

INTERNATIONAL HUMAN DIMENSIONS
PROGRAMME ON GLOBAL
ENVIRONMENTAL CHANGE

GERMAN POLITICAL SCIENCE ASSOCIATION

Science Projects 'Institutional Dimensions of
Global Environmental Change' and 'Industrial
Transformation'

Environmental Policy and Global Change section

2002 Berlin Conference on the Human Dimensions of Global Environmental Change

'Knowledge for the Sustainability Transition: The Challenge for Social Science'

Berlin, 6-7 December 2002

Preliminary Conference Programme

The Global
Governance Project

Potsdam Institute
for Climate Impact
Research

Environmental
Policy Research
Unit of the Free
University of Berlin

Federation of
German Scientists

German
Association for the
United Nations

THE 2002 BERLIN CONFERENCE ON THE HUMAN DIMENSIONS OF GLOBAL ENVIRONMENTAL CHANGE

'Knowledge for the Sustainability Transition: The Challenge for Social Science'

Berlin, 6-7 December 2002

IS ORGANISED BY THE The Global Governance Project [GLOGOV.ORG], a joint research
programme of the

Potsdam Institute for Climate Impact Research and the

Environmental Policy Research Unit, Free University of Berlin

ON BEHALF OF THE Environmental Policy and Global Change Section of the
German Political Science Association (DVPW)

ENDORSED BY Institutional Dimensions of Global Environmental Change
A Science Project of the International Human Dimensions Programme
on Global Environmental Change (IHDP)

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A Science Project of the International Human Dimensions Programme
on Global Environmental Change (IHDP)

WITH ADDITIONAL German Association for the United Nations, Berlin-Brandenburg
SUPPORT OF Chapter

Federation of German Scientists (VDW)

The Heinrich Böll Foundation, Berlin

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CONFERENCE VENUE

The 2002 Berlin Conference takes place in the Henry Ford Building and in the buildings of the Otto Suhr Institute for Political Science, both located on the Free University's Dahlem campus. The subway station 'Thielplatz' (metro line U1) is a few meters from the conference venue.

Henry Ford Building, Garystraße 35, 14195 Berlin

*Lower Floor: Registration
Paper Room*

*Konferenzraum 3
Lecture Hall A*

*Upper Floor: Konferenzraum 1
Konferenzraum 2
Akademischer Senat*

Otto Suhr Institute, Ihnstraße 21, 14195 Berlin

Ihnstraße 21, rooms to be announced

Registration								
Fri, 6 Dec. 08:30-09:20								
09:20-10:00	PD Dr Frank Biermann, Chair, DVPW Environmental Policy and Global Change Section, and Global Governance Project, Germany <i>Knowledge for the Sustainability Transition: An Introduction</i>							
10:00-10:45	Prof. Hans-Joachim Schellnhuber, Director, Tyndall Centre for Climate Change Research <i>A Hilbertian Programme for Earth System Science: The Challenge for the Social Sciences</i>							
10:45-11:30	Prof. Oran R. Young, Chair, IDGEC Scientific Committee, and Director, Institute of Arctic Studies and Institute on International Environmental Governance, Dartmouth College <i>Institutions and the Growth of Knowledge: Behavioural Mechanisms and Design Implications</i>							
11:45-13:15	<table border="1"> <tr> <td>Panel A.1— Measuring Global Environmental Change (I)</td> <td>Panel A.2— Stakeholder Dia- logues and Global Environmental As- sessments (I)</td> <td>Panel A.3—The Governance of Science: Compara- tive Studies of Re- search Programmes</td> <td>Panel A.4—The Crystal Ball Game: Scenarios of a Sus- tainable Future</td> <td>Panel A.5— Technology Dis- courses and Sus- tainable Develop- ment</td> <td>Panel A.6—Global Knowledge, Local Practice (I)</td> <td>Panel A.7— Transdisciplinarity: A Key Element of a Sustainability Sci- ence?</td> </tr> </table>	Panel A.1— Measuring Global Environmental Change (I)	Panel A.2— Stakeholder Dia- logues and Global Environmental As- sessments (I)	Panel A.3—The Governance of Science: Compara- tive Studies of Re- search Programmes	Panel A.4—The Crystal Ball Game: Scenarios of a Sus- tainable Future	Panel A.5— Technology Dis- courses and Sus- tainable Develop- ment	Panel A.6—Global Knowledge, Local Practice (I)	Panel A.7— Transdisciplinarity: A Key Element of a Sustainability Sci- ence?
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13:15-14:45	Lunch Break							
14:45-15:30	Dr Rajendra K. Pachauri, Chair, Intergovernmental Panel on Climate Change (IPCC) <i>Title to be arranged</i>							
15:30-16:15	Prof. Coleen H. Vogel, Chair, International Human Dimensions Programme (IHDP) <i>Title to be arranged</i>							
16:15-17:00	Meet Your Colleagues Session—Extended Coffee/Tea Break							
17:00-18:30	<table border="1"> <tr> <td>Panel B.1— Measuring Global Environmental Change (II)</td> <td>Panel B.2— Knowledge Flows: The Role of Interna- tional Institutions and Organisations</td> <td>Panel B.3—The Assessment of Cli- mate Change and Policies</td> <td>Panel B.4— Contested Knowl- edge: Analysing Different Discourses in Environmental Policy</td> <td>Panel B.5— Energetic Dis- courses: Energy and Economics in National Politics</td> <td>Panel B.6— Knowledge for Decision-making at the Local Level (I)</td> <td>Panel B.7—Knowl- edge Production and Dissemination for Non-State Deci- sion-makers</td> </tr> </table>	Panel B.1— Measuring Global Environmental Change (II)	Panel B.2— Knowledge Flows: The Role of Interna- tional Institutions and Organisations	Panel B.3—The Assessment of Cli- mate Change and Policies	Panel B.4— Contested Knowl- edge: Analysing Different Discourses in Environmental Policy	Panel B.5— Energetic Dis- courses: Energy and Economics in National Politics	Panel B.6— Knowledge for Decision-making at the Local Level (I)	Panel B.7—Knowl- edge Production and Dissemination for Non-State Deci- sion-makers
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Sat, 7 Dec. 8:45-9:15	Registration (continued)							

9:15-10:45	Panel C.1—Stakeholder Dialogues and Global Environmental Assessments (II)	Panel C.2—Advising Decision-makers: Comparative Studies of Nat'l Advisory Bodies	Panel C.3—Science-Policy Interfaces in a Local Context	Panel C.4—Credibility of Knowledge: The Role of International Institutions	Panel C.5—The Role of Science in Global Environmental Governance	Panel C.6—Education for the Sustainability Transition	Panel C.7—Sustainability Science: Application and Open Questions (I)	
11:00-11:45	Dr Christian Patermann, Director, Environment and Sustainable Development Programme, DG for Research, European Union <i>Knowledge for the Sustainability Transition: The European Union Perspective</i>							
11:45-12:30	Hansvolker Ziegler, Chair, Internat'l Group of Funding Agencies, & Dep. Dir.-Gen., Federal Ministry for Education & Research, Germany <i>Title to be arranged</i>							
Lunch Break								
13:45-15:00	<p style="text-align: center;">KNOWLEDGE CONVERSATION I</p> <p style="text-align: center;"><i>The Political Influence of Sustainability Knowledge</i> (plenary discussion)</p> <p>DISCUSSANTS: Dr Peter Feindt, Dr Joyeeta Gupta (invited), Professor Martin Jänicke, Professor Peter Sand and Dr Christian Patermann FACILITATOR: Dr Bernd Siebenhüner</p>							
15:15-16:45	<p style="text-align: center;">KNOWLEDGE CONVERSATION II</p> <p style="text-align: center;"><i>A 'Sustainability Science': What on Earth For?</i> (plenary discussion)</p> <p>DISCUSSANTS: Professor Hans-Joachim Schellhuber, Professor Coleen Vogel, Professor Oran R. Young and Hansvolker Ziegler FACILITATOR: PD Dr Frank Biermann Event co-sponsored by Federation of German Scientists (VDW)</p>							
17:00-18:30	Panel D.1—The Discourse of 'Sustainability'	Panel D.2—Tapping Indigenous Knowledge	Panel D.3—New Advances in the Modelling of Global Environmental Change	Panel D.4—Knowledge for Environmental Policy Integration	Panel D.5—Knowledge for All: The 'Right to Know'	Panel D.6—Participation in Local Decision-Making	Panel D.7—Global Knowledge, Local Practice (II)	Panel D.8—Knowledge for Action: Regional and Nat'l Capacity-Build'g (I)
18:30	Panel E.1—Local Belief Systems	Panel E.2—Global Knowledge, Local Practice (III)	Panel E.3—Sustainability Science: Application and Open Questions (II)	Panel E.4—Knowledge for Action: Reg'l and Nat'l Capacity-Build'g (II)	Panel E.5—Knowledge Dissemination: The Role of the Media	Panel E.6—Knowledge for Decision-making at the Local Level (II)	Panel E.7—The Role of Knowledge in National Energy Policy	
Adjourn								
20:00	Dinner in traditional Berlin restaurant (by invitation)							

FRIDAY, 6 DECEMBER

8:30-9:20 *Registration*

PLENARY SESSION

Moderator:

Alexander Carius, executive committee (co-opted), Environmental Policy and Global Change section, German Political Science Association

Room: N.N.

- 9:20-10:00 PD DR FRANK BIERMANN
Chair, DVPW Environmental Policy and Global Change section, and leader, Global Governance Project, PIK and Free University of Berlin, Germany
Knowledge for the Sustainability Transition: An Introduction
- 10:00-10:45 PROF. HANS-JOACHIM SCHELLNHUBER
Director, Tyndall Centre for Climate Change Research, and chair, Global Analysis, Integration and Modelling (GAIM) project of the International Geosphere-Biosphere Programme, United Kingdom
A Hilbertian Programme for Earth System Science: The Challenges for the Social Sciences
- 10:45-11:30 PROF. ORAN R. YOUNG
Chair, IDGEC Scientific Committee, and Director, Institute of Arctic Studies and Institute on International Environmental Governance, Dartmouth College, USA
Institutions and the Growth of Knowledge: Behavioural Mechanisms and Design Implications
- 11:30-11:45 **BREAK**

PANEL SESSIONS

11:45-13:15 **PANEL A.1—MEASURING GLOBAL ENVIRONMENTAL CHANGE (I)**

Chair and Discussant: N.N.

Room: N.N.

BAULER, TOM

Institut de Gestion de l'Environnement et d'Aménagement du Territoire, Université Libre de Bruxelles, Belgium

A Push-start for Indicators for Sustainable Development: Contextual Knowledge on a Procedural Research Project

Among the indirect implementation and capacity-building strategies towards sustainable development, enhancing the evaluation of sustainable development through the construction of indicators for sustainable development (ISD) is thought of by stakeholders as most promising. In the context of large conceptual and methodological uncertainties and a general lack of data, ISD projects mostly depend on multi-stakeholder pilot studies that will eventually elaborate a tight procedural and methodological framework. After analysing the extent to which these studies dealing with ISD issues are themselves based on procedural mechanisms, we will explore their limits and capacities to influence and enhance durably institutional processes and mechanisms towards sustainable development. The paper will present an in-depth case study of a Belgian federal (multi-stakeholder) research platform dealing with ISD. We will explore the extent to which both the concepts of sustainable development and the particular political-institutional sustainable development context in Belgium configured the scientific platform and its working mechanisms as well as the scientific expertise constructed thereafter. In parallel, the paper will extrude and document some hypotheses on the influence of the research platform on the layout of future policies (both political and scientific) regarding ISD issues in Belgium.

BOYD, HEATHER

Gardner Pinfold Consulting Economists Ltd., Canada

Sustainable Development Indicators in Marine Capture Fisheries

Sustainable development in marine capture fisheries has been the subject of considerable research over the past fifty years. Despite this attention, most fisheries around the world are approaching or have reached an unsustainable rate of harvest. The Food and Agriculture Organisation of the United Nations is encouraging nations and fishing communities alike to monitor fisheries sustainability by using indicators of sustainable development. This paper explores how sustainable development indicators of marine capture fisheries can contribute to monitoring the sustainability of local fishing communities. The first part of the paper describes the current use of sustainable development indicators in fisheries and argues for a more comprehensive approach to monitoring sustainability. I propose that greater emphasis on institutional, socio-economic and community indicators is needed. The second part recommends a process that local communities can use to design indicators as a way to become engaged in monitoring progress toward sustainability locally.

BRUYNINCKX, HANS

Wageningen University, Social Sciences, Environmental Policy Group, Wageningen, The Netherlands

The Creation of a National Set of Indicators for Sustainable Development: The Case of Belgium

The call for indicators for sustainable development is strong both at the international and national level. This demand stems from the belief that sustainable development is a fundamentally different project of social change which requires new policy making dynamics, based on a different knowledge base and supported by new sorts of policy instruments. The process of indicator creation is an example of certain aspects of this process of change. In the case of Belgium the process takes place at the level of participatory advisory boards, at the level of bureaucratic national and international (environmental) policy making, and at the level of the epistemic communities interested in the topic. This has led to a lively debate between different views on the type of knowledge needed, the type of social and political process that should produce this knowledge, and finally on the institutional limits of the Belgian model of policy making. This paper is based on both research experience in the field of sustainability indicators (co-promotor of the National Platform for Indicators of Sustainable Development) and participatory observation as academic advisor to the Federal Council for Sustainable Development.

KIEKEN, HUBERT/TREYER, SEBASTIEN

French Institute of Forestry, Agricultural and Environmental Engineering (ENGREF)/International Research Centre on Environment and Development (CIRED), France

Knowledge Co-construction for the Sustainability Transition: The Role of Epistemic Communities

Regarding the global environmental crises, scientists are confronted with a lack of knowledge, and policy-makers with high-stake and long term issues. We thus need to choose between two kinds of risks: an infinite postponement of decision-making until a hypothetical fully scientific understanding of the issues has been reached and validated; and an early decision-making process based on uncertain ground and contested knowledge. The implications of such a configuration have been identified by Funtowicz and Ravetz more than a decade ago. To illustrate the latter case, our paper is based on two case studies, the evolution of water-scarcity indices and the corresponding progressive understanding of the sustainability transition in water policies, and the development, implementation and use of the RAINS model for the definition of transboundary air pollution policies. It will be focused on the elaboration and evolution of knowledge for the decision process. We will describe the complex processes of interactions among the *epistemic communities*, as defined by P. Haas, composed of both scientists working on these subjects and policy-makers confronted with these issues. We will in particular show how the indices in the first case, the computer model in the second, are co-constructed by the community and used for policy making.

11:45-13:15 **PANEL A.2—STAKEHOLDER DIALOGUES AND GLOBAL ENVIRONMENTAL ASSESSMENTS (I)**

Chair and Discussant: N.N.

Room: N.N.

SIEBENHÜNER, BERND

Global Governance Project, Potsdam Institute for Climate Impact Research and Oldenburg University, Germany

Social Learning and Sustainability Science: Which Role Can Stakeholder Participation Play?

Claims for the involvement of societal stakeholders in processes of knowledge generation abound in discussions about sustainability science and new modes of scientific research. Their participation is seen as a means for empowerment and education as well as for increasing legitimacy of scientific research. In addition, proponents of sustainability science regard stakeholder participation as a way to integrate municipali-

ties, lobbies, industry, environmentalist groups into both the generation of knowledge and its practical implementation. Meanwhile, there are numerous examples of participatory approaches in scientific knowledge generation which allow for a first review of the experiences gathered so far. The paper will give an account of these experiences and will analyse facilitators and hurdles in these procedures in the light of criteria derived from the discussions around sustainability science. It is the objective of the paper to identify possible pathways and stumbling blocks to participation in sustainability science.

KILVINGTON, MARGARET/ ALLEN, WILL

Landcare Research NZ Ltd., Canterbury Agriculture and Science Centre, New Zealand

Sustainability Science: Introducing Collaborative Learning Processes to Environmental Research Programmes

Sustainability science recognises the need for closer links between science and its stakeholders and a cyclical learning approach to problem solving grounded in real-life situations. However, current attempts to achieve this have done little to alter the status quo. Particular barriers include institutional bias against meaningful participation, a research culture which promotes one-shot approaches to problem-solving, an emphasis on linear forms of information transfer and a lack of knowledge about multi-sectoral engagement. As social researchers within a fundamentally biophysically oriented research environment our work has been to explore the opportunities for facilitating collaborative learning approaches to environmental problems. In this paper, examples of new practices for linking stakeholders and scientists in the areas of nutrient water contamination, catchment management, biodiversity protection and global climate change will be used to illustrate our current learning on the processes for enacting sustainability science. This includes addressing questions of trust and capacity building for stakeholders and researchers alike and looks at stakeholder analysis and formative evaluation as potential processes for promoting change within science and stakeholder relationships.

ANDIMA, DYMPHINA

KARI-Regional Research Centre, Kenya

Agricultural Knowledge, Stakeholder Involvement and Sustainability: A Review of Kenya

Agriculture is the mainstay of Kenya's economy and ranks highly as the most important compared to other sectors of the economy. The concept of agricultural knowledge's stakeholder involvement and sustainable development have gained increased debate in recent years in Kenya. Previously, agricultural research was basic in application and recommendations were made by biophysical or natural scientists to end-users. With time it was realised that they were not being adopted and therefore this was not beneficial to the end-users. This resulted in change of approaches to make the process more participatory and how better to target technologies to specific groups of people. However questions arising out of this were; Did the end-users have the knowledge of agricultural technologies? Who were the stakeholders involved in this process? How sustainable were the technologies? A study conducted by researchers in the Kisii mandate region in Southwest Kenya indicates that the existing political process and involvement of other stakeholders in technology development influence decision-making and how it contributes to sustainable development both at the local, regional and National levels. However, it is not clear whether this has led to improved livelihoods of end-users who are mainly farmers.

VOEHRINGER, FRANK

Environmental Economics and Natural Resources Group, Department of Social Sciences, Wageningen University, The Netherlands

Participatory and Neoclassical Sustainability Concepts: Are They Mutually Exclusive?

Economic analysis is dominated by neoclassical methods and is influential in many policy fields that are connected to sustainability issues. The advice of economic experts that calculate 'optimal' policies seems to be incompatible with a participatory approach to sustainability. Often, economic advice which is based on the discounting of the future even appears to be a motivation for unsustainable policies. The participatory approach, on the other hand, has produced such an abundance of sustainability criteria and indicators that there is a strong need for theories that help to make a manageable but comprehensive selection. This paper seeks to reconcile the neoclassical with the participatory approach. It shows that a critically extended neoclassical framework is an attractive tool for structuring the sustainability problem. Several normative steps are necessary when economic theory is used to generate sustainability criteria and policy recommendations. It is essential that scientists and policy-makers are aware of and disclose their normative choices, including the normative foundations of the neoclassical assumptions. Participatory methods can be integrated into economic analysis, which in turn can be integrated into a multidisciplinary and participatory approach to sustainability.

11:45-13:15 **PANEL A.3—THE GOVERNANCE OF SCIENCE: COMPARATIVE STUDIES OF RESEARCH PROGRAMMES**

Chair and Discussant: N.N.

Room: N.N.

ISRAELI, AVIEZER

Medionics International Ltd, Israel

Environmental Policy for Sustainable Exploitation of Research and Development

Environmental policy is essential for research and development programmes to assure that innovative products, technologies or projects are oriented to maximum positive environmental impact and global sustainability. Current policies deal with the environmental impact of industries, products and infrastructures. Research and development encourage environmental considerations, but have no tool to guide scientists and no regulations to enforce projects in this direction. This work concept is to encourage decision-makers to establish environmental policies to be implemented in research and development programmes. A study was performed with decision-makers in governmental and public research and development of various ministries and organisations. We surveyed environmental issues and approaches in diversified research and development programmes. We also communicated with environmental authorities in some overseas countries. A methodology for environmental policy in research and development programmes has been developed, to integrate environmental aspects in scientific and technological activities. It can benefit decision-makers and authorities that sponsor applied research and development activities for potential sustainable exploitation. The methodology is based on the projected exploitation of research and development programmes and nature of the research and development activity.

WHITELEGG, KATY

Department of Technology Policy, ARC Seibersdorf Research, Austria

Organising Research for Sustainable Development: An Assessment of National Research Programmes

The paper is based on the results of the study 'Identifying and Assessing National Research Activities on Sustainable Development' that was set up through the Institute for Prospective Technological Studies' ESTO network in February 2001. The study identified national, publicly funded SD research programmes and assessed the way in which they contributed towards supporting SD. It looked at programmes in Austria, Belgium, Germany, The Netherlands, Portugal, Sweden and the United Kingdom. 102 were assessed using both a set of thematic and process-orientated criteria to assess the

programmes' contribution towards SD. This paper aims to assess the relationship between national innovation systems and the organisation of research programmes in support of SD in selected member states. It aims to identify specific features that influence the ability to both design and implement inter and trans-disciplinary research programmes on the national level. This includes looking at the types of programme design for SD including the use of umbrella programmes to co-ordinate research activities, types of programme management structures, concepts and mechanisms for overcoming disciplinary, organisational and institutional barriers to SD inherent in national research systems and the use of SD research programmes to form new research networks, establish new research communities and initiate change.

SCHEPELMANN, PHILIPP

Wuppertal Institute, Germany

The EU STRATA Project 'Adaptive Integration of Research and Policy for Sustainable Development'

AIRP-SD intends to stimulate innovations in Research, Technological development and Demonstration (RTD) in order to contribute positively to processes and strategies leading to radical improvements in the sustainability of production-consumption systems. This will be accomplished by developing recommendations for a European research programme. The recommendations will describe strategies for innovative RTD programmes and list criteria necessary for sustainable EU research calls, proposals and evaluations. Best practices, induced and deduced criteria on how to leverage impacts on future research activity and how to make research more integral to sustainable development will be highlighted to EU and Member State science policy makers. The project runs from January 2001 until June 2003. We would like to present first results of the project.

11:45-13:15 **PANEL A.4—THE CRYSTAL BALL GAME: SCENARIOS OF A SUSTAINABLE FUTURE**

Chair and Discussant: N.N.

Room: N.N.

GROSSKURTH, JASPER

International Centre for Integrative Studies (ICIS), Maastricht, The Netherlands

New Knowledge for Sustainable Governance: The SCENE Approach

The transition towards a sustainable society is one of the most ambitious challenges in the field of social science. Supporting policy makers in the development of strategies for this sustainability transition requires innovative and sophisticated methods and tools for the analysis of regional sustainable development and more specifically of the role of governance in sustainable development. Non-linearities, interdependencies, uncertainty and subjectivity need to be addressed in the process. In this paper we present the preliminary results of the SCENE project. SCENE aims at an integrated analysis of the fundamental dynamics of sustainable development in the Netherlands. The interactive computer simulation model describes key dynamics for the development of the Netherlands with a time-horizon of 50 years. The SCENE project is specifically aimed at providing policy makers with a new conceptual knowledge of long-term societal dynamics, government interference and sustainable development. Policy strategies such as the distribution of the government budget, the assignment of land area for different types of land-use (e.g. housing, business or nature) or efficiency measures can be explored. The model is being developed in co-operation with several Dutch government agencies.

CARIUS, ALEXANDER/SCHROEDER-WILDBERG, ESTHER

Director/Research Fellow, Adelphi Research, Berlin, Germany

Foresight for Sustainable Transport and Mobility

In 1998, the EU member states adopted the Cardiff Strategy on the integration of environmental concerns into the different sector policies. Regarding transport policy, in spring 2001 the European Commission released a working paper on the integration of the environment into energy and transport policies. Studies on the relationship between the environment and transport focused almost exclusively on the environmental impacts of transport. Assessments of non-transport policies on transport and mobility were limited to technology assessments. Foresight for transport, funded by the European Commission, is an interdisciplinary project that takes a comprehensive look at these impact pathways. The foresight methodology can be characterised by its long-term look into the future. In addition, foresight is a process rather than a set of techniques, which contains the interaction of societal groups like scientists, policy-makers and different economic sectors. The results can provide guidance for policy-makers by identifying indicators and e.g. developing a monitoring system. So far, foresight exercises on the environment and/or transport have been quite rare. This paper elaborates on foresight as a comprehensive methodology for knowledge transfer and applies foresight to the impacts of developments in the area of energy and environment on sustainable transport and mobility in Europe.

RASKIN, PAUL/SWART, ROB/ROBINSON, JOHN

Stockholm Environment Institute Boston Centre, MA, USA/National Institute of Public Health and the Environment (RIVM), The Netherlands/Sustainable Research Institute (SDRI), Canada

Navigating the Sustainability Transition: The Future of Scenarios

New directions in science—'sustainability science'—have been proposed to help addressing the unsustainable development of global society and to provide the instruments to navigate towards a sustainable future. This poses a number of substantial and methodological challenges which would require to chart new scientific territory, expanding the current global environmental change research agenda. The paper discusses ten of such challenges: (i) spanning the range of spatial scales; (ii) accounting for temporal inertia and urgency; (iii) reflecting functional complexity and multiple stresses; (iv) recognising the wide range of outlooks; (v) linking themes and issues; (vi) understanding and reflecting deep uncertainty; (vii) incorporating surprise, critical thresholds and abrupt change, (viii) accounting for volition and human choice; (ix) effectively combining qualitative and quantitative analysis; and (x) linking with policy development and action through stakeholder participation. Rather than science-driven, sustainability science research efforts should be problem-driven and collaborative work with non-scientific stakeholders is urgent. Participatory scenario analysis is one promising approach to meet the challenges and explore opportunities and risks for a sustainability transition.

MIEG, HARALD A.

Eidgenössische Technische Hochschule, Zürich, Switzerland

The Precarious Role of Scenarios in Global Environmental Politics

Kahn and Wiener, 1967, introduced scenario construction as a tool for science-based political decision-making. More recently, scenarios have been used by the IPCC to translate findings of climate-change science into international politics. This paper presents results from our studies on scenario construction. We can show how scenarios, on the one hand, support decision-making and, on the other hand, mislead insight into social and environmental processes. In particular, scenarios tend to disregard incremental processes and mistake seemingly non-measurable factors (such as social values). The paper discusses scenario construction from three different points of view: the cognitive psychology of decision-making, methodology (hidden assumptions of modelling), the role of experts and expertise in sustainable-development politics.

11:45-13:15 **PANEL A.5—TECHNOLOGY DISCOURSES AND SUSTAINABLE DEVELOPMENT**

Chair and Discussant:

ROOM: N.N.

DE GRASSI, AARON

Institute of Development Studies, University of Sussex, Brighton, United Kingdom

Induced Apathy: The Politics of Knowledge in New-Institutional Theories and Policies

Much recent development research has moved beyond neo-classical economics to emphasise the vital role of social institutions in markets as well as management of natural resources, and particularly the role of knowledge and information in trust, monitoring and enforcement. However, this 'new-institutionalism', or the 'new information economics' as it is sometimes called, continues to rely on older, problematic positivistic conceptions of knowledge. This paper first briefly reviews recent significant new-institutionalist works on knowledge and institutional evolution. Then it shows continuities in the way knowledge has been conceptualised as a discrete, objective commodity, produced and exchanged in accordance with the laws of supply and demand. It then shows that because such a view neglects the ways in which power and politics at multiple historical and geographical scales shape institutional dynamics and thus the content and distribution of knowledge, projects and policies emerging from the new-institutional perspective will remain ineffective in addressing poverty and environmental degradation. An empirical example is provided with the agricultural research and extension institutions in Ghana and at the global level with the Consultative Group on International Agricultural Research, both of which are salient examples cited in the burgeoning new-institutionalist literature and policies.

GUPTA, AARTI

Research Scholar, Transparency International, Berlin, Germany

Knowledge Flows and the Sustainability Challenge: Biotechnology Governance in India

In the knowledge-intensive 21st century, is a transition to global sustainability hampered by 'knowledge divides' between North and South? A number of alleged divides, such as a 'digital divide' or a 'genetic divide' are increasingly posited. To date, scholarly and policy makers' attention has focused on ensuring greater access to new technologies as a way to bridge potential divides. However, a sustainability transition requires more than access to knowledge. Most urgently, it requires governance structures that can ensure that knowledge and innovations are used to fulfil desired societal goals. Yet, such governance structures are largely missing, especially in developing countries. This paper explores the scientific and institutional structures in place to generate and adapt knowledge relating to biotechnology use in India. Is a potential 'biotechnology divide' in India the result of an increasing commodification of knowledge previously in the public domain? Or growing ascendancy of corporate science versus public sector science? Or regulatory frameworks that do not reflect a social consensus about appropriate use of biotechnology in India? In addressing such questions, the paper analyses the changing role of science for sustainability, as well as enduring social science challenges such as how 'social consensus' about technological change can be generated.

KURIAN, PRIYA/MUNSHI, DEBASHISH

Senior Lecturer, Department of Political Science and Public Policy/Senior Lecturer, Department of Management Communication, both University of Waikato, Hamilton, New Zealand

Democracy, Diversity and the Discourses of New Technologies: Negotiating Equitable Environmental Policies in the Biotech Era

The phenomenon of computer-enhanced biotechnologies emerging in areas such as genetic modification, cloning and patenting of living organisms, has major implications for global environmental sustainability. Many of these implications are socio-political in nature: The destruction of biological and cultural diversity; the commercialisation of nature; the division between the haves and the have-nots, aggravating

gender-race-class discrimination; the appropriation of indigenous knowledge; and the debilitation of democratic decision-making in policy processes dominated by scientists, technologists and corporate executives. This paper monitors the discourses around modern technologies in New Zealand to identify the contentious socio-political values inherent in them. It examines a sampling of primary documents, drawn from governmental and non-governmental sources, to systematically analyse those practices and values that underpin the use of computer-aided biotechnologies. The paper argues that these wider discursive struggles over power and meaning in society have an impact on policy making processes. Understanding these discourses is critical in designing policies sensitive to issues of equity, diversity and justice that must inform our search for global environmental sustainability.

11:45-13:15 **PANEL A.6—GLOBAL KNOWLEDGE, LOCAL PRACTICE (I)**

Chair and Discussant: N.N.

Room: N.N.

DE VRIES, DANIEL H.

PhD Candidate in Anthropology, University of North Carolina at Chapel Hill, NC, USA
Monitoring Dynamic Human-Environmental Systems: A Historical and Political Ecological Critique on the Role of Baseline Analyses

The relevance of historical ecology to sustainable development is increasingly recognised. The perspective reminds scientists that all systems, organic and mechanical, have histories that shape current systemic parameters. Yet, despite widespread recognition of historical ecology's potential role in sustainable development, environmental intervention strategies often unnecessarily obscure, simplify and politicise the past. Baseline analyses, which are commonly used in evaluating/assessing intervention effectiveness, typify this problem. In a baseline, researchers often attempt to measure the physical and social features of the current environment that they believe are most critical to documenting the changes they aim to bring about through intervening. In this paper, I use two case studies to illustrate the political motivations of using such static representations of dynamic human-ecological systems within baseline analyses. First, I will examine the racial history of European colonial policies in East Africa to show the negative consequences of choosing the wrong baseline in the formulation of environmental policy. Second, I use ethnographic research on Tanzanian forest conservation to show mistakes from the past are repeated today. The paper concludes that uncritical, widespread use of baselines reduces the potential insights offered by historical ecology and explores alternative approaches that more successfully integrate these insights.

ENGEL-DI MAURO, SALVATORE

Department of Geography and Geology, University of Wisconsin-Stevens Point, WI, USA

The Persistence of Unsustainable Soil Management in the United States: Tailoring Scientific Knowledge to Farming Policies

Sustainability programmes have recently proliferated in the United States. The National Resource Conservation Service (NRCS), the US Department of Agriculture (USDA) and various scientific establishments have played prominent roles in redirecting land use towards a sustainability transition. Yet soils in the United States continue to be degraded, eroding away, for example, at faster than replenishment rates. The disjuncture between sustainability efforts and farming practices can only be partially imputed to farming ventures' reticence to adopt sustainable methods. The research priorities, discursive practices and knowledge creation of scientific and state institutions reveal a consistent allegiance to mainstream farming and a preoccupation with increasing productivity levels conventionally. Results from quantitative and content analyses of research publications, funding programmes and professional newsletters demonstrate a low priority for sustainable approaches and the invocation of processes beyond the immediate object of scientific inquiry. The persisting problem of

unsustainability in soil management therefore beckons a critical reassessment of scientific knowledge production and distribution that encompasses the wider political economic context.

TENNBERG, MONICA

Department of Social Studies, University of Lapland, Finland

Knowledge, Maps and Politics: Some Polar Examples

This paper is based on the idea of globalisation of the environment as the compression of time and space relations. Time and space relations are constructed as discourses, representations and practices in the making of maps with experience, perception and imagination contributing to them. Maps themselves are discourses made of signs and sign systems as well as they can be studied as part of broader historical and intellectual movements. Maps are also a means of communicating scientific messages of climate researchers to the decision-makers. This paper studies practices of representing of polar regions in scientific and non-scientific cartographic discourses by analysing a selection of maps and discussing the role of maps in communicating knowledge of climate change to the policy-making community. The use of projection, scale, symbolisation and colour will be analysed from a selection of maps representing global climate change in polar regions. From this analysis some examples of 'cartographic silences' in the international and regional climate discourses can be detected which are politically relevant. These include a limited understanding of human agency in polar regions and a narrow view of globalisation of the environment focusing on the scientific importance of the region instead of the economic significance.

PANEL A.7—TRANSDISCIPLINARITY: A KEY ELEMENT OF A SUSTAINABILITY SCIENCE?

Chair and Discussant: N.N.

Room: N.N.

PETER H. FEINDT

Research Centre for Biotechnology, Society and the Environment, Research Group 'Ag Change: Society's Approach to Nature in Transition?', University of Hamburg, Germany

Which Science for Sustainable Agriculture? Reflections on Methodological Challenges in Inter- and Transdisciplinary Research

In this paper, the current revision of the European Union's common agricultural policy serves to discuss methodological problems of a transdisciplinary research design that aims at assessing the institutional viability and ecological soundness of sustainability-oriented reform strategies. While the common agricultural policy has been widely criticised for its detrimental economic and ecological effects, most European farmers depend on the present subsidy system. Moreover, the visions of experts, politicians and laymen of what a European sustainable agricultural system should look like range from 100 percent organic farming to enforced implementation of genetic engineering or the minimisation of systemic risks through diversification strategies. Accordingly, most antagonistic research and policy strategies are recommended. The challenges this generates for any sustainability science approach to the topic are discussed from a political science perspective, focusing on transdisciplinarity (what is the starting point of a problem-driven approach when the very nature of the problem is embattled?), interdisciplinarity (how can political scientists work on sustainability strategies when natural scientists deeply disagree on the valuation of the long-term impacts of agricultural activities on productivity and the environment?), stakeholder orientation and a multi-level approach.

HIRSCH HADORN, GERTRUDE/MAIER, SIMONE

Swiss Federal Institute of Technology Zürich, Switzerland/Schweizer Verband der Raif-

feisenbanken, Switzerland

Options and Restrictions: A Heuristic Tool in Transdisciplinary Research for an Effective Implementation of Sustainable Practices

'Options and Restrictions' is a heuristic tool that was developed and applied in a transdisciplinary research project on sustainable development in the need-field of nutrition in the Swiss Priority Programme Environment. 'Options and Restrictions' addresses research for an effective implementation of more sustainable practices. The heuristic tool consists of five steps. It can be applied to identify the restrictions that keep actors from taking up options of more sustainable practices. It is also useful to develop strategies for actors to overcome the restrictions. The heuristic tool can be applied in a qualitative research design with actors participating in the research process as well as in a standardised empirical research design. The focus may be on systems knowledge about restrictions, on target knowledge about more sustainable options or on transformation knowledge to overcome restrictions by effective strategies. The paper presents the five steps and the various ways of applications, illustrated with research examples.

DOVERS, STEPHEN

Senior Fellow, Centre for Resource and Environmental Studies, The Australian National University, Canberra, Australia

Integrating Knowledge for the Sustainability Transition

Comprehending and managing sustainability is widely perceived to demand integration of diverse forms of information and of a wide range of disciplinary and other knowledge systems. This paper will define and explore three closely related aspects of this: Integration across academic disciplines and across the social—natural sciences—humanities divides (interdisciplinarity); integration of understandings and knowledges between research and lay communities (participatory research and development); and integration between academic research and policy process (science-policy linkages). The paper draws on processes with which I have been closely involved: the internationally significant interdisciplines of environmental history and ecological economics, specifically cross-disciplinary projects within those; analyses of a diversity of participatory approaches and a major review of institutional arrangements for integrated environmental management in Australia; a recent review of the experiences in integrative research and education from 1973-2002 at the Centre for Resource and Environmental Studies; and the formulation and operation of an explicitly integrative sustainability research programme.

13:15-14:45

LUNCH BREAK

PLENARY SESSION

Moderator:

PD Dr Frank Biermann, Chair, Environmental Policy and Global Change section, German Political Science Association

Room: N.N.

14:45-15:30

DR RAJENDRA K. PACHAURI

Chair, Intergovernmental Panel on Climate Change, and director, Tata Energy Research Institute, New Delhi

Title to be arranged

15:30-16:15 PROF. COLEEN H. VOGEL
Chair, International Human Dimensions Programme on Global Environmental Change
Title to be arranged

16:15-17:00 **MEET YOUR COLLEAGUES SESSION—EXTENDED COFFEE/TEA BREAK**

PANEL SESSIONS

17:00-18:30 **PANEL B.1—MEASURING GLOBAL ENVIRONMENTAL CHANGE (II)**

Chair and Discussant: N.N.

Room: N.N.

LOTZE-CAMPEN, HERMANN/LUCHT, WOLFGANG

Department of Global Change and Social Systems/Department of Global Change and Natural Systems, Potsdam Institute for Climate Impact Research, Potsdam, Germany

How to Observe and Model Transitions Towards Sustainability: The Geoscope Initiative

In order to meet the challenges of global change in the 21st century, human society has to develop a more comprehensive global knowledge base to guide economic, social and environmental action towards more sustainable development. Major transitions have to be achieved on a global scale in very different areas, like the energy system, urbanisation, land and water use, waste disposal, or biodiversity loss. The emerging science of sustainability will have to explain how such transitions to sustainable development may start, how they can be directed and amplified, in what patterns they emerge and what kind of barriers have to be overcome. These tasks require new theoretical concepts, continuous data streams with sufficient spatial coverage and improved modelling capacities for simulating the complexity of nature-society interactions. The Sustainability Geoscope provides a framework for an integrated global observation and monitoring system. It builds upon experiences in the natural and social sciences, economics and the humanities. Time series data of a new quality will be generated in an expanding set of comparative regional case studies on a global scale, through a combination of satellite remote sensing and on-the-ground observations.

RAIMADOYA, MAHMUD A./TRISASONGKO, BAMBANG

Department of Soil Sciences, Bogor Agricultural University, Indonesia

Development of Participatory Forest Inspection System for Indonesian Community Plantation Forestry

A model of Participatory Forest Inspection System for Community Plantation Forest is under development in Indonesia. The purpose is to develop a participatory model of satellite-based monitoring for community plantation forest; to advocate application of model to become government policy; and to support rural livelihood opportunity as an anticipation to carbon trade under the 1997 Kyoto Protocol and the 1992 UN Framework Convention on Climate Change. In this context, the developed system will be used as regular inspection system for community plantation forest and as a monitoring system of carbon offset under the clean development mechanism. This exercise

is intended as part of the Kyoto Protocol's 1997 capacity building in developing countries. It is supported by ESA within research of: 'Operational Application of Envisat-1 Advanced Synthetic-Aperture Radar (ASAR) for Production Forest Management in Indonesia (AO ID869)'. Envisat-1 was launched in March 2002 and this exercise will be implemented in two years. It is expected that after its completion, the tenth session of the conference of the parties of UNFCCC will approve Land Use, Land Use Change and Forestry sector as part of CDM. The system, therefore, could be applied to improve rural livelihood through carbon trade monitoring of community plantation forest.

ZIESCHANK, ROLAND

Environmental Policy Research Unit, Free University of Berlin, Germany

Political Functions of Environment-related Indicators

The industrialised countries in particular will have to address the issue to which degree they have come closer to an ecologically sustainable development and which areas need further action in the future. Clarifications in this respect require a system of control that allows for documentation and evaluate trends over an extended period of time. Knowledge in a specific form and on a specific topic becomes important: Environmental indicators are the most concentrated form of socio-ecological knowledge, and information about the state of the environment will finally decide about success or failure of sustainable transition. The UN, the EU and the OECD are striving to formulate concepts for environmental and sustainability indicators. Yet, the political strategies behind these attempts are very different. The paper presents different political functions and potentials of environmental indicator systems. Experiences from several research projects show that the construction of indicators follows in some parts at best the paradigm of 'post normal science', for example by establishing stakeholder dialogues. This will also facilitate the knowledge transfer into political decision and social action.

OHNDORF, MARKUS/ SCHMITZ, SIMON

Centre for Economic Research, Swiss Federal Institute of Technology Zürich, Switzerland/ World Business Council for Sustainable Development; Geneva, Switzerland

When Accountants Create Knowledge: Learning from the International Standardization of Greenhouse Gas Accounting

National and international climate change policies emphasise the need for the development of accurate and comparable information systems for greenhouse gas emissions of companies. This paper deals with different knowledge generation issues which have become apparent during the development of an international standard for greenhouse gas accounting on the company level within the framework of the 'GHG Protocol Initiative'. The GHG Protocol represents a non-governmental international institution, developed within an ongoing process, which is open to all interested groups, including business, NGOs, regulators and academics. Through the introduction of general rules on how to develop a GHG Inventory, the companies are enabled to plan their GHG reduction policies based on reliable information. The introduction of a Greenhouse Gas accounting system is necessary to determine the companies' emission reduction potential. An international standard is also a prerequisite for the well-functioning of policy instruments like emissions trading or direct taxation of emissions as it makes the inventories of different actors comparable. The standardisation of GHG accounting is therefore the basis for an innovative competition that generates knowledge about less emitting technologies and should set the economies of the developed countries on a path towards more sustainability.

17:00-18:30

PANEL B.2—KNOWLEDGE FLOWS: THE ROLE OF INTERNATIONAL INSTITUTIONS AND ORGANISATIONS

Chair and Discussant: N.N.

Room: N.N.

BETSILL, MICHELE M./BULKELEY, HARRIET

Colorado State University, CO, USA/Department of Geography, University of Cambridge, UNITED KINGDOM

Network Governance and Policy Learning: the Case of the Cities for Climate Protection Programme

Constructivist approaches to regime theory, together with more radical shifts away from state centred analyses of global environmental politics, challenge traditional hierarchical concepts of power and influence. Accounts of the roles of transnational networks and non-state actors in processes of global environmental governance stress that political authority is accrued through their ability to garner and deploy information, ideas and values. Through the production and exchange of knowledge, such institutions shape the conceptualisation of global environmental problems and concomitant solutions, and create a degree of 'policy learning', so that existing rhetorics and practices are reformed or replaced. In order to explore these processes this paper examines how knowledge for local climate protection is generated, distributed and used by actors within the Cities for Climate Protection programme, a transnational network of local governments. The paper assesses the extent to which new knowledges concerning the need for local action to protect the climate have been generated through this network, and their impact on local decision-making in selected cities in the United Kingdom, US and Australia. Through this analysis, the paper explores the nature of policy learning within new forms of network governance and the implications for our understanding of the role of transnational institutions in knowledge-generation processes.

BAUER, STEFFEN/BUSCH, PER-OLOF

Global Governance Project of the Potsdam Institute for Climate Impact Research and the Free University of Berlin, Germany

International Organisations as Actors for the Sustainability Transition

What is the influence of international organisations on the generation, synthesis and dissemination of knowledge for the sustainability transition? We aim at further analytical distinction in examining intergovernmental organisations in international environmental politics and will thus focus on organisational variety in the generation and dissemination of knowledge for the sustainability transition. We assume that international bureaucracies are relevant actors in international relations by shaping the ways in which sustainability knowledge is generated, distributed and operationalised in global environmental governance. Drawing on a comprehensive review of existing literature on knowledge-related activities of international organisations and the few existing case studies that explicitly analyse organisations—as opposed to regimes, which have generated a much larger literature—we will identify a set of distinct ways for international bureaucracies to generate and disseminate knowledge. From this set of features we will develop a typology of organisations operating in the field of international environmental politics. The typology may serve as a conceptual framework to better enable scholars to formulate specific and testable hypotheses when analysing the potential of international environmental organisations to influence the sustainability transition.

KIRTON, JOHN

Professor, University of Toronto, Canada

International Institutions, Sustainability Knowledge and Policy Change: The North American Experience

The Commission for Environmental Co-operation (CEC), created in 1994 as part of the side agreement to the North American Free Trade Agreement, was primarily designed to influence environmental policies and practices through the creation, dissemination and application of sustainability knowledge throughout an open, democratic North American society. To enhance the effectiveness of such processes the CEC gave civil

society actors an important role in much of its governance structure. At the centre of the CEC's knowledge-based change strategy were four mechanisms: the 'top down' Article 13 procedure through which CEC staff could independently investigate and report on any matter related to its work programme; 2. the 'bottom up' Article 14-15 'citizens submission' procedure through which any interested party could call for a 'factual record' on whether national governments were not enforcing its own environmental laws; 3. the scientifically standard Article 10 (2) 'State of the Environment' report; and 4. the analytically innovative Article 10 (6) process of 'considering on an ongoing basis the environmental effects of NAFTA'. By reviewing the CEC's record during its first eight years in operation, the paper assesses which of these four knowledge-centric approaches has been most effective in inducing environmental policy change, and how NAFTA and other regional and global regimes could be strengthened in the future.

VANDEVEER, STACY D.

Assistant Professor, Department of Political Science, University of New Hampshire, NH, USA

European Politics and International Environmental Assessment: Air Pollution Knowledge East and West

The Long-Range Transboundary Air Pollution (LRTAP) Convention and its related activities, situated within the United Nations Economic Commission for Europe (UNECE), organise European air pollution assessment and policy-making. This paper draws attention to unequal participation in assessment processes and policy-making between Western and Eastern European state officials and scientific and technical experts. LRTAP information has had different levels of salience, credibility and legitimacy in Central and Eastern Europe than in Western Europe. This study demonstrates that salience may be directly associated with the organised information and its perceived effects, as in most Western European states, or that it may rest on links between the environmental issue and broader political interests. While the credibility of LRTAP-related assessment information appears similar across East and West, the East-West differences in issue and information salience reflect the East-West differences in policy outcomes. While environmental leader states and scientific communities have demonstrated the ability to drive the LRTAP assessment and policy-making agenda, they have been largely unable to significantly and directly influence Eastern European domestic air pollution policy outcomes. Pushing environmental 'laggards' with assessment information and international legal agreements has had limited policy results.

17:00-18:30

PANEL B.3—THE ASSESSMENT OF CLIMATE CHANGE AND POLICIES

Chair and Discussant: N.N.

Room: N.N.

COHEN, CLAUDE/MUYLAERT, MARIA SILVIA/PEREIRA, ANDRÉ SANTOS/ROSA, LUIZ PINGUELLI

Federal University of Rio de Janeiro, and International Virtual Institute on Global Change, Brazil

Equity, Responsibility and Political Decision-making in the Climate Change Regime

Focusing on the climate change regime, this paper shows that knowledge is indeed a factor that has been affecting the political decision-making under the United Nations Framework Convention on Climate Change (UNFCCC), influenced by powerful and clearly positioned economic and political interests. The Intergovernmental Panel on Climate Change process—which purpose is not to produce new knowledge, but only to assess and compile the already existing climate change knowledge to feed back the Convention Bodies and Parties—reveals how the Panel affects the UNFCCC and

other political decision-making process. Although the IPCC does not produce new knowledge, its process, specially the 'summary for policy makers' writing, reveals a strong political and ideological debate, which is made evident by several biased comments from scientists. Several concrete examples of the debate on equity and responsibility of climate change between scientists from developed and developing countries are given to demonstrate this. To some extent, the same applies to peer-reviewed scientific journals.

FÜSSEL, HANS-MARTIN

Department of Integrated System Analysis, Potsdam Institute for Climate Impact Research, Potsdam, Germany

Co-evolution of Conceptual and Political Frameworks for Climate Change Assessments

Vulnerability assessments of climate change aim at producing knowledge for the minimisation of climate-related risks worldwide. This paper presents the historical development of climate change assessments, which is characterised by a shift from positive assessments of potential biophysical impacts to normative assessments that recommend specific policy actions. Four generations of assessments are distinguished based on their analytical purpose, the set of response options considered, the importance of normative evaluations and the degree of stakeholder involvement. Each assessment category is described by means of a conceptual framework based on analytical relationships and the formulation of response strategies. The evolution of vulnerability assessments is reflected in the increasing emphasis laid on current climate-related risks, in the progressive inclusion of non-climatic determinants of vulnerability, including adaptive capacity, and in the more detailed consideration of policy responses. Climate change assessments are largely influenced by the relevant legal, financial and scientific frameworks, including the UN Framework Convention on Climate Change and the Kyoto Protocol, various programmes initiated by intergovernmental organisations as well as individual governments, and the principles and procedures of the IPCC. I characterise their development as a co-evolutionary process between the methodology and practice of climate assessments and of the relevant political frameworks.

FURLOW, JOHN

Global Change Research Programme, Office of Research and Development, US Environmental Protection Agency, Washington DC, USA

Lessons Learned from the US National Assessment

From 1997 through 2000, the US Global Change Research Programme co-ordinated a National Assessment of climate change impacts comprising 16 regional and 6 sectoral assessments. The US Environmental Protection Agency collaborated with university researchers on 4 of these assessments. One purpose of the assessments was to explore ways of improving scientific support for public and private sector policy making. EPA stressed the importance of having stakeholder needs guide the scientific agenda and the products delivered. In 2001, EPA convened a 'lessons learned' workshop of the principal investigators from each of the assessments it sponsored, plus assessment experts from the EPA, USGCRP, Environment Canada and the WHO. The workshop provided the first opportunity for those engaged in the national assessment and those to discuss what had worked and what had not. Topics included planning a large-scale assessment, engagement of stakeholders, identification of assessment topics, and useful and timely communication of information for decision-makers. This paper presents the lessons of the EPA-sponsored assessments, lessons that could be valuable to others as they try to improve scientific support for policy.

17:00-18:30

PANEL B.4—CONTESTED KNOWLEDGE: EXAMINING DISCOURSES IN INTERNATIONAL ENVIRONMENTAL POLICY

Chair and Discussant: N.N.

Room: N.N.

LINDSETH, GARD

Programme for Research and Documentation for a Sustainable Society, Centre for Development and the Environment (ProSus/SUM), University of Oslo, Norway

Norwegian Climate Policy: Acting Nationally or Thinking Globally?

Norway is often recognised as a pioneer country in environmental politics. This paper draws attention to the fact that Norwegian climate policy has changed considerably during the 1990s. It has evolved from a situation in 1989 where there was a broad consensus round the notion that a national target for stabilisation of carbon dioxide emissions was the principal instrument for climate change abatement, to a situation at the turn of the century where Norway emerged as one of the most committed supporters of flexible mechanisms, the so-called 'Kyoto mechanisms'. How has this change come about? We draw on discourse analysis to reconstruct the story of climate policy in Norway. We identify two main discourses in the climate change controversy and label them 'Acting nationally' and 'Thinking globally'. The paper gives insight in to the core elements of these two discourses and it shows how they act as basic knowledge systems when actors put forward standpoints on the climate change issue. The paper ends with a discussion on the institutional outputs of Norwegian climate policy in light of the two discourses.

SCHILLER, FRANK/TÄNZLER, DENNIS

PhD Candidate, University of Göttingen/Research Fellow, Adelphi Research, Berlin, both Germany

Dissent About Scientific Uncertainties: Implications in Policy Arenas

The role of science in the process of environmental policy making has changed fundamentally due to emerging new problems. Consequently, scientific and societal discourses get more and more relevant for decision-making processes. In the light of high prognostic uncertainties science does not only provide fundamental research but also generates consensual knowledge with truth claims. However, analysing the types of arguments used in scientific discourse shows that prognostic and epistemic uncertainty can be distinguished. The latter involves plausibility claims which reflect an internal scientific dissent. From a discourse analytical perspective this paper attempts to shed further light on how this difference impacts on the discourses in different policy areas in particular with respect to the instrumental use of arguments. It should be shown that by ignoring the different kinds of uncertainty science politicises itself. Therefore, the paper proceeds as follows. First, we discuss the theoretical background of both kinds of uncertainty. Second, our understanding of 'discourse' is elaborated with a special emphasis on the role of scientist as actors in discourse coalitions. Finally, the insights gained from this theoretical discussion are applied to the specific discourses on climate change and the release of genetically modified organisms.

HEALY, STEPHEN

School of Science and Technology Studies, University of New South Wales, Sydney, Australia

Power, Knowledge and Sustainability

This paper argues that current interpretations of science and their manifestation in institutions and broader politics cannot deliver sustainability and develops an alternative. Using J. Rouse's Foucauldian analysis epistemology is shown to be a matter of practice and not metaphysics. The resultant focus on context and process clarifies how the deployment of science is a matter of power-structuring human choice both materially and institutionally. In addition, the traditional epistemological insistence on one true, all-encompassing scientific vision finds resonance in and legitimates an analogously constrained politics. Sustainability rather requires a pluralist politics embracing, as a necessary but not sufficient condition, a pluralist knowledge politics. To this end an approach of 'epistemological pluralism' is developed using examples including the formulation of the IPCC's Third Assessment Report. The implications of this approach for scientific practice, stakeholder involvement and broader politics are

explored and comparisons made with related proposals such as 'sustainability science'.

JOKELA, MINNA

Department of Political Science, University of Turku, Finland

Construction of 'Global Knowledge' in Global Environmental Negotiations

This paper analyses the emergence of global knowledge in global environmental negotiations. This paper argues that 'knowledge' is an important variable when explaining the evolution of global policy. By 'global knowledge' we refer in the empirical sense to the evolving variety of knowledge—consciousness, perception, understanding—of global problems and policies that prevails among relevant international policy-makers. This paper argues that global threats are giving rise to a new kind of mental orientation to life and politics. This new thinking culture is generally characterised by high attention and priority given to global problems and action, as contrasted with traditional nationalist and regional ways of thinking. The new mental orientation improves the preconditions of reforming the institutional basis of global action to better meet the challenge of the aggravating problems. Progress in global institution-building will in turn support the development of global consciousness and knowledge. This paper is in particular concentrating on the construction of consensual knowledge that deals with global environmental problems and governance. The competition between different ways of defining the problems and understanding policy-making is one of the objects of this paper.

17:00-18:30 **B.5—ENERGETIC DISCOURSES: ENERGY AND ECONOMICS IN NATIONAL POLITICS**

Chair and Discussant: N.N.

Room: N.N.

JÓHANNESSON, INGÓLFUR ÁSGEIR

Associate Professor of Education, The University of Akureyri, Iceland

How Can Iceland Contribute to the Combat Against the Greenhouse Gas Effects? A Bourdieuean/Foucaultian Analysis of the Discourse on Global Environmental Change in Iceland

The paper analyses aspects of the discourse on global environmental change in Iceland and how that the increasing use of that discursive theme has impacted the discussions on soil and forest reclamation and hydro-electric projects in the interior of Iceland. These aspects are the possibilities that Iceland can reclaim soil that has eroded in the last Millennium by growing forests, grass, the Alaska lupine and other plants and by that also contribute to the combat against the greenhouse gas effects; and the claim of Iceland, accepted in the Kyoto Protocol, that building aluminium smelters in Iceland using hydro-electric power from dams raised in the interior of the country can contribute to fighting global environmental change. The analysis is based on Foucault's method of genealogy. It is used to trace the political and cultural struggles that have built up the discursive principles of seeing dark sands and green forests in contrast to each other and how both sides use references to global responsibilities. Bourdieu's ideas of cultural capital and social strategies that individuals employ to gain symbolic capital are also used to analyse the debates of the Kyoto Protocol and Iceland's fight for a particular status.

SIMON, DAVID

Royal Holloway, University of London, United Kingdom

Development-Environment Discourses, Policies and Practice in Post-Apartheid Southern Africa

Against the background of South Africa's post-apartheid transition, the ongoing con-

flicts in Angola and the Congo and the increasingly dominant neoliberal economic agenda, this paper examines aspects of emerging discourses, policies and practice in southern Africa. The focus is on supranational and especially transboundary issues and processes, including transport corridors and spatial development initiatives; energy and water provision; aspects of trade and population mobility policy; and transfrontier conservation areas and Peace Parks. Some of these have long histories while others are decisively post-apartheid in origin. The dynamics of continuity and change will therefore be explored, along with the often complex interfaces between such explicitly regional dynamics and domestic policies and international agendas.

TROY, PATRICK

Emeritus Professor, Centre for Resource and Environmental Studies, Australian National University, Canberra, Australia

Transition to Sustainability: An Australian Perspective

The economic nature of contemporary social science, reinforced by econocratic policy realms (especially in anglophone countries), prevents it from grappling with knowledge produced by natural scientists relating to sustainability. Economism thus becomes part of the sustainability problem especially in its neoliberal manifestation as rationalisation of growth. The problem of complex and contested knowledge and its socialisation can only be overcome by social scientists engaging with natural scientists in the development of new understandings. This would lead to new policies and practices which place greater weight on longer-term consequences of individual and social behaviour and on the need to develop conceptions of citizens' rights that include consideration of environmental rights. Currently the knowledge base has been too simplified and insufficiently socialised so that we experience a non-empirical debate among a small group of scholars that is too easily translated into policy nostrums that will not provide a pathway to sustainability. Better knowledge of the consumption of energy provides one illustration of ways in which improved understanding by social scientists could lead to better understanding of sustainability and the development of policies designed to achieve it.

KERKKANEN, ANU

Department of regional studies and environmental policy, University of Tampere, Finland

The Influence of Economic Knowledge of Finnish Climate Policy

In Finland the public discussion on the implementation of the international climate policy has strongly concentrated on the economic aspects of the different policy options. During the preparation of the first national climate strategy particularly the different economic calculations played an important role as they were often used as a basis for argumentation. In my paper I will analyse in which ways the economic calculations, made by three independent research organisations, affect the political decision-making and what kind of other economic knowledge is used when the decisions regarding climate policy are made in Finland. I will also analyse how the historically constructed belief systems and economic ideas affect the attitudes that different actors have towards the national climate policy. The focus of my study is on finding the contradictions between the different economic interpretations of climate policy and analysing their socio-material context. The analysis is based on the interviews with the key-actors and on the official documents and the newspaper articles.

17:00-18:30 **PANEL B.6—KNOWLEDGE FOR DECISION-MAKING AT THE LOCAL LEVEL (I)**

Chair and Discussant: N.N.

Room: N.N.

HIRSCH HADORN, GERTRUDE/KISSLING-NÄF, INGRID/POHL, CHRISTAN

Swiss Federal Institute of Technology Zürich/Swiss Academy of Sciences, Bern/Swiss Federal Institute of Technology Zürich, all Switzerland

How to Design an Interface Between Science and Society? Lessons from Theme Related Platforms for the Knowledge Communication in Switzerland

How to design institutions for the transfer of knowledge and the dialogue between science and societal actors and how to pool and transfer scientific knowledge for utilisation in political decision-making? Research on knowledge management and implementation has a long tradition in social sciences and is again a topic in the debate on sustainability transition. The paper addresses the question on how interfaces can contribute to the generation of knowledge in areas such as biodiversity, climate change and development co-operation. In the nineties, the Swiss Academy of Sciences has created platforms to promote scientific knowledge about biological diversity, global change and other issues, to stimulate contacts within the Swiss community and exchange with international programmes and to intensify communication between researcher, agencies and the private and general public. The idea of interfaces corresponds to a particular concept of the science-society-interrelation. With reference to knowledge utilisation research we discuss how these institutions have been designed, that is on what concept of science-society-interrelation they base. We further ask how successful they have been. We conclude on design principles for interfaces as conditions for sustainability transition as well as by giving some propositions for an alternative concept of the science-society interrelation.

COLLINS, EVA

University of Waikato, Hamilton, New Zealand

From National Policy to Regional Implementation: Local Government's Utilisation of Climate Change Science in New Zealand

New Zealand's signing and imminent ratification of the Kyoto Protocol requires that the public policy needed to implement the Protocol be understood and supported at all levels of society. A theoretical foundation of public policy is that for a policy to be effective it must first be accepted by society as being for the 'public good'. The greater the economic and political consequences of the policy, however, the more difficult it becomes to reach broad agreement on what constitutes the 'public good'. Policies adopted to implement the Kyoto Protocol have the potential to create substantial economic and political upheaval. This paper uses the Kyoto Protocol to explore the critical link between expert knowledge and environmental governance. A series of semi-structured interviews with local government representatives and scientists tracked the uptake of scientific information at the local government level. The paper illustrates the conceptual gap between global climate systems and regional government's focus on localised weather impacts of climate change. This paper concludes with a description of the type of scientific information utilised by local government, how it was utilised and what type of information local governments lack.

BARKMANN, JAN/FISCHER, ANKE/HESPELT, SONJA-KATERINA/MARGGRAF, RAINER
Institute of Agricultural Economics, University of Göttingen, Germany

Biodiversity Protection Within the EU Common Agricultural Policy: The Role of Knowledge in Decentralised Decision-Making Processes

Among other shortcomings, the European Union's Common Agricultural Policy (CAP) contains ineffective conservation programmes largely ignoring local stakeholder knowledge and preferences. We present results of a biology and global change (BIOLOG) case study in Northeim County (Lower Saxony/Germany) on a decentralised and outcome-based agri-environment scheme that ties payments to compliance with regional plant biodiversity standards. The project intends to develop mechanisms that can implement ecological aspects of the progressing CAP reform. A regional advisory board with stakeholder representatives was established in 2001 to identify local biodiversity demand. Within the project, an interview study on knowledge and biodiversity preferences was conducted (n=299). Individual stakeholders' expressions of preferences depended on ecological knowledge and on the amount of requested information on the project (p<0.01). The regional advisory board achieved unanimous integration of local and external scientific knowledge, e.g., in defining biodiversity 'products' in demand. The proposed ecological funding priorities

were accepted by farmers and conservationists. All stakeholder groups appreciated the opportunity to shape the regional implementation of centralised regulations. The project is perceived as a financial and ecological win-win-situation; a factor that significantly facilitated knowledge integration. Inferences on the role of knowledge in decentralised decision-making are drawn and discussed from psychological and normative perspectives.

SCHRADER, ULF

Department of Marketing and Consumer Research, Universität Hannover, Germany

The Knowledgeable Consumer as a Precondition for Sustainable Development

Political science has paid only little attention to the consumer as a crucial actor for global change towards sustainability. Sociology, psychology and consumer research have focused much more on green and social consumer behaviour, however have put only minor emphasis on information and knowledge as prerequisites for sustainable consumption. The paper will stress the significance of the knowledgeable consumer and deduce consequences for policy by dealing with the following questions: What explains the significance of consumers for the global change towards sustainability? Consumer authority in a global market economy. What kind of knowledge is necessary for consumers to fulfil their role as change agents for sustainability? Knowledge about the problem and knowledge about possible solutions; special challenge due to credence qualities of environmental and social problems · To what extent are companies able and willing to provide the necessary information? Disclosure as an important topic within the discussion about Corporate Citizenship and Corporate Social Responsibility. How can governmental policy guarantee the availability of necessary information? --> Close the gap between voluntary disclosure and demand of information; encourage and force companies to go further; provide own information. The aspects presented are first results of a more extensive research project about "Transparency of Social and Ecological Consequences of Corporate Behaviour as a Precondition for Sustainable Consumption"

17:00-18:30

PANEL B.7—KNOWLEDGE PRODUCTION AND DISSEMINATION FOR NON-STATE DECISION-MAKERS

Chair and Discussant: N.N.

Room: N.N.

MATSUMOTO, YASUKO

NIES Fellow, Climate Change Project, National Institute for Environmental Studies, Japan

International NGOs as Knowledge Mediators: A Case Study on Decision-Making on Hydrocarbon Refrigerators by a Japanese Appliance Maker

This paper discusses the decision-making process behind the hydrocarbon refrigerators debuted by a major Japanese appliance maker early this year and analyses the role of an international NGO (Greenpeace), which was one of the knowledge mediators, by focusing on how scientific knowledge about HFCs' global warming potentials and knowledge about alternative technologies affected that company's decision making. Hydrocarbon refrigerators debuted in Japan about 10 years later than in Germany. It is rare in Japan for a major corporation to convert production lines to a technology championed by environmental organisations, especially without government policy or guidance, after having already invested much in other technologies. A primary factor behind this corporate policy change was campaigns by Greenpeace, which used the knowledge gained through its involvement in the climate change and ozone layer protection regimes to put the refrigerator issue in a perspective that revealed its scientific and policy linkages. This paper examines the interaction between knowledge obtained by the refrigerator maker itself and the knowledge purveyed by Greenpeace and how the knowledge affected the company's decision making.

KANIE, NORICHIKA

Associate Professor, Faculty of Law and Policy Studies, The University of Kitakyushu, and Visiting Researcher, Institute for Global Environmental Strategies (IGES), Japan
The Influence of NGO Involvement In The National Delegation: A Case of Japanese Delegation to the WSSD

In recent years there is a growing tendency, especially in the West, that the representatives from non-governmental organisations (NGOs) are invited to the national delegation team in many international negotiation processes on the sustainability issues. The main rationale for this is that national delegations negotiating with other countries (civil servants) are better informed in this way on the practical aspects of the given issue area. But, whether or not and to what extent NGOs knowledge, opinion and/or ideas are actually incorporated into the deliberation and subsequently affect the national position by their participation in the government delegation is not clear. This paper will examine how and to what extent the NGO delegations' knowledge base affects the negotiation position of the nation state. The case is chosen for the Japanese delegation to the WSSD, which is the very first attempt in Japan to include NGO representative in the delegation for the negotiation with the main focus on the sustainable development.

ROPER, JULIET

University of Waikato, Hamilton, New Zealand

Mixed Interests and Mixed Messages: What Are The Preferred Sources of Information on and Interpretations of Climate Change Science for New Zealand Business Leaders?

Climate change is of such social and environmental significance that the science itself has become politicised and a strategic tool in its own right. The economic and political consequences of climate change and of potential policy responses, have impeded effective communication of the underlying science to stakeholder groups. There is widespread dissemination of contradictory messages, some of which is caused by uncertainty of the science, and some of which intentionally serves parties' direct economic or political interests. This paper looks at the findings of a 2002 interview-based study of New Zealand business leaders who have a direct interest in climate change policy. It identifies their preferred interpretations of climate science, and their information sources, that have served to guide business decisions of support (or otherwise) of the New Zealand government's intention to ratify the Kyoto Protocol. It also examines the views of business leaders regarding their responsibilities in greenhouse gas mitigation.

TIMMER, VANESSA

Research Fellow, Belfer Centre for Science and International Affairs, Kennedy School of Government, Harvard University, USA

Civil Society and a Systems Thinking Approach to Global Sustainability Governance

The global and systemic nature of the challenge of sustainability has overwhelmed the traditional institutional approaches to addressing the problem. Designing effective institutional responses is a key task in addressing this challenge. Transnational civil society has emerged in response to this institutional gap and plays a central role within the international political decision-making process as a disseminator of sustainability-relevant knowledge in order to influence the design of global sustainability governance institutions. This paper argues that the conceptual stream of systems thinking that several of the transnational civil society actors employ is influencing this political process and shaping the design of global governance structures to fit the nature of the problems they are established to address. The systemic approach shifts emphasis towards a focus on the whole system rather than on components, on patterns rather than on content, on process and relationships rather than objects and issues, on networks rather than hierarchies and on contextual agreements and knowledge rather

than absolute knowledge or truth.

Saturday, 7 December

8:45-9:15 **REGISTRATION (CONTINUED)**

PANEL SESSIONS

9:15-10:45 **PANEL C.1—STAKEHOLDER DIALOGUES AND ENVIRONMENTAL ASSESSMENTS (II)**

Chair and Discussant: N.N.

Room: N.N.

WELP, MARTIN

Department of Global Change and Social Systems, Potsdam Institute for Climate Impact Research, Germany

Stakeholder Involvement in Global Change Research

Researchers doing integrated assessments in the field of global change research are seeking novel approaches and methods of how to engage stakeholders in the process of generating knowledge for a sustainability transition. The objectives of participatory efforts range from identifying socially relevant research questions, identifying key data or important parameters, conducting a reality check for what one is doing or asking for people's preferences and future expectations. The paper builds on recent experiences with science-based stakeholder dialogues with businesses and non-governmental organisations and presents approaches that seem to be promising for the task. Many methods and formal techniques have been developed for participation in management, planning and policy making. Some of these may be applicable for stakeholder dialogues in research as well, but since the process of generating new and relevant knowledge is not as straightforward as for example a formal planning procedure, there is urgent need for new approaches. One challenge is how to combine computer modelling or multi-criteria analysis with deliberative methods. An assessment of the transition of the global energy systems and alternative energy options serves as an illustrative example of how such processes can be structured.

KESKITALO, CARINA

International Relations, University of Lapland, Rovaniemi, Finland

Stakeholder Consultation on Global Change: The Case of the Barents Region

The aim of this paper is to outline a qualitative assessment model to describe the relations between 1) global change in a region, 2) regional occupational and leisure practices and 3) coping capacity in policy, governance and organisation. The assessment is suggested to be based on document study of the region from a broad social, environmental, economical and political perspective; qualitative interviews and participatory observation in the region; and scientist-stakeholder collaborative discussions. For the case of the Barents region (here northern Norway, Sweden and Finland), discussions will focus on the relative concern of natural resource-related practices within the spectra of occupations and practices in communities. Especially, the paper discusses the possible contradictions between literature on the Arctic and understandings in the areas. It suggests that an assessment must be based in understandings of change in the region, as well as pay attention to possible problematiques

of communication between scientist, stakeholder and policy contexts.

JÜRGENS, INGMAR

Organisation for Economic Co-operation and Development, Policies and Environment Division, Directorate for Food, Agriculture and Fisheries, Paris, France

Science-Stakeholder Dialogue and Climate Change. Towards a Participatory Notion of Communication

Communication is an increasingly acknowledged feature of contemporary science. As means of connecting science to the outside world, it can be interpreted in different ways, according to the goals associated with it. The aim of this study is to further the deeper understanding of this communication process and to contribute to the development of successful means of science-stakeholder interactions, with a focus on the relation between policy makers and scientists. In environmental science in general and in climate change impact assessment specifically, the complexity, uncertainty and large temporal and spatial scales of the issue imply a strong urge for an adequate notion of communication. I develop a participatory notion of communication based on three basic rationales: Expanding the knowledge base, realising a broad representation of interests and creating legitimacy. The second part of the study addresses the organisation, translation and application of the concept that has been developed before. A review of research about science-stakeholder interactions helps to organise the concept into its procedural and knowledge related spheres, to formulate respective criteria and conditions for participatory communication and to apply it to a specific research project on climate impact assessment and stakeholder dialogue.

ALLEN, WILL/KILVINGTON, MARGARET/HARMSWORTH, GARTH

Landcare Research NZ Ltd., Canterbury Agriculture and Science Centre, New Zealand

Learning and Working Together for the Environment: Applying the Integrated Systems for Knowledge Management (ISKM)

Environmental issues continually change over time in response to co-evolving social, economic and ecological systems. Under these conditions adaptive management, or 'learning by doing', provides a way for managers and researchers to work together to deal with the uncertainty of such systems. In turn, this will require fragmented knowledge sources (science, local and traditional) to be brought together, and used to develop a co-ordinated approach to policy and management. This paper outlines the Integrated Systems for Knowledge Management (ISKM) approach which is designed to support ongoing processes of constructive dialogue to help stakeholders (e.g. land managers, scientists, policy makers and other interest groups)—share their experiences and observations in order to develop the knowledge needed for environmental management decision-making. To explain how the steps in ISKM can be applied in practice we refer to experience gained in a number of case studies involving catchment or regional scale environmental management covering public and private lands. Particular attention is paid to the issues that emerge as a result of multiple stakeholder involvement within environmental problem situations. Finally, the role of social capital (networking, trust and norms for sharing) in supporting such a collaborative learning approach is discussed.

9:15-10:45

PANEL C.2—ADVISING DECISION-MAKERS: COMPARATIVE STUDIES OF NATIONAL ADVISORY BODIES

Chair and Discussant: N.N.

Room: N.N.

HEINRICHS, HARALD

Programme Group Humans, Environment, Technology (MUT) of the German Research Centre Jülich, Germany

Knowledge for Sustainability Governance: From Policy Advice to Policy-oriented Knowledge Communication

This paper explores to what extent traditional government-oriented advisory systems are adapted to the challenges of sustainability-governance in social complex, pluralistic knowledge societies. Within an international comparative study about advisory systems for environmental policy in Germany and the United States deficits of advisory processes are identified and design options are presented. Sustainable development is still controversial: social actors have multiple opinions and representations about the meaning of sustainable development and its governance. Traditional models of government-oriented policy advice, in which apparently unambiguous expert knowledge is transferred to decision-makers, seems to be insufficient: scientific knowledge, professional knowledge and cultural everyday-knowledge must be brought together in a structured and systematic way, and underlying values and interests must be taken into account. Based on the comparison study four dimensions are presented to evaluate advisory systems: 'distance to politics', 'political function', 'handling of pluralism in knowledge, value and interests' as well as 'communication, inclusion, interaction'. Finally a three-step-model of policy-oriented knowledge communication is proposed: orientation advice, strategy advice and evaluation advice, in which different actors and competencies are needed.

ISHII, ATSUSHI

NIES Assistant Fellow, National Institute for Environmental Studies, Japan

Diplomacy Science: Modelling the Hybrid Character of Policy-advisory Science for Diplomacy

Complex global environmental problems necessitate massive use of advisory scientific knowledge for rational problem-solving by diplomacy. However, there is no appropriate model for accounting the distinct hybrid character of policy-advisory science stemming from the diplomatic context. Theories of knowledge-based international regime suffer from the lack of appropriate modelling of advisory science. 'Sustainability science' also suffers from lacking of appropriate conceptualisation of science-policy interaction if it intends to have persuasive power to policy-makers. Taking the example of European acid rain regime and others, the mode of advisory science is prodigiously different from those of research science and regulatory science. The objective of the advisory science is to produce diplomacy-relevant and policy-useful knowledge. In order to achieve this, the quality criteria of advisory knowledge are: political neutrality; user-friendliness; and advocating consensus of both epistemic and policy-makers' communities. The utilised methodologies to achieve these criteria are: fixing diplomatic-relevant time and spatial scale; managing uncertainty and ignorance; communication between epistemic and policy-makers' communities; utilising boundary objects and international organisations; etc. This model is named as 'diplomacy science'.

OWENS, SUSAN

OBE, Reader in Environment and Policy, University of Cambridge, Department of Geography, United Kingdom

Knowledge Brokers or Policy Entrepreneurs? Exploring the Role and Influence of Advisory bodies in Environmental Policy Formulation

Ideas, discourses and beliefs are widely acknowledged to be significant in policy-making, but the role of advisory bodies, operating at the interface between knowledge and power, remains under-theorised. This paper combines theoretical insights with empirical research on a key advisory body, the UK Royal Commission on Environmental Pollution. Over three decades, this high-level Commission has exerted considerable influence on environmental policy in the United Kingdom and beyond. It has reported on a wide range of important and controversial subjects, and has been a powerful advocate of key principles of sustainability including precaution, freedom of information and public engagement. Many of its concepts and recommendations have been reflected in legislation, though change may only be visible over long periods of time. The Commission has acted variously as knowledge broker, policy entre-

preneur and persuasive advocate of new approaches. Characteristics enabling it to play these roles have been its long institutional memory, its authority, legitimacy and independence and its ability to act as a de-politicised forum in which policy learning can occur. As well as exploring how this particular body has contributed to policy change, the paper reflects on the utility of different approaches in theorising the role of advisory bodies in general.

D'HAESELEER, WILLIAM/LAES, ERIK/MESKENS, GASTON/WEILER, RAOUL
University of Louvain/Belgian Nuclear Research Centre, all Belgium

Nuclear Energy and Sustainability: Results of Interviews with Members of the Belgian Federal Council for Sustainable Development

The sustainability debate in general, and climate change in particular, has moved the contribution of nuclear power to future energy systems again to the forefront of the discussion. Traditional science-based methods, stemming from quantitative environmental sciences and formal decision theory (Cost-Benefit Analysis, Multiple Criteria Analysis) have not been able to provide conclusive answers. These methods reveal shortcomings that relate directly to the value systems underpinning them. Therefore, we employed participative technology assessment methodologies as a necessary complement. This was done through interviews with members of the Belgian Federal Council for Sustainable Development. The analytical categories used to describe the different perspectives result from our interpretation of key issues in the interviews. All of these categories were connected in such way as to provide different consistent knowledge systems on sustainable energy and the role of nuclear power. They consist of heterogeneous entities such as 'the economic structure', 'opening of electricity markets', or even 'society' or 'the role of technology in society'. The resulting set of possible approaches could yield more clarifying insights than the 'best' approach founded on a contested decision-making method.

9:15-10:45 **PANEL C.3—SCIENCE-POLICY INTERFACES IN A LOCAL CONTEXT**

Chair and Discussant: N.N.

Room: N.N.

LOORBACH, DERK

ICIS, Maastricht University, The Netherlands

Transition Management: Knowledge Production or Policy-making?

In this paper we discuss our concepts of transition-management as a form of governance aimed at generating a sustainable development with respect to the question of how it combines elements of knowledge production and policy making. In transition-management, all actors are supposed to develop new roles, practices and behaviour to be able to participate in the transition-arena's or innovation-networks. Most notably, because transition-management finds itself at the intersection of science and policy, this applies to governmental bodies and scientific research. Government for example has to be able to give up control now and then and science will have to develop new methods and practices to properly address societal issues (e.g. 'mode 2 science').

MCBEATH, JERRY

Professor of Political Science, University of Alaska, Fairbanks, AK, USA

Science and Politics in Marine Mammal Conservation

This study demonstrates the need to analyse reciprocal effects of scientific knowledge and political decision-making in the sustainability transition. The case concerns crisis in the conservation of Steller sea lions, whose population in the Bering Sea and Aleutian Islands plummeted more than 80 percent after the 1950s. It examines three decisions

of the US National Marine Fisheries Service: to list the sea lions as threatened in 1990; to upgrade the listing of Western sea lions to endangered in 1997; and in its first biological opinion in 1999, to permit continued operation of the 1 billion US dollar bottomfish fishery, notwithstanding the belief of scientists and environmentalists that cause of depletion was nutritional stress (the fishery competed with sea lions for prey). The paper asks the extent to which these decisions were based on scientifically determined characteristics of the species as compared to non-scientific variables capturing aspects of the mammal's charisma and appeal or political economic value of its habitat. It finds that the boundaries of science and politics are blurred in this case, and then asks why by briefly comparing the finding to recent decision-making in protection of other endangered species.

LOIBL, MARIE CÉLINE

Austrian Institute for Applied Ecology, Austria

Bridges and Borderlines: Boundary Work in Transdisciplinary Research

Referring to the discussion on 'blurring boundaries' versus 'boundary work' (Weingart, Gieryn) the paper presents key results of a 5-year Austrian monitoring study on transdisciplinary sustainability research. Using a large database of qualitative and quantitative surveys a model has been developed and empirically checked that focuses on the theoretical and cultural borderlines within heterogeneous research teams. As the disciplinary and institutional team-mix of transdisciplinary projects mirrors the problems worked on, these borderlines offer diagnostic accesses for boundaries between functional social subsystems such as the political system and science system that are highly relevant for sustainability transition. The model has been used to create new methods for this 'boundary work' of identifying paradigmatic and methodological gaps within working areas that combine knowledge production and policy-making. They help to localise such basic incompatibilities and to capitalise them as signposts for social outsourcing-strategies of negative external effects that are relevant for the evolution of the problems worked on. An example for the design of such workshop techniques and for the bridges being built by working on the boundaries will be presented referring to the theoretical backgrounds of the model.

VOß, JAN-PETER/BAUKNECHT, DIERK

Öko-Institut (Institute for Applied Ecology), Freiburg, Germany

Societal Learning: Fusing Knowledge Production and Governance for Shaping Sustainable Transformation

Against the background of current developments in knowledge production and governance e.g. 'mode 2' and 'interactive governance' the paper discusses 'societal learning' as a mode of societal problem treatment in which knowledge production and collective action is inextricably combined. It is argued that this mode is empirically as well as theoretically gaining importance as an adequate response to complex policy problems of sustainability. As compared to functional differentiation which is the organisational backbone of modernism societal learning is interpreted as an innovation for societal re-integration in the course of reflexive modernisation. The argument rests on a comparative discussion of recent literature on new forms of knowledge production and governance. From this discussion a typology of integration modes is constructed which shows the different ways in which both research and governance develop new forms of coupling with their societal environment. Societal learning processes comprise heterogeneous actors who drive or are affected by the transformation process. The paper presents the methodical set-up of a major project on transformations in the German utility sector as a detailed example of the practical set-up and application of societal learning.

Chair and Discussant: N.N.

Room: N.N.

CONNOLLY, BARBARA

Assistant Professor, Department of Political Science, University of Notre Dame, IN, USA
Information, Institutions and Credibility: Information Strategies for the Sustainability Challenge

This paper poses the question of what makes information generated and distributed by international institutions involved in sustainable development credible and to whom? The credibility of information to different actor groups (and hence its political influence) varies with the tightness of the connection between information provision and other functions of international institutions, such as facilitating bargaining, monitoring and enforcement. Information distributed by the IMF, for example, may prove highly credible to 'insiders' involved in bargaining and enforcement and hence highly influential. That same information may not be credible to outsiders, affected by IMF decisions but unable to participate in the information process. Actor strategies thus range from influencing the process of information gathering within international institutions to attempting to discredit international institutions altogether in the face of undesirable decisions. Understanding the strategies by which various actors manipulate international information gathering is critical to improving decision-making for sustainable development.

ROBINSON, JOHN/SHAW, ALISON

Sustainable Development Research Institute, University of British Columbia, Vancouver, Canada

Imbued Meaning: Science-Policy Interaction in the IPCC

The Intergovernmental Panel on Climate Change (IPCC) represents perhaps the largest example of 'mandated science' ever undertaken. Its activities therefore raise a number of critical issues concerning the science/policy interface. While previous studies of the IPCC have focused on the scientific credibility of its findings, this paper will examine the credibility of the process and protocols employed to assess 'policy relevant but not policy prescriptive scientific information'. In particular we will examine two unique devices used in the IPCC: the Summary for Policymakers and the Policy Relevant Scientific Questions. It will be argued that, despite unhappiness on the part of some of the scientific participants, the negotiation of meaning given rise to in these processes represents a credible and useful way to bridge the science/policy divide.

GUPTA, JOYEETA

Programme Manager, International Environmental Governance, and Interim Head, Environmental Policy Analysis, Institute for Environmental Studies, Vrije Universiteit Amsterdam, The Netherlands

The Structural Imbalance in Sustainability Knowledge in North-South Relations: Capacity Building Under the Climate Change Convention

It is widely assumed that developing countries lack both knowledge and capacity to determine their own interests and to implement internationally negotiated agreements. Consequently, a trend of developing capacity building projects that transfer Western 'sustainability' knowledge to developing countries has been initiated by the World Bank, the UNDP and others. This is an admirable and adequate response if the assumption is that developed countries know how to achieve the transition towards sustainable development and are in a position to transfer that knowledge. This paper argues that there is reason to doubt the scientific and related policy commitment to the spirit of the sustainable development enterprise. It argues that there is serious need for new scientific tools and capacity building in the North with respect to the global human dimensions of the sustainable development crises. This paper argues that sustainability science calls for collectively unlearning the basis assumptions in research and for policy-makers to collectively un-learn the development paradigm of which modern society is both the product and the victim. In the meanwhile, transfer of such

knowledge to developing countries might lead to the very same technological and ideological lock-in that we seek to avoid.

9:15-10:45 **PANEL C.5—THE ROLE OF SCIENCE IN GLOBAL ENVIRONMENTAL GOVERNANCE**

Chair and Discussant: N.N.

Room: N.N.

ANDRESEN, STEINAR

Professor of Political Science, University of Oslo, and Senior Research Fellow, Fridtjof Nansen Institute, Norway

Knowledge and Political Polarisation: Unfortunate Mix

Recent research has suggested that science does have an impact on decisions taken within international environmental and resource regimes. As a point of departure it also makes a difference how the science-policy interphase is organised, good news for analysts and policy makers preoccupied with designing 'effective regimes'. A brief account will be given on these first two points before zooming into the main topic of the paper: The effect of polarisation and conflicts over values for the process of knowledge production as well as for the impact of knowledge on decisions made. Research findings indicate that when this is the case, it does not help much whether the science policy nexus is organised 'according to the book', whether it is advanced and consensual: Its impact tend to be minuscule. What causes such polarisation, what is the role of various actors in such processes and are there ways that such polarisation can be reduced—or if not the case, may knowledge still have a role to play? Empirical illustrations will be drawn in from various regimes, maybe most prominently the whaling regime, but also the dumping issue as well as climate change. These will be contrasted with 'low polarisation' cases like the ozone regime and acid rain.

BÄCKSTRAND, KARIN

Wallenberg Research Fellow on Environment and Sustainability, Massachusetts Institute of Technology, MA, USA

The Role of Science in Environmental Governance: Scientisation or Democratisation?

The increasingly contested role of science in modern societies is evident in environmental decision-making, sustainable development and management and protection of natural resources. Many regard sound scientific knowledge as crucial to devising effective political responses to environmental problems. However, critics argue that the forces of modern science and technology have in fact accelerated the environmental crisis, enhanced technocracy and diminished democracy. This paper captures the changing role of scientific expertise and conceptualises the link between science and policy in different environmental policy processes. Hence, the theory and practice of a 'science for sustainable development' are explored. The trade-off between technocratic or scientised and democratic or deliberative decision-making through various case studies of environmental issue areas is explored. Moving beyond the instrumentalist conception of science in international relations literature, I argue that the normative issues tied to the employment of scientific advisory are crucial. Representation, democracy, participation and legitimacy are crucial issues in facilitating a constructive science-policy dialogue. We cannot expect science to provide 'hard', complete and certain knowledge for environmental policy-making.

PAAVOLA, JOUNI

Senior Research Associate; Centre for Social and Economic Research on the Global Environment (CSERGE); University of East Anglia, United Kingdom

Knowledge and Participation for Sustainability? Science, Pluralism and

Environmental Governance for Adaptation to Climate Change

The paper will examine the roles of scientific knowledge and participation in environmental decision-making and governance in the light of theories of plural values and notions of justice, with a particular reference to adaptation to climate change. The paper's main argument is that scientific knowledge cannot replace but complements participation as an input to environmental decision-making and governance. The paper first discusses how scientific knowledge contributes to environmental decision-making by fostering learning and clarification of values. It argues that while learning and clarification of values play a role in the making of 'good decisions', they also provide the foundation for justification and legitimacy of environmental decisions and ultimately for effectiveness of environmental governance. The paper then demonstrates how participation also contributes to good decisions and is needed for the legitimacy and effectiveness of environmental decision-making and governance independently of scientific knowledge. The paper develops these arguments by critical analysis of theories of rational choice, environmental governance and plural values and notions of justice and elaborates and substantiates the arguments by applying them to adaptation to climate change.

9:15-10:45

PANEL C.6—EDUCATION FOR THE SUSTAINABILITY TRANSITION

Chair and Discussant: N.N.

Room: N.N.

THORESEN, VICTORIA

Assistant Professor, University College of Hedmark, Norway

Consumer Citizenship Education: Transforming Knowledge into Sustainable Development

Patterns of political behaviour are to a great extent determined when one is a youth. Thus educational systems play a central role in transferring knowledge, fostering attitudes and training skills which could lead to sustainable development. Educational systems, however, tend to be conservative of nature, individualistic of approach and descriptive, rather than transformative, in their manner of teaching. Rational objectivity and social relativism rank ahead of principled directedness despite the fact that societies are still based upon moral codes intentionally leading to universal well-being and happiness. One noteworthy effort which attempts to counteract the expansion of relativism in higher education is the global discourse on consumer citizenship education. Consumer citizenship is based upon the concept of world citizenship which claims to provide a global ethic for sustainable development. Consumer citizenship education addresses both the supply and demand sides of sustainable consumption in light of intra-generational equity. It analyses the prerequisites for and the implications of sustainable consumption. Development is studied in personal, local, national and international contexts. Consumer citizenship education aims to facilitate the locating and understanding of relevant scientific information. This paper seeks to explore the direct and indirect influences of consumer citizenship education on political decision-making.

IGNATOW, GABRIEL

Department of Sociology, Stanford University, Ca, USA

Energy Use and the Educated Society: Ecology Organisation Foundings in 49 Nations, 1968-1995

Organisations dedicated to ecological preservation through science are important linkages between the environmental movement and research science worldwide. This paper analyses the genesis of these organisations in two ways: by exploring the effects of both material and social factors on the founding of scientific ecology organisations and by sorting out the effects of education variables on such founding. After review-

ing several contemporary theoretical accounts of the growth of fields of ecology organisations, I present an alternative, mass-education model of mainstream environmentalism that theorises the relationships between systems of mass education and the founding of voluntary organisations. Results of an event count analysis of the founding of scientific ecology organisations in 46 nations between 1968 and 1995 most strongly support 'environmental realist' arguments and the mass education model, provide some support for world society perspectives and do not support resource mobilisation or new class theories. These results suggest that mainstream, scientific environmentalism is less a consequence of societal wealth or the actions of groups of educational elites than of industrialisation and ecosystem 'extractions', and systems of mass compulsory education which provide critical social and ideological bases for both public science and voluntary complex organisation.

MAUBREY, REGIS

Director, Greenway International, Paris; INSEEC Group and University of Paris XIII, France

The Role for International Business Schools in Surveying the Dissemination of Environmentally Relevant Knowledge and Procedures in France

Business schools and their internal and external environments are good sites for assessing long-term prospects and changes, for several reasons: many of their student bodies come with experience and knowledge of different countries, many members of their faculties are active professionals bringing in up-dated know-how and their network of supportive companies contribute their knowledge, questions and problems often regarding environmental policy and strategy issues. A two-pronged methodology will be used to assess the knowledge and impact of the aforementioned companies with regards to national and international environmental policies and approaches linked to the concept of 'sustainability'. Information will be obtained, firstly through interviews and eventually through a sampling of these companies. A historical perspective will be used in order to better evaluate the chronological changes that may have occurred, in conjunction with both national (and local—urban and regional) and international (European and other) regulations, legislation and directives.

9:15-10:45

PANEL C.7—SUSTAINABILITY SCIENCE: APPLICATION AND OPEN QUESTIONS (I)

Chair and Discussant: N.N.

Room: N.N.

GÖLL, EDGAR

Institute for Futures Studies and Technology Assessment, Berlin, Germany

Sustainability Science as Change Agent?

Sustainable development is an extraordinary challenge for civilisation and severe obstacles have to be overcome. These problems are linked to societal structures and human action. From the sustainability discourses we can derive five basic principles for social sciences: integrative character (holistic, including gender); long-term perspective; participation (stakeholder); practice and goal orientation; local-global nexus. As a consequence of the last ten years of activities the main tasks are to build and improve capacities for 'self-reflexivity' of societies and to widen our thinking in contingencies and alternative options. Based on empirical examples, for those tasks singular solutions are discussed (scenario-technique, future workshops, action research etc.) and strategies are derived, like de-legitimisation of the current ways of living and offering attractive alternatives (including reversal of evidence). The main conclusion of the paper is that diffusion of the five basic principles into all (social) sciences has to be improved and for that strategy the creation of some sort of 'sustainability science' can become a temporary necessity ('change agent').

TEISMAN, GEERT R./EDELLENBOS, JURIAN

Centre of Public Management, Erasmus University Rotterdam, The Netherlands
*Sustainable Development as an Joint Fact-Finding Process: Overcoming
 Institutional Barriers through Process Management*

Sustainable development is seen as one of the important qualities pursued by society. There seems to be a broad consensus on the need for quality. At the same time, however, there seems to be general confusion on the question of what quality is and how it is to be achieved. In practice, this means that sustainability may be achieved in multiple ways, in the sense that there is not one single agreed goal that should be reached. This observation will serve as a basis for our paper. We will argue in the paper that because of the multiplicity of the concept 'sustainable development', the transition process towards sustainability has to be organised in terms of interactive processes. We define an interactive process as a process of joint fact-finding, in which all kind of actors share knowledge and interactively develop a picture of what sustainability should look like. Governments in the Netherlands are very attracted to joint-fact finding processes. However, these processes meet a lot of institutional barriers in practice, which obstruct the way sustainability knowledge is generated, distributed and used. We will elaborate on these institutional barriers in the full-length paper. We also describe possibilities to bypass these barriers.

SCHMANDT, JURGEN

Houston Advanced Research Centre (HARC) and University of Texas at Austin

Integrated and Place-based: Two Characteristics of Sustainability Science

A study by the US National Academy of Sciences concludes that science and management of specific environmental threats, such as water pollution or acid rain, have improved significantly. However, we poorly understand or manage environmental threats arising from multiple, cumulative and interactive stresses, driven by a variety of human activities. In response, the Academy calls for integrated and place-based sustainability science. I will develop the concept of integrated and place-based sustainability science in the context of the Rio Grande basin, a large desert region shared by Mexico and the United States. Current conditions are unsustainable: arid climate, rapid population growth, declining water supplies, competition for water between agriculture, cities and nature. In addition, bi-national arrangements for water management reflect outdated knowledge and policy goals. What methodological and institutional innovations will produce sustainability knowledge for the basin that is useful to policy-makers and managers? The paper draws on extensive fieldwork.

BECHMANN, GOTTHARD/STEHR, NICO

Forschungszentrum Karlsruhe Institut für Technikfolgenabschätzung und Systemanalyse (ITAS), Germany/Senior Research Associate, Sustainable Development Research Institute, University of British Columbia, Vancouver, Canada, and Alcatel Professor, Technical University, Darmstadt, Germany

Scientific Knowledge and the Malleability of Societal Conditions

In this paper, we analyse the question about the kinds of attributes that ought to characterise scientific knowledge if it is to be 'powerful' or useful in practice. We will examine the issue of the practicality of scientific knowledge and by implication the bases for effective policy advice in a number of steps: (1) we will briefly refer to the prevailing self-understanding of social scientists when it comes to the usefulness and practical success of their knowledge, (2) we will describe the typical response of the social science to the common observation that their efforts in generating useful knowledge is compared to the natural sciences, almost hopelessly inferior as the result of the immense complexity of the social world and (3) we will address the question what attributes social sciences knowledge should have in order to be useful. This analysis benefits from an examination of the nature and the practical success of Keynesian economic inquiry. It can be shown that the usual attributes held responsible for the societal failure of social science knowledge represent an inadequate account of what might make social science knowledge useful. Finally, we will try to make the case that these observations apply to natural science knowledge as well.

PLENARY SESSION

Moderator:

Dr Klaus Jacob, executive committee, Environmental Policy and Global Change section, German Political Science Association

Room: N.N.

11:00-11:45 DR CHRISTIAN PATERMANN
 Director, Environment and Sustainable Development Programme, DG for Research, European Union
Knowledge for the Sustainability Transition: The European Union Perspective

11:45-12:30 HANSVOLKER ZIEGLER
 Chair, International Group of Funding Agencies, and Deputy Director General, Federal Ministry for Education and Research, Germany
Title to be arranged

12:30-13:45 **LUNCH BREAK**

KNOWLEDGE CONVERSATIONS

13:45-15:00 **CONVERSATION 1—THE POLITICAL INFLUENCE OF SUSTAINABILITY KNOWLEDGE (SEMI-PLENARY DISCUSSION)**

ROOM: N.N.

DISCUSSANTS:

- Dr Peter Feindt
- Dr Joyeeta Gupta (invited)
- Professor Martin Jänicke
- Professor Peter Sand
- Dr Christian Patermann

FACILITATOR: Dr Bernd Siebenhüner

13:45-15:00 **CONVERSATION II—A 'SUSTAINABILITY SCIENCE': WHAT ON EARTH FOR? (SEMI-PLENARY DISCUSSION)**

ROOM: N.N.

DISCUSSANTS:

- Professor Hans-Joachim Schellnhuber
- Professor Coleen Vogel
- Professor Oran R. Young
- Hansvolker Ziegler

FACILITATOR: PD Dr Frank Biermann

15:00-15:15 **BREAK**

PANEL SESSIONS

15:15-16:45 **PANEL D.1—THE DISCOURSE OF 'SUSTAINABILITY'**

Chair and Discussant: N.N.

Room: N.N.

SINGH, ASHBINDU

Regional Co-ordinator, UNEP Division of Early Warning and Assessment North America, EROS Data Centre, USA

Linking Human Concerns Key to Transition for Sustainability

Human beings are at the centre of concerns for sustainable development. However, a majority of concerned scientific studies are often too theoretical and pay attention to the analysis of environmental change itself, overlooking the quantified impact these changes might have on the societies. This is particularly important as public is not interested say in atmospheric pollutants but they do want to know how it might effect their health. So it is critical to establish analytical relationships, which can visualise the changes of environment and guide towards consequences of such changes to people. This kind of analysis could be organised around nine different themes such as poverty, health, economic losses, food security, equity, loss of natural heritage and experiences, loss of intellectual property rights, conflict, exposure to extreme events and climate change impacts. It would have a greater resonance to organise sustainability issues around these themes rather than around resource or pressure variables. There is a need for better scientific approaches and methodologies to look in to these issues. It would help public understanding of 'why environmental changes matters' and such a connection would lead to more societal commitments.

BHAGAT, RAM B.

Tata Institute of Social Sciences, Mumbai, India

The Demographic Knowledge and Sustainability Issues in India

Demographic size and growth are paramount issues in the debate on sustainable development in India, although the Indian economy has grown little over five percent during the last two decades compared to population growth of two per cent during the same period. The reason is that the Malthusian concern has been the core of Indian policy planning thinking. This has perpetuated the belief that population growth is the immediate culprit of high poverty and environmental degradation. But solutions are never sought politically as the political parties hardly mention population growth and family planning issues in their election manifestos. The disinterestedness of the political parties in demographic issues and the nexus of bureaucrats with neo-Malthusian academics have determined the extent of the generation and use of demographic knowledge. Demographic issues such as distribution of population, age composition, work force structure, migration and urbanisation are thus neglected issues in the planning for sustainable development. The paper highlights the lack of integration of com-

prehensive demographic knowledge with sustainable development planning in India and explores the political economy reasons for lopsided consideration of demographic knowledge in sustainable development planning during the last five decades.

15:15-16:45 **PANEL D.2—TAPPING INDIGENOUS KNOWLEDGE**

Chair and Discussant: N.N.

Room: N.N.

SHUAIB, LWASA

Geography Department, Makerere University, Uganda

Indigenous Systems of Knowledge Generation for Sustainability: Dismissable or Adaptable in Resource Use and Management?

Indigenous Knowledge Systems (IKS) have for a long time been ignored as a source of knowledge especially when applied in fields where scientific research, based on empiricism has produced 'reliable knowledge'. Such knowledge has been generated in fields including natural resource management. But in developing countries where traditional institutions within local communities are still strong, indigenous knowledge systems continue to form a strong base for knowledge generation in resource use and management. Yet indigenous knowledge is often dismissed as a basis for decision-making in development projects. IKS are useful because local people are familiar with indigenous practices, technologies and draw on local resources making people less dependent on outside supplies. This paper seeks to discuss the relevance of IKS as a source of knowledge for sustainability and whether IKS are dismissable or adaptable in knowledge generation. It seeks to address the generation of 'traditional knowledge', its successes in resource use and potentials for transition to sustainability. The paper will highlight the role of IKS in decision-making for two Hydropower generation projects in Uganda. These projects are selected because of their regional importance in respect of use of a common pool of resources; that is the Nile river basin.

KUMAR, PUSHPAM/TARUI, NORI

Associate Professor, Institute of Economic Growth, Delhi, India/Department of Applied Economics, University of Minnesota, MN, USA

Does Indigenous Knowledge Contribute Towards the Benefits of Bioprospecting?

This paper examines the contribution of indigenous and traditional knowledge in the process of bioprospecting and proposes a model to analyse how such knowledge influences the benefits of bioprospecting. Empirical evidence suggests that (i) out of the two widely debated but dissenting hypotheses on the benefits of bioprospecting, one estimating higher values is supported and (ii) if the bioprospecting search is based on ethnobotanical information available from local people, then the value of bioprospecting benefits will be higher than those predicted by the two hypotheses. It is crucial for bioprospecting firms to design a scheme where the information as well as access to the resources can be effectively shared between the firms and the local people in the bioprospecting site.

SAIKIA, ANUP

Lecturer, Department of Geography, Gauhati University, Guwahati, India

Tribal Institutions, Decision-making and Sustainability in the Hills of North East India

More than 200 tribal groups at various stages of socio-economic development are settled in India's north eastern region, prompting the government to allow these sensitive, hitherto loosely administered territories under British rule to be governed by a separate Sixth Schedule under the Constitution of India. This Schedule was enacted

five decades ago to allow autonomy to tribal communities in their administrative, legislative and financial matters; it also served to protect them from domination and exploitation from external forces. As a result land, forest and mineral resources were exploited on a community basis; tribal institutions governed the use of resources and tribal belief systems promoted sustainable use and exploitation of common resources. The preservation of 'sacred forests' and unabated shifting cultivation are examples that show that the results of self governance were a mixed bag. The paper explores how egalitarian tribal institutions tread the path to sustainable development and as to what lessons can be drawn for societies elsewhere.

MORRISON, KEITH

Centre for Maori and Indigenous Planning and Development, Lincoln University, Canterbury, New Zealand

Uniting Social Theory and Practice in Wisdom

To achieve social scientific understanding that can adequately assist indigenous development requires questioning the fundamental way social science is carried out. Systems thinking and phenomenology are helpful but of other traditions are also necessary. Others that have been found to be helpful include the work of the 7th Century Maximus the Confessor, Tibetan Buddhism and Polynesian traditions. Common to the ontological positions of all these alternative traditions is an explicit reference to a fifth dimension of depth that at once inextricably links subjectivity to objectivity and also the individual to society and nature. Epistemological consequences of this all provide frameworks to guide the process of discovering helpful knowledge for society. They all involve the gaining of wisdom along with practical skills. Incorporating this enhanced understanding into the systems and phenomenological traditions highlights the significance of emergent systems features, fractals and self-referential or reflexive adaptive systems. It is of universal value to social science as it attunes objective social theory to successful social practice facilitating emergent non-regulative and participatory-democratic community planning and self-management.

15:15-16:45 **PANEL D.3—NEW ADVANCES IN MODELLING AND SCENARIO ANALYSIS**

Chair and Discussant: N.N.

Room: N.N.

MARSCHINSKI, ROBERT/PETSCHEL-HELD, GERHARD

Global Governance Project and Department of Integrated System Analysis, Potsdam Institute for Climate Impact Research, Germany

Introducing Earth System Analysis: An Application to Environmental Regime Effectiveness

As a consequence of the high complexity of the earth's ecosphere system, new multidisciplinary approaches that draw from both social and natural science have recently emerged, forming new schools known as 'Earth System Analysis' (ESA) or 'Sustainability Science'. This constitutes a challenge for traditional social science and in particular for political science and global environmental policy research. In our paper, we first present some general ideas about ESA and then elaborate on which role the so-called 'Qualitative Modelling' formalism could play in creating synergies between social and natural sciences. As a mean to illustrate how these ideas can be put into practice, we will apply it to a particular problem of environmental policy research: the question of the effectiveness of environmental regimes. In the context of a conceptual 'Earth System Model', which features some essential aspects of the natural, economic and political world, we consider an integrated measure of regime effectiveness and discuss some of its characteristic properties. Finally, we give some hints on how the formalism could be extended to the analysis of environmental organisations.

DEVINE-WRIGHT, H./DEVINE-WRIGHT, P.

Department of Building and Civil Engineering, Loughborough University, Leicester-

shire/Institute of Energy and Sustainable Development, De Montfort University, Scraptoft Campus, Leicester, both United Kingdom

Avoiding Hydra Through Optimal Theory Design: Towards a Sustainable Science

Social scientists have responded to the challenge presented by global environmental change in many ways, including borrowing concepts from other scientific domains, adopting an interdisciplinary focus, considering many scales of analysis and including diverse stakeholders in the research process. There is a danger that urgent responses designed to make social science relevant and significant in dealing with global environmental change could result in a many-headed sprawling mass of tangled ideas. In our view, it is appropriate to consider how to optimally design models that can bridge theoretical and applied research and make a significant contribution to the problem. Just as sustainability practitioners strive to reduce and even eliminate waste, in the same way, social scientific researchers need to avoid 'waste' ideas, striving for new theoretical models that meet the challenge of global environmental change in a way that is characterised by elegance, simplicity and parsimony. The outcome would be optimally designed theoretical models that are likely to be more sustainable in meeting the challenges of global environmental change.

SCHEFFRAN, JÜRGEN/SPRINZ, DETLEF

Potsdam Institute for Climate Impact Research, Potsdam/University of Potsdam, Germany

Modelling Multi-Level Governance in Global Sustainability Transitions

Decision-making at multiple levels of governance require sophisticated tools to analyse the opportunities and challenges of global environmental transitions. We outline a modelling perspective to systematically replicate major political decisions taken in a set of key countries around the globe within two sets of modelling tools and relate these findings to measures of regime effectiveness. The expected utility model of Bueno de Mesquita is used to arrive at replications of decisions. The experience gained in this endeavour will be applied to short-term and longer-term forecasts (e.g., prospects for deep cuts in greenhouse gases) of political decisions. Building on the above, we develop scenarios for improving regime effectiveness for decision-making in multi-level political environments shaped by dynamic interactions among multiple players. To check against reality, experimental simulations involve real-world actors and stakeholders to solicit conditions for a self-organised sustainability transition. Extending available methodologies, we assess the effectiveness of past decisions and explore the effect of forecasted political decisions. Simulation approaches and regime effectiveness assessments are closely intertwined both in terms of data generation as well as in terms of the ability to make ex ante regime assessments being contingent on forecasted results.

15:15-16:45

PANEL D.4—KNOWLEDGE FOR ENVIRONMENTAL POLICY INTEGRATION

Chair and Discussant: N.N.

Room: N.N.

JACOB, KLAUS/VOLKERY, AXEL/Zieschank, ROLAND

Environmental Policy Research Unit, Free University of Berlin, Germany

Environmental Policy Integration: Potentials and Limits for Policy Change Through Learning

There are many efforts under way to integrate the needs of the environment into sectoral policies such as agriculture, energy, industry, etc. Driving forces are the Rio Convention, the Amsterdam Treaty and different requirements on the national level. A range of strategies and instruments have been developed to implement the EPI principle, among these Cardiff type sectoral strategies, Strategic Environmental Assess-

ments (SEA), green cabinets, etc. Many of these efforts stress the need of knowledge to rationalise policy making. However, past experiences show that an improved knowledge basis on its own is not sufficient for better sectoral policies. There are also requirements for a political will for policy changes. The paper will provide a systematic typology of the different approaches for EPI in European countries. It will be analysed on the background of historical experiences with EPI which of the current approaches are likely to be successful. The paper is part of the BMBF-funded research project POINT3D that develops a software for an integrated appraisal of new policies.

KIM, JOY AEREE

PhD Candidate, Tyndall Centre for Climate Change Research, United Kingdom

Institutional Interplay between Biodiversity and Climate Change: Toward Synergy Creation

Over the last few decades, the number and the scale of environmental regimes have grown, heralding their inevitable interaction, the importance of which lies in the fact that it affects their performance, effectiveness and even survival. In this paper, the inter-linkage between biodiversity and climate-change regimes is examined. There is a growing scientific consensus that climate change poses a major threat to biodiversity, both at the species and ecosystem levels and that major vegetational changes in response to climate change are, in turn, likely to further affect global and regional climate. Concern is also being fuelled by that fact that, at the institutional level, efforts by the climate-change regime to mitigate greenhouse gas emissions seem likely to affect biodiversity, as regulations being developed by both regimes are diverging. At the same time, with the regimes aware of the interplay and striving to co-ordinate how they address the issue, there is an avenue for the creation of synergy between the two. On the basis of an analysis of this interplay, the paper maps a path towards synergy creation, drawing a line between synergy and trade-offs that will need to be made by both regimes.

JÖRGENSEN, KIRSTEN

Environmental Policy Research Unit, Free University of Berlin, Germany

Policy-making for Ecological Sustainability in the German Bundesländer and the US States: Knowledge-Based Benchmarking as Driving Force

Regarding governance for ecological sustainability in federal systems the German Länder and the US states have the scope and the means to approach policy-making from both a self-contained approach and in the context of federal policy-making. The integration of environmental goals into polluting sectors and public policy sectors is at the early stages in both Germany and the United States. As existing approaches to the management of persistent problems show, the sub-national level can become more important in the future and, with a view of the diffusion of decentralised problem solutions, should be regarded as such. So the question shall be posed how the problem-solving capacity on the sub-national level can be promoted. Some examples will be demonstrated that show that the sub-national level may invent smart policies that provide for vertical and sectoral policy integration and the sub-national level may be more appropriate for encouraging public/private collaboration. Taking the examples of the German Bundesländer and the US states I will discuss how a knowledge-based benchmarking may promote the problem-solving capacity of the sub-national level.

15:15-16:45 **PANEL D.5—KNOWLEDGE FOR ALL: THE ‘RIGHT TO KNOW’**

Chair and Discussant: N.N.

Room: N.N.

SAND, PETER H.

Institute of International Law, University of Munich, Germany

The Right to Know: Environmental Information Disclosure by Government and Industry

Global knowledge management is crucially dependent on public access to information—in particular, information on environmental risks. Yet most existing systems of governance favour administrative or corporate secrecy and thereby monopolise environmental information in the hands of governmental authorities or private stakeholders. This paper describes innovative initiatives to establish civil society's 'right to know', by mandatory disclosure of government-held information (from the 1966 US Freedom of Information Act, to the 1998 UN/ECE Aarhus Convention) and of industry-held environmental risk data (through the worldwide spread of Pollutant Release and Transfer Registers and through court-enforced access to 'privileged' documentation—for example, on tobacco-related health risks). These disclosure strategies have triggered a new 'third wave' of environmental regulation, replacing or supplementing traditional command-and-control and market-based instruments. However, the paper also highlights continuing transparency deficits (sometimes resulting in 'manufactured uncertainty') with regard to risk-sensitive information of common concern.

KHOVANSKAIA, MARIA

Project Officer, Regional Environmental Centre for Central and Eastern Europe, Hungary

Aarhus Convention as a Factor in Kyoto Protocol Process in CEE Countries

The paper presents results of a survey in six Central and Eastern European countries. The survey examined the degree of implementation of the Aarhus Convention on public participation in decision-making and access to information in the field of climate change. The first part of the survey was on opportunities for the general public to access information on climate change and Kyoto protocol. The second part examined public participation in climate policy making. The results of the survey can be read as indicating a lack of institutional back up for influence of the informed public on policy making in the area of climate change. In fact, in most cases the existing weak public discourse does not affect policies at all. One can still observe positive trends as political decisions become increasingly motivated by the public demands based on knowledge of relevant issues.

15:15-16:45 **PANEL D.6—PARTICIPATION IN LOCAL DECISION-MAKING**

Chair and Discussant: N.N.

Room: N.N.

HENDRIKS, CAROLYN

Social and Political Theory Programme, Research School of Social Sciences, Australian National University Canberra, Australia

Sustainable Public Participation: Dealing With Many Publics and Competing Roles

Effective environmental policy requires not only the public's co-operation and commitment but also their input into the decisions shaping these policies. Yet disagreement abounds on what form this public involvement should take and who it should involve. This paper discusses how current debates on public participation in environmental policy can be linked to the competing views offered by the discourse of ecological modernisation and the 'risk society' thesis. Ecological modernisation, with its emphasis on reconciling business and ecological interests, favours collaborative forms of public participation between the state and 'key stakeholders' such as interest groups and experts. In contrast, the 'risk-society' thesis is highly sceptical of decision-making structures dominated by powerful interests and experts and advocates that environmental risks require broad democratic involvement of civil society. Based on ongoing comparative research between Germany and Australia, this paper explores the tensions

that can arise when risk-society models of public participation assign roles to citizens and interest groups that differ from the roles these actors adopt in participatory processes shaped by ecological modernisation. The paper calls for policy makers to consider the potentially inconsistent and incompatible roles assigned to civil society when designing participatory processes.

STOLL-KLEEMANN, SUSANNE

Faculty of Political and Social Sciences, Free University of Berlin, Germany

Testing Public Participation for Sustainability: Theory and Application

The 'buzz' word nowadays is 'governance'. This is a term of art to describe a wider, more informed and interactive form of managing natural and social worlds in an integrated manner, through learning, regulating, interpreting and doing. This paper will summarise the many approaches to interpreting 'government' and 'governance' as these apply to charting the transition to sustainability. The paper contends that there is no conceptual agreement as to what constitutes the relationship between the two themes, nor is there any coherent approach to examining different models, styles and processes. The paper will seek to test the concept of governance for sustainability via two sets of case studies. One will look at participatory forms of biodiversity protection and enhancement, involving various institutional approaches. The aim will be to lay out criteria for determining under what conditions will various participatory and governmental mixes lead to improved biodiversity. The other will examine the experience of interactive integrated assessment producers for determining climate futures. This looks at means for enabling key interests to 'play' integrated climate assessment models to see how they generate scenarios that may help them make informed choices over investment in technology, pricing of funds and lifestyle behaviour changes. Again how various patterns of governance can be included in these procedures and revealed by them, forms an important part of the paper.

SNELL, CAROLYN

Department of Social Policy and Social Work, University of York, Heslington, United Kingdom

Local Sustainable Development: Revitalising Local Democracy?

Local Agenda 21 recognises that social and environmental problems are intrinsically connected and that addressing them in a local, participatory and socially-inclusive manner is likely to produce more appropriate policies. It emphasises local community participation, with the aim of giving local communities greater ownership over their surroundings and also rebuilding faith in local government. In the United Kingdom every local authority was to produce a Local Agenda 21 strategy by December 2000. This paper uses case study evidence to explore how local needs have been represented. The paper illustrates how attempts at community participation have struggled to reach those (arguably) in most need and questions the assumption that similar groups of people have homogenous needs. The relationship between participants and the local authority is also explored, finding that participants are likely to be disillusioned with the local authority if it is seen not to have taken the process seriously. The paper concludes by discussing the future of this approach to local sustainable development, arguing that more participation is not necessarily better participation.

THROGMORTON, JAMES

Associate Professor, Graduate Programme in Urban and Regional Planning, University of Iowa, IA, USA

Imagining Sustainable Places

This paper focuses on ways in which technical knowledge and concepts can be woven into persuasive and politically-viable stories that help people imagine, desire and create sustainable places. Drawing in part on my past experience as an elected city councillor, I seek to answer the following question: given the capacity of technosystems and complex environmental pathways to produce 'remote' effects and the capacity of unpriced costs ('negative externalities'), 'technological somnambulism' and 'environmental unconscious' to foreshorten awareness of these effects at their

points of origin, how can people act wisely in the here and now of particular city-regions? The paper argues that local actors need to 'make space' for stories that draw attention to their regions' 'ecological footprints', demonstrate the merits of increasing the efficiency of the value chains that produce those footprints (by constructing a 'Factor-10 economy)', and reveal the value of building a more compact, diverse and transit-oriented 'Regional City'. Making space for such stories requires simultaneous creation of inclusive (discursive) processes and inclusive public places.

15:15-16:45 **D.7—GLOBAL KNOWLEDGE, LOCAL PRACTICE (II)**

Chair and Discussant: N.N.

Room: N.N.

HOOGENBOOM, GERRIT/INGRAM, KEITH/KIRSHEN, PAUL/JOST, CHRISTINE/RONCOLI, CARLA (PRESENTER)

University of Georgia/University of Georgia/Tufts University/University of Georgia, all USA
Scientific Discourse and Social Meanings in the Dissemination of Seasonal Rainfall Forecasts in the Sudan-Sahel Region of West Africa

This paper addresses the political dimensions of climate information. Recent advances in climate science have led to the development of global circulation models that make it possible to forecast seasonal rainfall in various parts of the world. This has engendered high hopes among donors and policy makers that this information may be the key to sustainable development for drought-prone areas such as West Africa. Research among farmers of Burkina Faso by the NOAA-funded Climate Forecasting and Agricultural Resource project highlights both the opportunities to apply forecasts to improve agricultural sustainability and the dilemmas and disconnects that mark the process whereby scientific information is rendered into a message directed to lay users. This process occurs in a political context that shapes how farmers understand forecasts and apply them to sustain their livelihoods. A particular problem is that, because of differential access to information technology, resources and skills among social actors, forecasts may reinforce social marginality. The probabilistic nature of seasonal rainfall forecasts allows for latitude in interpretation that may be used, either intentionally or unintentionally, to support specific biases. The scope and parameters of forecasts are sometimes at odds with farmers' cognitive and decisional frames of reference, and yet the authority and exigencies of science may limit the extent to which the information package can be translated into relevant knowledge.

PATT, ANTHONY

Department of Global Change and Social Systems, Potsdam Institute for Climate Impact Research, Potsdam, Germany

Seasonal Forecast Applications in Southern Africa: Participation and Credibility

One of the exciting new areas of knowledge application for sustainable development is the attempt to communicate seasonal climate forecasts to subsistence farmers, in places such as southern Africa and South America. One of the principal findings of research has been, however, that these forecasts often lack credibility, especially after perceived errors in the forecast. In this paper, we discuss results from an ongoing project in Zimbabwe aimed at communicating the forecast via a participatory approach. In September of 2000, 2001 and 2002, the project has organised a set of local workshops to discuss the forecasts with farmers and to seek their guidance in developing response strategies. In 2001, however, Zimbabwe suffered from a severe drought that appeared to contradict the earlier forecast. Did this potential error in the forecast lead to a decrease in the credibility of the forecasts and of scientific knowledge in general? Does public participation in the forecast application process influence the change in credibility. During the 2002 workshops, we will have examined these issues with farmers. In this paper, then, we focus on whether a participatory approach to forecast applications, including attention to traditional indicators, enhances the credibility of the fore-

cast and indeed of scientific knowledge in general.

OLSSON, LENNART/TSCHAKERT, PETRA/WARREN, ANDREW

Lund University, Sweden/University of Arizona, USA/University College London, United Kingdom

Indigenous Knowledge in African Drylands and the Kyoto Protocol

Modifying natural ecosystems for producing food has to a large extent been a process of learning-by-doing by generation after generation of farmers rather than a scientific one, particularly in developing countries. How can the concept of carbon sequestration be reconciled with land management practices as they have evolved in African drylands? Degraded agricultural soils have been depleted of nutrients and soil organic matter with a declining agricultural yield as a result. Investments in improved land management (e.g. agro forestry, livestock, crop rotation, mulching) can increase productivity and at the same time increase the storage of organic carbon. The paper reports from two research projects in Sub Saharan Africa investigating the possibilities to combine improved land management (based on traditional practices) among peasants with the sequestration of soil carbon. Even if indigenous knowledge on good land management corresponds with the scientific principles behind carbon sequestration there is a huge gap between the Kyoto Protocol and the potential implementation of its mechanisms in rural areas of many developing countries. Here we report on a systems analysis approach to reconcile the scientific and the indigenous knowledge necessary for implementation of climate change mitigation in Sudan and Senegal.

15:15-16:45 **PANEL D.8—KNOWLEDGE FOR ACTION: REGIONAL AND NATIONAL CAPACITY-BUILDING (I)**

Chair and Discussant: N.N.

Room: N.N.

ALNEWASHI, QASEM

Ministry of Education, Jordan

The Role of the Political System in Generating Knowledge on Sustainable Tourism: The Case of Jordan

In order to make a successful transition to sustainability as a new path of human development, political decision-makers must assume responsibility for providing the materials, technologies and information required to feed, employ and educate more people than ever before while attempting to preserve natural systems and human heritage at the same time. For understanding the role of political decision-making in the process of generating knowledge on sustainability, especially in developing countries, the development of tourism in Jordan is an interesting case. This paper investigates the effectiveness of the political system in Jordan for bringing responsible tourism to the country. Firstly the paper reviews the literature that focuses on various factors that influence the processes by which knowledge on sustainability is generated. This review includes details of several political decision-making models that relate to sustainable tourism. The paper then investigates the influence of political decision-making on the implementation of applied research and development projects related to sustainable tourism. This is based on a survey of the perspectives of national and international organisations in Jordan. Finally the paper suggests a number of areas to which political decision-makers could direct greater attention in order to more effectively promote the generation, distribution and utilisation of knowledge on sustainable tourism.

JIEHUA, LU

Professor of Division of International Area Studies, Pukyong National University, Korea

Regional Research Capacity-Building in Sustainability: Facts, Gaps and Futures

in Northeast Asia

The concept of sustainable development has begun to absorb the attention from scholars and policy-makers over the last two decades. Evidence shows that some conceptual ideas concerning local and global sustainability have been adopted somehow by some official documents in northeast Asian nations such as South Korea, China and Japan, which seems to be a very positive signal for the future development of sustainability science in this region. However, our studies turn out that there are still major gaps at the process of development of sustainability science in northeast Asian region: one is how to build up the regional research capacity of sustainability science in this region across different disciplines as well as different political systems in order to have a better bilateral or multilateral understanding of the sustainability science; and another is how to shift the conceptual frameworks of sustainability science into the operational policy frameworks in order to maximise the positive effects of scientific research on the future sustainable development. Therefore, this paper proposes some necessary steps in near future in northeast Asia in order to build up the regional research capacity in sustainability science to realise the both local and global goals of the sustainable development.

BABU, LENIN

Fellow, Department of Environmental Sciences, Bangalore University, India

Role and Reach of Perceptions and Scientific Understanding on Sustainable Environmental Governance: A Case Study of India's Position from Montreal Protocol to UNFCCC

In a democratic system, perceptions and knowledge are two prime forces that shape the policies related to the governance of frontier areas like environmental governance. Already in 1972 it was felt by India that the initiative of the Stockholm conference probably was a discriminatory measure of North. Over the years, at international forums, the tone of argument has changed to luxury emissions versus life-sustaining emissions in case of the Montreal Protocol and historical contributions versus development emissions in case of climate protocol at international forums. Perceptions at domestic level such as that it would be better to have few grams of DDT in the blood rather than malaria have influenced the political decision-making as well the implementation of environmental legislation. However, there is slight change observed after the Bhopal catastrophe on account of changes in perceptions. Coupled with these perceptions, the other vital aspect that influences the environmental governance is lack of required scientific information to assist the nation to draw coherent conclusions of the various global environmental problems. Together, these factors made the efforts towards sustainability half-hearted one in India so far, and appears that this trend will continue for a while. This paper attempts to present a critical examination of these issues with specific case study of India's environmental policies towards sustainable development.

16:45-17:00

BREAK

PANEL SESSIONS

17:00-18:30

PANEL E.1—LOCAL BELIEF SYSTEMS

Chair and Discussant:

Dr Angela Oels, Department of Political Science, University of Hamburg, Germany

Room: N.N.

MALA, WILLIAM ARMAND/DIAW, MARITHEUW CHIMÈRE

Centre for International Forestry Research, West and Central Africa Regional Office,
Cameroon

*Local Perceptions at the Forest-Agriculture Frontier in Southern Cameroon:
Tools for Decision-Making and Adaptation*

The Congo Basin has the world's largest rainforest after the Amazon. Its importance and potential for biodiversity conservation, sustainable development, policy-making and livelihoods is well documented. At the intersection of the main streams of this scientific production, this paper addresses the central question of landscape change and forest-agriculture relations. Based on research conducted in Southern Cameroon since 1998, it describes the way people perceive and manipulate forest elements at the agriculture frontier, an interface characterised by both its 'diversity' and its 'unity'. The paper shows how social representations and the belief and cultural system are embedded in the interactions between people, forest components and uses and how this affect decision-making and adaptation. The paper tackles the issue of social feasibility and recommends that scientific knowledge on social ecology should be converted into strategic material for the scientific articulation of agriculture and forest through the recognition of local knowledge and adaptive agro-ecological improvement.

QUINN, CLAIRE

Department of Social Policy and Social Work, University of York, Heslington, United Kingdom

Livelihoods, Gender and Local Perceptions of Risk in Semi-arid Tanzania

Common Pool Resources are of wide importance to rural communities in semi-arid Tanzania and many rely on them to provide at least part of their livelihoods. A fences and fines approach has previously been used to protect natural resources from perceived degradation but current thinking is now focused on participatory approaches to resource management. The purpose of this paper is to examine perceptions of risk by rural communities through analysis of risk questionnaires. Often development projects have been based on researchers' preconceptions or anecdotal assessment of the risks. In this study heterogeneity in risk perception was found for what would seem to be a homogenous group with perceptions influenced by both livelihood and gender. Therefore, development projects that seek to improve livelihoods need to have a clear understanding of the risks faced by their target groups if they are to be successful. Examining perceptions of risk provides one way of identifying priorities. This may help to improve the success rate of projects if they seek to address and reduce the risks faced by communities.

DAVIDSON, DEBRA J./STEDMAN, RICHARD C./WELLSTEAD, ADAM M.

Assistant Professor, College of Agricultural Sciences at Penn State University, PA, USA/Assistant Professor, University of Alberta, Canada/Northern Forestry Centre, Canadian Forest Service, Canada

Assessing the Potential for Policy Responses to Climate Change

Our research examines the role of knowledge and policy oriented belief systems in climate change decision-making within Canadian Prairie policy regimes. An online survey of over 700 policy elites in agricultural, forestry and water sectors examined policy relevant belief systems and considered the probable policy responses to climate change and related scientific information. Several bodies of scholarship were employed to develop this research. In particular, the policy community/network analysis and the advocacy coalition framework models, as well as risk perception research were utilised. Policy networks that identify knowledge and power exchanges are identified using similar methods employed by Knoke, Laumann and other European social scientists. This network analysis is combined with another body of research, the advocacy coalition framework (ACF). The ACF examines policy change according to a set of well-defined research hypotheses that describes the role and relevance of policy

oriented beliefs. In this study both the results of the research are presented as well as commentary on the role of methods required to understand the inter-relationships between regional, national and international policy actors in influencing the decision-making process in other contexts.

SAARIKOSKI, HELI

Department of City and Regional Planning Cardiff University, Wales, United Kingdom

When Frames Conflict—Potential for Collaborative Dialogue in Stubborn Environmental Policy Controversies

The role of conflicting frames in intractable environmental policy controversies is emphasised in recent literature on environmental policy-making. The argument is that the environmental conflict does not appear as primarily a conflict over certain interests or values but a conflict over definition and meaning of environmental problems. Furthermore, it is argued that these conflicts are immune to resolution by appeal to facts because frames determine what counts as a fact and what interpretations are taken to be relevant. This paper analyses the concept of frame conflict in environmental policy-making through a case study on a policy dialogue concerning waste management and the related question of natural resource use. The analysis suggests that discordant frames indeed play an important role in the persistency of waste policy controversies. However, it seems that some of the controversies rooted in different belief systems are in fact more amenable to solution through joint fact-finding than controversies which are based on opposite interests. The paper suggests that contrary to a common assumption, new evidence can sometimes be instrumental for reflexive dialogue across different frames.

17:00-18:30 **PANEL E.2—GLOBAL KNOWLEDGE, LOCAL PRACTICE (III)**

Chair and Discussant: N.N.

Room: N.N.

LOCATELLI, BRUNO/SALINAS, ZENIA

CIRAD Forêt, France/Centro Agrónomico Tropical de Investigación (CATIE), Costa Rica

Distribution of Knowledge Related to Climate Change and Forestry in Central America

Developing countries may play an important role in the context of climate change. The forestry sectors of these countries can participate in the mitigation of climate change, through carbon sequestration and through biomass energy production. Tropical forest ecosystems can improve the adaptation to climate change impacts, for example through watershed protection and biodiversity conservation. For allowing the participation of the national forestry sectors to climate change mitigation and adaptation and the development of adequate national policies and local forestry projects, a certain level of knowledge is required. A study was conducted in 2001 on 120 persons of the forestry sectors of Costa Rica, Nicaragua, El Salvador, Honduras and Guatemala to evaluate the level of knowledge on these themes. The results show the distribution of the knowledge among institutional groups (governments, international, development organisations, NGO, private sector, organisations of producers, education and research). The distribution of the knowledge by topics and by group is compared to the level necessary for allowing each group to play his specific role. The current situation is compared with the past national training efforts, in order to analyse the impacts of information dissemination and capacity-building events. The paper concludes on the necessary future efforts for each country and each institutional group.

DAVIDSON, DEBRA J./PARKINS, JOHN/WILLIAMSON, TIM

Assistant Professor of Sociology, Department of Rural Economy, University of Alberta/PhD Candidate, Department of Sociology, University of Alberta and Canadian Forest Service/PhD Candidate, Department of Rural Economy, University of Alberta

and Canadian Forest Service, all Canada

Climate Change and Risk Perception in Forest-based Communities

Much research attention regarding climate change has been focused on the macro-physical and to a lesser extent the macro-social features of this phenomenon. An important step in mitigation and adaptation will be to examine the ways climate change risks manifest themselves in particular social localities. Certain social groups may be at greater risk, not solely due to their geographic location in a region of high climate sensitivity, but also due to economic, political and cultural characteristics. We combine the insights of economics and sociology to offer an analysis of the social particularities of climate change risk to forest-based communities, suggesting that these communities may represent a particularised social context in regard to climate change. Five features of forest-based communities describe this context: the limited adaptive capacity of forest-based communities; tendencies to underestimate the risks associated with climate change; the potential for forest protection to be defined as a priority mitigation strategy in national and international environmental politics; the nature of commercial forestry decision-making; and the multiplicity of climate change risk factors in forest-based communities.

PERGOLA, TANYA

Co-Director, Terrawatu, Arusha, Tanzania

From Subsistence to Sustainable Lifestyles: Is Psychological Leap-frogging Possible?

Those working in green-business communities talk about 'leap-frogging' technologies, e.g. moving from no electricity to solar-powered systems. But what about the associated psychological leap that is often necessary for sustained adaptation to new lifestyles? For example, in many Third World towns, recent migrants are more interested in adapting lifestyles they understand to be 'Western/modern' than using practices their fathers used, as they feel shameful about their 'primitive' practices. On one level, we are advocating for a return to subsistence lifestyles that many in Tanzania are trying to break out of. Using examples from our work in Arusha Region, this paper argues that understanding the social-psychological dynamics of people in less-developed areas is important for learning why many development projects fail; and how to improve upon the interaction between North and South global community workers in the area of sustainable development. I point out that the 'sustainability' conversation does seem to be advocating something different—some hybrid combination of indigenous 'earth friendly' know-how with ultra-modern technological innovations we have worked so hard for. Some of our collective work now should be focused on how to 'package' this story in a way that makes sense to those who have a chance to leap from subsistence to sustainable lifestyles.

ROLL, GULNARA

Peipsi Centre for Transboundary Cooperation—Peipsi CTC, Estonia

Information and Communication Strategy for Implementation of the EU Water Policy in Transboundary Water Basins: A Pilot Study for Lake Peipsi Basin

In the context of globalisation and emergence of the new economy, research on producing usable knowledge as knowledge that will enhance our ability to control human actions that cause or threaten to cause disruptive changes in human-dominated ecosystems becomes a critically important direction of the research in policy implementation. It is a common practice all over the world that experts work and produce a growing amount of information but users cannot use this information; and this remains to be a major bottleneck in implementing environmental and development policies on all levels of governance—from local to global. The paper will present results of research on information dissemination and interactive planning in implementation of the EU Water Policy on transboundary waters in Europe conducted by Peipsi CTC within the MANTRA East research project. The study included an assessment of information needs of decision-makers and stakeholders, an interdisciplinary research of approaches to information dissemination and communication in implementation of environmental policies; and an Internet based demonstration prototype for information exchange

and communication aimed to support implementation of the EU water policy in the project pilot water basin of Lake Peipsi.

15:45-17:15 **PANEL E.3—SUSTAINABILITY SCIENCE: APPLICATION AND OPEN QUESTIONS (II)**

Chair and Discussant: N.N.

Room: N.N.

BLÄTTEL-MINK, BIRGIT

IfS-Abteilung für Arbeits- und Organisationssoziologie, University of Stuttgart, Germany

Analysing Sustainability Research: Towards a Conceptual Framework

Studying research reality in the field of sustainable development in Germany we identified mainly disciplinary reasons that prevented transdisciplinarity or Mode 2 research: disciplinary codes and disciplinary world views. Taken these results it becomes clear that communication is crucial for sustainability research but in what way? I want to develop a theoretical frame that enables us to analyse sustainability research and its barriers. Therefore I wish to confront two approaches: organisational learning and (interorganisational and interindividual) network research in relation to their capacities to explain barriers of transdisciplinarity.

MICHAELS, SARAH

School of Planning, University of Waterloo, Canada

Applying Knowledge Management to Sustainability Science: Watershed Lessons

A knowledge management framework affords an insightful means to explore how an institution and the actors associated with it influence the creation, acquisition, representation, transfer and application of sustainability knowledge. Knowledge management is about how an institution, including its associated networks, uses its intellectual or knowledge-based assets to create more efficient and effective processes for executing its mandate. Bounded rationality, communicative action, network analysis, discourse analysis and participatory democratic theory all inform the conceptual framework of knowledge management. The utility of this framework for understanding the influences on generating, distributing and using sustainability knowledge is evaluated through a case study approach. The flow of sustainability knowledge is traced through a Canadian conservation authority recognised internationally for its innovation in watershed management. Using the watershed as the unit of analysis provides an opportunity to critique efforts to forge a watershed science. Like sustainability science, watershed science is built on the premise of adaptive environmental management, strives to be practitioner-driven, problem-oriented, internationally connected, locality based and multidisciplinary. Creating and sharing knowledge is fundamental to both sciences. Consequently, there are applicable lessons to draw from watershed science to sustainability science about what works and what does not.

BOEHMER-CHRISTIANSEN, SONJA

Faculty of Science, Hull University, United Kingdom

The Danger of Policy-relevant Science: Is 'Sustainability Science' a Threat to Humanity?

Given the dependence of sustainability science research on large scale funding, scientific institutions themselves have become deeply involved in politics. In striving to be perceived as policy relevant, these institutions tend to appeal to populist ideologies (green alarmism), commercial and political opportunism and the often manipulated 'concerns' and dreams of 'civil society' lobbies. I ask who claims that there is a global environmental crisis and what opportunities this holds for contemporary political systems allegedly calling for the 'underpinning' knowledge base. Promising sustainability based on 'scientific principles' raises profound ethical questions for science. Given the

current human condition, this promise is likely to weaken science further in public esteem because it tends to replace the search for truth with that for favour by offering solutions to problems that may not exist or not be 'solvable' in the real world. I will illustrate this interpretation of the science-politics link with reference to the transformation of IPCC reports into policy-makers summaries and their use in contemporary energy politics. Science mixed with ideology and in search of policy relevance is in danger of becoming perverted a servant of power rather than truth, seeking relevance without responsibility. It is likely to be the long-term loser.

17:00-18:30 **PANEL E.4—KNOWLEDGE FOR ACTION: REGIONAL AND NATIONAL CAPACITY-BUILDING (II)**

Chair and Discussant: N.N.

Room: N.N.

REBORI, MARLENE K.

Community and Organisational Development, University of Nevada, USA

The Role of Community Capacity in Helping to Bridge the Global-Local Divide in Environmental Decision-making

Evolving trends in devolution, decentralisation and regionalism throughout the western world are giving rise to the increasing role of community in all avenues of political decision-making, especially environmental decision-making. Rather than setting policies from a centralised hierarchy, many countries are devolving environmental decision-making to regional and local communities. Environmental decision-making generated from the community level is more innovative and efficient and thus better able to foster a transition to one level of sustainability. Transitioning to sustainability through community capacity helps to bridge the local global divide by recognising existing and diverse forms of knowledge. In a community capacity approach to sustainability, what is required is not new forms of knowledge, but recognising the necessity of new ways of conducting business. Most importantly, this requires creating a network of relationships between global and local partners to demonstrate leadership and support for a community driven process.

BRUECKNER, MARTIN

Centre for Ecosystem Management, Edith Cowan University, Western Australia, Australia

Trees, Science and Public Processes: A Western Australian Experience

Since the 1960s the native forests of Western Australia have been subject of much heated debate and controversy between conservationists, the State's timber-dependant industries and successive governments. The forest conflict was also national in scope and increasingly became politically precarious. In 1992, in an attempt to resolve the forest dispute, the Commonwealth and all State and Territory governments agreed to commit to a Regional Forest Agreement (RFA) process, which meant to deliver resource security for timber industries, protection of natural and cultural forest values and ecologically sustainable forest management. The RFA processes were promised to be highly scientific and to be based on the best knowledge available. Yet, despite a strong involvement of the scientific community, the Western Australian RFA process and its outcomes were widely rejected by the Western Australian public and scientists themselves. The question is thus whether a lack of scientific credibility led to political failure. This paper examines the role of science and scientists during the Western Australian RFA through the analysis of RFA-related discourses. Also, consideration is given to the question how science might be used more constructively in democratic processes by the governing institutions and what role science 'ought' to play in the quest for sustainability.

IDINOBA, PHILIP A.

Inland Valley Consortium, WARDA/ADRAO, Côte d'Ivoire

Beyond Rhetoric to Building Sustainability Knowledge Bridges and Capacity for Natural Resource Management in Inland Valley Watersheds

Feeding the growing African population through rapid agricultural development while preserving the natural resources base has been an objective of partners involved in the African dilemma for over four decades. Efforts at improving agricultural production especially in watersheds environment has witnessed increasing resource and environmental degradation. In Africa, the failure of sustainable environmental management is not as much of absence of policy intervention as it is of lack of human capital development and community capacity building for sustainability knowledge generation, distribution and use. The transition to sustainable agriculture and environmental management would require the development of sustainability knowledge base among local communities, integration of the objectives of actors which calls for institutional flexibility as well as building strong partnership between research-extension-farmers' organisation. This paper examines the existing gaps in sustainability knowledge generation and diffusion amongst partners, while highlighting the need for greater integration of the social (social science) component of African rural communities and their livelihood (agricultural science). Also, the paper argues that sustainability in agriculture will remain rhetoric in the absence of well-developed human and social capital at the communities level and proposes participatory learning and action research for social and human capital development.

17:00-18:30

PANEL E.5— KNOWLEDGE DISSEMINATION: THE ROLE OF THE MEDIA

Chair and Discussant: N.N.

Room: N.N.

BOYKOFF, MAXWELL T./BOYKOFF, JULES M.

Environmental Studies Department, University of California, Santa Cruz, CA/ Department of Government, American University, Washington DC; both USA

Bias As Balance: Global Warming and the US Prestige Press

Despite the Intergovernmental Panel on Climate Change's (IPCC) assertion that anthropogenic activities have had a 'discernible' influence on the global climate, significant and concerted international action has not been taken to curb practices that contribute to global warming. In other words, the IPCC scientific discourse has not smoothly translated into popular discourse. This paper demonstrates that the US prestige press—meaning the New York Times, the Washington Post, the Los Angeles Times and the Wall Street Journal—has contributed in significant ways to this failed discursive translation. This failure is an accumulation of tactical media responses and practices guided by widely accepted journalistic norms and values. Through a content analysis of US prestige press coverage of global warming from 1988 to the present, this paper focuses on one such value—balanced reporting—and demonstrates how the prestige press's adherence to the norm of balanced reporting actually leads to biased coverage. Such bias, masked as journalistic balance, facilitates the US government's persistently obdurate stance regarding global warming, a minority position among the nations of the world.

STEHLÍKOVÁ, DZAMILA

Department of Social Sciences, Faculty of Environmental Studies, University of Jan Evangelista Purkyně, Ústí nad Labem, Czech Republic

Mass Media as Mediator in Urban Environmental Conflicts and Its Impact on Local Political Decision-making: The Experience of the Czech Republic

Czech local governments have strengthened their autonomy in the 1990s. Here, in many cases sustainability tends to be seen as a barrier to the use of some resources or to the creation of locality attractiveness in economic sense. The lack of policy training and environmental knowledge in local policy makers includes deprecation of normative issues and public values other than the economic impact of decision-making. The only concrete example of environmental policy discussion in 2002 in Chomutov (North Bohemia) is that of plan to build a shopping centre and kidland on the territory of the biggest wildlife park in Czech Republic. Fortunately, this plan has been rejected. All observers seem to agree that television, newspapers and other mass media has had a decisive impact on politicians' decisions on the wildlife park in Chomutov and other urban environmental conflicts. These cases suggest that public opinion and ethical considerations in environmental policy are at least as important as technical issues. Discourses of sustainability—ways of talking and thinking about sustainability in the Czech republic—have changed over last 13 years. Within the discourse of sustainability some things cannot be done. The dominant discourses have an effect similar to that of ethical norms or even ideology.

KARMANSKI, ANDREAS

Environmental Policy Research Unit, Free University of Berlin, Germany

Improving the Knowledge Transfer Between the Social Sciences and Environmental Policy Actors Regarding Sustainability Strategies

The knowledge transfer between the (social) sciences and political or societal actors is often perceived as deficient in different respects. Among the most frequently mentioned problems are difficulties of mutual understanding of scientists and practitioners involved, lack of political or social relevance of transferred research findings and the 'one-way' character of many transfer practices. Based on literature reviews, internet inquiries and expert workshops the paper identifies restrictions and approaches to an improved dissemination of the results of social environmental research. It focuses on the improvement of communication processes regarding sustainability strategies. Among the identified approaches are the development of specific communication strategies for individual target groups and the use of the specific possibilities of the (new) media for knowledge transfer. Recommendations concerning the improvement of (social science based) environmental communication are made on the basis of the discussion of the identified approaches. The results presented are based on a research project financed by the German Environmental Protection Agency.

17:00-18:30 **PANEL E.6—KNOWLEDGE FOR DECISION-MAKING AT THE LOCAL LEVEL (II)**

Chair and Discussant: N.N.

Room: N.N.

MASANJA, ALOYCE L.

University College of Lands and Architectural Studies (UCLAS), Department of Urban and Regional Planning, Dar es Salaam, Tanzania

Knowledge and Political Decision-making in Africa: The Case of Tanzania

This paper analyses the ways in which existing knowledge 'technologies' influences political decision-making in African countries. The paper discusses discourses or belief systems and the ways in which political actors respond to the global environmental crisis. The discussion starts from the premise that we are witnessing a shift to the use of access to modern technology as the main vehicle for existing control over productive activities of Third World countries. The paper answers questions such as: Are there dominant discourses and ideas that prevent Africa from reaching a more sustainable development? Does 'science' and modern technology in itself lead to sustainable development paths? How can democratic political institutions manage to live with? The paper then summarises key science and development issues that affect and influence political decision-making including existing innovative technologies that are suit-

able for use on small farms, in small scale industries by community organisations and being developed by groups outside the traditional research and development establishment.

WAHL, LISSIE

Instituto de Investigaciones de la Amazonía Peruana (IIAP), Peru

Natural Resource Management and Everyday Forms of State Formation: The Nanay River Basin in the Peruvian Amazon

Natural resource legislation in the Peruvian Amazon is among the most technically advanced in all of Latin America. At the same time, when compared with those of the remaining Amazon countries, the forest and biodiversity resources of the Peruvian Amazon remain among those in the best state of conservation. This, however, does not constitute a product of the first. The sophistication of current natural resource legislation in Peru does not underlie the present state of conservation of natural resources in the Peruvian Amazon. It is very possible, moreover, that just the opposite may occur in the short term. In the context of current political economic forces, the legislation actually in existence in Peru places the Amazon before the greatest risks in all of its existence with regard to the future of its biodiversity. This paper examines the relationship between natural resource management and everyday processes of state-formation in the Peruvian Amazon, focusing on the case study of the Nanay River Basin in Loreto. It argues that, as important as the scientific knowledge underlying sustainable legal strategies of natural resource use and management, are the social mechanisms of decision-making and construction of knowledge underlying such public policies.

SCHIPPER, EMMA LISA

Tyndall Centre for Climate Change Research, School of Development Studies, University of East Anglia, United Kingdom

Between International and Local: Understanding How Adaptation to Climate Change Can Promote Development

This paper addresses differences in understanding of policy-issues surrounding the concept of adaptation to climate change. Based on a case study in El Salvador, the paper asks why interpretations of needs and awareness of possibilities for the implementation of adaptation measures on a local level are not well understood by the international climate change community; what the impacts are of poor transmission of internationally established natural and social scientific information to the local level; why the local level is dependent on the awareness of this information on all levels; and what role the intermediate levels play in distorting or changing the information about the causes of climate change. El Salvador is a country with great discrepancies in wealth, education and political beliefs. It is also a country with frequently occurring seismic and climatic events and a highly vulnerable population, predominately composed of rural farmers. This paper argues that social and economic development of El Salvador is strongly linked to the ability of this country to adapt to its climatic circumstances and changes, with an emphasis on long-term risk management. The lack of understanding between the local, national and international levels on what causes climate change hinders the implementation of possible adaptation measures and thereby impedes sustainable development.

CHIKOORE, HECTOR

Meteorological Services, Harare, Zimbabwe

Seasonal Climate Prediction and Changing Socio-economic Factors: Challenges for Decision-making in Southern Africa

Recurrent droughts and floods are among many challenges facing agricultural and environmental management and socio-economic development in Southern Africa. In response, regional climate outlook forums evolved since 1990 and brought together research scientists, climate forecasters and climate information users. The forums train forecasters and users in the formulation of climate outlook guidance, its applications and limitations. Pilot studies show that information dissemination is effective in reaching

smallholder farmers who are resource poor and farm in marginal environments using rain dependant methods. However, the defect is in getting the right information across. Farmers' limited understanding of climate forecasting science, low forecast skill, poor timing and inappropriate forecast content inhibit linking forecasts with decision-making. Besides climate forecast information, other socio-economic factors—e.g. market forces, access to credit and economic hardships—exist which override the science. Political factors, e.g. policies on land tenure, have pivotal influences on decision-making. Climate experts have raised policy-makers' awareness of the importance of climate information in agricultural management and the need for proactive disaster management and adaptation strategies for environmental change.

17:00-18:30 **E.7—THE ROLE OF KNOWLEDGE IN NATIONAL ENERGY POLICY**

Chair and Discussant: N.N.

Room: N.N.

VARHO, VILJA

University of Helsinki, Finland

Knowledge and the Role of Experts in Wind Power Sector Development and Policy-making in Finland

Wind power is still a marginal field within the energy sector in Finland. Currently it relies heavily on public policy measures, but is believed to have considerable potential in reaching environmental and economic goals. This study is based on interviews of a number of experts and policy-makers. The first part of the paper discusses the way knowledge is produced and distributed by the wind power sector and policy-makers in Finland. Different types of knowledge were seen as necessary for the development of the sector, but all this knowledge is not necessarily policy-relevant. Still, there seems to be a consensus that also such research should receive public funding. The second part of the paper discusses the cultural and topical reasons for actors on the Finnish wind energy sector to emphasise their objective expertise and to refrain from discussing ideological issues.

NAUMANN, EKKEHART

Consultant, Vienna, Austria

Democratisation of Energy Service Supply: A Hen and Egg Problem?

It is a democratic right that further 75 per cent of the world population is to be included into the development strategies, including provision of (basic) energy service. This would cause an environmental collapse of the globe, if it would simply mean extending the traditional energy service patterns. Renewable Energy Technologies provide the only solution to increase energy service without causing environmental disasters. Why this strategy is nearly not realised up to today? The paper will highlight that in South Africa, Mandela's strong political will was translated into an effective programme for rural electrification, that an appropriate political, institutional and financial framework is of paramount importance for such a programme and that including private industry from the beginning is prerequisite for success of such programmes. Progress in decentralised energy service supply is creating such framework, but creation of the framework is prerequisite for implementation of decentralised energy service. Experience gained from Zimbabwe, Tanzania, Nepal, India and other countries will illuminate possible ways out of this dilemma.

NIKITINA, ELENA

Institute of World Economy and International Relations, Russian Academy of Sciences, Moscow, Russia

Evolution in Perceptions and Approaches to Climate Policy in Russia: Linkages

between Environmental and Economic Goals

During the last decade climate policies have evolved in Russia, and Russia has turned to be an important player in international climate change regime. This process was accompanied by significant evolution in approaches of the government, business and scientific communities and in institutional responses to climate change mitigation and adaptation. The core has been in combination of environmental and economic goals (including economic growth concerns) which ultimately affected decision-making regarding Russia's participation in the climate change regime, including recent delays in Russia's decision on ratification of the Kyoto Protocol. The paper analyses dynamics in perceptions of key actors at major stages of climate policy formation and assesses to what extent economic or environmental concerns or their combination governed positions within each group and what outcomes they had for national and international policy-making. The paper evaluates the institutional design of the Green Investment Scheme suggested by Russia as a mechanism for sustainability transition in implementation of the Kyoto Protocol, and to what extent economic and environmental interests of actors are reflected in it.

18:30

ADJOURN

20:00

DINNER