designing a slew of policy instruments to meet the challenge. Humans face an unfinished agenda of trying to device national and international processes through which they agree on how to ensure increases in human well-being without further impacting our common future negatively.

It is not easy to link this agenda to national, regional and local development issues. The elements of a possible framework in which to do this lie in the twin concepts of "ecosystem services" and "human well-being". The first underlines the similarity between services provided by ecosystems and other goods and services which contribute to human well-being. Ecosystem services, whether of the provisioning, regulating or cultural kind matter and contribute to the well-being of humans. Further, human well-being is a matter of multiple capabilities and access to different kinds of resources; finally, given appropriate time and spatial scales, there exists a fair degree of complementarity between environmental and developmental concerns. However, not enough effort is invested by decision makers in their individual and collective capacities to investigate into the nature of the appropriate scales and the ways to reach them.

Decision makers in different countries, whether at the individual, community or national levels, operate through a set of institutions. Some of these institutions are better linked with each other, and thereby impact choice between alternative uses of ecosystems faster and with greater impact. Foremost among these are markets which often do a great job in ensuring provisioning services for groups of stakeholders. Unfortunately, regulating and cultural services of natural ecosystems are often not mediated or even taken account of in these overly powerful institutions. This results in asymmetrical significance to different kinds of services, often to the detriment of the wellbeing of some sections and definitely at the cost of future wellbeing of all. Further, globalization of the world economy implies that trade has a profound impact on local incomes as also use of resources such as land and water.

IHDW: from research to action – the case of ecosystem services

One of the foci of KLSC and subsequently this training seminar is/was, broadly

speaking, the knowledge-action gap. One of the difficulties in addressing the threats to ecosystems in many parts of the world can be seen as being directly related to aspects of knowledge, learning, and behavioural change. Mobilizing public engagement in and support for sustainable practices in regard to threatened ecosystems on one hand and forming robust policy initiatives to direct change effectively are notoriously difficult. Does the community affected by or dependent on an ecosystem have the explicit knowledge and understanding to have an effective voice in finding ways to maintain essential ecosystem services? Are the negative determinants of change largely economic or political or social? Are there mechanisms that can couple initially isolated groups with a willingness to change and thereby lead to a sufficiently widespread and powerful movement that can influence the future of the ecosystem in a positive way? All these questions have been asked in the KLSC-headed workshop in New Delhi and participants were invited to play an active role in the further development of this new IHDP initiative.

V. Adaptive Water Management

Presentations given by trainers as well as participants addressed some of the most important issues in this field of research. While participants presented very much their individual research proposal/agenda and worked hard to improve them during and after the seminar, some overarching findings of this seminar should be briefly introduced. Somewhat different than the other seminars, this one had a special focus on “train-the-trainers” in adaptive water management.

UNW-DPC, the newly created UN-Water Decade Programme on Capacity Development, hosted by the United Nations University in Bonn, and NeWater, the European Union Integrated Project on “New Approaches to Adaptive Water Management under Uncertainty” have formed a new partnership in Capacity Development by convening a novel train-the-trainer course to disseminate the NeWater-GWSP curriculum on Adaptive Water Management at the International Human Dimensions Workshop (IHDW) 2008, organised by IHDP. This was held between the 12th and 15th October 2008 in New Delhi, India.

NeWater, through the University of Osnabrück in Germany, Alterra/Wageningen University in the Netherlands, and the Global Water System Project (GWSP), had launched a comprehensive teaching curriculum in adaptive water management aimed at instructors of Masters and PhD level programmes in environmental/resources management, hydrology and related disciplines. The first set of modules of the current curriculum is available on the internet in the form of freely available OpenCourseWare teaching modules that can be downloaded and modified for use by instructors. The modules have been written by international water management experts and introduce the concepts and methods of adaptive management and integrated water resources management for application in the context of global change. Topics include resilience and adaptive capacity, water policy mechanisms, uncertainty analysis, vulnerability assessment, participatory processes, performance indicators, monitoring and more. The modules include presentations with explanatory notes, exercises, discussion questions and background readings, as well as relevant links and case study profiles for teaching purposes.

The course convened at IHDW 2008 had been developed by train-the-trainers experts from NeWater and, in support, UNW-DPC. It was designed to help instructors learn how to use the curriculum so as to develop teaching capacity in the field of adaptive water management. As such, this course was an exciting innovation for IHDW, since it was the first time that a course was provided for trainers rather than students, as has been the tradition in past workshops, for example in Costa Rica (2004) and Chiang Mai (2006). Depending on the level of interest, further training courses for instructors will be organised. In fact, the group largely reconvened at the IHDP Open Meeting 2009, informing each other about progress

made since then.

General Results

To conclude this part of the report in general: the IHDW has built capacity and has build awareness of current challenges of global environmental change, both in terms of scholarly work and challenges faced by practitioners all over the world. The discussions have facilitated establishment of new networks and long-term partnerships between participants as well as collaborating institutions. One indicator of high potential of future cooperation resulting from the IHDW is a bottom-up driven on-line discussion group initiated by the workshop. The following statements provide another indication of the success of this event that covered with its five major themes a broad scope of human dimensions research on global environmental change.

Feedback by Participants

".... I want to use this medium to express my sincere gratitude, from the very depth of my heart for the great opportunity you at IHDP gave me to participate in the IHDW 2008. I would confess that I've not had the opportunity to learn much within that short period of time since the completion of my PhD. Not only that, I've now been educated and informed about a whole lot of issues surrounding the contemporary issue of climate change. I can say that I've now been fully prepared to engage actively in climate change research in Nigeria and indeed in Africa. I would like to say also that considering the dearth of researchers in climate change research in Nigeria, I've now been trained to train others and to actively pioneer major researches on this in my Institute in collaboration with others I hope to positively influenced and get engaged on this. Once more, accept my sincere thanks and I look forward to further interaction, collaboration and cooperation in climate change research activities by we young scholars in Nigeria. Your investment in me is a generational investment and I will forever be grateful for this."

"Many thanks to everybody, and especially to the IAI, which funded my trip, for the days we had together in New Delhi (...) I think the academic quality of the course was very good and I feel now I have got a systematic introduction to my theoretical field, which was really useful. Sometimes such short events can be of big importance and give new knowledge, energy and new contacts that can become important for work and opportunities for a long time to come...."

"The experience I shared with you all was wonderful. You were all very cool to work with and my challenges were made very easy by our able trainers as well as the group activities I got involved with. I must say I will keep these memories for a long time to come (...) I believe my perspective and demeanor has been positively changed by participating in this workshop I believe I can keep this memory forever when I complete my PhD in IT. I thanks you all, and also the APN donors, for doing what was needed to make our session and the IHDW successful."

"Dear Organisers of the train-the-trainers course on capacity development in adaptive water management which has been concluded in New Delhi-India: I appreciate that training the trainers is a tool for capacity building and for assuring that Eastern Africa is benefited. I will tell the gospel of Adaptive Water Management to seven countries through raising awareness programs and I have achieved all my expectations. Training multidisciplinary is the way to bring stakeholders involvement in Adaptive water management".

"Dear All: When I arrived at home and opened my mailbox and saw the email traffic I understood how valuable experience it was to meet and work with you and how

much positive energy I got from this! ..."

"Congratulations to you and your team for the successful completion of the IHDW 2008. I know it is very difficult to conduct so many parallel workshops in different parts of a city like Delhi and coordinating so many people."

4. Conclusions

Goals 1 and 2: to enhance awareness and understanding of the human dimensions of GEC, particularly within the social sciences research community; to increase the international visibility of the importance of HDGEC.

Result: By targeting younger researchers and policy makers, the IHDW discussed and instilled a strong sense of responsibility towards living, enabling and teaching sustainable lifestyles to others. Furthermore, most of the seminars dealt specifically with various aspects of sustainability, touching upon current research and trends on topics such as system innovation, urban management and health issues. As said above, since IHDP is now in a phase of its existence that is characterized of the synthesis of established projects and the launch of new initiative, such quite targeted events are of utmost to provide a platform for established scholars and researchers not yet (fully) involved in IHDP's lively research agenda and portfolio. As IHDP becomes increasingly sophisticated in its capacity development activities, the 6th IHDW from New-Delhi, 2008, adds another highly valuable contribution to this crucial part of the IHDP Strategic Plan 2007-2015.

Goal 3: to establish new or strengthened contacts and networks between researchers working in the field.

Result: The Participants have initiated and continuously maintain a discussion group through which they keep in touch and exchange local research experiences. Participants used this opportunity of first quality training to further improve their research and they have used the networking opportunities to build up connections both within their respective regions as well as between their background and the global network. Experience has shown that the IHDW are a major vehicle for the success of IHDP's community building efforts, a community that is in highest demand ever.

Goal 4: to facilitate the participants' own efforts to develop national and regional research programmes and activities related to the HDGEC.

Result: IHDP Secretariat has directed the participants interested in tighter bonds with the members of IHDP global network to IHDP National Committees and Contact Points. Some of the concrete and early results of this were presentation given at the IHDP Open Meeting 2009 (and other global events such as the GECHS synthesis conference) highlighting progress made since New-Delhi.

Goals 5 and 6: to promote communication between policy and scientific communities and to identify policy needs and priorities related to further development of IHDP science agendas and activities; to promote the use of scientific information into the policy and decision making planning process.

Result: The IHDW had a strong link to policy relevance, through several means: firstly, the participants themselves were composed of both young researchers and young policy makers, either of whom might be likely to continue in this field after the workshop. Secondly, several trainers for the workshop were brought from the

policy community, for example through to the UN link esp. of the adaptive water management seminar. Thirdly, the thematic foci of the seminars addressed some of the most pressing issues nowadays, paying attention to the role of Science in addressing these issues. Finally, the science-policy interaction was addressed as an issue of research itself, for example in the KLSC seminar and picked up 6 months later at the IHDP Open Meeting 2009.

5. Future Directions

Each of the IHDW participants is well positioned to be integrated into IHDP research projects, the Young Human Dimensions Researchers network and as added to the IHDP listserv to stay in touch with work done within the global network. Further opportunities for the participants are in the planning process and have been presented above in the section called "Potential for further work". Due to the overall set-up of the workshop where individual projects are taking a lead scientifically, most of this work is taking place within these projects, e.g. within the synthesis of projects such as IHDP-IT or GECHS and the debate about potential follow up activities or within the community building process of new initiatives such as the project on human health or Knowledge, Learning, and Societal Change.

As said before, follow-up activities for some of the seminars have taken place at the IHDP Open Meeting 2009, too. The next workshop of IHDW series is currently planned for 2011. To improve the results of its work constantly, using the IHDP Strategic Plan 2015 as a baseline, lessons learned from the 6th IHDW will be used for designing the next one. While it was logistically quite challenging to run five workshops in parallel, its broader scientific scope and its shortened length can be seen as promising options for future similar activities.

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Appendices

Workshop Programme

IHDP International Human Dimensions Workshop 2008
 October 12 -15, 2008
 New Delhi, India

Venues:

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Programme

	Saturday 11 October	Sunday 12 October	Monday 13 October	Tuesday 14 October	Wednesday 15 October	Thursday 16 October	Friday 17 October
Morning		9.30 – 12.00 IHDW Opening Plenary at JNU School of International Studies (SIS) 12.00 – 13.00 Lunch Break 13.00 Departure for IEG and Un Office	Workshops continuing	9:00 Start IHDW SC Meeting at JNU-SIS Workshops continuing	Wrap-up of the workshops SC meeting continuing	“Meet the Senior”: Interaction session between IHDP SC and IHDP people at JNU School of International Studies SC Meeting continuing	SC Meeting continuing
Afternoon		14.00 Workshops start	Workshops continuing	Workshops continuing	14:30 – 17:30 Closing plenary at JNU School of International Studies	Departure of participants	End of SC Meeting IPCC Meeting (both at JNU)
Evening	19:00 “Meet the peers”: Dinner at Institute for Economic Growth (IEG) with all IHDW participants and trainers as well as invited guests			16:30 Public event for all IHDP related events in Delhi/ lecturer: Elinor Ostrom Location: IEG 19:00 Group Dinner		19:30 Official launch of the MIT Press Book series and ESG inauguration celebration/recept ion	

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II. Transitions to Sustainability through System Innovation

Headed up by the IHDP-IT (Industrial Transformation) project

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III. Sustainable Adaptation to climate change

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IV. From Research to Social Change: The Case of Ecosystem Services

Course Organizers:

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V. Adaptive Water Management

Course Organisers:

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Glossary of Terms

ESSP:	Earth System Science Partnership
GEC:	Global Environmental Change
GECHH:	Global Environmental Change and Human Health
GECHS:	Global Environmental Change and Human Security
GWSP:	Global Water System Project
HDGEC:	Human Dimensions of Global Environmental Change
IHDP:	International Human Dimensions Programme on Global Environmental Change
IHDW:	International Human Dimensions Workshop
IT:	Industrial Transformation
KLSC:	Knowledge, Learning, and Societal Change
SC:	Scientific Committee
YHDR:	Young Human Dimensions Researchers