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**INTERNATIONAL HUMAN DIMENSIONS PROGRAMME
ON GLOBAL ENVIRONMENTAL CHANGE**

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2000**

IHDP



**INTERNATIONAL HUMAN DIMENSIONS PROGRAMME
ON GLOBAL ENVIRONMENTAL CHANGE**

Annual Report 2000



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Foreword

The Annual Report of 1998/1999 illustrated the progress made by IHDP in setting up an international and interdisciplinary research programme to address the major human causes and consequences of global environmental change. This Annual Report shows the substantial progress made in just one year in the implementation of the IHDP agenda and in the development of joint projects with our partner programmes, the International Geosphere-Biosphere Programme (IGBP) and the World Climate Research Programme (WCRP). At the same time, however, the report points to the enormous challenges ahead. While we are much encouraged - sometimes even overwhelmed - by the growing demand for contributions from human dimensions research, we remain severely constrained by the scarce supply of stable, long-term funding. The IHDP does not yet have the broad basis of long-term financial support that is required, if it is to respond to the immediate and important demands to include the human dimensions in studies of global environmental change.

The progress made by the IHDP core projects has been sincerely acknowledged by the IHDP Scientific Committee. I would like to express my strong appreciation for the excellent work done by our project leaders in moving these research projects forward. Credit goes also to the International Project Offices. With the establishment of a new IPO of LUCC (Land-Use and Land-Cover Change Project, jointly sponsored by IGBP) with support from the Belgian Government, we have seen substantial progress in the implementation of research in this area. Similarly, the support from the US National Science Foundation for the International Project Office of IDGEC (Institutional Dimensions of Global Environmental Change Project) has been essential in the progress made with three very important flagship activities. We are still working on raising support for the other two core projects (Industrial Transformation and Global Environmental Change and Human Security), as well as bringing the level of support for all core project offices to the required level.

Parallel to the progress in the IHDP core projects, the year 2000 brought substantial advances in the development of joint projects with IGBP and WCRP. Scoping meetings, tele-conferences, e-mail conferences and resulting drafting processes have both led to the joint work with the partner programmes as well as the development of a "human dimen-



Arild Underdal, Chair of the IHDP-Scientific Committee



sions perspective" on the issues of Carbon, Global Environmental Change and Food Systems (GECaFS), and Water. In particular, in the development of the GECaFS project, the process of involving IHDP scholars from the beginning in the determination of the research questions of interest to both natural and social scientists, while also being responsive to the need to consider the causes and consequences of global environmental change, has demonstrated what can be accomplished in terms of developing a common agenda for integrated global change research.

This Annual Report contains a large amount of information on human dimensions research activities from the core projects, joint projects and national programmes. The Secretariat in Bonn, supported in 2000 by the German Federal Ministry for Education and Research, the Ministry for Education and Research of the German State of North Rhine Westfalia, the United States National Science Foundation and national contributions from Austria, The Netherlands, New Zealand, Norway, Sweden, Spain, and Switzerland, has played a central role in stimulating, co-ordinating and establishing networks for these advances. Being able to follow their work through frequent contact, I know that the Executive Director and her staff have contributed enormously and far beyond the call of duty to the strengthening of IHDP. I also know that I speak on behalf of the entire IHDP community, when I express my appreciation of, and gratitude for, the work they do for the programme.

As I write this foreword, I am also aware of the fact that the first "generation" of Scientific Committee members are entering the last year of their second term. One of the initial members of the Scientific Committee, Peter de Janosi, who served as treasurer for five years, stepped down in March last year, and the Committee and Secretariat expressed their gratitude for his leadership, consistent help and wonderful humour in establishing IHDP as an important player in global environmental change research. As several other members will be leaving the Scientific Committee at the end of this year, I would like to acknowledge the important role that the Committee has played in the development of the programme. Important progress has indeed been made since 1996!

At the same time, this really indicates a turning point for IHDP. The core projects are in their implementation phase, new joint projects with the partner programmes contributing to "Earth System Science" have started, while the team that has guided and supported these developments will change over the next year. The scientific sponsors of IHDP, the International Council for Science (ICSU) and the International Council for Social Science (ISSC), have recently approved the nomination of three new members of the Scientific Committee. I am confident that they, together with new members to be nominated in 2001, will be able to make further progress in achieving the ambitious and important mission of IHDP.

*Arild Underdal
Chair, IHDP-Scientific Committee
Oslo, March 2001*



Part I: The IHDP

The Human Dimensions Summer Workshop

IHDP supports research capacity building through its scientific activities and in training workshops. Many of the capacity-building initiatives are undertaken through direct collaboration with START (Global Change **S**ys**T**em for **A**nalysis, **R**esearch and **T**raining). IHDP and START hosted the 2nd bi-annual International Human Dimensions Workshop (IHDW) for young, developing country scientists in Bonn, Germany from September 10-19, 2000. Twenty-eight young social and natural scientists (selected from over 350 applicants) from countries in Africa, Latin America and Asia came together to explore the workshop theme: "Human Dimensions in the Coastal Zones".

Current scientific research must be increasingly involved in linking and integrating the development of practicable solutions to tangible, real-world problems. This is only possible through inter- and trans-disciplinary research in collaboration with key actors in society, policy and industry. While this approach to research represents a great opportunity, it carries with it an additional challenge for the new generation of Human Dimensions of Global Environmental Change (HD-GEC) researchers.

Events such as the IHDW are aimed at enhancing the capacity of the younger generation of scientists to work on integrated Global Environmental Change (GEC) science.

The workshop sessions were designed to be interactive and dynamic, including debates, policy development, working groups and role-playing. The programme was divided into 1-2 day sessions, during which representatives from the four IHDP science projects, UNESCO¹, the German research community, and the IGBP Land-Ocean Interactions in the Coastal Zone (LOICZ) project, worked with the participants on major research themes in the coastal zones. The themes included: environmental psychology; cities and urbanisation; human security and migration; drivers of land-use and land-cover change; and the institutional aspects of coastal zone management. Participants were especially interested in themes that cross-cut the various science projects represented, such as vulnerability, institutional capacity and the need for increased education and awareness-raising of individuals and communities in coastal zones. During these sessions, the participants also gave presentations on their own research, which corresponded with the session themes. The participants had the opportunity to experiment with tools used in interdisciplinary human dimensions research, to work in small groups on assigned problems and to find ways to link their own research interests to research foci of the IHDP projects.

1 For abbreviations and acronyms used in the text, please refer to the Appendix.

Current scientific research must be increasingly involved in linking and integrating the development of practicable solutions to tangible, real-world problems.

Workshop Report available at:
www.uni-bonn.de/iudp/public.htm
#IHDP Report



Since the IHDP wishes to encourage young scientists to become involved in, co-ordinate, and even initiate human dimensions activities and networks in their home countries, a representative of the IHDP Secretariat gave an account of how human dimensions national committees and contact groups have been established to date.

The most exciting aspects of the workshop were the research linkages, networks and plans for future collaboration among participants. This excitement was also felt by session leaders, who left with new perspectives on their own research and new contacts. Several ideas were discussed among participants and session leaders for joint projects and initiatives to be developed for possible input to major GEC conferences in 2001 (Global Change Open Science Conference, Amsterdam and Human Dimensions Open Meeting, Brazil). Two groups formed as a result of the workshop are elaborating their own projects: one to develop a network of Latin American and African researchers on land-use and land-cover change issues; and the other to design and distribute a course manual and study guide on human dimensions in the coastal zones (in printed and CD-ROM multi-media versions). Other participants are interested in acting as contact points for national human dimensions communities in their own countries, with the goal of establishing national committees. IHDP's already successful Seed Grant Initiative was suggested as a mechanism to assist in this.

The scholars who attended the meeting participated actively in the sessions and clearly developed a vision of the importance of human dimensions research in tackling complex global environmental change issues. The IHDP hopes that some, if not all, of them will use what they learned at the workshop in their further work. We look forward to their future participation in the IHDP and START networks.

A sea port in Thailand





Part II: Integrated Global Change Research

A Human Dimensions Perspective

"Human action is now a major driving force in a large number of biogeophysical systems. The challenge is to find ways to understand the links and connections in these coupled, complex systems. It's simply not on to view human beings as a disturbance. We need a new set of analytical constructs that can incorporate both anthropogenic and biogeophysical forces ... Let's try together by pooling contributions from people with real expertise." Oran R. Young

Global environmental change is increasingly recognised across societal sectors, cultures and nations as a reality and as the central "problematique" facing further societal development. There is a growing recognition of the interconnectedness in many facets of global environmental change – among land, oceanic and atmospheric processes; across local, regional and global scales; and from the past through the present and into the future. It is becoming increasingly clear that the Earth and the increasing human enterprise together function as a single system, with properties and behaviour that are characteristic of the system as a whole. These properties include critical thresholds, 'switch' or 'control' points, strong non-linearities, and substantial uncertainties. Research addressing issues of this type and complexity require input from many people, in a transdisciplinary framework.

Traditional science is conducted in disciplines, and as knowledge production has grown, so has the number of disciplines. The shortcomings of this approach have been increasingly recognised in the context of global environmental change, leading to the development of new types of scientific endeavours. So far, these have mostly been natural science projects, with only some input from social scientists. Many claim that the social sciences have not been equal partners in formulating the questions of global change research. Stepping outside the boundaries of traditional scientific disciplines is never easy. Different perspectives determine what questions are asked: For example, what is our ultimate concern: ecosystem health or human welfare? Integrative research also suffers from structural deficiencies in the academic system, where there is commonly a lack of incentives for participating scientists, as reward structures (such as promotion) are disciplinary based.

IHDP is a programme that has integration as the core of its *raison d'être*. It is clear, there are no formulae for making it happen, only examples where it has worked, and many where it has not. IHDP therefore plays an important role in fostering discussion about conceptual frameworks of integration, developing rigorous approaches, and promoting successfully implemented examples. The most recent activity in this field was a

**Oran Young chairs
the IDGEC project**

**A published report on
the workshop can be
obtained from
The Swedish Research
Council,
Email: awj@vr.se**



highly successful **international workshop** organised by the **Swedish Human Dimensions Committee** and **IHDP**, sponsored by the Swedish Council for the Planning and Co-ordination of Research (FRN) and IHDP, in November 2000.

At the workshop, it was recognised that there are ongoing efforts to integrate the social and natural sciences within the same research frame. One example is the jointly sponsored IGBP / IHDP project studying land-use and -cover change (LUCC). New integrated projects are also being initiated on themes such as food systems, the carbon cycle, and water. The experiences gained from LUCC and the food systems project provide examples of how integrated research can ask new questions. Although LUCC has been successful at integrating several disciplines, integration across different scales remains a significant conceptual challenge. Another challenge for all global change researchers is to include both physical and social dimensions within the same models.

The workshop identified two potential frameworks for successful integrative science: vulnerability and resilience. It was recognised that vulnerability and other such over-arching concepts can easily be interpreted differently by the involved actors, because of varying underlying assumptions.

Oran Young (IDGEC) summarised his experiences in seven 'rules of engagement' for integrative science:

1. Always frame the key science questions in such a way that they cannot be answered without contributions from all partners.
2. Focus foremost on substantive questions rather than on methods and tools.
3. Insist on balanced participation in science planning activities and emphasise open and inclusive processes.
4. Establish implementing and oversight committees with appropriate representation. Favour consensual processes.
5. Adjust reward structures for participating scientists to increase incentives of individuals to engage in integrative science.
6. Persuade funders to prioritise adequate resources for integrative infrastructures.
7. Always employ a decadal perspective in assessing progress.

It seems obvious, but is often forgotten, that the research questions should be formulated in such a way that all partners must contribute.

Two conclusions from the workshop were that integration is most successful when projects are driven by questions requiring answers, and that integration has to start in the formulation of the research problem. It seems obvious, but is often forgotten, that the research questions should be formulated in such a way that all partners *must* contribute, for example: What will the concentration of carbon dioxide in the atmosphere be in the future?

Workshops such as this one are an essential component of the IHDP research strategy. Progress may seem incremental, but the challenge of achieving a more integrated perspective on global environmental change is real and immediate.



Part III: IHDP Projects

Introduction

IHDP has four core projects. They are a key mechanism used to:

- i) identify and generate new IHDP research activities in priority areas,
- ii) promote international collaboration, and
- iii) link policy-makers and researchers

The Annual Report 1998/99 gave more general information on the projects. This Annual Report describes major developments that occurred in the year 2000 within the projects.

The IHDP asked the Project Leaders to give some personal impressions of the most significant developments within their projects and the most important events that occurred in the year 2000. Their responses to the posed questions can be read at the beginning of each Project section.

Land-Use and Land-Cover Change - LUCC

"In terms of major events we had four very focused and well prepared workshops in the last year, each contributing in a major way to one of our main activities. Probably the most interesting one was the Stockholm workshop organised by LUCC and funded by the Royal Swedish Academy of Sciences. The workshop was on the drivers of LUCC. We brought together 25 top scientists from a wide range of disciplines to discuss the evidence from case studies and to try to identify the myths of land-use change. Simplifications prevail on the policies related to land-use change. The intention of the workshop was not only to identify simplifications, but also to identify more complex pathways that are generic to land-use change. The outcomes of the discussions and working sessions were brought together in a synthesis paper..."

"...The Stockholm workshop was a great step forward due to the extreme multidisciplinary of its participants. Among the participants we had a number of new scholars who haven't been involved in LUCC before. In the past years, many workshops were organised to plan and identify research questions. This workshop focused entirely on major findings. What do we know today about land-use changes that we didn't know five or ten years ago? In my view the output is a major breakthrough, through synthesis of important research..."

"...Regarding major scientific developments, I would like to mention the scientific work that Helmut Geist and I have done together. In the past, case studies were conducted on deforestation with statistical analysis at the national level on the drivers of land-use change. These studies were

LUCC homepage:
www.geo.ucl.ac.be/LUCC



Eric Lambin, LUCC chair



controversial, because they were extremely aggregated. We reviewed 150 local scale case studies on deforestation, some of them quantitative, but most of them qualitative. We came out with a very rich quantitative analysis of the drivers, on a fine scale and very standardised. Currently, we are writing a paper on the results. The analysis was so successful, that the same procedure is being applied to "agricultural intensification" and "dryland degradation". The synthesis work is highly complementary to the Stockholm workshop, because we highlight the same kind of driving forces, the same processes."

The developments throughout the global change research community in the year 2000 put the LUCC project in a challenging, yet strong position. Major changes within the IGBP structure, preparing for an integrative, interdisciplinary second phase of research, coincided with the IHDP research projects entering their phase of implementation. These developments influenced various fields of inter-programme collaboration and design of future research frameworks. LUCC, situated at the interface of natural and social sciences, thus already a model for integration of research communities, began to position itself with respect to these developments.

Major progress has been made through four major international workshops, case study evaluation, publications, regional activities of endorsed projects and activities of the LUCC Scientific Steering Committee members. One important improvement was the establishment of the International Project Office at the University Louvain-la-Neuve, as the new host organisation in Belgium.

The workshop on "Current progress in quantifying spatially explicit causes and effects of land-use/-cover change", organised by CLUE, was organised in order to obtain a state-of-the-art overview of spatially explicit land-use change models. Such models serve as tools to grasp part of the complexity of land-use systems. They further offer the possibility of testing the sensitivity of land-use patterns to changes. The workshop proceedings will be published in a special issue of "Agricultural Ecosystems and Environment" in 2001.

The joint LUCC-PAGES initiative on a reconstruction of land-cover over the last 300 years, called BIOME 300, once more reflected the need for a concerted approach to issues of data standardisation and validation. A group of around 40 interested scientists came together in Bern in March 2000 at the first BIOME 300 workshop. The historical reconstruction for the recent past is intended to span the period of the last 300 years. It consists of coarse (50-100 years) time steps in the earlier eras and finer (10-25 years) in later periods. Participants highlighted local and regional inconsistencies that should be dealt with in the further development of this global historical land-cover database. "Meeting in the Middle: the challenge of meso-level data integration," a workshop organised by the LUCC Focus 1 office (LUCC has three Programme Offices acting as the focal points for the implementation of the three science foci) addressed a main challenge for the LUCC research community: the forging of robust linkages between the fine-grained understandings of land-use decisions and broad-scale models of land-cover. Discussions on compatibility of data derived from household surveys with information about land-cover, derived from remotely sensed images, once more raised the



issue of confidentiality related to the integration of satellite and social science data.

A first step to derive general principles explaining the driving forces of land-use and land-cover changes, was taken by a workshop in Stockholm, held in March 2000 entitled: "Key drivers of land-use/-cover change processes." Participants searched for "generalities" of land-use and land-cover change. Case study evidence supported the conclusion that the simple answers found in population growth, poverty, and infrastructure rarely provide an adequate understanding of land-use and land-cover change. In this workshop several myths on land-use/-cover change were dispelled. An extended version of the workshop findings will be published in the journal "Global Environmental Change."

Complementing the effort of the LUCC International Project Office running a meta-analysis of 152 cases of tropical deforestation, the LUCC Focus 1 office started to build up a case study database and began the comparative examination of case studies of agricultural intensification. Since comparative efforts require compatibility between case studies, work on developing guidelines for the standardisation of methodologies and experimental protocols was started.

Using the Agro-Ecological Zones (AEZ) methodology, the LUCC Focus 3 office has developed, in collaboration with FAO, a system that enables rational land-use planning on the basis of an inventory of land resources and evaluation of biophysical limitations and potentials. Recent availability of digital global datasets has allowed for revisions and improvements in calculation procedures and the global expansion of assessments. Implementation of AEZ based on pan-European datasets is now under way. (<http://www.iiasa.ac.at/Research/LUC/GAEZ/index.htm>).

Thirteen new projects were endorsed during the year 2000. Please visit <http://www.geo.ucl.ac.be/LUCC/endorsement/lucc.html>.

Institutional Dimensions of Global Environmental Change - IDGEC

"The most important event for IDGEC was the securing of the support for the International Project Office (IPO) and the appointment of a new Executive Officer. Another major step forward was the addition of new members to the Scientific Steering Committee (SSC). What is particularly important is that three of them come from the developing countries (Trinidad, Senegal and Indonesia). This improves upon the diversity, balance and range of perspectives within the SSC..."

"...Beyond those big events was the evolution of our so-called flagship activities. Two of them now have substantial science agendas of their own; the third one has almost finished its scoping activity. These flagship activities are now moving towards substantial research, based on the science agendas they have been working out. One of them is dealing with

E. F. Lambin et al.:
"The cause of land-use and land-cover change: Moving beyond the myths."
Global Environmental Change: Human and Policy Dimensions, Vol. 4/2001

IDGEC homepage:
www.dartmouth.edu/~idgrec



Syma Ebbin (IPO Executive Officer) and Oran Young (IDGEC chair)

carbon management issues. It is very much linked to the effort of the cross-cutting carbon theme with IGBP and WCRP. The really big challenge at this stage is that we now have to go to the next step and have a number of substantive research activities focussing on issues that we have identified as important. We are considering, for example, in this context workshops designed to bring together groups of younger scientists: people who are writing their Ph. D. thesis, or post doctoral fellows, young scientists who are very focussed on substantive research...

"...One of the important events within the carbon management flagship activity, was a workshop held in Tokyo at the end of May 2000. There was a very interesting mix of people – about 30 participants – coming from the science and policy communities. We worked together to identify what kinds of research topics would be interesting at the same time to the policy community as well as to the science community. We've also been in close contact with the UN Secretariat of the Framework Convention on Climate Change (UNFCCC) to discuss their needs. The collaboration between the two communities worked out really well. Bringing together people with diverse backgrounds always takes some time, because it is not only an integration across disciplines, but also integration across people from various parts of society and areas of life."

IDGEC's overriding goal is to catalyse and to co-ordinate a vibrant research community, focused on the interactions between institutions and global environmental systems. One important insight regarding the causal significance of institutions is beginning to emerge already. In most cases, institutions affect collective outcomes as one of a cluster of interactive driving forces, which also includes political power, economic development, population growth, and technological change. The role of institutions in these interactive clusters varies from dominant to marginal in individual cases. One important consequence of this pattern of causation is that it is difficult – often impossible – to construct simple generalisations regarding the roles institutions play in causing and confronting environmental changes. Convincing accounts of the causal significance of institutions must feature contextualised assessments that highlight interactions between institutions and other driving forces as they play out in specific settings. Another important consequence is that efforts to design institutions to deal with specific environmental concerns (e.g. climate change, loss of biodiversity) must be tailored to particular features of specific problems. Institutions sometimes emerge as significant factors in coming to terms with environmental problems. However, one size does not fit all. Successful institutions are those that achieve a good fit between institutional attributes and the bio-geo-physical and socio-economic properties of the problem at hand.

The SSC identified three substantive topics as themes for "flagship" research activities: Ocean Governance, Climate Change, and Boreal and Tropical Forests. Since September 1999, the IDGEC team has been working on scoping reports for the flagship activities. Two of three scoping reports were published in 2000: "Performance of Exclusive Economic Zones (EEZs)" and "Climate Change: Carbon Management Research Activity (CMRA)" (both reports available at <http://www.dartmouth.edu/~idgcec/pages/Papers-Publications/papers.html>), and a draft report on "The Political Economy of Boreal and Tropical Forests" (to be published in 2001). A key measure of performance in the development of the IDGEC

"Are Institutions Intervening Variables or Basic Causal Factors? Causal Clusters vs. Causal Forces in International Society."
by Oran Young

"The Institutional Dimensions of Environmental Change: Fit, Interplay and Scale."
by Oran Young.

Both reports available at: www.dartmouth.edu/~idgcec/pages/Papers-Publications/papers.html



flagships activities, will be the level of success of efforts in linking work on these topics to broader questions of interest for social scientists and to use these activities to improve communication among those working in different research traditions.

Over 30 researchers from 12 countries and a wide range of disciplines attended a workshop on carbon management in May 2000 in Tokyo. It was designed to take the activity from "paper to practice", and an international group of scholars discussed research projects to deal with both the short-term and long-term institutional issues related to carbon management.

Workshop Report
"Carbon Management
Research Activity"
(CMRA) available at
[www.dartmouth.edu/](http://www.dartmouth.edu/~idgcec)
 ~idgcec

The IPO started operations in September 1999 under the leadership of Virginia Walsh. In September 2000, Ms. Walsh left the post of IDGEC Executive Officer. She has continued her affiliation with IDGEC and has been working on developing a cross-cutting theme related to Knowledge and Institutions under the joint umbrella of IDGEC and the Center for Global Change and Governance (CGCC) at Rutgers University. Syma Ebbin took over as IDGEC's Executive Officer in September 2000 and is now leading the IPO. IDGEC is developing the IPO as an intellectual centre, albeit a lean one, committed to developing co-ordinated research projects throughout an expanding network.

IDGEC's network spans academic disciplines and brings together professionals in universities, the public sector, and non-governmental organisations. IDGEC has created two list-servers to connect their global network of researchers and practitioners and to provide a forum for the exchange of ideas. The IDGEC list-server sends information of general interest to those interested in international governance and institutions. The CMRA list-server is focused more specifically on issues involving carbon management and was created to further develop the goals outlined by participants at the May Workshop in Tokyo. In addition, the IPO maintains a database of over 300 individuals who have expressed an interest in IDGEC's activities and research foci.

Irrigation System, Wadi Ayyan, Jemen



© Joker, Paul Eckernoth



Global Environmental Change and Human Security - GECHS

GECHS homepage:
www.gechs.org

"Over the last year we've seen the project move from the development of a science plan to a research programme. We are beginning to initiate a number of research projects. We see that the term "Environment and Human Security" is being used a lot more in the literature – it is becoming a standard expression in the discussions...

"...There's some exciting research starting. One area of research looks at issues of food security, particularly how vulnerable certain communities are to disruptions in food supply, as a result of environmental change, and how adaptable they are going to be. Another area is looking more specifically at issues of conflicts over water management, for example, how co-operative agreements over water can sometimes be made even when there are conflicts between countries, such as between Nepal, India and Pakistan. That's a very exciting area. We have also started to look at specific case studies in countries such as Russia and Pakistan...

"...We had a workshop in the area of environment and security at the University of California in March 2000. It was well attended and provided a useful critique of existing studies on environment and security and of new research directions...

"...For me personally, the increased involvement of researchers from developing countries in our work rather than one specific event is the most important development in the GECHS project in the year 2000. It is significant that developing country researchers contribute articles for a policy briefing series, participate in research activities and become more involved in the project."

In 2000, the GECHS project launched the implementation phase of its Science Plan. The task in 2000 was, and for the coming year 2001 will be, to consolidate and monitor these activities as part of the implementation phase of the project. Research partnerships with scientists in the developing countries were an important element of all GECHS initiatives in 2000.

After three years as Chair of the GECHS Scientific Planning Committee (SPC) and then the SSC, Steve Lonergan stepped down at the end of 2000. Mike Brklacich (Carleton University, Ottawa, Canada) was approved as the new Chair of the GECHS SSC for a term of three years beginning in January 2001.

At the 2000 meeting of the GECHS SSC, the implementation strategy for the project was discussed. As part of this strategy guidelines for what determines GECHS core research were finalised. The SSC discussed two signature research initiatives at their SSC meeting:

- "Environment and Human Security: New Dimensions of Insecurity in Russia," led by Elena Nikitina of the GECHS SSC
- "Differential Socio-Economic Vulnerabilities, GEC and Human Security: Lower Mekong River Basin Case Study," led by Mike Brklacich, Chris Cocklin and Chou Meng Tarr of the GECHS SSC



GECHS Programme Offices have had an active year in 2000 in implementing the GECHS research agenda on a regional level:

- Chris Cocklin, who heads the Australian GECHS Programme Office, has received, together with Richard Berk at UCLA, USA, an APN grant to develop a research initiative on "Climate Change and Water Resources in Asia Pacific Cities." This initiative brings together research foci on water and urbanisation common to both the GECHS and IT agendas.
- Nils Petter Gleditsch, who heads the Norwegian Programme Office, which was established in 1999, obtained a grant starting in 2000 from the Research Council of Norway. This grant is being used to support a three-phase research initiative on "Environmental Change, Good Governance, Development, and Human Security."
- Richard Matthew heads the programme office, established in July 1999 at the University of California, Irvine. Activities in 2000 include: 1) a workshop on environment, population and security at UCI, which brought together 30 top scholars in the field, from around the world, for focused discussions on findings, methodology and future research. The workshop was co-sponsored by the Woodrow Wilson Centre (WWC), and funded by the International Studies Association, the UC Global Peace and Conflict Studies Program (GPACS), and the WWC; 2) members of Richard Matthew's team are preparing a study on the effects of environmental stress on democratic transitions, funded by the Centre for the Study of Democracy; and 3) working with researchers from IIS and IUCN-Pakistan, Richard Matthew spent the summer of 2000 in Pakistan conducting research on resource scarcity and insecurity in northern Pakistan.



Steve Lonergan, GECHS chair

The GECHS SSC and network members participated in the ENRICH project on Environment and Security (NES). The objectives of this project were to foster a European network of researchers working on environment and security issues. Three workshops were held – two in 1999, and the final one in 2000 – during which researchers presented case studies and developed cross-national methodologies. At the workshops, European researchers from Greece, Italy, Norway, Romania, Russia, The Netherlands, and the UK were joined by experts from Costa Rica, Australia, Canada, the USA, and Ghana. The papers presented at these workshops are being published by the GECHS project in their AVISO series, and also as an edited volume.

Industrial Transformation - IT

"The publication of the Science Plan and the quick response we got from a few hundred scientists world-wide, who wanted to co-operate and participate in the project were major events..."

"...One of the most important developments within the project in the year 2000, was the increasing number of pilot projects being developed by individual researchers conducting work in the field of energy and material flows. We can help researchers by bringing them into contact with other researchers through our networks. We had five evolving projects in the last months. One of the pilot projects deals

IT homepage:
www.vu.nl/ivm/research/ihdp-it/



with the production of organic food in developing countries, another one with the feasibility of bio-fuels from an incentives and a technological change perspective...

"...Another small success was the funding by the EU (ENRICH) of a major project on carbon flows between Eastern and Western European countries. It's a significant project, because there will be a great number of researchers who will be active in this field over the next 10 years. So we see the project as a starting point for the development of a crucial network...

"...In November we held a very exciting workshop on economic modelling and the incorporation of technological change. It examined the costs and benefits of system change, for example from fossil fuels to lower carbon fuels or to renewable energies...

"...In the IPO, we have a team that is really on top of all these issues. A highlight of 2000 was the establishment of the International Project Office in Amsterdam that is generating and helping to set up some 15 pilot projects world-wide."

Industrial Transformation research seeks to understand complex society-environment interactions, identify driving forces for change, and explore development trajectories that have a significantly smaller burden on the environment. It is based on the assumption that important changes in production and consumption systems will be required in order to meet the needs and aspirations of a growing world population while using environmental resources in a sustainable manner. In 2000, a newly appointed international Scientific Steering Committee developed an implementation strategy that will explore industrial transformation with a focus on: Energy and Material Flows, Food Consumption and Production Systems, Information and Communication, Cities and IT, and Governance and Transformation Processes. The IT research agenda resonates strongly in regions such as the Asia-Pacific areas and Eastern Europe, where concentrated and large populations, and/or strong economic development imperatives are often clashing with vulnerable environments. The IT project is in a unique position among the IHDP Science Projects to forge concrete linkages between the scientific, policy and industrial communities. This will be the focus of the implementation phase of the IT project, and is reflected in the agendas of two major projects (on cities, and on carbon flows between Eastern and Western Europe) initiated by IT scientists in 2000. Also, through the participation of several members of the IT network, the systems approach inherent in IT research has been clearly reflected in the development of the joint initiatives on Food Systems, Water and the Carbon Cycle (being developed jointly with IGBP and WCRP).



Pier Vellinga, IT chair

The publication of the Science Plan at the beginning of the year 2000 was an important step for the development of the project. The IT-IPO distributed the IT Science Plan to approximately 1500 interested researchers in all areas of the world. The Science Plan was accompanied by a questionnaire from which the IT-IPO has developed a database of researchers.

With the published Science Plan the next step for the project was to launch its implementation phase. To take the project from Science Plan



into the implementation phase an international Scientific Steering Committee was appointed by IHDP, chaired by Pier Vellinga. The ten SSC members will guide research initiatives that correspond to IT research foci, and implement new IT research projects.

The first meeting of the IT-SSC was held from December 1-2, 2000 in Amsterdam, The Netherlands. SSC members agreed on the strategy for the implementation of the IT research agenda, which focuses on the scientific guidance and recognition of existing research, and the development of new IT research projects. To set certain guidelines as to whether submitted project proposals would qualify as Industrial Transformation research, five general requirements were defined:

Industrial Transformation research

- i) deals with the relationship between societal, technological, and environmental change;
- ii) focuses on systems and explores system changes that are relevant to issues of global environmental change;
- iii) relates producer and consumer perspectives, including the incentives and institutions that help in shaping these perspectives;
- iv) is international in scope. Researchers from more than one country and preferably more than one continent should co-operate on each research project;
- v) should address one or more research questions as outlined in the IT Science Plan.

The ENRICH proposal on "Carbon Flows between Eastern and Western Europe (CFEWE)", submitted by the IPO to the European Commission in February 2000 was approved. The CFEWE project is a two-year endeavour bringing together members of the IT SSC and the IT research community, as well as members of IHDP national committees in Eastern Europe. The aims of the project are: i) to summarise how climate change policies will affect the carbon flows (natural gas, biomass) between Eastern and Western Europe, taking into account aspects such as industrial transformation, mechanisms for trading carbon credits and liberalisation of the energy market; ii) discuss how the various economies of both Western and Eastern Europe can benefit from the above, while simultaneously meeting climate change goals.

Richard Rockwell, member of the IT-SSC, is spearheading activities within the project to develop the core Focus on Cities and Industrial Transformation. As part of these activities, he was awarded a grant from the US National Science Foundation as part of its Biocomplexity Incubation Activities entitled: "Complex Systems: Cities in their Environments". This 2-year activity will be a core research initiative for the IT Project, and will seek to develop integrated models of two sub-systems (water and human use of water; and fuel/energy/transportation system) that are central both to the building and operation of cities and to their interactions with the environment.

Members of the project participated in IT-related international events to promote the IT research agenda. The International Project Office was involved in the organisation of three important events that gave the



Anna J. Wiczorek, Project Co-ordinator



scientists the opportunity to work on the identified research foci, to broaden the IT network, and to discuss the implementation in countries with economies under transition.

“Economic Modelling of Environmental Policy and Endogenous Technological Change” is a core IT project in the area of Energy and Material Flows. The IPO assisted in the organisation of a workshop in November 2000 within the framework of this project. The proceedings of the workshop will be published.

A seminar on “Effective Environmental Regulation: Learning from Poland’s Experience”, given by members of the IT research networks Halina Brown and David Angel, was held in Amsterdam on October 17, 2000. The seminar enabled IT researchers to meet and discuss the concept of leap-frogging and opportunities of Industrial Transformation in countries with economies in transition.

Chemical Plant in Wesseling, Germany





A Ph. D. Course on "Human Dimensions of Global Environmental Change" was held in Wageningen, The Netherlands from November 20-24 2000. Every two years, the SENSE Research School (Socio-Economic and Natural Sciences of the Environment) organises a course on global environmental change issues within the context of the SENSE Core 3 Research Programme on 'Climate Change, Land-Use and Biogeochemical Cycles'. In 2000, the course focussed on the human dimensions of global environmental change, and members of the IT research community in the Netherlands participated as presenters in the workshop sessions. The course aims to provide Ph. D. -candidates from SENSE and other research schools (as well as advisors in industry, non-governmental organisations (NGOs) and policy) with insight into natural and social sciences aspects of the many interactions and feedback-mechanisms between human activities and major global environmental change issues. Towards the end of the course, participants discussed the main drivers of global environmental change, analysed their ecological and socio-economic effects and evaluated the range of possible responses.

The IPO facilitates communication between IT researchers via its website: www.vu.nl/ivm/research/ihdp-it. Thus, in addition to the calendar of IT-relevant events and the project endorsement procedures, the website now offers a list of endorsed projects to encourage leaders to exchange experiences and information on their projects and related issues. To keep the IT community informed of activities and to strengthen the IT network, the IPO published two Status Reports in 2000.



Part IV: Joint Projects and New Initiatives

The International Global Change Research Programmes IGBP, WCRP, and IHDP have identified three new research themes requiring the development of partnerships across natural and social science disciplines. The global carbon cycle, together with food systems and water, were identified as research areas demanding such an integrative approach. At the beginning of 2000 the IGBP, WCRP and IHDP Scientific Committees approved the establishment of an international framework of research for each of these "Joint Projects." Scoping meetings for all three of the projects took place during 2000. There is clear agreement that all scientific communities have continuing interests in the identified research areas, and the Joint Projects should focus on working together on problems requiring cooperative action, i.e. cannot be answered by one programme alone.

Global Environmental Change and Food Systems - GECaFS

Food Systems – here defined as systems that encompass food production, its distribution and consumption, comprise issues such as the access to food as well as the vulnerability of people to global environmental change. It is especially this latter problem that poses important questions to the scientific community in view of an increasing world population, the globalisation of economies and the tangible impacts of global environmental change. At the same time, the complexity of food systems is increasingly recognised, and therefore there is a need to integrate research across disciplines, in order to be able to understand and project changes in the systems.

Informal discussions during 1999 and early 2000 among the three Global Change Programmes culminated in a Scoping Meeting in March 2000, where the Executive Directors of IHDP, IGBP and WCRP agreed to develop a Joint Project on Food. The Planning Process of the Joint Project was later formally endorsed by the three Scientific Committees of the Global Change Programmes.

A six-person Planning Group with members from each of the Programmes was established to guide the planning process of the Joint Project. It was agreed that although the mandates of the three Programmes are very broad, they are still insufficient to cover the full spectrum of issues that need to be considered. Therefore, it was decided that strategic alliances with other research bodies and international policy formulating agencies would be established. Representatives from the donor community were brought into the planning process from the beginning, in order to guarantee that the research agenda would also reflect their interests.



An initial Planning Workshop was held at the University of Reading, UK in July 2000. It was the first major step in developing the science agenda and its framework.

The provision of food in sufficient quantity and quality to certain sections of society is a major problem in many parts of the world. GEC will in many cases, bring additional complications to the already difficult task. However, not all individuals and sections of society are equally *vulnerable* to global environmental change. Their capacity to cope with existing variability in bio-physical and socio-economic systems, and their ability to perceive global environmental change and adapt food systems accordingly varies considerably. This is because these factors are controlled by the flexibility with which food provision (i.e. supply, availability and access to food and related, essential resources) is mediated by institutions governing how bio-physical and socio-economic factors interact (e.g. land tenure, access to credit, exploitation rights of renewable resources, etc.). This baseline of the project is captured in its three overarching questions:

- How does GEC additionally affect food provision and vulnerability in different regions and among different social groups?
- How might different societies and different categories of producers adapt their food systems to cope with both global environmental change and changing demands?
- What would be the environmental and socio-economic consequences of adaptations to these changes?

Of ultimate interest to the Joint Project is the link between GEC and societal well-being. This requires an innovative, interdisciplinary approach.

It was planned for the Reading workshop to be followed by a series of three follow-up workshops with the aim of refining the framework, building example questions, approaching different communities and launching the project. The first follow-up workshop took place in Stockholm in November 2000. Those present worked on refining the principles of the overall project and the individual projects. The group also discussed the further process in developing and launching the project.

The IHDP Project Leaders and Officers agreed to set up a task group on the "Human Dimensions of Food Systems" parallel to the joint initiative, in order to address the need to develop a human dimensions perspective on food systems.

The involvement in the food systems activities poses new and exciting challenges to the human dimensions community. It not only requires new perspectives from the scientists, due to the interaction with colleagues with diverse scientific backgrounds, but also with colleagues from the donor community. It also demands an approach that is very problem-focused. Inputs from the human dimensions scientists are needed in order to seek solutions that take interdependencies and complexities into consideration.



The Global Carbon Cycle

The joint IGBP, IHDP and WCRP endeavour to develop an international framework for carbon research aims to establish a platform for research addressing system-wide questions about interactions between humans and one of the most fundamental bio-geochemical cycles. It will also provide the context for major carbon-related components of the Global Environmental Change Programmes (IGBP, WCRP, IHDP) research, together with national and regional studies/programmes. In turn the framework can provide a global context within which the national and regional studies can interpret their work for their own aims and objectives.

The Scoping Meeting in Oslo in April 2000 was followed by a meeting of terrestrial carbon cycle researchers in Lisbon in May 2000 to develop a “first cut” of a draft framework for an international, integrated approach to global carbon cycle research.

The next meeting in Durham, New Hampshire, USA, October 2000 was organised around three questions:

- (1) Where, geographically and physically/ecologically, are the current sources and sinks of carbon and why? What are the natural patterns of temporal variability in the carbon cycle?
- (2) What is the nature of human alterations of the carbon cycle ?
- (3) What will the likely dynamics of the carbon cycle be in the future?

These were treated as separate entities on the second and third day of the workshop. The focus then shifted to the examination of four perspectives: process studies, observations, diagnostic models, and prognostic models. One interpretation of this scheme implies human dimensions were segmented out as a separate consideration. It became clear that these analytic separations might make sense for a variety of scientific investigations, but not necessarily for an integrated framework—the purpose of the conference. Oran Young, chair of the IDGEC project, successfully made the point (with the support of other human dimensions representatives at the meeting) that the human dimension must be included in all parts of the framework. This means that the human dimensions research community is obliged to provide input for all elements of the integrated framework.

The participants of the Durham meeting concluded that there is still a long way to go before an integrated framework document on carbon-cycle research can be presented to the scientific and policy communities. It was agreed to set up a process to facilitate the production of such a framework document. A smaller writing group was identified to take the document to the next stage.

Apart from the outlined developments within the IGBP/IHDP/WCRP joint carbon initiative, the IHDP Project Leaders and Officers agreed that IHDP should continue to draft an IHDP position paper on the carbon issue parallel to the development of the joint research framework.

An international approach to integrating the atmospheric, oceanic, terrestrial, and human dimensions aspects of the carbon cycle is a great challenge that needs commitment and balanced input from all relevant

research communities. It is therefore important for IHDP to ensure and support a significant level of engagement in this enterprise. Close collaboration between the scientific communities is required to develop a research framework that is focused, and achievable, while remaining sufficiently flexible to integrate contributions from a larger number of carbon projects on a global scale.

Water

There is little doubt that "water" is one of the emerging themes on which the world will concentrate its attention in the 21st century. Each year, more and more people become vulnerable to deficiencies in access to, supply, and quality of water.

The development of a Joint Project on Water with IGBP and WCRP was endorsed in 2000 by all three Scientific Committees. Planning began in September 2000 with a Scoping Meeting hosted by ICSU in Paris. Participants included not only representatives of all IHDP Projects, IGBP, and WCRP, but also other ICSU bodies (Scientific Committee on Water Research, International Association of Hydrological Sciences), UNESCO (Hydrology for Environment, Life, and Policy; International Hydrological Programme), and the Stockholm International Water Institute. The initial scoping activity identified the variety of ongoing and planned initiatives, outlined several key themes warranting further investigation, and established a process to further develop the ideas. It is clear that there is a wealth of relevant research being carried out by the Programmes, and the Joint Project should draw upon them. A potential goal for the GEC Programmes is to hold a major Science Forum within the Third Water Forum in Tokyo in March 2003.

Well in the Tihama Desert, Jemen





Vulnerability and Sustainability

In 1999, project discussions showed clearly that *Vulnerability* was a cross-cutting theme within the IHDP core projects. Consequently, IHDP was one of the co-sponsors of a workshop on this topic in May 2000 and the conclusions of this path-breaking workshop are reported here. In addition, the presentation by Professor William Clark at the annual meeting of the IHDP Scientific Committee showed clearly that IHDP faces a number of research challenges in dealing with "*The Sustainability Transition*." The summary below of a meeting held in Sweden, including participants from the IHDP Secretariat and Scientific Committee, illustrates the directions of "Sustainability Science." Both of these meetings will be followed up by workshops and research initiatives in which IHDP will be involved.

Assessing Vulnerability to Global Environmental Risks

Recently, questions about the *vulnerability* of social and ecological systems are emerging as a central focus of policy-driven assessments of global environmental risks. Initial efforts to shape a useful understanding of vulnerability to global change have found the task difficult, hampered by conflicting conceptual frameworks, unconsolidated data, and inadequate models. Scholarly research on vulnerability has nonetheless begun to mature and produce cumulative results that are potentially relevant. Unfortunately, the communities of decision-oriented vulnerability assessors for global environmental change issues, research-oriented vulnerability scholars generally focusing on regional scale human-environment interactions, and those conducting vulnerability assessments that assist in targeting improved intervention and mitigation strategies have operated largely independently. In May 2000, a workshop co-organised by IHDP was held in Airlie House, Warrenton, USA as a first effort to integrate the insights and experiences of these communities. The results of the workshop are reported by Clark et al. (2000).

The Workshop explored the similarities and differences between vulnerability and impact assessment.

In principle, the same global change phenomena could be assessed from both perspectives, but in practice, impact studies have been most helpful where they have been able to focus on a single stress that dominates system response. Policy dialogues and scholarship are increasingly suggesting, however, that some of the greatest challenges arising from the interactions between human development and the global environment entail complex system responses to multiple and interacting stresses originating in both the social and environmental realms. Conventional impact assessment practices have been relatively unhelpful in addressing such challenges, primarily because they provide little strategic guidance on which of these multiple stresses a given analysis should consider. Vulnerability assessment offers a maturing strategy to provide such guidance.

It was agreed that "vulnerability" is a multidimensional concept involving at least *exposure* – the degree to which a human group or ecosystem

**William Clark et al.,
(2000) "Assessing
Vulnerability to Global
Environmental Risks."**

[www.ksgnotes/
harvard.edu/bcsia/
sust.nsj/publications](http://www.ksgnotes/harvard.edu/bcsia/sust.nsj/publications)



comes into contact with particular stresses; *sensitivity* – the degree to which an exposure unit is affected by exposure to any set of stresses; and *resilience* – the ability of the exposure unit to resist or recover from the damage associated with the convergence of multiple stresses. The concepts of preparedness, coping reserve, and adaptive capacity are clearly important – but as yet under-theorised – underlying determinants of the sensitivity and resilience of an exposure unit. Scholarship tracing the “causal chains” of vulnerability has begun to significantly deepen the understanding of how different components of vulnerability arise, how overall causal structure and systems of vulnerability may be characterised, and what reducing vulnerability and thereby increasing security may entail.

The scale-dependence of vulnerability was also discussed. It was clear that much of the importance for societies’ efforts to cope with global environmental change will be missed by assessments focused on a narrow range of scales. In particular, strategies for reducing vulnerability to global environmental change will require assessments that go beyond the global or continental analyses adopted for pragmatic reasons in most contemporary work. Some recent studies suggest useful, innovative approaches for determining the scales that must be addressed.

Finally, the workshop considered the role of scenarios. In particular, approaches to vulnerability analysis that begin by looking at potential outcomes could lead to the creation of scenarios rather than having scenarios as initial input. Such vulnerability scenarios would have coherent story-lines, regional and sectoral specificity, and deeper causal complexity than conventional scenarios.

The workshop recommended a number of activities to contribute to an increased understanding of vulnerability to global change. IHDP is contri-

Mine worker family fleeing from water pollution caused by the Ok Tedi coppermine in Papua New Guinea





buting to these activities, in particular through co-sponsorship of a follow-up workshop in 2001.

Reference

Clark, William C., et al. (2000) "Assessing Vulnerability to Global Environmental Risks." Report of the Workshop on Vulnerability to Global Environmental Change: Challenges for Research, Assessment and Decision Making. May 22-25, 2000, Airlie House, Warrenton, Virginia. Cambridge, MA: Belfer Center for Science and International Affairs (BCSIA) Discussion Paper 2000-12, Environment and Natural Resources Program, Kennedy School of Government, Harvard University. Available at <http://www.ksgnotes.harvard.edu/bcsia/sust.nsj/publications>

Sustainability Science

[http://
sustainabilityscience.org](http://sustainabilityscience.org)

The world's present development path is not sustainable. Efforts to meet the needs of a growing population in a globalising, unequal and human-dominated world will continue to exert unsustainable pressures on the Earth's essential life-support systems. Worrying interactions among climate change, loss of biological diversity, increasing poverty and disease, and growing inequality combine to increase the vulnerability of humans and nature. Meeting fundamental human needs, while preserving the life-support systems of Earth, will require a world-wide acceleration of today's halting progress in a transition toward sustainability. A response as to how this transition might be achieved has begun to emerge in recent reports of national and international scientific organisations, as well as from independent networks of activists and scientists.

To take these ideas further, two dozen scientists, drawn from the natural and social sciences and from across the world, convened at Friibergh Manor in Sweden in October 2000. Participants concluded that promoting the goal of sustainability requires the emergence and conduct of the new field of sustainability science.

Sustainability science seeks to improve on the substantial, but still limited understanding of nature-society interactions gained in recent decades. This has been achieved through work in the environmental sciences, estimating and evaluating human impacts, and evidence from social and development studies that takes into account environmental influences on human well-being. What is urgently needed now is a better general understanding of the complex dynamic interactions between society and nature so that the alarming trend towards increasing vulnerability is reversed. This will require major advances in our ability to analyse and predict the behaviour of complex self-organising systems, characterise the irreversible impacts of interacting stresses, interpret multiple scales of organisation, and assess the roles of various social actors with divergent expectations. Much contemporary experience points to the need to address these issues through integrated scientific efforts focused on the social and ecological characteristics of particular places or regions. The workshop formulated an initial set of core questions that examines the combinational character of nature-society interactions, our ability to guide those interactions along more sustainable trajectories, and ways to promote and implement the social learning that will be essential to the navigation of a transition to sustainability.



By structure, method, and content, sustainability science must differ fundamentally from most science as we know it. Familiar approaches to developing and testing hypotheses are inadequate because of non-linearity, complexity, and long time lags between actions and their consequences. Additional complications arise from the recognition that human beings cannot stand outside the nature-society system. The common sequential analytical phases of scientific inquiry, such as conceptualising the problem, collecting data, developing theories and applying the results, will become parallel functions of social learning, which incorporate the elements of action, adaptive management and policy as experiment. Sustainability science will therefore need to employ new methodologies that generate the semi-quantitative models of qualitative data, build upon lessons from case studies, and extract inverse approaches that work backwards from undesirable consequences to identify pathways that can avoid such outcomes. Scientists and practitioners will need to work together with the public at large to produce trustworthy knowledge and judgement that is scientifically sound and rooted in social understanding.

Furthermore, sustainability science will learn to work with all manner of social groups to recognise how they come to gain knowledge, establish certainty of outlooks, and adjust their perceptions as they relate to each other's needs. This in turn will require sustainability science to better sense how governments are responding, how democracies are improving and how citizens generally act to play out the sustainability transition.

Meeting the challenge of sustainability science will also require new styles of institutional organisation to foster and support inter-disciplinary research over the long term; to build capacity for such research, especially in developing countries; and to integrate such research in coherent systems of research planning, assessment and decision support. We need to be able to involve scientists, practitioners, and citizens in setting priorities, creating new knowledge, evaluating its possible consequences, and testing it in action. This will require integration of this new active knowledge in particular locations and cultural settings through broader networks of research and monitoring.

In the coming years, the emerging field of sustainability science will need to move forward along several pathways, if it is to prove successful. There will be wide discussion within scientific communities, North and South, of the approach, its key questions, methods of inquiry, and institutional needs. There should be an effort to reconnect science to the many political efforts for promoting sustainable development.

A report on the Workshop, together with updates on a larger follow up meeting to be held in the Southern Hemisphere, will be posted on <http://sustsci.harvard.edu/events.htm>.



Part V: National Committees

Seed Grant Initiative 2000

IHDP's commitment to promote the development and strengthening of national human dimensions programmes in developing countries and transition economies is being matched by considerable interest and activity in a growing number of countries. The IHDP has allocated resources from the ISSC/UNESCO to fund a small grants programme to provide "seed money" to:

- Existing National Human Dimensions Committees/Programmes in developing countries and countries with economies in transition
- Groups of researchers from developing countries and transition economies to help establish a formal national HD committee

and to facilitate

- the creation of new research networks
- the convening of national workshops
- specific national human dimensions research initiatives

Three Seed Grants were granted in 2000:

- to Bolivia (to hold a national workshop and an inventory of research),
- to Romania (for the preparation of a national inventory of HD research activities), and
- to Russia (for the preparation of a national inventory of HD research activities).

In addition, several projects supported by Seed Grants awarded in 1999 were completed in 2000.

The following article is a report of the workshop hosted by the national global change committee in Bulgaria and supported by an IHDP Seed Grant.

A Bulgarian Human Dimensions Research Programme

The National Human Dimensions Research Programme in Bulgaria was established through a project, "Capacity Building for the Bulgarian Human Dimensions Programme," which was implemented within the framework of the National Co-ordination Centre for Global Change at the Bulgarian Academy of Sciences (NCCGC-BAS) during the first half of 2000 with the financial support of IHDP. The project objectives were: to create a National HD Committee, to establish a National Human Dimensions Programme of research and to convene a national workshop



“Capacity Building for a Bulgarian Human Dimensions Programme.” During the first stage of the implementation, an annotated bibliography of HD/GEC related authors and papers showing “who is doing what,” and inventories of the research institutes, specialists and scientists, working in the area of the HD/GEC, was compiled. During the second stage, a workshop entitled, “Capacity Building for the Bulgarian Human Dimensions Programme” was held in Sofia from June 2-3, 2000. 47 scientists participated in the workshop.

A national human dimensions programme of research was adopted. A national committee for its implementation was discussed. Bulgarian global change scientists worked together at the workshop to identify the following key issues as a programme for research:

- Information and data on the problems related to the HD/GEC;
- Water resources and HD/GEC;
- Vulnerability and assessment of the impacts of HD/GEC on the social and economic systems;
- Assessment of regional environmental change downscaled from global change (mountain and coastal zones and towns);
- Sustainable development of forests and agricultural systems and global change;
- Sustainable social and economic development and ecological efficiency;
- Human health and global change;
- Training Activities.

Plans for research collaboration at the regional level between Bulgarian, Romanian and Greek global change communities were also discussed by the representatives present at the workshop. In particular, issues of sustainable development of the region emerged as a key common research interest.

Although the NCCGC was only recently established, it has already been very successful at integrating the research activities and outputs of various institutions, scientists and experts working on global environmental change at the national level, and also at supporting processes to improve the effectiveness of these efforts by establishing research linkages with international organisations and participating in international projects.



Part VI: The IHDP in 2000

Events

IHDP

Listed below are those events, which were sponsored by IHDP. The endorsement policy of IHDP requires that IHDP has influence on the formulation of the agenda and that members of IHDP are substantive contributors to the programme.

Scoping Meeting on Sustainability

Paris, France, March 1, 2000

Representatives from the GEC programmes and SCOPE met with ICSU in order to discuss a possible science agenda for sustainability.

Workshop on Vulnerability

Washington DC, USA, May 22-25, 2000

During the meeting, a conceptual framework for vulnerability analysis was developed and an agenda for future research outlined (Discussion paper available at <http://www.ksg.harvard.edu/sust>).

Workshop “Human Dimensions of Global Change”

Schloss Wendgräben, Madgeburg, Germany, July 13-15, 2000

Around 30 scientists from Germany and other countries discussed the development of a German research agenda on human dimensions research.

Workshop on “Global Environmental Change and Food Systems - GECaFS”

Reading, UK, July, 20-21, 2000

The objective of the workshop was to define the main science areas for the Food Systems Project and to develop a draft outline of the scientific framework. The workshop was attended by participants from the GEC Programmes, the donor community and other scientific institutions working in the area of food and GEC.

Water Scoping Meeting

Paris, France, September 5, 2000

The GEC Programmes summarised their ongoing work on “Water.” A range of other relevant activities were presented as well. The discussion



focused on the development of a project that would “add value” to the other work on water carried out by the GEC Programmes.

IHDP/START Workshop on Human Dimensions in Coastal Zones

Bonn, Germany, September 10-19, 2000

IHDP and START hosted the 2nd bi-annual International Human Dimensions Workshop for young, developing country scientists. Twenty-eight young scientists from countries in Africa, Asia, and Latin America met in Bonn with the overall objective of exploring ways to design, analyse and implement well-integrated research on GEC in coastal zones. Representatives from the IHDP core projects and from LOICZ worked together with the participants on coastal zones issues from the projects' perspective.

Workshop Report available at:
www.uni-bonn.de/ihdp/public.htm
#IHDP Report

International Workshop on Climatic Change: Implications for the Hydrological Cycle and for Water Management (co-sponsored by IHDP)

Wengen, Switzerland, September 27-29, 2000

START/CIRA/IHDP Workshop on Integrated Regional Assessment (IRA)

Washington DC, USA, October 6-7, 2000

Workshop on Sustainability Science

Friibergh Manor, Sweden, October 10-14, 2000

The purpose of the Workshop was to further discussions on the need to meet fundamental human needs, while preserving the life support systems of Earth, determine how science can promote a transition towards sustainability, and identify core scientific questions and research strategies for the future (more information on the workshop and planned follow-up meetings can be found at: www.sustainability science.org).

International Workshop on Integrated Carbon Cycle Research

Durham, New Hampshire, USA, October 17-20, 2000

The objective of the meeting was to refine the three major questions on the Carbon Cycle which were developed during previous meetings.

International Scientific Planning Committee of the Open Meeting (ISPC) Meeting

Bonn, Germany, October 19-20, 2000

Members of the ISPC met to discuss the agenda, speakers, fund-raising and local organisation of the Open Meeting of the Human Dimensions



Information on the Open Meeting of the Human Dimensions Research Community available at: <http://www.sedac.ciesin.org/openmeeting>

Research Community, which will take place in Rio de Janeiro, Brazil, from October 6-8, 2001.

Workshop on Socio-Economics of Climate Change in Alpine Regions: Impacts and Mitigation (co-sponsored by IHDP)

Innsbruck, Austria, October 19-20, 2000

(http://www.35k/unigraz.ac.at/vw/www/HDP/alps/alps_main.htm)

Towards Integration in Global Change Research: Outlook from a Human Dimensions Perspective

Friibergh Manor, Sweden, November 17-19, 2000

Global change research has shown that human activities play a major role in changing the Earth's System. Science is now entering a phase of integrating knowledge from many disciplines, including human dimensions. To highlight the potential of this new scientific endeavour and explore its challenges, the Swedish Human Dimensions Committee and the IHDP held this workshop in Sweden.

Planning Workshop - Global Environmental Change and Food Systems (GECaFS)

Stockholm, Sweden, November 20-22, 2000

The first GECaFS Planning Workshop focused on the nature of individual research projects and on defining their criteria.

Project Events

LUCC Events

Current Progress in Quantifying Spatially Explicit Causes and Effects of Land-Use/-Cover Change

Wageningen, The Netherlands, December 7-8, 1999

The workshop, organised by CLUE, intended to obtain a state-of-the-art overview of spatially explicit land-use change models. Because no standard methodologies and approaches to model land-use change exist at present, a fast and direct way to communicate progress and developments was provided by this workshop.

(<http://gissrv.iend.wau.nl/~clue>)

BIOME 300 Workshop

Bern, Switzerland, March 5-7, 2000

A group of around 40 interested researchers came together in Bern at the first BIOME 300 workshop. The historic reconstruction for the recent past is intended to span the period of the last 300 years (i.e. 1700 to 2000) and consists of coarse (50-100 years) time steps in the earlier eras and finer in later periods (10-25 years). During the workshop, the global databases of Klein Goldewijk and Ramankutty were presented and discussed.

(<http://www.indiana.edu/~act/focus1/biome300.html>)

Human Modification of the Biosphere: Key Drivers of Land-Use/-Cover Change Processes

Stockholm, Sweden, 13-15 March 2000

The workshop brought together 25 participants to increase the understanding of driving forces inherent in land-use and cover change processes. The common agreement was to hold empirical case study evidence against myths or simplifications about causes of change circulated in the science and policy community. Going beyond an "every situation is complex" syndrome, the workshop moved towards a more robust and usable system of generalisation (classification) that will supposedly trigger and guide new research efforts in the field of land science and global environmental change.

Meeting in the Middle: The Challenge of Meso-Level Integration

Ispira, Italy, 17-20 October 2000

Addressing one of the main challenges facing the LUCC research community is the forging of robust linkages between the fine-grained understandings of land-use decisions and broad-scale models of land-cover. The workshop brought together 25 scientists from both communities to share their experiences.

(<http://www.indiana.edu/~act/focus1/mnm>)

IDGEC

IDGEC's Carbon Management and Forests Meeting

Chiang Mai, Thailand, January 17-18, 2000

Members of IDGEC's carbon management and forest teams met in Chiang Mai to discuss and finalise scoping reports and to advance from the planning to the implementation phase.



Workshop of the Carbon Management Research Activity (CMRA)

Tokyo, Japan, May 29-30, 2000

Over 30 researchers from 12 countries and a wide range of disciplines attended the meeting. It was designed to take the activity from “paper to practice” and an international group of scholars discussed research projects to deal with both the short- and long-term institutional issues related to carbon management.

(<http://www.dartmouth.edu/~idgcec/pages/Papers-Publications/papers.html>)

Panel at the International Association for the Study of Common Property (IASCP)

Indiana University, Bloomington, Indiana, USA, May 31 - June 4, 2000

The panel was used to present the IDGEC flagship activities. A survey was distributed to the attendees to identify individuals interested in becoming members of the IDGEC network.

(<http://www.indana.edu/~iascp/2000.html>)

GECHS

ENRICH European Network on Environment and Security

Siros, Greece, September 8-9, 2000

This was the third and final workshop in the ENRICH European Network on Environment and Security. Researchers met to exchange research results and agree on strategies for expansion of the network. Over the past decade, there has been increasing discussion of the links among these three elements – environment, impoverishment and security – and between environment and security in particular. In an effort to address these issues, a formal International Network for Environment and Security (INES), which will promote research cooperation and collaboration among research institutions world-wide has been established.

IT

Effective Environmental Regulation: Learning from Poland's Experience

Amsterdam, The Netherlands, October 17, 2000

The seminar enabled IT researchers to meet and discuss the concept of leap-frogging and opportunities of Industrial Transformation in countries with economies in transition.

Further information available at:

<http://www.vu.nl/ivm/research/technology.htm>



Economic Modelling of Environmental Policy and Endogenous Technological Change

Amsterdam, The Netherlands, November 16-17, 2000

Economic modelling is recognised as a core IT project in the area of "Energy and Material Flows." The IPO assisted in the organisation of the workshop in the framework of this project.

Ph.D. Course on Human Dimensions of Global Environmental Change

Wageningen, The Netherlands, November 20-24

The objective of the course aimed at providing insights on the natural and social science aspects of the interactions and feedback-mechanisms between human activities and the main global environmental change issues. The participants furthermore gained insight into several important research agendas.

Communication and Publications

Newsletters: Themes and Contributions

1/00

Project Report: Network on Environment and Security

Viewpoint: A Fond Farewell by *Eckart Ehlers*

IHDP Science Projects: First GECHS SSC Meeting

Conference Report: Understanding the Earth System

IHDP Science Projects: IDGEC Flagship Activities

Workshop Report: Freshwater Resources in Sub-Saharan Africa

IHDP Science Projects: IT publishes Science Plan

HD Research: Climate Variability: A Mongolian Case Study

National Committees: The Philippines

2/00: Thematic Focus on Food Systems

Sustainability of Food Consumption and Production Systems
by *Ken Green*

Viewpoint: Food in the 21st century: a very Human Dimension
by *Neil T. M. Hamilton*

The PROFETAS Programme by *Harry Aiking*

Food Security by *Mike Brklacich*

Conference Report: Seasonal Climate Prediction and Managing for Variability by *Reid Basher*

The Land-Use Change Project at IIASA by *Günther Fischer*





IHDP Science Projects: Research Activities and GECHS-UCI
by *Richard A. Matthew*

National Committees: HDGEC Research in the US by *Tom Dietz*

Project Report: Setting an Agenda for Research on Health and the Environment by *Mark W. Rosenberg*

Conference Report: Swiss Global Change Day by *Christoph Ritz*

Conference Session Report III: The US National Science Foundation HDGEC Centers and Teams by *C. Gregory Knight*

Conference Report IV: European Society for Ecological Economic meets by *Helga Weisz* and *Franz E. Prettenhaler*

3/00: Thematic Focus on Carbon

Long Term Biogeophysical Controls on the Carbon Cycle
by *Keith Alverson*

Viewpoint: Inequity: A Root Cause of Climate Change by *Jyoti Parikh*

HD Research: Ecological Economics by *Clive Spash*

BIOME 300 by *Rik Leemans*

Institutional Uncertainties in the International Climate Change Regime by *Granville Sewell*

Climate Change and the Challenge for International Relations
by *Joyeeta Gupta*

International Climate Policy: An Assessment
by *Richard Tol*

Energy Security and Carbon Emissions in Africa
by *Ogunlade Davidson*

Workshop Report I: IHDP/START Workshop 2000

Workshop Report II: Second IAI/UM Summer Institute
by *R. Grau* and *E. Fraser*

HD Research: Towards a Vulnerability Science? By *Thomas Downing*

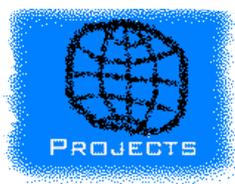
National Committees: Bulgarian HD Research Programme
by *D. Mishev* and *T. Hristov*



Webpage



INTERNATIONAL HUMAN DIMENSIONS PROGRAMME ON GLOBAL ENVIRONMENTAL CHANGE



[Challenges of a Changing Earth
Open Science Conference
10-13 July 2001,
Amsterdam, The Netherlands](#)

[Open Meeting
of the Human Dimensions of Global
Environmental Change Research
Community
6 - 8 October 2001
Rio de Janeiro/Brazil](#)

IHDP Webpage: <http://www.ihdp.org>

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IHDP Scientific Committee and the IHDP Secretariat, March 2000

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Following an interim period at IHDP/University of Bonn, Germany, the International Project Office has been operational again since the 1st of August 2000. It has been attached to the Department of Geography at the University of Louvain. Funding is provided by the Federal Office for Scientific and Technical Affairs (OSTC) of the Belgian Government up to March 2003.

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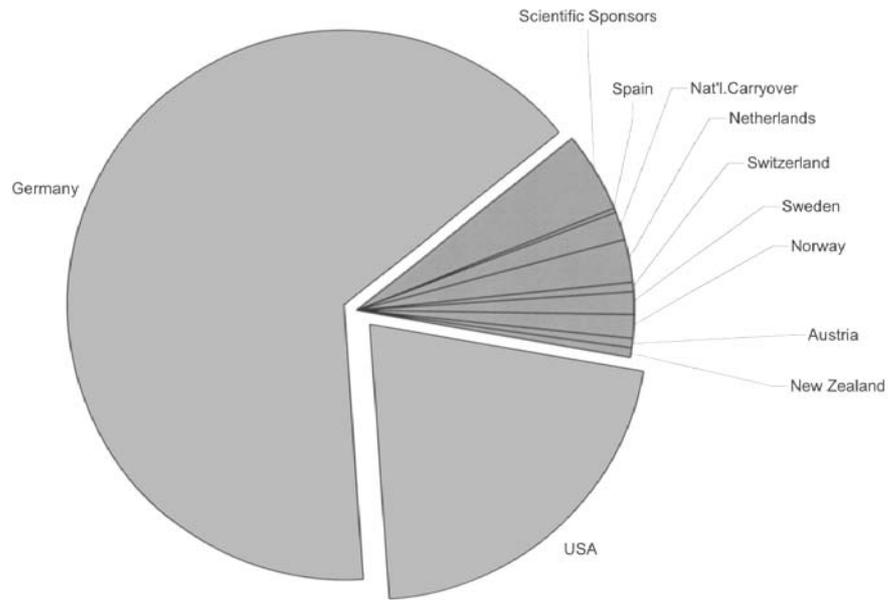
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Secretariat Finances

IHDP Secretariat Funding Sources 2000



List of Abbreviations & Acronyms

AEZ	Agro-Ecological Zones
APN	Asia-Pacific Network for Global Change
CFWE	Carbon Flows between Eastern and Western Europe, IT-ENRICH project
CLUE	Conversion of Land-Use and its Effects.
EEZ	Exclusive Economic Zones, IDGEC Flagship activity
FAO	Food and Agriculture Organization of the United Nations
FRN	Swedish Council of Planning and Coordination of Research
GC	Global Change
GEC	Global Environmental Change
GECHS	Global Environmental Change and Human Security, IHDP Science Project
GPACS	Global Peace and Conflict Studies Program
ICSU	International Council for Science
IDGEC	Institutional Dimensions of Global Environmental Change, IHDP Science Project
IGBP	International Geosphere-Biosphere Programme
IHDP	International Human Dimensions Programme on Global Environmental Change
IHDW	International Human Dimensions Workshop
IPO	International Project Office
ISSC	International Social Science Council
IUCN	The World Conservation Union
HD	Human Dimensions
HD-GEC	Human Dimensions of Global Environmental Change
IT	Industrial Transformation, IHDP Science Project
LOICZ	Land-Ocean Interactions in the Coastal Zones, IGBP Core Project
LUCC	Land-Use and Land-Cover Change, IHDP-IGBP Joint Science Project
NCCGC-BAS	National Coordination Center for Global Change at the Bulgarian Academy of Sciences
NES	Network on Environment and Security, a European Network funded by ENRICH
NGO	Non-Governmental Organisation
PAGES	Past Global Changes, IGBP Core Project
PIK	Potsdam Institute for Climate Impacts Research, Germany
SCOPE	Scientific Committee on Problems of the Environment, ICSU- Committee
SENSE	Socio-Economic and Natural Sciences of the Environment (The Netherlands)
SPC	Scientific Planning Committee
SSC	Scientific Steering Committee
START	Global Change SysTEm for Analysis, Research and Training
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
WCRP	World Climate Research Programme
WMO	World Meteorological Organisation
WWC	Woodrow Wilson Centre

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