



2006 BERLIN CONFERENCE ON THE HUMAN DIMENSIONS OF GLOBAL ENVIRONMENTAL CHANGE

**“Resource Policies:
Effectiveness, Efficiency, and Equity”**

Berlin, 17-18 November 2006

PROGRAMME

Conference Venue

The 2006 Berlin Conference on the Human Dimensions of Global Environmental Change will be held at the Freie Universität Berlin.

You will find the **registration desk**, the **lecture hall (Room 1)** and **Room 2** in the

Institute for Chemistry and Biochemistry – Anorganic Chemistry
Fabeckstr. 34
14195 Berlin

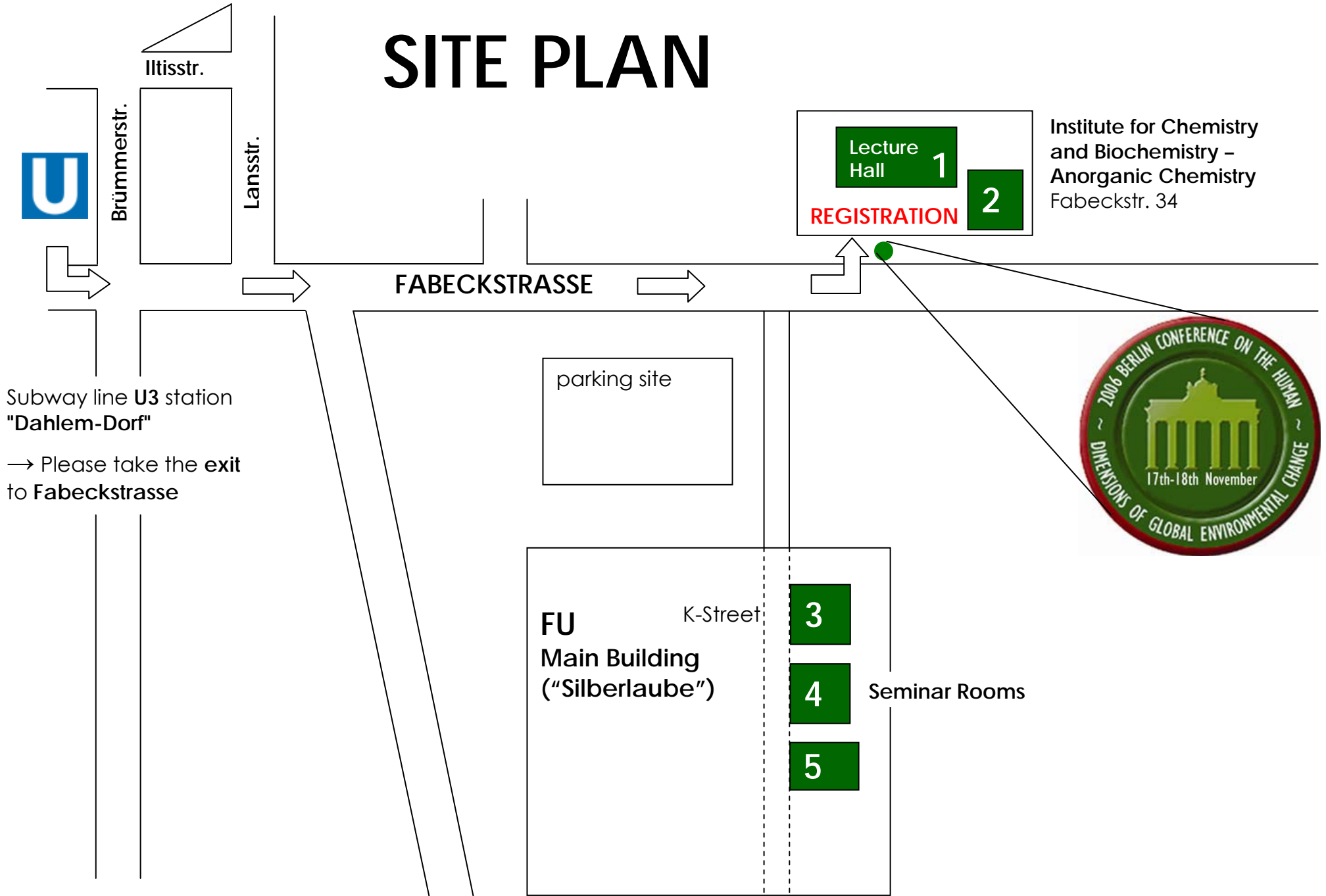
You can reach the venue taking the U-Bahn (subway) line U3 (direction "Krumme Lanke"). The next subway station is "Dahlem-Dorf".

All plenary sessions on Friday and Saturday will take place in the same building.

Room 3, 4, and 5 where some of the panel sessions will take place can be found in the main building of the FU (the so-called "Silberlaube") in close vicinity to the lecture hall.

Please consult the site plan below for further information about the exact location of your panel.

SITE PLAN



Institute for Chemistry and Biochemistry – Anorganic Chemistry
Fabeckstr. 34

Subway line U3 station "Dahlem-Dorf"
→ Please take the exit to Fabeckstrasse



Fri, 17 Nov 08:00-09:00	Registration				
09:00-09:30	WELCOME ADDRESSES <i>Klaus Jacob, Environmental Policy Research Centre</i> <i>Werner Vöth, Vice President of the Freie Universität Berlin</i>				
09:30-10:00	„GOVERNING ENVIRONMENTAL FLOWS“ <i>Martin Jänicke, Freie Universität Berlin</i>				
10:00-10:45	Meet your Colleagues Session – Extended Coffee Break				
10:45-12:00	“MANAGING AN EXPLOSION?” <i>Marina Fischer-Kowalski, Institute of Social Ecology, Vienna</i> “DISCOUNTING AND THE ROLE OF RELATIVE PRICES IN LONG-TERM ENVIRONMENTAL ISSUES” <i>Thomas Sterner, University of Gothenburg</i>				
12:00-13:15	Lunch Break				
13:15-14:45	Panel A.1— Resource Management (I): Agriculture	Panel A.2— Resource Policies: European and National Strategies	Panel A.3— Monitoring and Assessment (I)	Panel A.4— Institutional Innovations: Role and Transformation of the Nation State	Panel A.5— Participatory approaches (I)
14:50-15:40	“CREATING AN INTERNATIONAL PANEL ON RESOURCE USE” <i>Inhee Chung, UNEP, Division of Technology, Industry, and Economics</i> “RESOURCES, SCENARIOS, AND APPROACHES FOR EFFECTIVE CLIMATE POLICIES” <i>Antonio Pflüger, International Energy Agency</i>				
15:40-16:00	Coffee Break				
16:00-17:30	Panel B.1— Resource Management (II): Biodiver- sity	Panel B.2— Transport	Panel B.3— Monitoring and Assessment (II)	Panel B.4— Teaching	
17:45-19:15	Panel C.1— Resource Management (III): Fishery	Panel C.2— Sectoral Modernisation	Panel C.3— Institutional Innovations: Transboundary Water	Panel C.4— Participatory Approaches (II)	Panel C.5— Resource Management (IV): Biodiversity (II)

Sat, 18 Nov 8:45-09:00	Registration (continued)				
09:00-10:30	Panel D.1— Climate Change Policies	Panel D.2— Resources and Security: Energy	Panel D.3— Institutional Innovations	Panel D.4— Resource Management (V): Reforming the Water Sector	
10:30-10:45	Coffee Break				
10:45-12:15	<p>“REDUCING RESOURCE FLOWS: PRICES, INFORMATION AND MARKET FAILURE” <i>Paul Ekins, PSI London</i></p> <p>“CREATING ECONOMIC GROWTH FROM A CLIMATE CONSTRAINT” <i>Chris J. Mottershead, BP Group</i></p>				
12:15-13:30	Lunch Break				
13:30-14:45	<p>ENERGY SECURITY AND SUSTAINABILITY- WHAT COUNTS MOST? <i>Claudia Kemfert, German Institute for Economic Research (DIW Berlin)</i></p> <p>“TOWARD UNDERSTANDING GLOBAL TENSION: NATURAL RESOURCES AND COMPETING ECONOMIC HISTORIES” <i>Daniel Bromley, University of Wisconsin</i></p>				
15:00-16:30	Panel E.1— Resources and Development	Panel E.2— Resources and Property Rights	Panel E.3— Resource Management VI: Forestry (I)	Panel E.4— Resource Use and Policies	
16:30-17:00	Coffee Break				
17:00-18:30	Panel F.1— Resource Management (VII): Biodiversity (III)	Panel F.2— Resource Policies: European and national Strategies (II)	Panel F.3— Resource Management (VIII): Forestry (II)	Panel F.4— Land Use Policies	Panel F.5— Resource Management (IX): Water
18:30-19:15	<p>“ONE PLANET BUDGETING WITH THE ECOLOGICAL FOOTPRINT: OPPORTUNITIES AND LIMITATIONS” <i>Mathis Wackernagel, Global Footprint Network</i></p>				
19:15	Adjourn				
20:30	Dinner in traditional restaurant (by invitation)				

Conference Themes

Theme 1 Resource Management

Friday 17th	Panel A.1	Agriculture	Room 1
	Panel B.1	Biodiversity (I)	Room 1
	Panel C.1	Fishery	Room 4
	Panel C.5	Biodiversity (II)	Room 1
	Saturday 18th	Panel D.4	Reforming the Water Sector
Panel E.3		Forestry (I)	Room 4
Panel F.1		Biodiversity (III)	Room 3
Panel F.3		Forestry (II)	Room 4
Panel F.5		Water	Room 5

Theme 2 Policy Strategies

Friday 17th	Panel A.2	European and National Strategies (I)	Room 2
Saturday 18th	Panel E.4	Resource Use and Policies	Room 1
	Panel F.2	European and national Strategies (II)	Room 1
	Panel F.4	Land Use Policies	Room 2

Theme 3 Participatory Approaches

Friday 17th	Panel A.5	Participatory approaches (I)	Room 5
	Panel C.4	Participatory Approaches (II)	Room 5

Theme 4 Monitoring & Assessment

Friday 17th	Panel A.3	Monitoring and Assessment (I)	Room 3
	Panel B.3	Monitoring and Assessment (II)	Room 3

Theme 5 Institutional design

Friday 17th	Panel A.4	Institutional Innovations (I): Role and Transformation of the Nation State	Room 4
	Panel C.3	Institutional Innovations (II): Transboundary Water	Room 3
Saturday 18th	Panel D.3	Institutional Innovations (III)	Room 3

Theme 6 Teaching

Friday 17th	Panel B.4	Teaching	Room 4
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Theme 7 Resources & Security

Saturday 18th	Panel D.2	Resources and Security: Energy	Room 2
	Panel E.1	Resources and Development	Room 3
	Panel E.2	Resources and Property Rights	Room 2

Theme 8 Sectoral and corporate strategies

Friday 17th	Panel B.2	Transport	Room 2
	Panel C.2	Sectoral Modernisation	Room 2

Theme 9 Climate Change

Saturday 18th	Panel D.1	Climate Change Policies	Room 1
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FRIDAY, 17 NOVEMBER

08:00-09:00 Registration

PLENARY SESSION I

Chair: Klaus Jacob, Freie Universität Berlin
Room 1 (Lecture Hall)

09:00-09:30 WELCOME ADDRESSES:

KLAUS JACOB

Freie Universität Berlin, Environmental Policy Research Centre

WERNER VÄTH

Vice President of the Freie Universität Berlin

09:30-10:00

MARTIN JÄNICKE

Freie Universität Berlin, Environmental Policy Research Centre
"Governing Environmental Flows"

10:00-10:45

Meet your Colleagues session - Extended Coffee Break

PLENARY SESSION II

Chair: Per-Olof Busch, Freie Universität Berlin
Room 1 (Lecture hall)

10:45-12:00

MARINA FISCHER-KOWALSKI

Institute of Social Ecology, Vienna, Austria
"Managing an Explosion?"

THOMAS STERNER

University of Gothenburg, Sweden

"Discounting and the Role of Relative Prices in Long Term Environmental Issues"

12:00-13:15

Lunch Break

PANEL SESSIONS A

13:15-14:45 **PANEL A.1 - RESOURCE MANAGEMENT: AGRICULTURE**

ROOM 1

Chair: HUBERT WIGGERING, ZALF, Germany

PETER H. FEINDT
University of Hamburg, Germany

New agricultural policy patterns in OECD countries: More effective, efficient and equal?

The agricultural policies of industrialised countries have been considered to rank among "the longest running scandals in the civilised world" (Timothy Garton Ash). Stimulating overproduction without encouraging the sustainable use of resources, these policies have repeatedly been criticised for being both ineffective and inefficient. Recent public criticism in the US and the EU has added to the agenda the problem of unequal distribution of subsidies and other benefits. From a global perspective, restricted market access, certain types of domestic support and export subsidies that are part of 'old' agricultural policies contribute considerably to the prolongation of poverty and unequal living opportunities by denying market opportunities to producers in developing countries.

Over the last two decades and under pressure from budget restrictions, world trade talks and public criticism, OECD countries have been widely restructuring their agricultural policies. This paper will analyse the shift of policy patterns and assess if the new type of policies are more effective and efficient with regard to sustainable use of resources and if they can be expected to improve equity on a domestic and global scale.

In the first part of the paper, the shift in agricultural policies will be assessed with regard to policy ideas, instruments and settings, using Peter Hall's concept of policy paradigms. Data are mainly taken from OECD annual country reports. In the second part, the new instruments will be assessed with regard to efficiency, effectiveness and equity. Special consideration will be given to trends that have been introduced with recourse to the concept of sustainable development: decoupling of farm payments and introduction of direct payments; cross compliance; modulation; and agricultural environmental programs. The conclusion will link the results to the patterns of institutional settings of agricultural policy making.

SUNIL NAUTIYAL / HARALD KAECHLE
Leibniz-Centre for Agricultural Landscape Research (ZALF), Germany

Traditional landraces needs policy support for conservation and management of agroecosystems in Himalayas of India

In situ (on-farm) conservation of agrobiodiversity in traditional agroecosystems has gained importance worldwide in the recent past. The traditional agroecosystems are characterized by their dependence on local resources and locally developed technologies and sustainability of agriculture depends great deal on deploying more and more diversity in production systems. In the present study, inventorisation of traditional crop resources was done in Uttaranchal Himalaya taking a watershed of mid-high altitude as a case study. There farmers practice traditional agriculture and traditional landraces of various

crops are grown. Erosion in landraces of during the recent past was documented in detail. Meanwhile the ethnobotanical knowledge related to traditional landraces of paddy was also documented as many of these landraces, besides staple food, are used in traditional healthcare system for various ailments by the local farmers. It was found that farmers possess enough knowledge regarding cropping potential and methods of husbandry used to optimize long-term crop productivity in such marginal areas by maintaining high quality germplasm for changing environmental and cultural demands. However, there is gradual erosion of traditional landraces and associated knowledge due to several factors in the recent past. An institutional and policy support to conserve these traditional crop resources, enhancing their utilization for economic incentives to farmers. Further maintaining and developing the knowledge possessed by the farming communities also need to be emphasized. The satellite data used to analyse the land use cover change in fragile Himalayan Environment.

13:15-14:45 **PANEL A.2 - RESOURCE POLICIES: EUROPEAN AND NATIONAL STRATEGIES**

ROOM 2

CHAIR: ULRICH PETSCHOW, INSTITUTE FOR ECOLOGICAL ECONOMIC RESEARCH, GERMANY

Silke Karcher / Lorenzo Ciccarese
UBA, Germany / APAT, Italy

Delivering the Sustainable Use of Natural Resources: A Contribution from the Network of Heads of European Environment Protection Agencies on the Thematic Strategy on the Sustainable Use of Natural Resources

In December 2005, the EC published its Strategy on Sustainable Use of Natural Resources, a key document for enhancing sustainable development in Europe and other world regions.

European EPAs already play a significant role in tackling unsustainable resource use through their regulatory, advisory and educational work and the research and policy analysis they carry out. This paper aims at supporting the Resources Strategy and draws on this work in identifying both the key challenges ahead and the role the EPA Network can play to deliver sustainable resource use.

The wide interpretation of natural resources as given in the strategy would theoretically embrace all environmental policies. In order to reduce the complexity of the issue, the EPA Network proposes not to focus on traditional and well-established environmental themes and policy areas which are covered by the other priority areas of the 6th EAP, such as water and air, but to focus on the use of renewable and non-renewable materials and land use.

After exposing the current global trends of use of natural resources, the paper expresses specific recommendations pertaining to quantitative targets (particularly for raw material consumption and land-use change). In addition, the paper suggests fundamental principles, which should underpin the Resources Strategy, as well the needs (gather knowledge, assess policies and measures, change economic frameworks, use public procurement, support technology and knowledge transfer, change accountability of ownership and use).

In this respect, the EPA Network will work on: evaluating and establishing a consistent role for the EPA Network members in the development of both National and Sectorial Action Plans; initiating best practice networks and partnerships among EU agencies and with other non-European environmental agencies in the communication of objectives, methodologies, indicators and tar-

gets relating to the Resources Strategy; further refining strategies, specifying indicators and proposing technical, legal, and economic instruments for examining and managing main stream material flows.

RAIMUND BLEISCHWITZ / BETTINA BAHN-WALKOWIAK
Wuppertal Institute, Germany

Outline of a German Resource Policy

The paper scrutinises the background for policy intervention to increase resource productivity, analyses environmental instruments concerning their contribution to resource use, and outlines a resource policy that obviates present deficits and weaknesses.

A first chapter examines the implementation deficits of the German Sustainability Strategy such as insufficiently considering hidden flows of resource use, scarcity of resources and market failure. Deficits in orientation, information, adaptation and cooperation are displayed. It discusses the accentuation of positive externalities like innovation effects and a policy that serves as tool for orientation and extension of scope for evolutionary economic policy, dynamic regulatory policy and the interlocking of environmental, research, economic and innovation policies.

The question how deficits, inconsistencies and coordination weaknesses of present policies may be overcome is addressed within a second chapter. Results of a screening of environmental instruments are presented and an impact and implementation assessment is introduced, thus enhancing the instruments debate. It also discusses innovation-inducing instruments adapted to market development and business management.

A third chapter outlines a possible resource policy. It provides manifestations of present resource productivity potentials and suggests clearance of information deficits through network supporting and support programmes. Existing approaches like recycling management policy, Integrated Product Policy, product and material liability are advanced and interlinked with energy, coal, climate and constructions policies. Technology and innovation policies, sectoral strategies and specific economic incentives may serve as tools on the way to Faktor X.

Conclusions are drawn concerning the internal market in an expanding EU, Europe's future role as location for resource extraction and material intensive production, and the prospective follow-up of the EU resources strategy. An outlook is given towards European and Foreign Policy referring developing countries, here regarding issues of security of supply and development politics, the role of the UN, and multilateral agreements.

STEFAN GILJUM / ARNO BEHRENS / FRIEDRICH HINTERBERGER / CHRISTIAN LUTZ /
BERND MEYER
SERI Wien, Austria / GWS Osnabrück, Germany

Towards sustainable resource use in the European Union: scenario results from the MOSUS project

In the EU project MOSUS (Modelling opportunities and limits for restructuring Europe towards sustainability), a global economy-energy model system was extended by a world-wide database on material inputs, in order to run three different sets of scenarios for European (EU-25) development until 2020: a baseline scenario, without policy intervention, and two sustainability scenarios, simulating the implementation of six packages of policy measures geared towards further decoupling economic activity from material and energy throughput. These included, among others, taxes on CO₂, higher transport

costs, increased material recycling rates, and an increase in material productivity of industrial sectors.

This paper presents the evaluation of the three scenarios with regard to raw material extraction and use on the European and global level. The baseline scenario reveals stable amounts of domestic material extraction (DE) within the EU until 2020 and decreased unused domestic extraction. The stabilisation of DE is accompanied by growing imports of material intensive products, indicating that the resource basis of the European economy is increasingly dependent on imports from abroad. The implementation of the six sustainability policy measures applied in the sustainability scenarios results in an absolute reduction of DE in all European countries and significantly increased resource productivity, with stimulating effects on economic growth and improved competitiveness of European industries on global markets. The results suggest that policy instruments aimed at raising eco-efficiency on the micro level must be accompanied by other policies limiting possible rebound effects on the macro level, in order to achieve an absolute reduction of resource use and related environmental pressures.

On the global level, the baseline scenario predicts a significant growth of resource extraction until 2020, illustrating the growing demand for natural resources of emerging economies such as China and India.

BENJAMIN GÖRLACH / EDUARD INTERWIES / JODI NEWCOMBE
Ecologic, Germany

How are we performing? The Role of ex-post Cost-Effectiveness-Analyses in European Environmental Policies

Economic analysis for policy appraisal is generally about two questions: 'is a given policy objective worth achieving?' and 'If so, what is the most cost-effective way of achieving it?'. While the first question is addressed in a cost-benefit analysis (CBA), the second question can be answered through a cost-effectiveness analysis (CEA). CEA can be applied both as an ex-ante appraisal and as an ex-post evaluation tool. While an ex-ante CEA determines the most cost-effective way of achieving a given target, an ex-post CEA helps to assess whether a policy measure has been effective in addressing the problem it was designed for, and at what cost.

Although some European countries have moved ahead with ex-post evaluation of environmental policy performance in recent years, it remains a relatively recent and rare phenomenon. At the European level, there is little experience with such assessments, or with feeding back their results into policy implementation. With the recent attention for cost-effective environmental policies – as expressed e.g. in the Commission's impact assessments – it can be expected that the role of CEA will increase. The main challenge encountered is to establish the causality between observed effects and influencing factors. Another main issue relates to the scale of the analysis – traditionally, CEAs have mainly been applied to individual measures at the local level. Upscaling the analysis to strategies or policies at European level necessarily increases the uncertainty.

This paper summarises results of the project "Cost-effectiveness of environmental policies", carried out by Ecologic, eftec and IVM for the EEA. Following the structure of this project, it first provides an overview of legal requirements for ex-post CEA in European environmental policy, then surveys existing guidance documents and manuals for ex-post CEAs, and finally summarises the current practice in EU Member States with regard to ex-post CEA of environmental policies.

13:15-14:45

PANEL A.3 – MONITORING & ASSESSMENT I

ROOM 3

CHAIR: ALEXANDRA DEHNHARDT, INSTITUTE FOR ECOLOGICAL ECONOMIC RESEARCH (IÖW), GERMANY

GARY BRYNER
Brigham Young University, USA

Beyond Cost-Benefit Analysis: Promoting Ecological Sustainability in Natural Resource and Environmental Agencies in the United States

Cost benefit analysis (CBA) is widely used in natural resource and environmental policy making at all levels of government in the United States. At the federal level, Congress and the Executive Branch have emphasized CBA in bureaucratic decision making, particularly in formulating and assessing policy alternatives when agencies issue environmental and natural resource rules and regulations. CBA is championed as a way to ensure that policy decisions are economically efficient and consistent with a market-based economy, that only worthwhile projects are undertaken, and that imposing costs does not waste resources that could be put to more productive use. Despite decades of use in natural resource and environmental policy making, however, CBA is still a very problematic decision making framework, for several reasons, including the difficulties in assessing market-based prices for most ecological services and in quantifying and monetizing environmental variables, the subjectivity of decisions about what to include as relevant costs and benefits, and the bias of CBA in favor of easily quantified values, such as industry compliance costs, and against more intangible and hard to quantify ethical values of biodiversity, environmental health, social equity and empowerment of politically disadvantaged groups, and public well being. This paper explores the problems of CBA in environmental and natural resource policy making and examines how concepts from ecological sustainability and ecological science could replace CBA as an analytic framework for evaluating environmental and natural resource policy options. using examples from U.S. agencies as well as European agencies that embrace the idea of environmental policy integration. The ultimate goal of the paper is to propose how CBA can be replaced with an alternative analytic framework that can lead to greater protection of environmental and natural resource values.

ECKHARD STÖRMER / ANNETTE RUEF / BERNHARD TRUFFER
Eawag-Cirus, Switzerland

Planning for Sustainable Sanitation Infrastructures: Ensuring eco-efficient resource use through participatory foresight

The sanitation sector uses and offers resources in two quite different meanings: 1) It ensures water resources by treatment of used water. This process requires further resources e.g. in the form of treatment plants and infrastructure networks. 2) The availability of sanitation capacities is a resource which affects the scope for regional development of settlements and industries.

The traditional infrastructure in industrialised countries is based on the paradigm of slack, long lasting technologies (25-80 years) with limited flexibility. Current forms of governance seem strongly biased towards perpetuating the predominant infrastructure solutions which risk to render future sanitation highly inefficient.

The proposed paper suggests a more sustainability oriented planning method

for this sector. The imminent replacement of plants built in the 1960s/'70s opens a window of opportunity for adequately dimensioned sanitation capacities and new, eco-efficient technological and organisational solutions. These should allow a flexible adaptation to unforeseen future challenges. A participatory foresight process over the life time of the constructions enables the design of robust strategies for the planning of infrastructures.

The proposed instrument induces a learning process on long term strategic decision-making at the interface of public management and regional planning. On the one hand, outcomes are a better understanding of the interdependence of the regional resource of sanitation capacities and regional development in the long run. In a discursive scenario-process, participating stakeholders of the regional sanitation system reflect weak signals of future change and infrastructure's external effects and integrate them into the planning process. On the other hand, the consideration of innovative technologies and new organisational structures widen the scope for action and open the window for eco-efficient and -effective solutions.

This learning process is interpreted as an important part of a transition process to a more sustainable, resource efficient and -effective design of infrastructures.

L. CICCARESE / C. CASCONI / M. GIUNTA / S. CARNEVALINO

Italy's Agency for Environmental Protection and Technical Services, Italy

Sustainable use of natural resources in Italy: measuring effectiveness of policies through decoupling indicators

Sustainable use of natural resources is a sound topic in sectorial policies of both EU and all industrialised countries.

Since 1987, when the Brundtland Commission defined the concept of sustainable development, the need of efficient strategies became essential for developing effective resource policies to guaranty decoupling of "economic goods" from "environmental bads".

In 2000 with the Lisbon strategy European leaders agreed to stimulate economic growth and employment and make Europe's economy the most competitive in the world.

In 2001 EU adopted sustainable development strategy and the sixth environment action programme that expressly calls for 'breaking linkages between economic growth and resource use'.

The Thematic Strategy on Sustainable Use of Natural Resources - COM(2005)670 - emphasizes the importance of integration of environmental concerns into policies that affect environmental impacts of natural resources use. Main objective of the strategy is developing a set of indicators to measure efficiency of economic activity in using resources. By 2008, the Commission will develop indicators to measure progress in efficiency and productivity in the use of natural resources (including energy) and resource-specific indicators to evaluate how negative environmental impacts have been decoupled from resource use (eco-efficiency indicator).

Environmental indicators are based on the Driving Force-Pressure-State-Impact-Response (DPSIR) model and decoupling indicators describe relationships between the first two components of this structure.

In this framework APAT produces the Yearbook of Environmental Data, which also includes eco-efficiency indicators to satisfy needs of information for policy-makers. Eco-efficiency indicators are the basis to construction of decoupling indicators. Examples of such indicators are eco-efficiency in agriculture and energy efficiency in transportation.

In the paper the conceptual approach used to develop decoupling indicators will be described as well as further development of specific indicators, able to measure adequately the progress towards the strategy's objective

demands and to make information available to policymakers and citizens.

SOFIA FRANTZI
University of York, UK

What role does environmental monitoring and assessment play in decision making under international environmental regimes? The case of MED POL programme and the Barcelona Convention.

Monitoring and assessment of trends in resource use and environmental parameters have been the focus of substantial effort on a regional and global scale. However, many questions arise about how these efforts are actually used in policy making. Firstly, there is a question of whether enough reliable scientific evidence is available for accurate environmental decision making in an international regime. Secondly, in the case of sufficient scientific data, it is ambiguous whether these data are taken into consideration by policy-makers. Thirdly, if an environmental regime is not using all the available scientific information, then it is of interest to see what other criteria determine decisions and directions of the regime. This paper examines these issues by using the case study of the Barcelona Convention, which is the legal component of the Mediterranean Action Plan (MAP) created in 1975 under the auspices of the UNEP. The Environmental Assessment Component of MAP aims to provide data for protection of the Mediterranean Sea against pollution through the MED POL programme. The latter started operation in 1975 and continues up to the present day. In addition to training and capacity building activities, it has produced a range of publications concerning pollution of the Mediterranean. Some of its outputs include Databases for Trace Elements and Chlorinated Hydrocarbons of Phase I and II, the Baseline Budget of pollutants releases for the Mediterranean region, the Transboundary Diagnostic Analysis for the Mediterranean region. Concluding, this paper identifies the major importance of environmental monitoring and assessment, however it stresses the difficulties in obtaining a reliable picture of the environment and furthermore in bridging the gap between scientifically correct and politically acceptable decisions.

13:15-14:45 **PANEL A.4 – ROLE AND TRANSFORMATION OF THE NATION STATE**

ROOM 4

CHAIR: N.N.

LAURA NISTOR
"Babes-Bolyai" University, Cluj-Napoca, Romania

How an environmental good governance should look like? The impact of EU on Romania's environmental transition

It is a commonplace that former socialist countries reached the 1990s with a very polluted environmental background due to the communist regime's ideology: heavy industrial production, mono-industrial areas, weak environmental regulations, etc. In the first years of political and social transition such countries usually have realized a so called 'clean-up by default' since polluting branches of the national economy collapsed. Then came the mirage of EU accession conditioned to acquis adoption.

In the present paper, based on the Romanian case I'll explore to what extent the EU can generate a kind of environmental good governance. The main question is whether environmental acquis transposition and structural reforms like institutional restructuring are enough for real improvements? The last EU issued country reports suggest Romania has not been a story of success: envi-

ronmental debt is as serious as corruption, considered the country's main problem. After presenting some longitudinal data about environmental quality in Romania, I'll be mostly concerned about what has really happened regarding the environment since the country has opened the negotiations for EU accession and implicitly began acquis adoption, what Romania did well and what did not at all.

HARI M. OSOFSKY
University of Oregon School of Law, USA

Geographic Approaches to Transnational Regulatory Governance: Lessons from Climate Change Litigation

This paper proposal falls under topic (3): institutional design. The proposed article is the theoretical/normative companion piece to *The Geography of Climate Change Litigation: Implications for Transnational Regulatory Governance*, Wash. U.L.Q. (forthcoming Summer 2006). The piece will explore the implications of the geography of climate change litigation at subnational, national, and supranational levels for transnational regulatory governance. It will begin by examining how a law and geography approach could contribute to theoretical accounts of transnational litigation and its role in transnational regulatory governance, and demonstrating that contribution in the particular context of analyzing climate change litigation. Building from that conceptual framework, the article will then engage questions of narrative, culture, and identity. In particular, drawing from the conceptual approaches of scholars like Keith Aoki and Madhavi Sunder, it will consider how the cultural geography of climate change litigation might impact its role in the transnational regulatory process. Finally, given the significant greenhouse gas contributions of the United States and the increasing efforts at climate change litigation in that country, it will situate the geography of this litigation in the broader context of controversies in the United States over isolationism and exceptionalism. The article will conclude by reflecting upon the climate change litigation as an example of emerging spaces for transnational regulatory governance.

FRANCESCO SINDICO
Universitat Jaume I, Castellón de la Plana, Spain

Climate Taxes and the WTO: Is the Multilateral Trade Regime a Further Obstacle for Efficient Domestic Climate Policies?

Industrialised countries are often required to make unpopular policy choices in order to efficiently tackle climate change. On the one hand, domestic industries might consider national climate measures as an excessive burden that may damage their competitiveness. On the other hand, the public may not be willing to pay a higher price for climate friendly products. Furthermore, an obstacle may arise from other international legal regimes whose goals may be undermined by climate domestic measures. In the paper I will examine this last possibility. In particular, I will assess whether the international trade regime may constitute an obstacle for future domestic climate measures. An affirmative or negative conclusion will be drawn after having answered three crucial questions throughout the paper.

First, have domestic climate measures already clashed with trade regimes? In 2001 the problematic relationship between a taxation scheme adopted by Finland to improve energy efficiency and EC rules on the free movement goods highlighted this possibility.

Second, are taxation schemes still being used in order to tackle climate change? Current climate policies show that not only taxes are being estab-

lished, but that in the future measures based on border tax adjustments are also taken into consideration.

Third, are climate taxes WTO compatible? The analysis of those WTO rules with whom the climate domestic measures may enter into conflict, and the study of the environmental exceptions that could be applied to the climate taxation schemes, will guide our analysis on this point.

In conclusion, trade regimes should not constitute an obstacle for domestic climate measures. However, as the EU example demonstrates, this is not always true. Therefore, proposals able to bridge the goals of the two regimes must be made in order to prevent the WTO from being considered another obstacle for efficient domestic climate policies.

13:15-14:45 **PANEL A.5 – PARTICIPATORY APPROACHES I**

ROOM 5

CHAIR: N.N.

KLAUS HUBACEK / CHRISTINA PRELL / CLAIRE QUINN / MARK REED
University of Leeds / University of Sheffield, UK

Stakeholder selection as precondition for successful participatory processes

There is growing awareness that effective management of socio-ecological systems requires close collaboration between research disciplines, policy-makers and stakeholders at all levels to strike a balance between different perspectives and objectives. To facilitate this, a range of participatory research methods have emerged in recent years that have gained mainstream acceptance in many policy and research circles. However, the limitations of participatory research are increasingly being recognised. For example, participatory research can reinforce existing privileges, and group dynamics can discourage minority perspectives from being expressed.

Appropriate stakeholder selection is a key challenge for participatory research. Participatory approaches to conflict management must be as inclusive as possible to avoid marginalising stakeholder groups, and this is a challenge with the small sample sizes that are usually used to attain depth of understanding in participatory research. On the other hand participatory process can only be legitimate and effective if it represents all sides of the debate. The participatory literature proposes a variety of ways to select representative participants, but few of these are without problems. To address these challenges, this paper proposes an approach to select participants who are: a) representative of the wider stakeholder community; b) likely to engage constructively in dialogue; and c) are well known and respected enough to diffuse ideas from this dialogue to a wide social network. By using a combination of stakeholder analysis and social network analysis to target the involvement of these individuals in a participatory process, it may be possible to attain 'better' quality resource management strategies; ones that reflect the multiple values and knowledges of stakeholders. In addition to techniques for stakeholder engagement soft factors such as language differences, trust, and continuity are key elements of successful processes. This paper provides learning experiences from a case study of natural resource management in the UK's Peak District National Park.

MARC HUFTY
Graduate Institute of Development Studies, Geneva, Switzerland

Governance, participation and citizenship in protected areas. Towards a trans-disciplinary approach

Protected areas represent the main mechanism used for protection of species and ecosystems all over the world. The question of their ecological and social sustainability is one of the main challenges to global environmental governance today.

Historically, most protected areas were created under the assumption that humans had to be excluded from these areas. But many studies have presented evidence that this approach was ineffective regarding both conservation and livelihoods. A 'new paradigm' emerged in the 1970s: it is now widely believed that conservation is best achieved if local participation is guaranteed in the governance of PAs. But on the ground, 'participation' is practiced in many different ways.

Our research is based on the following assumptions:

1) Protected areas where participation is weak are bound to fail, except in cases with strong control. These failures will most certainly delegitimize the 'new paradigm' and send us back to the 'fortress paradigm'. Participation must then be studied in depth.

2) Research on protected areas must take into account power and governance issues on a multi-level scale (international conservation regime, public policies, local politics). We work with a governance analytical framework, based on the analysis of actors, processes, social norms and institutions. It enables a multi-level analytical perspective.

3) Marginalized groups (indigenous, women...) are those who count in PAs political economy. Citizenship (understood as the capacity of social groups to enter the public space and modify the norms that define their relations to the polity) must be studied and empowering them has to be done, based on a transdisciplinary methodology.

These are the basic principles of the ongoing research program developed by the Group for Research on Environment and Governance. We are currently working in 6 countries, with fundings from various agencies. We will present our methodology and some preliminary results.

KATJA ARZT

Humboldt University Berlin, Germany

The Dynamic Influences of Institutions and Design-Principals on the Outcomes of a Participatory Process

Since the agreement from Maastricht in 1993 about the 'subsidiarian' principle, exists an urgent need for new ideas about decentralized co-ordination mechanism. It is assumed that the legitimization and the efficiency of bottom-up approaches might better fit into local circumstances (environmentally and socially) as top-down procedures. The leading question of the paper is: Under which circumstances co-operation over environmental problems can emerge through participation? Co-operation among participants could be challenged by existing power-asymmetries. Those power structures are determined by institutions, which possibly will exist beyond the influence of a local participatory process. However, thoughtful communication and fair decision-procedures may overcome some distributional conflicts. The paper is about how established institutions and design-principles determine choices in local participatory processes.

The paper elaborates an analytical framework that divides the influencing variables on a participatory process in context and interior variables: To explain mechanisms of context variables (e.g. social capital, property rights of the environmental good), I used the distributional theory of institutional

change. To explain influences of interior variables I used the collective-choice theories based on the "second generation of rational-choice theories" and interactionist approaches to group-sociology. To illustrate the influences a case-study is presented. It reflects on one participatory method: the round table, which was established in two regions in North East Germany, in order to formulate regional agro-environmental measurements. The paper closes with a dynamic perspective on the interior and context variables. It shows that learning and co-operation is based on a trust-building process, which will appear only when carefully chosen design-principals of a participatory process account for existing institutions and the properties of environmental goods. In the paper I will show details about those interconnections. The paper will enhance the knowledge about what kind of arrangements facilitate sustainable resource use and environmental cooperation at a local level.

HEIKO GARRELTS
Universität Bremen; Germany

Potentials and restrictions of nongovernmental organizations in sustainable resource use and environmental cooperation*

NGOs can be powerful actors within sustainable resource use and environmental cooperation. If power is defined by the "capacity to achieve outcomes" (A. Giddens) three possible arrangements can be differentiated analytically (B. Arts):

1. Due to substantial knowledge and political access especially within the political structure of the European Union and of the UN, NGOs influence policy making at different stages of the policy cycle from issue creation to implementation. The activities of NGOs are protesting, lobbying, advocacy and monitoring (for example: NATURA 2000).
2. Due to moral legitimacy and access to mass media NGOs influence discursive positions of states and international organizations. The activities of NGOs here are naming, framing and campaigning (examples: concept of sustainable development; "think globally, act locally").
3. Due to technical expertise and institutional voids (M. Hajer) NGOs build green coalitions with business actors. NGOs contribute to voluntary rule making and implementation (for example: Forest Stewardship Council).

However, NGO interventions are subject to at least two restrictions:

1. Resource mobilization remains a crucial point - NGOs rely on financial resources delivered by donors or by governmental and/or private organizations.
2. NGOs have to comply with rules of international institutions. Within private governance they must respect the interests of business actors. Thus, there is a price to be paid for political access and market access as new radical issues might not come on the agenda.

Together, this causes selectivities in the issues addressed, makes "success" absolutely necessary and diminishes the NGOs' independency. Resource mobilization points to a general weakness of nongovernmental actors: their tendency to instability and discontinuity.

In consequence, NGOs can make crucial contributions to sustainable resource

use and environmental cooperation, but can't replace governmental policy making.

PLENARY SESSION III

CHAIR: SUSANNE DRÖGE, STIFTUNG WISSENSCHAFT UND POLITIK – GERMAN INSTITUTE FOR INTERNATIONAL AND SECURITY AFFAIRS, GERMANY

ROOM 1 (LECTURE HALL)

14:50-15:40

INHEE CHUNG

UNEP, DIVISION OF TECHNOLOGY, INDUSTRY, AND ECONOMICS

"Creating an International Panel on Resource Use"

ANTONIO PFLÜGER

INTERNATIONAL ENERGY AGENCY - IEA

"Resources, Scenarios, and Approaches for Effective Climate Policies"

15:40-16:00

COFFEE BREAK (FOYER)

PANEL SESSIONS B

16:00-17:30

PANEL B.1 - RESOURCE MANAGEMENT: BIODIVERSITY

ROOM 1

Chair: N.N.

NADINE FRITZ-VIETTA / SUSANNE STOLL-KLEEMANN
Humboldt University Berlin

Fostering Efficiency of Natural Resource Use in Madagascar: Integrating Nature Conservation and Poverty Alleviation in the Biosphere Reserve Mananara-Nord

As a matter of fact insufficient knowledge concerning ecosystem services and management, policy responses benefiting from these services while conserving resources lack oftentimes successful implementation means to enable an efficient and sustainable resource use. Especially in the context of protected area management in developing countries responsible actors face the dilemma to safeguard persisting natural resources without restraining basic needs of local people living adjacent to a protected area.

In the special case of Madagascar the government seeks to facilitate collaboration at different institutional levels to integrate nature conservation with developmental activities. The Biosphere Reserve Mananara-Nord, as part of Madagascar's protected area network, meets this challenge through the particular emphasis on participatory programs and small-scale projects.

As part of the GoBi-Project (Governance of Biodiversity), which evaluates success and failure factors of management concepts regarding the sustainable use of biodiversity, a case study on site was conducted. The implementation level of national policies regarding sustainable natural resource use has been investigated. Ensuing thorough analysis this paper presents an innovative ap-

proach to manage and monitor the biosphere reserve Mananara-Nord pertaining the requirement of natural resource use in a sustainable manner. Thereby the focus is set on the determination of framing conditions, definition and classification of influencing factors, and finally the formulation of a Balanced Scorecard. This management tool enables a well-balanced assessment of management structures and processes through fostering the improvement of management effectiveness. The theoretical part will be underlined by a practical example on transfer of public forest administration to communities as nationwide protected areas' strategy to implement the national conservation policy.

STRATOS ARAMPATZIS / OLAF BASTIAN / THOMAS HAHN / VICTOR GALAZ / PROFESSOR BASIL MANOS / ION NAVODARU / ZOLTAN KARACSONY / ROBERT KENWARD / ANNEKE VON RAGGAMBY / RAINER MÜSSNER / ANDREW TERRY
Governance & Ecosystem Management for the Conservation of Biodiversity, Europe

A Framework for Analysing the Interactions between Governance, Ecosystem Management, and Biodiversity

Coping with threats to biodiversity is far from being a simple matter of getting the incentives right through legislation and firmer government control. In a number of ways, biodiversity crisis often intersects with governance crisis, i.e. a crisis in which the capacity to effectively implement resource allocation and regulation lies beyond that of the state. Governance, policy and institutional capacity, modes of ecosystem management, and the state of biodiversity are closely interconnected issues. Our understanding of these interconnections is in great need of further elaboration.

The paper we are proposing to the Berlin Conference presents a framework for analysing the interactions/interconnections between governance, ecosystem management, and biodiversity. Since getting a complete grasp of the governance aspects relevant for understanding the full array of factors that affect and maintain biodiversity is likely to be a futile ambition, we admit a number of key governance features identified in earlier research, but cover new territory in exploring the relationships among these features, particularly ecosystem management and the state of biodiversity.

The paper thus provides an extensive review of the until now poorly elaborated (c.f. Millenium Ecosystem Assessment) linkages between governance aspects - such as government capacity, governability, economic incentives, and the state of biodiversity and ecosystem services.

The analytical framework presented in the paper will be developed in the context of the EU funded project " Governance & Ecosystem Management for the Conservation of Biodiversity" (GEM-CON-BIO). The project explores the interactions between governance, ecosystem management and biodiversity. Principal aim of the project is to identify which processes and institutions may best contribute to the conservation of biodiversity – and thus to the maintenance of ecosystem services.

GUY SALMON / JÖRN SCHERZER / HANNA-MARIA BÄRLUND / KIM ZILLIACUS
Ecologic Foundation, Nelson / University of Helsinki

Biodiversity Protection on Private Land: Eliciting Institutional Change Toward Sustainability in Finland, Sweden and New Zealand

Land use intensification, in a context of traditional private property rights, threatens biodiversity on agricultural land in many countries. Using data from over 100 in-depth interviews with participants in policy processes, we examine

and compare institutional change in response to public demands for biodiversity protection on private land in Finland, Sweden and New Zealand. In all three countries, landowners initially resisted what they saw as unwanted impositions, and public debate became polarised. Subsequently, in the two Nordic countries, the major stakeholders largely resolved national frameworks for action on a consensual basis and proceeded to relatively effective policy implementation; but in New Zealand, protracted efforts over seven years to prepare a national policy were unsuccessful. Instead, by default, the task of policy resolution devolved to 73 district councils where costly formal processes were repeatedly used in attempts to resolve the same issues in each locality. Outcomes at this level proved to be largely dependent once again on the capacity or otherwise of major stakeholders to reach agreement.

The three countries' policy implementation at the national, regional and local levels is analysed from perspectives of ecological modernisation and network governance, and conclusions are drawn for institutional design and practice. The capacity of network governance to elicit innovation and new leadership styles is explored. The high economic, social and environmental costs associated with a limited institutional capacity to resolve contentious issues are highlighted. The New Zealand data in particular indicate that, given the barriers to stakeholder agreement, the strongest determinant of success in biodiversity protection efforts is the formation of trusting one-on-one relationships between public authority representatives and affected individual landowners. Where such relationships are developed, traditional landowner conceptions of property rights can be modified in practice to embrace sustainability responsibilities even where little or no financial compensation is made available to landowners.

16:00-17:30

PANEL B.2 – TRANSPORT

ROOM 2

CHAIR: HANS-LIUDGER DIENEL, ZTG, TECHNICAL UNIVERSITY BERLIN, GERMANY

Flor Avelino
Erasmus University of Rotterdam

The Aspect of Power in Transition Management Practices for Sustainable Mobility: the Case of the Netherlands

This paper assesses the aspect of power relations in the application of Transition Management in Dutch transport policy, by making use of phronetic planning research (Flyvbjerg, 2004) and ethnographic methods to study the effects of power (Flyvbjerg 1998, 2001).

Transition Management (TM) (Rotmans & Loorbach, 2005) is an operational governance model designed to deal with the complexity of societal systems with persistent environmental problems. In 2001 the 4th Dutch National Environmental Policy Plan presented TM as a strategy to deal with environmental degradation by stimulating sustainable development as a specific aim of policy making. In September 2005 the ministries of Economics, Environmental Planning, Transport & Water together published the latest 'Policy Paper on Mobility' in which TM was presented as the cabinet's innovation strategy to "achieve sustainable mobility (...) with a long-term time horizon and – related to that – innovation programs (...) for the short-term".

This paper discusses how this academic and governmental discourse on TM is practiced within the Dutch traffic and transport sector. It is questioned to what extent relations of power and the distribution of resources are really affected by TM. Several transport-specific institutional arrangements have been made

on the basis of TM to facilitate new forms of cooperation between governments, businesses, NGO's and knowledge institutes. So far it has remained unclear to what extents these new institutional arrangements really empower actors to influence / change the traffic and transport sector in terms of sustainable development. This article answers these questions on the basis of reviews of policy documents and interviews with several actors involved with mobility and / or TM networks. In conclusion we learn from the practices in this case study by suggesting how the TM model may be improved in terms of paying more attention to the effects of power.

Markku Lehtonen
University of Sussex, UK

Decoupling freight transport from GDP – conditions for a 'regime shift'

Until recently, the volume of road freight transport has been expected to follow the growth of GDP and any policy aimed at curbing freight demand has been thought deleterious to economic development. However, recent studies indicate a 'relative decoupling' in some European countries, including the UK. These figures may be misleading, since they fail to take into account the increasing proportion of foreign haulers in the UK, and the increasing volume of imports in many industrial sectors. Moreover, a far more drastic system change – a transformation of the oil-dependent 'socio-technical regime' – will be needed to achieve the UK government's goal of 60% reduction in CO₂-emissions by 2050.

This paper first describes the results of a 'decomposition analysis' of energy use in the UK road freight sector quantifying the relative contribution of different factors to the growth in energy consumption in 1989-2003. It then identifies the drivers behind the increasing freight demand, such as the growth of production volume, liberalisation and deregulation of the formerly highly regulated freight sector, complexification of supply chains and extension of both the supply and market areas, decline of the relative cost of road freight transport, greater sophistication of product design, and increasing adherence to a just-in-time delivery regime. It takes a critical look at the industry's attempts at 'greening of logistics' as well as the potential to bring down freight volumes through 'dematerialisation', fuel taxes, modal shift, or consumer information. The needed 'regime shift' will require a clear understanding of the relative roles of the different actors – private sector, government and consumers – and may require a reassessment of the assumption that each sector should 60% reduction target. Finally, a key question is how to ensure that improving the efficiency of the existing system does not become an obstacle to transformation by reinforcing the prevailing regime.

MUHAMMAD IMRAN / NICHOLAS LOW
University of Melbourne, Australia

Identifying the institutional barriers to sustainable urban transport in Pakistan

Urban transport is one of the most important sectors that have direct bearing throughout the world on greenhouse gas emissions, energy consumption, road crashes and the deteriorating urban environment. These concerns are managed in Pakistan by relieving congestion by building larger and better roads. By contrast the principles of sustainable urban transport encourage the use of non-motorized and low cost public transport. These modes of transport are more efficient in high density cities. Although demographic indicators show that Pakistani cities could perform well with sustainable modes of transport, the direction of current policy points in the opposite direction: to heavy investment

only in roads. The in-depth study of transport institutions in Pakistan indicates that transport solutions are primarily a matter of the export of knowledge from the developed to the developing world, mainly driven by the international development institutions and their associated consultants. Pakistani cities, especially Lahore, have welcomed this transfer of urban transport knowledge due to the involvement of international institutions. The transfer of concepts from the developed worlds results in a mismatch of transport policy with local needs for mobility and safety as well as ecological sustainability.

The theoretical framework developed on the concept of path dependence helped to develop details necessary to explain this mismatch in urban transport complexity in Pakistan. By applying the methodological approach on the basis of critical juncture and self-reinforcement mechanism, research has explored how urban transport solutions in Lahore become locked-in over time as a result of past decisions on infrastructure investment, funding priorities, organizational structure, technical methodologies and mental models of international and local institutions. The research has identified institutions, techniques and discourse fields in path dependence approach as barriers to sustainable urban transport planning in Pakistan. The research concluded that three fields in path dependence approach are reinforcing each other over time and require full treatment for institutional change, not only to save Lahore from air pollution and road crashes but also save the world from the threat of climate change.

DANIEL BONGARDT / HOLGER DALKMANN / WOLFGANG STERK / BETTINA WITTNEBEN
Wuppertal Institute / Erasmus University Rotterdam

Equity in Mobility - Increasing Efficiency in the Transport Sector through an Effective Clean Development Mechanism

Traffic congestion in a megacity: the deafening noise, the difficulty to breathe, the grey sky, the nauseating smell. Mobility is intimately linked to economic progress, both on a national and personal level. Nevertheless, the externalities of transport activities include numerous health hazards and environmental harms. Local and national policy instruments both in the global North and South have grappled more or less effectively with this issue. Resource constraints have forced governments and citizens to become more conservative when dealing with their mobility needs. Yet, the transport sector is continuing to expand globally and with it are the CO₂ emissions, constituting already one quarter of the global greenhouse gas emissions that lead to dangerous climate change.

In this paper, we attempt to make the connection between existing institutional arrangements in transportation policy and the international climate change regime. The transport sector has hardly been affected by global climate policy, and the Kyoto Protocol's Clean Development Mechanism (CDM) that allows countries of the global North to count emission reduction efforts in the global South towards their reduction targets, has not induced any projects in transportation. After pointing out the barriers to transport projects that are inherent to the CDM, we define how an enhanced CDM, in particular a sectoral approach, can encourage transportation measures in the global South. The sectoral approach to the CDM allows a project developer to include a collection of similar sites or even a national programme in a CDM project proposal. This change from singular projects to multiple projects under one proposal is still evolving and has not been sufficiently defined in the global climate policy arena. We discuss how an effective institutional design of an improved CDM could enhance the application of efficient resource use by the transport sector.

16:00-17:30 **PANEL B.3 – MONITORING & ASSESSMENT II**

ROOM 3

CHAIR: ECKHARD STÖRMER, CIRUS, SWITZERLAND

JOHN MANOOCHEHRI

University of Surrey / Royal Institute of Technology, Stockholm, Sweden

Empirical measures of resource efficiency: unbundling microeconomics, measuring slack capacity, new policy and new information.

/How can systematic measures of 'resource efficiency' ignore unused consumer stuff?/

This paper introduces the tradition of empirically assessing transformation of resources (Geddes 1885) as a reaction against economic methods, showing its development into the programme called 'industrial metabolism' or (more narrowly) 'material flow analysis' (MFA). At the heart of MFA are sets of transformation ratios accounting for the efficiency of conversion of natural resources into human welfare, or 'resource efficiency'. We observe difficulties in quantising (and policy-making with) these ratios without reliance on monetary indicators, and show how MFA research veers back towards problematic microeconomic conceptions of efficiency.

We then propose a quantitative measure for one of the ratios - 'use intensity' of commodities. The formal measure we describe provides a quantitative way to model the sustainability contribution of so-called product-service systems (PSS). PSS observes that while modern economies are apparently becoming more 'market efficient', an enormous and increasing amount of slack capacity exists in the commodity stock of modern consumers: partially or non-used televisions, cars, home appliances, washing machines, etc. This would be lessened, say PSS advocates, if access to products were through 'services', rather than sheer product sales. To date however, no standard measurement is available for PSS, which may account for the lack of policy for it.

This paper concludes by noting how resisting the urge to monetise resource efficiency data puts proper emphasis on concretising alternative non-monetary indicators of efficiency. Major policy opportunities for resource efficiency not perceivable through microeconomic lenses, may thus become available - and attractive. More broadly the paper invites consolidation of the attempt to assess the real conditions - physical, spatial, social-institutional - of creation, distribution, storage and accessing of value, some of which are entirely absent from mainstream notions of microeconomic 'efficiency' in resource allocation, perhaps even obscured by it.

DAGMAR TIMMER / VANESSA TIMMER

Resourceful Solutions Consulting / University of British Columbia

Stepping towards Sustainability: Assessing the Effectiveness of Ecological Footprint Analysis as a Guide to Sustainable Consumption and Production Policy

Ecological footprint analysis approximates the amount of ecologically productive land and water area required to sustain a person, human population, or activity, given the prevailing technology. Since its introduction in 1996, this conceptual and analytical tool has been employed within educational, research and policy contexts. This paper seeks to advance understanding of the effectiveness of ecological footprint analysis in guiding policy making on resource consumption and production. Existing literature on

ecological footprint analysis details human-environment interconnections and suggests that consumption and production have surpassed the planet's ability to produce resources sustainably and to absorb the resulting wastes; however, gaps remain in identifying the utility of this tool in supporting decision-making at the policy level. This paper investigates the following research question: to what extent has ecological footprint analysis provided the basis for policy making on sustainable consumption and production? This paper addresses this question by examining a comparative case study of governments that have employed ecological footprint analysis in resource tracking initiatives. For example, it reviews a recent national resource tracking effort in the United Kingdom which drew on ecological footprint analysis to produce a standardized data set on resource flows through London, recommendations for efficiency gains in specific industrial clusters nationally, and a suggested national "eco-budget." The paper explores the impact of ecological footprint analysis within all stages of policy making: agenda setting, policy formulation, policy implementation, and policy evolution and social learning. It also investigates the extent to which this conceptual and analytical tool assists in tracking resource flows, providing baseline data for monitoring and assessment, and identifying promising entry points for action and policy. This paper seeks to contribute to a richer understanding of the effectiveness of conceptual tools in guiding decision-making on global sustainability issues.

BERND MEYER / MARTIN DISTELKAMP / MARC INGO WOLTER
GWS Osnabrück, Germany / Department of Economics, University of Osnabrück, Germany

Material Efficiency and Economic-Environmental Sustainability - Results of Simulations for Germany with the Model PANTA RHEI

Based on empirical evidence, the paper discusses the impact of a consulting and information program for the improvement of material productivity with regard to economic and environmental targets for Germany. The instrument used in the analysis is the integrated economic-environmental model PANTA RHEI, which is parameterized econometrically. The paper presents the model and shows in a baseline forecast that without policy changes, sustainability will be violated in both the economic and the environmental dimensions. This applies to the latter particularly with regard to land use and material consumption. The alternative simulation that introduces a consulting and information program for the improvement of material productivity yields a win-win result: growth rates of GDP and employment are rising, the public debt is reduced, and material consumption is much lower than in the baseline and remains at the actual level, which means that a decoupling of growth and material consumption is possible.

16:00-17:30 **PANEL B.4 – TEACHING**

ROOM 4

CHAIR: KIRSTEN JÖRGENSEN, FREIE UNIVERSITÄT BERLIN, GERMANY

ALAN REID / JUTTA NIKEL / SUSANNE MUELLER
Centre for Research in Education and the Environment (CREE), University of Bath, UK

Indicators for sustainable development: perspectives, challenges and progress in relation to education

The last decade has seen sustainable development (SD) and relatedly, Education for Sustainable Development (ESD), grow in influence in policy-making at national, regional and international levels. Both challenge traditional views on the process and direction of wealth generation and social development. A reorientation towards sustainable growth / consumption is one focal point of initiatives; other approaches make environmental and social justice their main focus. In all this, education is seen as a vital prerequisite for the mobilisation of 'human resources' and is assigned an important role in bringing about socio-economic change in these directions. Chapter 37 of Agenda 21 highlights this, reinforcing points made in Chapter 36 on education, stating: "A country's ability to develop sustainably depends on the capacity of its people and institutions to understand complex environment and development issues so that they can make the right development choices." Indicators are now one of the most common evaluative strategies monitoring and informing SD and education policy-making, and increasingly, for ESD (Scott, Reid, Nickel, 2006). Yet using indicators as a measure of the effectiveness of educational and other endeavours of progress towards SD remains contested. This paper reviews ESD Indicator initiatives from England and Germany to examine core issues regarding the deployment of indicator strategies across multiple fields (e.g. aggregation/disaggregation, coupling/decoupling); reflect on developments to date (e.g. UNECE ESD work); and promote critical discussion on ESD implementation and evaluation issues. It addresses the following questions:

- 1) How has concern for indicators evolved in relation to ESD? What types of indicators are being developed and from what assumptions and frameworks? Who are the stakeholders and what are their roles, interests and responsibilities?
- 2) How generalisable, contextual and perspective-specific are ESD indicators?
- 3) How does the development of policy (e.g. National SD strategies) relate to ESD indicators, and vice versa?

MARTIN WELP / CHRISTOPH NOWICKI / PIERRE L. IBISCH
University of Applied Sciences Eberswalde, Germany

Global Change Management in Higher Education

The context in which natural resource management takes place is changing rapidly. Urbanisation, globalization of markets, and climate warming, have direct impacts on forestry, biodiversity conservation and water management. Human beings have become a major global environmental force. The Nobel prize winner Paul Crutzen has characterized this new geological epoch as the Anthropocene. A shift is needed in natural resource management away from a static, equilibrium type of thinking towards an approach that target the maintenance of changeability and resilience of functional ecosystems.

Global change in its full complexity thus poses an intellectual and practical challenge for resource managers, planners, and decision-makers on different levels. Higher education is only gradually responding to the need for specialists, with profound knowledge about global change and its dynamics.

The University of Applied Sciences Eberswalde has launched a new international Master Programme "Global Change Management", which fills a gap in higher environmental education in Germany. The aim is to train specialists who are able to effectively contribute to the mitigation of and adaptation to the impacts of Global Change.

Managing global climate change requires bringing together different knowledge bases, including the knowledge of different stakeholder groups such as companies, NGOs, public administration, and local people. The new Master Programme therefore works together with renowned companies, NGOs and research institutes, which provide modules on issues such as risk management

or global climate policy.

KLAUS EISENACK

Potsdam-Institute for Climate Impact Research, Germany

A board game for interdisciplinary training and dialogue

The paper reports on the design and educational use of a board game on climate change which covers couples central bio-physical, economic and political aspects of the issue. By using a board game as common language between students and scientists from different scientific cultures, knowledge of different disciplines can be integrated and different views can be discussed. Familiarity with a particular jargon is not needed, but can develop through playing and debriefing the game. Already in the game design phase scientists from climatology, economy, political science and modelling as well as inter-gration experts were involved.

It includes (i) a simple climate module accounting for greenhouse gases, global mean temperature and climate impacts, (ii) an economic growth and innovation module which allows to switch between energy technologies, and (iii) a political network with international coalitions and trans-national actors. Thus, even complex issues as the freerider problem, trade-offs between adaptation and mitigation of climate change and path-dependencies can be studied. The game is called Keep Cool and is readily available for educational use from a publisher. The experience with the game indicates that it can be effectively used in training seminars with students and pupils. This contribution also shows some pitfalls and essential instruments for its adequate use.

Panel Sessions C

17:45-19:15

PANEL C.1 - RESOURCE MANAGEMENT: FISHERY

ROOM 4

CHAIR: ROBERT ARLINGHAUS, HUMBOLDT UNIVERSITY BERLIN, GERMANY

MARIE-CAROLINE BADJECK / HELLMUTH LANGE / JAIME MENDO

ZMT Bremen / Uni Bremen, Germany / Universidad Nacional Agraria La Molina, Peru

Peruvian artisanal fisheries management in the context of climate variability and change: How can institutional arrangements promote efficient, equitable and sustainable resource use?

Peru has a centralized government which is reflected through the limited autonomy of regional government agencies to develop and implement institutional arrangements in the fisheries sector that respond to specific regional needs and realities. Additionally Peruvian fisheries are characterized by a de-facto open access system which in the context of resource fluctuations induced by climate variability further complicates the management of the artisanal fishing sector. The objective of the paper is to understand what is the role of institutions in the fishing sector and how do they respond to environmental change. The paper explores how centralized management and property rights regimes have influenced responses of the fisheries sector to El Niño events in two coastal regions of Peru and its implication for marine ecosystems.

The paper then examines how institutional change, through the current decentralization process as well as the promotion of community or group-based rights, is impacting artisanal fisheries management and its implications for future response to climate variability. It argues that re-designing institutional arrangements based on the fallacies of old ones will not fulfil the objectives of efficiency, equity and sustainability of fisheries policies, especially in light of a fluctuating resource base. As examples the introduction of community property rights into the scallop fishery and the creation of partnerships between NGOs, universities, local communities, the private sector and the government are analysed. This research is a contribution to the ongoing debate on the role, performance and response of institutions in the fisheries sector, especially in light of external factors such as climate variability. The research is part of the project CENSOR which aim is to understand the implications of climate variability on the artisanal fishing sector in Peru and Chile (www.censor.name).

MARIA REBECCA A. CAMPOS, PH.D.

Southeast Asian Regional Center for Graduate Study and Research in Agriculture,
Philippines

ECONOMIC EVALUATION OF FISHERIES POLICIES IN THE PHILIPPINES

The Philippines is surrounded with many fishing grounds. In spite of this, most fishermen in the area live in poverty, and their plight is getting worse, not better. Current fisheries policies have failed to improve the situation but no research has been done to find out why.

This report attempts to fill this information gap about the reasons for policy failure. Drawing on data from secondary sources and an original survey, it uses a bioeconomic model to simulate the effects of changes in the enforcement levels of current policies. Investments of the government on different levels of enforcement were assessed using benefit cost analysis.

The report assesses the effects of enforcing current fisheries policies more stringently. It finds that a substantial investment (PHP 614,000 per year) would be required to ensure compliance with regulations and that the benefits of achieving high levels of compliance would exceed costs by only a tiny margin. The situation would be transformed into one in which large and perhaps increasing numbers of people would continue to fish, expending larger amounts of effort to comply with various gear restrictions but, in all likelihood, harvesting no fewer fish. Because the bay is already overfished, catch per unit effort and marginal productivity would decrease. Any additional fishing effort in the bay will result in a decrease in the average catch of all fishermen. Enforcement of current policies will not address the underlying problems of open access and the overfishing it leads to.

One policy to deal with the problems of open access and overfishing is to set a limit on the total number of fish that can be caught and divide this quota among Lamon Bay's fishermen. Over time, the total allowable catch might be reduced. To allow flexibility, the quotas allocated to individual fishers might be tradeable.

INGRID J. VISSEREN-HAMAKERS / PIETER GLASBERGEN
Utrecht University, Netherlands

The role of international intersectoral partnerships in sustainable fisheries - Crossing multiple borders for sustainable development

Increasingly, governments, business and civil society work together in partnerships to contribute to sustainable development. Often, these partnerships

emerge in areas where governments have not been willing or able to regulate, and thus have not been effective. Numerous partnerships are following the Marine Stewardship Council (MSC) and are trying to tackle one of the largest problem areas in the field of natural resource use, unsustainable fisheries. This paper researches several new partnerships for sustainable fisheries and aquaculture from a governance perspective. It analyzes the way in which and the extent to which these partnerships contribute to the effectiveness and legitimacy of the international fisheries governance system. This governance system is the total of all international public and private initiatives for sustainable fisheries. Hypothesis is that often partnerships are not able to address the main underlying problems in the fisheries governance system, among others equity, and only contribute to its piecemeal improvement. The paper focuses on international intersectoral partnerships, partnerships between government, business, and/or civil society representatives from more than one country, since these partnerships often operate in circumstances that are especially relevant for sustainable development. In these partnerships, the cultural differences, the different approaches of the different sectors of society, and the different power relationships between sectors of society in developing and developed countries have to be bridged. One of the main subjects of the paper is the role of governments in fisheries governance, both in the partnerships described and the interrelationship between government policy and the concerning partnerships.

KLAUS EISENACK

Potsdam-Institute for Climate Impact Research, Germany

Formal viability analysis of participatory fisheries management

The pressure on marine renewable resources has rapidly increased over the past decades, leading to a variety of institutional arrangements. In many cases they have not improved the current situation, mainly due to problems of institutional fit and intrinsic uncertainties about the state of resource stocks. In this paper, different participatory management schemes are assessed by using concepts from formal viability theory and a simple bio-economic dynamic model. It is shown that participatory management may lead to serious problems if a purely ecosystem-based strategy is employed. The analysis suggests that less risky strategies are possible even if only limited biological and economic data are available.

17:45-19:15 **PANEL C.2 – SECTORAL MODERNISATION**

ROOM 2

CHAIR: MARLEN ARNOLD, INSTITUTE FOR ECOLOGICAL ECONOMIC RESEARCH, GERMANY

A P TIWARI / V DUTTA

TERI School of Advanced Studies, India

CUSTOMERS' CHOICE AND PREFERENCE OF WATER SUPPLY INSTITUTIONS: A CASE OF WATER SECTOR REFORM FROM DELHI, INDIA

One of the important policy dimensions for water supply is whether planners in cities should worry about customers' preferences and is it necessary to consult them since the policy priorities are obvious from the stakeholder consultation. Performance of the water sector under the traditional fully integrated firm of

the state in most of the developing countries has been unsatisfactory. Part of the blame for disappointing performance (financial, quality and coverage) has been weak, vulnerable institutions, weak incentive structure, lack of competitive power, distorted pricing and enabling governance framework. The paper attempts to investigate into lesser explored areas of water supply sector reform in mega cities with examples from Delhi, India to show how customers' choice and preference structure influence the design of water institutions. The research uses the survey based approach of choice modeling from the targeted samples residing in the capital cities of Delhi. In designing institutions, the family of criteria based on equity, efficiency and risk has been chosen in such a way that all major concerns about sustainability of water institution have been taken care of. The decision to choose one of the water service delivery options is examined through NAIAD and discrete choice model. The analysis and empirical results provides considerable insights into the relative role and significance of the perception of performance of water utility by experts, and customers both in decision-making and for resolving the conflict among the various stakeholders.

ANNA KORPPOO
Imperial College London, UK

MODERNISATION OF RUSSIAN PULP AND PAPER INDUSTRY: LESSONS FROM FINLAND

The inefficiency of energy use by the Russian pulp and paper sector peaked in the mid-1990s, and as the situation is now normalising to the pre-transition levels, it is time to focus on how further improve the efficiency of energy use by modernising the sector. As the Finnish pulp and paper sector is significantly more energy efficient than that of Russia, Finland can provide lessons which factors can drive the modernisation of the sector, and which issues may deter it.

This paper looks at the drivers and barriers to modernisation of pulp and paper sector in Finland and in Russia, and draws lessons from Finland how to support modernisation of the sector in Russia. The main differences of the sector between the two countries include ownership structures, energy prices, economic and legal systems, and governance practices of state and regional administrations. The main lesson from Finland to Russia is the better coordination of policies, and in the case of Russia, economic and administrative reforms. Currently, the basic building blocks for energy saving – price of energy which would encourage saving and longer term planning by businesses – are missing in Russia. Single measures cannot improve the situation, and therefore, a coordinated approach is needed.

The paper is based on a PhD research during which 13 plants were visited and interviewed in the Russian regions of Karelia and Archangelsk, and in Finland. The main methods of qualitative analysis were drivers and barriers comparison, while quantitative comparison of the developments of energy efficiency is based on Energy Efficiency Index analysis.

ALEXANDER MOUTCHNIK
University of Heidelberg, Germany

Thinking globally - acting locally: Content and specifics of natural-resource policy of multinational corporations. The case of the cement industry.

The shortage of natural resources and the growing amounts of wastes are the consequences of the extensive industrial and urban development of the last decades. The balanced management of resources and wastes is therefore

one of the main pre-conditions for the sustainable economical development and for the continual improvement of the environmental situation.

This paper explores content and specifics of natural-resource policy of multinational cement corporations and elaborates a model of an exemplary management of natural resources and wastes in a multinational company. This model takes into account the current political, economical, social and environmental conditions that influence management decisions and examines how the management of a multinational corporation follows restrictions and requirements of the state authorities, society, emission trading mechanisms and the market. Furthermore it provides the analysis of the corporate emissions policy, corporate CO₂-policy, risk and cost minimization policy and finally the policy concerning the quality of the product.

This paper makes general propositions to the methodology and design of a corporate balanced management of natural resources and wastes and analyses its application at the operational level of a cement plant and at the level of the top-management of a large cement multinational corporation. The presented model is based on the in-depth case study of the environmental policy of a large multinational cement corporation and on the experience of participation in the international cement stakeholder dialogues. This paper contributes therefore to the current scientific and practice-oriented discussion on the effectiveness and efficiency of corporate environmental management and makes recommendations to the optimisation of interactions between corporations and political institutions and actors at the national and international level.

CAROLA KANTZ

London School of Economics and Political Science, UK

The Role of Multistakeholder Initiatives in Curbing Trade with Conflict Commodities - Old Wine in New Bottles or a Promising Tool of Governance?

Illicit flows of commodities have long served as a source of conflict in developing countries. Traditional intergovernmental actions prove to be inefficient in addressing link of trade with conflict commodities and civil war. Hence, in recent time innovative tools of governance, such as multistakeholder initiatives have been developed. They are said to be more effective in addressing the issue as they acknowledge the role the extractive industry can play. By becoming more transparent and accountable in their business procedures they are supposed to contribute to the reduction/ prevention of conflict.

A prominent example is the Kimberley Process Certification Scheme (KPCS), which aims at halting trade with conflict diamonds. The KPCS is a mix of an intergovernmental regime and self-regulation of the industry. Launched at the end of 2002 it will now go into its second phase. At the beginning the KPCS was widely criticised for being a weak regime which only appeases the diamond industry instead of setting up strict regulatory requirements. At the end of the first phase (2002-2006) most of those former critics recognize the significance of the scheme in having reduced the trade with illicit diamonds substantially.

The paper will analyse to what extent the institutional structure of the KPCS differs from traditional intergovernmental regimes. By examining the first phase of implementation (2002-2006) I will discuss whether the innovative institutional design of the KPCS is apt to curb trade with conflict diamonds. For instance, to what extent was it important to integrate the diamond industry so that trade with conflict diamonds could be curtailed more effectively? In order to answer these questions a distinctive methodological approach is required which bridges regime theory and the global governance approach. The paper thus wants to contribute the discussion of effectiveness of new modes of governance.

17:45-19:15 **PANEL C.3 - INSTITUTIONAL INNOVATIONS II: TRANSBOUNDARY WATER**

ROOM 3

CHAIR: STEFAN LINDEMANN, FREIE UNIVERSITAET BERLIN, GERMANY

INES DOMBROWSKY
UFZ Leipzig, Germany

Institutional Design and Regime Effectiveness - The Case of the International Commission for the Protection of the Elbe

While the new institutionalism has reasserted that institutions matter, much less remains known about how they matter. This general observation also holds true for the particular case of the management of international waters. In order to gain further insights into the relationship of institutional design and regime effectiveness, this paper presents a study on the International Commission for the Protection of the Elbe (ICPE). The case has inter alia been selected to test hypotheses generated for the Rhine Commission under more asymmetric conditions. The analysis is based on a review of pertinent documents and ten qualitative interviews with Czech and German Commission members and NGO representatives. Particular emphasis has been put on determining ICPEs specific contribution and the no-regime counterfactual as well as on the perceived expedience of the institutional arrangements.

The study shows that due to external as well as internal institutional factors ICPE proved relatively successful, and as such it also provides insights into how institutions matter: The commission served as platform for joint problem solving by identifying priorities for action. These international obligations increased the power of national administrations and their access to funds. At the same time, the Commission's reporting to the public served as an enforcement mechanism. There is consensus that in the absence of ICPE progress would have been much slower. However, while the reduction of pollution from municipal and industrial wastewater as well as the establishment of an international alarm system was comparatively successful, ICPEs contribution towards the improvement of fish patency or the reduction of agricultural non-point pollution remained low, indicating that the mechanism does not fit for all problems. The interviews also indicate that commission's efficiency still could have been improved. From a methodological point of view, the paper shows opportunities and limits of qualitative interviews in determining regime effectiveness.

JENNIVER SEHRING
University of Giessen, Germany

The politics of water institutional reform. A comparative analysis of Kyrgyzstan and Tajikistan

The aim of this paper is to challenge the widespread perception of water management as a technical system based on rational decision-making and implementation by experts, using a case study of Tajikistan and Kyrgyzstan. Both countries are characterized by a highly unsustainable water use. An institutional reform of water management is conducted to make it sustainable (through efficiency), market-oriented (through cost-recovery, less state interference), and democratic (through decentralization, user participation). This affects especially the irrigation sector where Water User Associations (WUAs) are established. However, the mainly donor-driven reforms did not meet their objectives so far.

The research is based on expert interviews with representatives of different agencies of the state water administration, NGOs, and donor agencies. In each country, a case study of one WUA was conducted using interviews, observations, and group discussions. The study builds on a neo-institutionalist approach by analyzing the role institutions (defined as formal as well as informal rules) play in shaping actors' perceptions, choices and strategies.

The paper argues that obstacles to reform are rooted in three main aspects:

1. The institutional environment in agriculture and in local governance does not provide the necessary incentives and conditions for the reform to become effective.
2. WUAs as new organizations are - in a process of "institutional bricolage" - co-opted by existing societal and political institutions.
3. The local and middle levels of state agencies are crucial for reform implementation but are marginalized in the programs of international donors.

The research contributes to an emerging discussion among academics as well as practitioners in the water sector about the long neglected political aspects of irrigation management.

AXEL KLAPHAKE / ANNIKA KRAMER / WALTINA SCHEUMANN
Technical University, Berlin / Adelphi Research, Germany

Cooperation on Turkey's Transboundary Water Resources

This paper provides an assessment of crucial management challenges on all Turkish transboundary rivers, the current state of cooperation and unresolved disputes. It includes the rivers Euphrates and Tigris, the Orontes, the Coruh, the Maritsa, and the Kura-Aras river basin. The picture of conflicts at the transboundary rivers is multi-faceted because of huge differences in terms of the hydropolitical constellations, the causes of individual water conflicts, the dynamics of the respective bilateral political relations, and the agreements concluded.

Most disagreements relate to dams, which influence river usability downstream. In situations where Turkey was upstream, classical upstream-downstream conflicts occurred characterised by divergent riparian interests. The Maritsa and Orontes rivers are important exceptions, with Turkey as a downstream riparian. Analysis of these hydropolitical relations shows that the downstream state Turkey has less means and can only exert limited influence on cooperative arrangements. However, there are forms of cooperation in both constellations which illustrate that cooperation principally can develop in upstream-downstream constellations too, and that location on a watercourse is not the decisive factor in explaining whether and when cooperation takes place. Furthermore, our analysis shows that "water disputes" were influenced by multifaceted interstate conflicts involving other core political issues (security, terrorism, border issues). Consequently, a careful analysis of the water disputes requires that the whole "security complex" and the hydropolitical power of the riparians is taken into consideration.

We will discuss that water conflicts can be seen as the external consequences of internal economic development strategies putting strong emphasis on the production of agricultural commodities and on achieving independency from energy imports. Apparently, the Turkish GAP project is the most important single Turkish development programme which caused the most downstream objections. But massive development programmes are under construction or are planned on the Coruh, Araks, and Orontes. However, it is important to note that all riparian states are following the hydraulic development path, and that their economies heavily rely on water for irrigation and power production. Finally, we will discuss how the EU accession perspective might shape the cooperation at the Turkish transboundary rivers and how the required implementation of EU water law and international law (UNECE conventions) might shape

future water negotiation patterns in the region.

C.4 – PARTICIPATORY APPROACHES III

ROOM 5

CHAIR: N.N.

COLLINS AYOO
Nova Scotia Agricultural College, USA

COMMUNITY BASED NATURAL RESOURCE MANAGEMENT IN KENYA: THE CASE OF WILDLIFE

The institutional frameworks within which the management of natural resources occurs have an important effect on the sustainability with which natural resources are utilized and the livelihoods of the communities that depend on those natural resources. In many developing countries government ownership and management of natural resources has been the common practice. Such government stewardship of natural resources has, however, largely been inequitable, and not cost effective. It has also marginalized local communities, excluded them from the resources on which they depend, undermined local economic development, and failed to stem the degradation of these resources. Community based natural resource management is an innovation that aims to achieve increased sustainability and equity in natural resource management practices and is motivated by the realization that when communities benefit from natural resources, it will be in their interest to protect and use those resources in a sustainable manner. It works through partnerships between governments and local communities with the local communities having a greater say in decisions that pertain to the management of natural resources and also a greater share of the benefits from these resources. For this approach to be successful, it is necessary for communities organize themselves and develop mechanisms for enforcing access restrictions to the natural resources. There should also be consultation among the various stakeholders to develop resource management plans that explicitly specify the sharing of responsibilities and benefits. Although community based natural resource management has the potential to conserve natural resources and yield substantial economic benefits to local communities this has not been so in many cases mainly because of the way it has been implemented.

TILL STELLMACHER
ZEF Bonn, Germany

From the top-down state to participation? Coffee forest conservation in Ethiopia

Some mountainous moist forests in Ethiopia comprise 'wild' populations of *Coffea arabica*, naturally regenerating in the forests' undergrowth. However, these coffee forests are subject to rapid depletion and deforestation, causing impacts like increasing scarcity of valuable forest products, diminishing agricultural productivity, land degradation, erosion, and change of microclimate, each one enhancing rural poverty. The paper provides explanations of how and why governmental forest conservation initiatives, despite different institutional approaches over time, have had little positive impact on coffee forests in Ethiopia, and how far non-governmental-initiated forest management approaches have the potential to provide better results. Using an analytic narratives approach, the paper examines the historical de-

velopment of governmentally-initiated forest conservation measures in the last three decades and draws a picture of actors and institutions that determine the present situation. It identifies over-extended governmental organizations, an inappropriate land tenure system, frequent and inconsistent changes of the formal institutional and constitutional landscape ('actionism without deliberation'), and - most importantly - no consultation and involvement of the local communities and their traditional knowledge as causes for the rapid loss of coffee forest resources. In a second step, the paper presents empirical findings of a non-governmental organization driven 'Participatory Forest Management' project, located in Kaffa Zone, the world-wide origin of *Coffea arabica* gene pool. The paper argues that particularly in forests with highly valuable non-timber forest products, such as forest coffee, forest conservation policies need to shift away from strict governmental top-down conservation efforts towards use and management practices based on local communities' needs and knowledge. Assigning long-term use rights to forest resource users under custody and assistance of non-governmental institutions would be a first step in this direction.

JIM SINNER / HANA CRENGLE

Ecologic Foundation / Auckland University of Technology, New Zealand

Improving market-based instruments through role-playing-games: Nitrate trading in New Zealand

Market-based instruments (MBI) such as tradable permits have been shown to be effective and efficient policy instruments. In many circumstances they can lead to better results than more traditional policy approaches. Yet, MBIs often face stiff opposition from stakeholders. This may be due to uncertainty about how they will operate in practice and their economic, environmental, and social consequences.

Water quality in Lake Taupo – the largest lake in New Zealand – has decreased significantly over the last 30 years through increased nitrogen inflows, primarily from pastoral farming. The local authority aims to reduce nitrogen inflows using "cap and trade" rules on farming and other land uses, i.e. a catchment-wide limit on the amount of nitrate leaching activity with ability for land users to trade "nitrogen discharge allowances". The proposed mechanism faces opposition from a variety of stakeholders.

We tested whether a role-playing-game involving the simulation of a cap and trade regime for non point source pollution would affect stakeholders' attitudes towards the cap and trade instrument, and whether it would help to identify consequences of trading and provide useful information for policy-makers on instrument design.

The role-playing game involved several players with hypothetical properties over a number of years, making decisions about how to manage the property (e.g. change the land use) and whether to buy or sell nitrogen discharge allowances.

In order to assess attitudinal change, a Q-sort technique was used, in which a subject models his or her subjective point of view on an issue by rank-ordering stimuli (statements expressing different opinions) into "piles" along a continuum defined by instructions.

ILONA BANASZAK

Humboldt University Berlin, Germany

The Role of the Leader in the Process of Establishing and Sustaining Cooperation

The literature from the area of game theory and collective action theory, as well as transaction cost economics, stresses the importance of leadership in achieving a cooperative outcome among a group of actors. The literature, though, does address the problem of how the institution of leadership evolves over time. Do the leaders stay leaders? Do they still promote cooperation? Such questions remain unanswered. This article fills the gap by analyzing and comparing the leader's role in the process of establishing and running cooperative organizations.

The empirical evidence was collected from Polish farmer cooperative organizations called producer groups. The main task performed by these groups was to organize joint sales of the output produced by individual farmers. All the groups had a similar governance structure. They were managed by a leader whose main task was to organize joint sales of the members' output. The leader was usually a member of the group as well.

The data suggest that while the leaders play a significant role in the process of establishing cooperation, later on in the process of running the group some leaders actually hinder cooperation, and in some cases their decisions push the group into a social dilemma situation where the members have incentives to deviate from the group norms. This was mainly a problem of groups which did not display gratitude for the work of the leader. At the beginning of cooperation the leader is willing to invest time and effort and work voluntarily for the group. Not compensated, however, the leader is less motivated over time to work for the group. He searches for stability and less work for himself rather than for the highest returns for the members, which causes members' dissatisfaction expressed in their deviation from group norms. Paradoxically, stability is usually good for the group as a whole. Nonetheless it creates a social dilemma situation where the profits from breaking group rules might be higher than the returns provided by the group.

17:45-19:15 **PANEL C.5 - RESOURCE MANAGEMENT: BIODIVERSITY II**

ROOM 1

CHAIR: PETER H. FEINDT, UNIVERSITY OF HAMBURG, GERMANY

SUSANNE STOLL-KLEEMANN / MONIKA BERTZKY / NADINE FRITZ-VIETTA / RAINER SCHLIEP

Humboldt University Berlin, Germany

Barriers and success factors for implementing biodiversity related policies

Biodiversity faces many types of threats to its ecological integrity and cultural significance. Harmful practices originate from the failure of policies, laws and decision-making processes to provide effective guidance and conservation incentives to managers and others involved who confirm that problems at the operational level are closely linked with broader governance issues. This paper presents results from the interdisciplinary research project GoBi (Governance of Biodiversity), which evaluates the success or failure for implementing biodiversity related policies. Its main hypothesis is that the ecological outcome of implementing biodiversity related policies depends on the appropriateness of the selected governance and management systems with regard to the local context, and on broader economic and political issues.

The study is based on a large set of expert interviews and a global survey as well as case studies. The research project GoBi connects different kinds of data by means of an integrative model to be used as a decision support tool in biodiversity conservation and sustainable resource use. The results show that

typical imperfections of governance and management institutions such as enforcement and monitoring problems, insufficient political support, lack of stakeholder involvement, corruption, lack of capacity and leadership play an important role in determining success or failure for implementing biodiversity policies. The empirical material raised shows correlations between singular success and failure factors and allows deriving reasons for the continuance of governance and management failures. Adaptable institutional arrangements including responsive leadership and capacity building are necessary to manage biodiversity and ecosystems that have complex social, political, cultural and ecological dimensions.

INGO BRÄUER / RAINER MÜSSNER
Ecologic, Germany

Market based incentives to protect biodiversity – review of the current use and future perspectives

Market Based Incentives (MBIs) are more and more popular in the political debate about future strategies for biodiversity conservation. The reasons for this are twofold. Firstly, MBIs offer policy-makers new cost-efficient ways to reach conservation objectives using less financial resources, since MBIs use market forces to achieve their objectives. Secondly, actual procedures to protect biodiversity, many of them command and control approaches (CAC), suffer an increasing lack of acceptance. Hence MBI can achieve results beyond these traditional approaches. Examples of market-based instruments that are already in place include e.g. trading schemes for fishing quotas, agri-environmental schemes, eco-labelling and taxes.

The objective of this study, commissioned by DG Environment of the EC, has been to analyse how MBIs are currently used for biodiversity conservation and to assess the success or failure of these instruments and their potential for further use in different contexts in the future.

Based on reviews of current literature and databases as well as on expert judgements about MBIs, successful and promising examples have been extracted. A strength and weaknesses evaluation has been performed for several categories of MBIs from inside as well as outside the EU.

The analysis shows that price-based instruments are more common than quantity based ones. Experiences with the use of MBIs show, that there is no single instrument that is to be preferred to others. Success depends on several key criteria that define altogether the appropriateness of the instrument under specific circumstances.

RALF NORDBECK / EVA KVARDA
BOKU Vienna, Austria

New Modes of Governance for Sustainability in Austria * Comparing the Legitimacy and Effectiveness of the Austrian Biodiversity Strategy and the Austrian Forest Dialogue

At the UN summit in Rio de Janeiro (1992), governments worldwide committed themselves to sustainable development as a goal of international and national policies. With Agenda 21, a new strategic concept was adopted at the same time. This new strategy for sustainable development includes the formulation of long-term goals and operative targets as well as instruments to monitor and evaluate the results. It calls for the participation of non-state actors in political decision-making processes, inter-sectoral coordination and the integration of different political and administrative levels. At the same time, planning is not understood as a one-off event, but as an iterative and adaptive

approach which is open for learning effects.

The new strategic approach has found its way into numerous political programs, not only as overarching National Strategies for Sustainable Development, but also through more focused strategies like national biodiversity strategies and National Forest Programmes. Despite the rapid international diffusion, only few studies analyse the legitimacy and effectiveness of this kind of national strategies. This paper, therefore, aims to compare two national strategies in Austria with regard to their effectiveness and procedural legitimacy: the Austrian Biodiversity Strategy and the Austrian Forest Dialogue. In our case studies, we first develop analytical criteria to measure the degree of legitimacy and effectiveness. Based on our analyses of both strategies, we then test several claims on how the two dimensions of legitimacy and effectiveness are interrelated.

SATURDAY, 18 NOVEMBER

08:45-09:00 REGISTRATION (CONTINUED)

PANEL SESSIONS D

09:00-10:30 **PANEL D.1 – CLIMATE CHANGE POLICIES**

ROOM 1

CHAIR: RÜDIGER HAUM, SPRU, UNIVERSITY OF SUSSEX, UK

KATHERINE CINQ-MARS
McGill University, Montreal, Canada

National greenhouse gas emissions performance: The importance of political-institutional variables

Fourteen years after the Rio Earth Summit and nearly ten years after the Kyoto conference, national greenhouse gas (GHG) emissions records clearly show that some countries have been more successful than others in reducing or controlling the growth of their emissions. What explains the wide variation in national per capita levels of GHG emissions? Why have some countries been more successful than others in controlling and even reducing their emissions over time? This paper attempts to explain, using quantitative analysis, the variance in national levels of GHG emissions per capita and percentage change over the 1990-2003 period in 22 Annex I OECD countries. The hypothesis guiding this study is that while national GHG emissions performance may reflect to a certain extent countries' economic and structural characteristics, success or failure to reduce or limit emissions is largely a matter of conscious policy choices. Pro-environment policy choices, it is argued, are more likely to be made when political institutions and systems encourage power sharing and decision-making through negotiation among a large number of societal actors (consensus democracy) than when they tend to concentrate power in a bare majority, and when parties on the left of the political ideological spectrum, rather than in the centre or on the right, do well at the polls. The findings support the hypothesis and show that political-institutional variables explain a significant proportion of the variance in countries' emissions levels. More specifically, the regression analyses suggest that consensus democracy and the strength of parties on the left of the political spectrum (votes and seats) are significantly and negatively associated with GHG emissions per capita. Contrary to widespread belief, gross domestic product per capita is also negatively correlated with emissions growth and there is no correlation between economic and emissions growth in the group as a whole over the 1990-2003 period.

Nana Künkel / Klaus Jacob / Per-Olof Busch
FreieUniversität Berlin, Germany

Climate policies in Annex I countries – A statistical analysis of their determinants

Countries vary considerably in the stringency and type of their domestic climate policies as well as regarding their international commitments. What are the explanatory factors for this variance? In our paper we firstly analyse in how far countries are comparable regarding their degree of ambition in climate policies despite of different preferences as regards policy instruments. Secondly, we relate the policy outputs of Annex I countries to a model of environmental policy capacities. We first develop a measure of climate policy performance to capture the various aspects of climate policy. Our index draws together existing quantitative and qualitative information on national climate policies. From an array of information, including e.g. emission targets, the portfolio of policy types, and use of flexible mechanisms, two information on the aggregate policy output are derived: a ranked, composite indicator on the one hand; and a multidimensional, unordered information – the profile of climate policy – as identified in a cluster analysis. The latter is able to capture the qualitative nature of climate policy, e.g. the sectors addressed and the policy types used. We then aim to explain the relative position of a country in terms of its capacity. Our model of capacities for environmental policies encompasses the relative strength, competence and configuration of the governmental and non-governmental proponents of environmental protection and the specific cognitive-informational, political-institutional and economic-technological framework conditions. Emphasis is put on issue specific capacities, e.g. the share of the CO₂ intensive industries in GDP.

Both the profile and the aggregate performance measure are regressed against components of climate policy capacities. With our model of capacities we offer an explanation for the relative position of the degree of a country's ambition and we also analyse in how far different elements of political capacity are decisive for the policy profile.

Michèle Bättig
ETH Zürich, Switzerland

Cooperation of countries in the international climate regime - a possible measure to stimulate effective and efficient energy use

The international climate change regime, here restricted to the United Nations Framework Convention on Climate Change (UNFCCC), is an institution with the ultimate objective to achieve stabilization of greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The Kyoto-Protocol is a first agreement within this framework that defines concrete emission goals for developed countries that are among the largest emitters worldwide. All other countries are encouraged - by means of different mechanisms - to slow down the increase of their GHG emissions.

The most important way of reducing GHG emissions is through an effective, efficient and sustainable use of energy resources. This way is laborious for most countries and associated with political action on a national and international level. However, to achieve an efficient international climate change regime, it needs cooperative countries that give not only declarations of intent, but also take action. Cooperative countries guarantee that the process gets going, keeps running and yields fruits.

We developed a Cooperation Index that estimates how cooperatively coun-

tries behave within the international climate regime. The index is composed of different indicators that measure whether and how fast countries have committed to common goals, and whether and how effectively measures have been implemented that are in line with the committed goals.

On the basis of this Cooperation Index we investigate groups of countries that behave similarly. In addition, we examine which factors can explain the cooperative behavior of countries.

Nicole Cosmann / Kate Faulhaber / JP Leous / Mario Lopez-Alcala / Neal Parry / Armando Rodriguez / Lyndon Valicenti
Columbia University's School of International and Public Affairs, USA

Driving Sustainable Development: Carbon Sequestration as a Vehicle for Multi-Stakeholder Participation in Realizing the Millennium Development Goals

Since the pre-industrial era, the combustion of fossil fuels, agriculture practices, and land-use changes have contributed to the harrowing atmospheric concentrations of greenhouse gases (GHGs) inducing global climate change. Climate change has the potential to most affect those in developing nations, as these areas of the world currently lack the resources to readily adapt to shifts in local weather patterns. The United Nations has consequently linked climate change with sustainable development in its Millennium Development Goals (MDGs) in an attempt to promote environmentally conscious economic growth in developing countries.

Of the many methods currently being pursued by private and public stakeholders to mitigate GHG emissions, carbon sequestration projects can act as a vehicle through which Multinational Corporations (MNCs) and developing nations can collaborate. Through such projects each party can meet its specific goals as well as achieve environmental benefits and sustainable economic development. MNCs can be significant drivers for: (1) the improvement of carbon sequestration mechanisms, (2) building the capacities of African nations, and (3) paving the way for additional firms to participate in development-focused sequestration projects.

To date several barriers have prevented MNC participation in sequestration projects and in partnerships with African countries more generally. However, the same characteristics that drive success in the private sector put MNCs in a position to champion solutions to these challenges. Current geologic, forestry, and soil sequestration projects demonstrate the potential for MNC leadership in mitigating GHG emissions and promoting sustainable development in Africa. In this report we present a conceptual model highlighting the relationship between MNCs, project host countries, and carbon sequestration mechanisms, and how this relationship can better funnel resources toward environmental protection and sustainable economic development.

09:00-10:30 **PANEL D.2 – RESOURCES AND SECURITY I: ENERGY**

ROOM 2

CHAIR: STEFFEN BAUER, GERMAN DEVELOPMENT INSTITUTE, BONN

DENNIS TÄNZLER
Adelphi Research, Germany

Energy Resources and Security: Implications of an Increased Use of Renewable Energies

The present structure of global energy consumption is characterized above all by the use of fossil energy carriers such as coal, oil and gas. Various aspects of

global energy supply can have security policy implications and, moreover, are not in line with the requirements of sustainable energy supply systems. The climate change resulting from greenhouse gas emissions caused by the combustion of fossil fuels is the greatest environmental policy challenge currently facing humankind. Already existing crisis-ridden constellations can be further exacerbated by climate change impacts. A further important aspect is that competition over the utilization of fossil energy carriers has led to political tensions and conflicts of various intensities. In many regions, access to fossil energy carriers is linked with geostrategic issues and regional hegemony. Rivalry over strategic access to mineral oil and natural gas reserves is unabated. Available forecasts underscore that these dependencies will continue to intensify, as at global level energy demand is rising steadily. In many of the poorer regions of the world there is a high degree of energy poverty; as a structural factor, this heightens the potential for diverse forms of crisis.

Against this backdrop, this paper discusses the peace-promoting potential of renewables by taking up key security-relevant aspects of present energy use and outlining their scope. First, the discussion examines the development of global energy requirements and regional energy suppliers and briefly characterizes specific security risks. A special focus is directed to the risks that can be derived from recent climate science findings, particularly the question of regional "tipping points". Second, it will be analysed to which extent the increased use of renewable energies can help to reduce security risks caused the global energy consumption. Part of this discussion is also whether new security risks might evolve by an increased use of certain renewable energies sources (e.g. biomass). The paper concludes by setting out a range of avenues by which renewable energy sources can reduce the stated security policy risks in concrete terms.

CATALINA BOLMA

University of Bucharest, Romania

The resource - security matrix and the involvement of international organization in solving it

The geographical unequal distribution of resources affects, in a large proportion, the economic development of the states, as well as, in several cases, represents a matter of survival for the population. In certain circumstances, especially in developing countries, the link between resource and security can be described as a vicious cycle. On one hand, when dealing with resource wealth in a certain region/state, illegal resource exploitation (diamonds, gemstones, timber, oil, minerals) funds war (usually triggered by other factors), and war provides the means and conditions that allow continued illegal access to these resources. On the other hand, resource exploitation, particularly, in developing countries has benefits only for a small group of business people and governmental elite. Moreover, ample resource endowments have negative economic consequences, since countries grow overly dependent on these resources, allocate inadequate capacities and labour and under invest in critical social areas such as education and health. Therefore the linkage between resource exploitation-economic development- human security-security is complex and takes the shape of a matrix, rather than of a linear relationship.

Environmental security is a new concept, created to overcome resource scarcity, risks caused by environmental degradation and environmental change, as well as those caused by human activity (ignorance, accidents, mismanagement). I intend to concentrate in my paper on environmental security as the modern paradigm to solve the resource-security dilemma, as well as on a analysis of the activity of the international organizations in this field. On a first sight, there are several initiatives with the same object of activity, there is little

concentration on the link between security and environment, as well as a constant lack of sufficient financial resources to promote concrete projects. Moreover, there is limited coordination among UN structures, as well as among all international bodies dealing with environmental protection and security.

OSAMU KIMURA

Central Research Institute of Electric Power Industry, Japan

30 years of solar energy development in Japan: co-evolution process of technology, policies, and the market

Technology development for a low-carbon economy, such as renewable energy development, plays a vital role in the global climate strategy. This paper analyses the 30 years history of solar energy development in Japan, and explores the reasons for the successful diffusion of solar cells from the mid 1990s. It reveals that a major success factor has been the combination of a consistent technology-push policy, the Sunshine Program established just after the Oil Crisis, and demand-pull policies, such as net-metering system and investment subsidies from the early 1990s. It also analyses the policy process as to how these policies were formulated out of the struggle among the government, producers, and utilities, and how such policy instruments influenced technological innovations by stable R&D support, procurement, and removing regulatory barriers. The analysis also points out the response by high-income consumers, the dominant purchasers of solar cells in Japan, as another critical factor. Finally, the paper asserts that, although Japanese photovoltaic development and diffusion seem to be an early success, its future development is highly uncertain due to the ongoing deregulation of utilities and the weak diffusion support by the government.

09:00-10:30

D.3 – INSTITUTIONAL INNOVATIONS

ROOM 3

CHAIR: LYDIA ILLGE, GERMAN INSTITUTE FOR ECONOMIC RESEARCH (DIW BERLIN), GERMANY

ANJULA GURTOO / S.J. ANTONY

Indian Institute of Science, India / University of Leeds, UK

Indirect and Unintended Consequences of Environmental Legislations on Economic and Business Activity: A Systematic Review

The environmental impact of products and practices has become an important issue of debate over the past few decades and stakeholders (companies, institutions, consumers and others) are being forced to consider the environmental impact of their actions. Several studies conducted in the area of regulatory studies since 1990s show significant direct impact of environment legislations on business and economy. Some of these direct impacts, as identified in literature, include product and process redesign to include environmentally friendly materials and processes; life cycle management for recycling and reuse; and new government structures and mechanisms for compliance monitoring.

However, legislations have the potential to produce secondary and tertiary impacts on various stakeholders which are either not clearly visible or take time to show their impact and this holds true for environmental legislations as well. For example, studies show that capital intensive nature of recycling may force inter-firm collaboration between competitors, which in turn may influence

market structures and firm level productivity. Studies also suggest emergence and growth of a new industry in recycling and recycled and refurbished goods, which may further create new opportunities in international trade between developed and developing countries. Therefore, it is required to move beyond simple cause-and-consequence to understand and identify these indirect causalities, complex causal chains that bring unpredictable surprises and the reflex nature of the environment.

This paper is a systematic review of literature in order to identify and categorize the secondary and tertiary impacts of environmental regulations on the broad areas of business and economics, with the main objective of exploring various dimensions through which environment legislations can indirectly influence business and economics. The paper then applies the economic-liberty perspective and its counterview, the public interest theory, to suggestions some propositions/hypotheses in order to establish new directions for research and theory.

SIMO KYLLÖNEN / ALFRED COLPAERT / HANNU HEIKKINEN / MIKKO JOKINEN / JOUKO KUMPULA / MIKA MARTTUNEN / KARI MUJE / KAISA RAITIO
University of Oulu / Finnish Forest Research Institute / University of Jyväskylä / University of Joensuu, Finland

Conflict management as a means to the sustainable use of natural resources

Disagreement rather than agreement characterises the normal state of democratic society. This tendency of democratic societies to engage in internal policy disputes has given rise to numerous sociological, political and philosophical studies and theories.

According to theories of conflict regulation conflicts per se should not be considered problems. Instead, social institutions should be developed so as to react to these conflicts constructively, and to make gradual social change possible. Conflict management could thus be seen as an integral part of the functioning of democratic societies. During the last fifty years economists and decision theorists, in turn, have developed different theoretical models to characterise individual behaviour, social choice, and strategic interaction.

The evolution of disputes concerning the use of different natural resources in Finland is analysed by using the theoretical models of frame analysis and strategic interaction. Disputes vary from lake fisheries and watercourse regulation to reindeer herding and forestry. Despite the differences between the natural resources and the institutions that manage them, the cases share many common features that explain their successes or their difficulties in terms of sustainable and cooperative use of these resources. The paper concludes with preliminary advice on how the institutional design can facilitate sustainable use of natural resources by the means of conflict management. These include credible alternative option for cooperation that affects the actors' payoff assessments, comprehensive analysis of multiple resource use and of actors' preferences in a way that decreases the negative impact of frame difference, explicit roles and a clear division of commitments and entitlements, and inclusion of sub-processes in which mutual trust between the actors (including a public manager or a third party) can emerge.

PATRICK MEIER
Tufts University, USA

CEWARN: An Early Warning System for Environmental Conflicts in the Horn of Africa

Environmental or resource-related conflicts often share characteristics specific

to a particular region. The Horn of Africa, for example, is characterized by semi-arid conditions that provide limited options for sustainable livelihoods other than pastoralism. The scarce resources that dot the region are scattered across political borders and their availability is dependent on erratic seasonal patterns driven by environmental change. Efforts undertaken to monitor and assess patterns of resource consumption on a regional scale suggest that cross-border conflicts over livestock and access to water are often associated with periods of environmental duress. To what extent are patterns of resource use predictable and what lessons can be drawn from previous studies? Do these efforts provide an effective basis for policy making? On the institutional side, what kinds of arrangements facilitate sustainable resource use and environmental cooperation? In other words, how can institutions integrate external effects and account for the complex interdependencies between human and ecological systems? And finally, what can be learned from existing institutions in this respect?

Environmental resource policies have to cope with a high degree of complexity to efficiently manage coupled human-environment systems. This is likely to pose a challenge for traditional institutions. To this end, regional collaboration to institutionalize regional early warning systems may be the most promising entry points for governmental intervention. That being said, it is subject to investigation whether specific institutions are more robust at managing these complex challenges than others and whether they actually diffuse environmental conflicts. This paper takes the regional Conflict Early Warning and Response Mechanism institutionalized by the Intergovernmental Authority on Development as a case study to address the questions associated with environmental change, resources and security. In so doing we demonstrate how insights from cross-disciplinary research between the social and natural sciences can improve early warning systems and environmental cooperation.

09:00-10:30

D.4 – RESOURCE MANAGEMENT: REFORMING THE WATER SECTOR

ROOM 4

CHAIR: GEORG MERAN, GERMAN INSTITUTE FOR ECONOMIC RESEARCH (DIW BERLIN), GERMANY

ARLETTE JAPPE

Fraunhofer Institute Systems and Innovation Research, Germany

Science for Sustainable River Basin Management

Experts maintain that river basins are the appropriate unit for sustainable water management. This paper examines ways to improve the communication between scientists and decision-makers to make river basin management more effective. Conceptually, we apply Oran Young's institutionalism of environmental regimes to river basins (institutional fit, scale and interplay), combined with specific insights from STI research (science, technology, innovation research) on boundary management between science and decision-making. Empirically, we investigate 30 river basin initiatives from 22 countries that participate in the Unesco Programme HELP (Hydrology for Environment, Life and Policy). HELP aims to foster river basin management through improved dialogue between scientists (hydrology and related environmental sciences), decision-makers and stakeholders. This comparative analysis is based both on documents that report activities of each initiative (from Unesco) and 20 semi-structured interviews with key participants.

Since our sample includes initiatives from North and South, water management issues, capacities and context conditions are diverse. Based on the content analysis, we distinguish four types of basin initiatives: (A) initiatives that are

associated with an established river management agency; (B) participatory processes led by a water related government agency; (C) cooperations between researchers and water user groups (e.g. farmers); (D) more conventional scientific advice to policy-making.

Our preliminary results show that different issues of boundary management are pertinent for the four types of initiatives. The understanding of assessments as social process (Jäger & Farell) and the institutionalisation of long term strategic research are important for type A and D. In type B and C, scientists' role as facilitators, mediators and information brokers between politics and stakeholders is at the fore, e.g. the use of models in participatory planning or local capacity building. Across all capacity levels, professional training is seen as essential for progress in sustainable basin management.

NIGEL HAYBALL

Australian National University, Australia

Knowledge Flows: Developing Informative Policy-Advice in Water Resource Commissions'

Finding the most effective set of water resource management policies is a great challenge we face on the planet today. The issue is complicated by water not being confined by jurisdiction boundaries. Governments are accepting the need to develop ways to work together to manage the resource, and Water Resource Commissions (WRCs) are becoming the main institutional arrangement for developing effective water management policies.

The institutional arrangement of WRCs would play a role in how the agenda is set, hence the development of policy. The number of communication pathways, the number of management levels, the composition of decision-making bodies are factors that could alter how the information gathered by supporting programs is turned into policy. It is unlikely one WRC would be structured the same as another.

Often WRCs are the highest-level advisory group that report directly to a policy decision-making body. A bottleneck information pathway occurs where information must be filtered, or culled, as there is only one high-level advisory group to review the many alternatives presented by supporting programs.

In WRCs decision-making is complicated by the range of technical expertise required for understanding the physical, biological, economic and social aspects of a basin system; and finding a way to balance input. The availability, the type, and possibility the order of how gathered information is considered is likely to be important for ensuring for effective management.

This research will examine how organisational arrangements of WRCs affect the development of policy. Knowledge Flows Theory, a new model, and the more traditional Rational Choice Model will be applied to examine three differently structured WRCs (i.e. MRC; MDBC; and the Australian National Water Commission) to determine whether the most advanced information, gathered from supporting programmes, is reaching decision-makers, and if so, does it enable the most effective policy to be developed.

PAULA NAUKKARINEN

Oxford Institute for Sustainable Development, UK

The role of policies and equal burden sharing in the ecological footprint of potable water production in Cyprus

Cyprus as a popular holiday destination has the pleasure of hosting over 2.3M tourists annually. But tourism has been a mixed blessing to an island that is struggling with droughts and subsequent water shortages. Water rationing has

traditionally been the key policy attempting to limit consumption and promote conservation. This literally meant intermittent water supply and as little as one day of running water per week in some areas of the island. While the islanders had to cope with such a harsh rationing regime, hotels and other tourist infrastructure had a continuous, unlimited water supply causing inequality in burden sharing.

The government of Cyprus has attempted to tackle the issue of diminishing water supply, and the past decade saw the commissioning of two desalination plants. Introducing desalination has certainly alleviated the immediate threat of potable water shortages but at what cost? Even with the most effective technology, desalination is extremely energy intensive thus creating a large ecological footprint for potable water. Electricity on the island is produced using crude oil, therefore increasing its carbon footprint compared to electricity produced from natural gas. In addition, it has been the government policy to heavily subsidise water prices which in turn means that the true costs of water production have not been passed to the end user. It is feared that under the EU legislation such subsidies cannot be continued indefinitely.

This paper aims to look at the energy intensity of potable water production and subsequently its ecological footprint in Cyprus. It is of particular interest to investigate how the tourism industry could bear its fair share in water conservation efforts thus providing a more equal basis for burden sharing. Subsequently, the role of water policies as the driver for water security will be examined in view of the EU framework.

RUTGER VAN DER BRUGGE / RUTGER DE GRAAF

Erasmus University Rotterdam / Technical University Delft, Netherlands

Transformation and Resilience of Water management regimes - A Rotterdam case study

In the water management literature the concept of water management regimes is not widely used, but refers to a constellation consisting of actors with specific practices and artifacts that are embedded in socio-cultural and institutional structures[3]. Generally, regimes have strong interdependencies between the elements they consist of and share a same logic, therefore enabling and constraining the practice of water resource management in specific ways. Climate change, environmental degradation and changing societal demands (i.e. public participation) trigger transitions towards new water management regimes across Europe. Existing regime constellations throw up barriers resisting necessary transformative changes for effectively dealing with their water resources. In this case study, we zoom in to the local level, to the Rotterdam area in the Netherlands and investigate how its water management regime can be characterized and manages its water resources. Secondly we investigate how the water system is envisioned to change in the upcoming 25 years[4]. Climate change causing sea level rise and salt-water intrusion in the Rhine delta and increased variability of water resources, poses threats for water resources of Rotterdam in the future. We elaborate opportunities to change from external river water resources to a more closed system of local urban water resources. The notion of transformability is used to indicate the regimes' capability to adapt to changing circumstances through renewal. Resilience on the other hand indicates the regimes ability to adapt, but though retaining essentially the same system[5]. Water system innovations are especially difficult to realize in densely populated urbanized areas with high investments in existing water supply infrastructure. However, the Rotterdam area of interest is currently in the middle of large urban restructuring process, providing opportunities for renewal in the water system. Thirdly, we will provide recommendations to anticipate on opportunities to overcome barriers resisting necessary transformative changes.

[3] The concept of 'regimes' originates from the technological innovation literature (e.g. Nelson and Winter, Rip), pointing out that technologies are always embedded in socio-technical systems. Nowadays, it is widely used in the transition management literature (e.g. Rotmans, Kemp, Loorbach, Schot, Geels) to explain why societal systems are so difficult to transform.

[4] We therefore make use of the report "Rotterdam Water City 2035"

[5] The notions of transformability and resilience originate from ecology (i.e. Holling, Walker, Folke, Scheffer). Here, we attempt to translate these concepts to societal systems, more specifically to water management regimes.

10:30-11:00

COFFEE BREAK (FOYER)

PLENARY SESSION IV

CHAIR: N.N.

ROOM 1 (LECTURE HALL)

11:00-12:15

PAUL EKINS

PSI London, UK

"Reducing Resource Flows: Prices, Information and Market Failure"

CHRIS J. MOTTERSHEAD

British Petroleum

"Creating Economic Growth from a Climate Constraint"

12:15-13:30

LUNCH BREAK (FOYER)

13:30-14:45

PLENARY SESSION V

Chair: Andreas Thiel, Humboldt University Berlin, Germany

ROOM 1 (LECTURE HALL)

CLAUDIA KEMFERT

German Institute for Economic Research (DIW Berlin), Germany

"Energy, Security and Sustainability – What Counts Most?"

DANIEL BROMLEY

University of Wisconsin, USA

"Toward Understanding Global Tension: Natural Resources and Competing Economic Histories"

PANEL SESSIONS E

15:00-16:30 **PANEL E.1 - RESOURCES AND DEVELOPMENT**

ROOM 3

CHAIR: INES DOMBROWSKY, UFZ LEIPZIG, GERMANY

ALEXANDER CARIUS
Adelphi Research, Germany

Conditions and constraints for environmental cooperation as a tool for crisis prevention and peace building

Notwithstanding the warnings of governments and international organizations about future water wars and environmental refugees threatening western democracies, there has been a growing hope that environmental cooperation promotes stability and peace between conflicting parties. Thus, transboundary cooperation for nature conservation, river basin management, regional marine agreements and joint environmental monitoring programmes can enhance cooperation between communities or countries. The more such initiatives exist and the more momentum they gain, the more they will help communities resolve conflicts in a constructive and consequently non-violent manner. Surprisingly, there is still relatively scant information on how to evolve transboundary initiatives for environmental cooperation and the conditions under which these could be optimally used for conflict prevention and peace building. Little is known about the constraints they would be subject to and under what conditions environmental cooperation can deepen into broader forms of political cooperation and generate a social dialogue going beyond environmental issues. There is insufficient empirical evidence so far to substantiate either the theory of environmental wars or environmental peace building. In this paper the author explores conditions under which environmental cooperation can facilitate conflict transformation and peace building. It is also examined which specific forms of negotiation or stakeholder constellations have so far proved successful. This paper is an attempt to systematize the role of environmental cooperation with regard to conflict prevention and peace building and to define its scope. The study focuses on the following issues:

1. Why does cooperation in shared natural resources lend itself to the prevention of armed conflicts and to building peace?
2. Which political and social factors favour the evolution of environmental cooperation into a more broad-based social and political peace process?
3. Which conditions facilitate or hinder this development?
4. Which methodological approaches are suitable for designing conflict-sensitive environmental and resource management projects?

STEFAN LINDEMANN
Freie Universitaet Berlin, Germany

Addressing the need for water service delivery in fragile states: The case of German donor involvement in Yemen

The challenge of global water service delivery is closely linked to the problem

of state fragility: As fragile states are often either unable or unwilling to provide water services to the majority of their peoples, especially the poor, they now contain about a third of the number of people globally living without sustainable access to safe drinking water. Western donors increasingly recognise the specific challenge of inadequate (water) service delivery in fragile environments and seek guidance on “how to deliver services in fragile states more effectively”. Against this background, I take the example of German donor involvement in the water sector of Yemen and identify lessons for good international engagement in fragile states. The Yemenite case resembles most a fragility scenario of (enduring) recovery where a relatively stable government is in place and basic state functions are slowly being established. Here, the water sector is of crucial importance since Yemen is one of the water scarcest countries in the world: While the country has recently made important progress in the institutional and organisational consolidation of the water sector, its performance in terms of water policy development/implementation is still weak and the overall structures remain largely unsustainable. German development cooperation has taken up this challenge by devising a “multi-level strategy” that successfully combines support to sectoral reform at the macro/meso level with the creation of decentralised and commercialised service utilities at the micro level. Specific “lessons learned” from German donor involvement in the Yemenite water sector include the need for (1) context sensitivity, (2) state building through intervention at different levels, (3) dialogue and participation, (4) conflict prevention, (5) alignment with local priorities, and (6) donor coordination.

LUISA MORETTO
University Ca' Foscari of Venice, Italy

VENEZUELAN WATER BOARDS AS A TOOL TO ENSURE EFFECTIVE AND EQUITABLE ACCESS TO WATER

This paper describes how the Venezuelan government is currently providing low-income urban communities with effective and equitable water supplies. Access to and sustainable use of urban water is one of the most pressing problems in cities of development countries. Moreover, after the widely recognised state-failures and market-failures in the water management in the countries in the South, the necessity for an alternative strategy to guarantee a sustainable access to urban water emerged.

In this context, the case of ‘water boards’ in Venezuela represents a successful alternative system to ensure effective and equitable access to urban water through new governance arrangements amongst the central and local governments, the state-owned water company and the low-income communities organised in ‘water boards’. The analysis of these governance arrangements systems is carried out through the tentative application of the UN-Habitat Urban Governance Index (UGI) to governance arrangements locally developed to organise water supplies in the Caracas Metropolitan Region.

The paper stresses how the application of the UN-Habitat UGI four basic principles (effectiveness, equity, participation and accountability), allows to analyse this new strategy for a sustainable use of water resources.

J. TIMMONS ROBERTS
The College of William and Mary, Department of Sociology, USA

Addressing the Structural Roots of Carbon Emissions Inequity: Export Profiles, Foreign Assistance, and “Pathway Switching” to Low-Carbon Development Strategies in LDCs

Some “development pathways” (as indicated by a nation's main export products) insulate countries from economic volatility more than others, cause less environmental damage, and give more options to planners. Some pathways—especially those based on the extraction and production of raw materials, semi-processed commodities and low-value manufactured goods—are much less profitable, produce fewer social benefits, and require huge amounts of raw materials and vast flows of fossil fuels for processing and transport. Many of the low-value/high-environmental impact development pathways are precisely those which have created societies in poorer nations which are characterized by stark social inequality, weak civil societies, and volatile political structures. Some domestic elites who have built their fortunes and political power on the basis of old and inefficient technologies will vigorously oppose the introduction of new, more efficient ones: compensation and assistance to shift to “alternative development pathways” will be critical for their participation in global initiatives on environmental protection, including climate change. This paper describes research in progress utilizing the Project-Level Aid (PLAID) dataset of 427,000 foreign assistance projects from multilateral and bilateral donors over the past three decades to address two lines of questions. First, what impact has three decades of aid had on the export profiles of developing nations, and what are the carbon implications of these changes? Does this suggest that aid can help drive future structural change, moving nations toward lower-carbon/higher value development pathways? Second, what features of recipient nations are being targeted for the 1,800 aid projects which claim to be addressing climate change and energy efficiency, and which types of nations are being neglected? What are these projects' likely impacts on emissions, given the nation's shifting position in the global economy? In sum, what is the role for foreign aid in addressing climate change (and other environmental impacts) in poor nations, and what should be proposed in the future?

15:00-16:30

PANEL E.2 – RESOURCES AND PROPERTY RIGHTS

ROOM 2

CHAIR: N.N.

DAVID AUBIN

Université catholique de Louvain / Université de Montréal, Belgium/Canada

Activation of Rules in Water Rivalries: Modes of Resolution between Users in Western Europe

Human pressure on natural resources is increasing, a trend that climate change tends to make worse. Resource users enter in competition for the exploitation of scarce resources. However, rivalries do not occur in an institutional void. A whole set of institutional rules frames the behaviour of resource users, mainly public policies and property rights. How do these rules intervene in rivalries between users? How do they contribute to their resolution? We suppose that users activate rules to assert their rights against their rival and find out a solution to the rivalry. Users have a bundle of rights at disposition, but tend to select either property rights or a public policy. Three hypotheses are put forward to understand this choice between rules: (1) The owner activates his property rights; (2) The non-owner activates a public policy that acknowledges him as final beneficiary; and (3) The owner activates a public policy if his property rights do not enable him to exclude his rival. The empirical test is made on twelve cases of activation identified in two river basins, one located in Belgium and the other in Switzerland. The deductive method is used based on a qualitative and comparative analysis (most different system design). The

hypotheses are confirmed in most cases. Rules are determinant in the process of resolution of rivalries. The activation of public policies is relatively frequent and policies can take the precedence over property rights in particular conditions. However, this kind of activation is difficult as non-owners need important resources to be formally recognised as final beneficiaries.

JEAN-DAVID GERBER, PETER KNOEPFEL, STÉPHANE NAHRATH, FRÉDÉRIC VARONE
IDHEAP, IEPI, University of Geneva, Switzerland

Institutional Resource Regimes: a Political Science Perspective on Sustainable Resource Management Combining Property Rights Theory and Policy Analysis

Despite considerable success environmental policies have reached over the last half-century, the latter are not able, in their current state, to actually guarantee a sustainable use of natural resources. Based on objectives and instruments designed to reduce and manage emissions, the various environmental protection policies, as well as the emerging "sustainability policies", are, paradoxically, not able to avoid situations of ecologically sound overexploitation of natural resources. We argue that this is due to the fact that these policies: (1) are sectorially designed protection policies, unable to provide a coordinated regulation of all the different (protection and exploitation) uses of a given resource, and (2) basically ignore the existing property right regimes stemming from private law (water rights, land property, etc.) that are regulating the definition and distribution of individual or collective property and use rights on the resources, and which might heavily disturb policy implementation processes.

Based on a review of the theoretical literature dealing with sustainable management of natural resources, as well as on an in-depth empirical analyses of resource exploitation processes and of the various rules that govern resource uses and resource users, our contribution will present a new reading of the empirical world by employing the concept of "institutional natural resource regimes" (INRR). This resource-based approach combines the analytical strengths of public policy analysis with the property rights theory developed within the institutional resource economics approach.

The presentation of some of the main results of the various empirical research realised during the last 6 years (water, air, soil, forest, landscape) will illustrate the relevance of this analytical framework for understanding the ecological, economical and social issues political regulation of natural resources are confronted with. It will also allow us to make some recommendation concerning the way in which actually sustainable resource policies should work.

DORU LEONARD IRIMIE
University of Freiburg, Germany

PROPERTY RIGHTS IN ROMANIAN FOREST POLICY An Institutional Analysis in the Context of Societal Transformation

Property rights over natural resources (e.g., forests) represent a distinct area of inquiry in environmental economics and policy, but it is ascertained that their role has not yet been investigated thoroughly. Transition countries represent an excellent opportunity to analyse the progression of various policies and institutional developments concerning the regime of use and management of natural resources, given the spectacular evolution of political, economic and social conditions. The processes of societal transformation driven by the major political events of the last century had deep impacts on the forestry sector too, entailing land reforms and subsequent changes to its institutional and organisational framework.

The research goal is to analyse the reciprocal relation between the evolving

institutional arrangements (forest property rights) and the attitude and conduct of policy actors, in connection with the impacts on the status of forests. The theoretical framework of the research is (new) institutional economics, with its interrelated theories: property rights theory, primary, and transaction costs theory, as well as agency theory, secondary. A core concept in the institutional analysis is that patterns of interaction between institutions and actors (organisations) produce physical outcomes, assessable by criteria such as equity and efficiency. Research data were collected by interviewing, literature review and participant observation and analysed through an integrated method of qualitative content analysis and a matrix analysis.

Following the analysis of three research periods and the corresponding property regimes, patterns of relation between the research variables were identified. They have been illustrated in two distinct models of interaction, one in the framework of a given property regime and the other in the context of institutional change. How efficiency and equity rationales were followed when designing and enforcing different institutional arrangements and to what particular effects are also presented.

DEREK KAUNECKIS
University of Nevada, USA

Re-thinking enforcement mechanisms in property rights to natural resources

The importance of enforcement is so widely accepted as to be a truism in property rights analysis. While enforcement activity is critical to understanding property right structures, it is often assumed to emerge naturally from legal structures and government action. However, this focus on formal enforcement activity often overlooks informal mechanisms that may be more important in understanding effective property right systems, and the success and failures of various reform efforts. Until recently, little work has examined the specific local mechanisms that make rights effective. This is especially important in property rights to natural resources where state agents may not have incentives to effectively enforce formal rights. Using comparative case studies and a simple game theoretic approach, this paper provides a conceptual framework that allows for the inclusion of multiple enforcement agents and interactions across different types of enforcement activities to explain variation in the property rights systems. Particular attention is placed on right structures to natural resources and illustrations are taken from numerous environmental resource management situations and property right reforms.

15:00-16:30

PANELS E.3 – RESOURCE MANAGEMENT: FORESTRY

ROOM 4

CHAIR: THOMAS SIKOR, HUMBOLDT UNIVERSITY BERLIN, GERMANY

K N NINAN
Institute for Social and Economic Change, Bangalore, India

NON TIMBER FOREST PRODUCTS AND BIODIVERSITY CONSERVATION- A STUDY OF TRIBALS IN A PROTECTED AREA IN INDIA

This study analyses the economics of Non Timber Forest Products (NTFPs) and the economic values appropriated by tribals in a protected area in India. Using primary data covering a cross section of tribals in the Nagarhole National Park (NNP), South India the study notes that the economic values appropriated by the tribals are quite high. Even after including external costs (i.e. wild-

life damages costs and defensive expenditures to protect against wildlife attacks) the Net Present Value of NTFP benefits derived by the tribal households was over Rs 30,378 per household (at 12% discount rate for cash flows summed over 25 years). Interestingly when the external costs borne by third parties (i.e., coffee growers) are taken into account the net NTFP benefits turned negative. In other words, although from the NTFP extractors viewpoint NTFP extraction is a viable activity, from the society's viewpoint this is not so. The estimated net NTFP benefits from NNP after including the external costs borne by NTFP extractors was estimated at between USD 33.5 to 167.5 per ha per year using alternate assumptions regarding the park's catchment area. The tribals have a positive attitude towards biodiversity conservation. Asked to justify and rank the reasons why biodiversity needs to be conserved, the tribals emphasized its livelihood and ecosystem functions. Using contingent valuation method, the study notes that those with income from coffee estates and forest employment, and those residing in the core zone of the national park are less willing to accept compensation and relocate outside the national park. The study suggests improving the incentive structure in order to obtain the support and participation of tribals in biodiversity conservation strategies.

KALPANA GIRI

University of Natural Resources and Applied Life Sciences, Vienna, Austria

Resource Complexities and Governance Mechanisms: Evaluating Community Forestry Program of Nepal*

The study of collective action for sustainable resource management entails complexities. Such complexities engender intricate uncertainties within the system at varying levels and stakes affecting governance mechanisms. This paper analyzes existing level of governance in Community Forestry Program based on case studies particularly limited to two community forest user groups (CFUGs) in Nepal. It assesses and analyzes existing institutional design of CFUGs at local level and the resulting interactions amidst different stakeholders. After reviewing academic literature, governance in this paper mainly, focuses on "how" concept illustrating the process adopted for resource management. Forest governance is characterized as a process encompassing participation, transparency, accountability, legitimacy of rules, equity and inclusiveness, effectiveness and efficiency. Analysis is based on field data obtained from household in-depth interview, focus group discussion, key informant interviews, social and resources mapping and matrix ranking. This study shows that in both CFUGs, complexities for effective governance though exists, are at differing extent. At local level, this difference results due to difference in history of land use, awareness, adoption of transparent and accountable mechanisms, existing conflict mechanisms, motivation for participation in forest management, degree and extent of rules enforcement and relationship with external authority. It also points that politicizing of power relations within resource system determine the overall process of governance of both CFUGs. This study shows that broad understanding of transparency only in terms of income and expenditure, both in policy and process, blurs governing process in Community Forestry Program. Governing process need to build upon transparent mechanisms in terms of access to information, decision-making, laws enforcement and benefits sharing as well. In addition, forest policies need to consider non-linearity and thereby, complexity as an inherent part of institutional design and focus on democratic process that allows a common understanding of shared complexities and associated solutions.

Radhika MURTI / Spike BOYDELL
United Nations Development Programme / University of Technology,
Fiji/Australia

Effectiveness, Efficiency, and Equity in Fiji's Community Forestry: Identifying Tools for Land Tenure Conflict Transformation

Community forestry has proven to be an effective advance towards achieving collaborative sustainable management of natural resources in various countries. However, like any management strategy, community forestry has its challenges and resultant conflicts. Conflicts occur within resource owning communities, between communities and external parties and among external parties.

Often conflicts are based on confusion over property rights related issues. Conflicts stemming from differing views on ownership, tenure and property rights within forest management in Fiji, have led to delayed implementation of critical environmental management plans, loss of economic benefits and disintegration within landowning (mataqali) units. In order to successfully implement sustainable forest management, the issue of land tenure conflict has to be understood and addressed.

This paper investigates the effectiveness, efficiency, and equity of two pioneering community forestry projects - The Drawa Block Sustainable Management Pilot Project (Pacific German Forestry Project – GTZ initiative) and The Sovi Basin Conservation Project (Conservation International initiative) - and identifies core tools to assist in conflict transformation. The IIED '4Rs' framework (rights, responsibilities, relationships and revenues) has been adopted as the principal transformation tool for pre-diagnosis and negotiation of conflicts. Other complementary tools (viz. Walker and Daniels 1996; Dubois 1998; & EC2000 AHP) have been integrated into the '4Rs' framework to assist in transforming conflict between multiple stakeholders.

15:00-16:30 **PANEL E.4 – RESOURCE USE AND POLICIES**

ROOM 1

CHAIR: N.N.

KYLA TIENHAARA
IVM, Vrije Universiteit Amsterdam, Netherlands

Mineral Policy in Developing Countries: Protecting Investors or the Environment?

This paper examines the relationship between foreign direct investment in the mineral sector and environmental regulation in developing countries. Global flows of foreign direct investment (FDI), including mineral investment, are overwhelmingly concentrated amongst OECD countries. However, for some developing countries, their small share of the global flows of mining investment can represent a considerable share of overall FDI entering the country, and can contribute significantly to state revenue. At the same time it is also the case that few if any forms of economic development present the array of potential environmental, social and economic problems of the mining industry. There is no comprehensive international agreement on mining, and environmental regulation for the sector in many developing countries is a relatively recent phenomenon. Furthermore, governments often lack the relevant tools and manpower to properly enforce the environmental regulations that are in

place. Against this backdrop, It is argued that two major trends in global mineral investment have emerged in recent years; the increasing competition amongst developing countries to attract mineral investment, and the development and proliferation of a standard set of legal protections for mineral investors including access to international arbitration, prohibitions on expropriation, and commitments to stability of the legal regime. Both of these trends may have implications for environmental regulation, which are examined in the paper both in general terms and in the context of two detailed case studies concerning mineral exploitation in protected forests in Ghana and Indonesia.

CHRISTIAN LUTZ / BERND MEYER / MARC INGO WOLTER / STEFAN GILJUM
SERI Wien, GWS Osnabrück, Austria/Germany

The GINFORS Model in the MOSUS project: Model Description and Baseline Projection

The Global INTERindustry FORecasting System (GINFORS) is an economy-energy-environment model with global coverage. A bilateral world trade model links national models for 25 commodity groups and services. All EU-25 countries, all OECD countries and their major trade partners are explicitly modeled. The model is based on time series of international statistics data from 1980 to 2002. Behavioural parameters are derived from econometric estimations assuming bounded rationality of agents with myopic foresight.

Additional to detailed economic models including Input-Output Structures for the 24 most important countries, resource use is explicitly modelled. Energy-emission models are based on energy balances of the International Energy Agency. Total final energy consumption, transformation and total primary energy supply are consistently linked for 12 energy carriers to the economic driving forces that are explained in the economic part of the model. Carbon emissions result from the use of fossil fuels. Furthermore, material input models have been integrated into the system. For all countries resource use extraction in tons is explained for 6 categories. Their development is either driven by the economic part of the model or the energy model concerning fossil fuel use. Land use models (LUM) are also linked to the economic models.

The model has been completed and applied in the EU project „MOSUS“ (Modelling opportunities and limits for restructuring Europe towards sustainability). It is a comprehensive tool for monitoring trends in global resource use. Due to the global coverage and the full link to economic development on sector and national level, the model can assess impacts of policy options and economic developments on national and global resource use. The paper presents the model structure and describes the baseline scenario of the project, which demonstrates the ability of the model to consistently project major EU sustainability indicators in a global context.

PROF. DR. RAIMUND BLEISCHWITZ / BETTINA BAHN-WALKOWIAK
Wuppertal Institute, Germany

Sustainable Development in the European aggregates industry: the case for sectoral strategies

The EU Sustainable Development Strategy, ensuing National Strategies, and the EU Thematic Strategy on the Sustainable Use of Natural Resources (COM(2005)670 final) alike call for a decoupling of natural resource use from GDP growth. Empirical analysis demonstrates that the largest share of natural resources stems from construction minerals, i.e. aggregates such as sand, gravel, crushed rock. According to Eurostat, they represent 40% of the Direct

Material Inputs into the European economy in 2002 (mineral fuels 25%). The paper analyses governance processes enhancing the sustainability performance of aggregates that have begun to take stock in Europe. A first chapter sheds light on how the combination of specific environmental impacts, consistent high volume of use and sectoral growth prospects shapes the economic and environmental relevance of aggregates in Europe. Data are gathered from recent Life Cycle/Material Flow Analyses and economic sectoral assessments.

Since aggregates are mainly no endproduct but serve basic human needs like housing and physical infrastructures, driving forces for aggregates consumption are found in construction. What they and a predominantly regional scope of production and use imply for SD strategies is discussed in a second chapter and highlighted by recent findings from dynamic input-output modelling.

A third chapter analyses existing EU policies and national economic instruments affecting aggregates and sectoral processes like sustainability initiatives and networks, thus exploring structures and mechanisms of inter-ministerial collaboration/horizontal policy integration. However, there are no policies yet addressing the use of aggregates in conjunction with their final demand in respective markets. Rather, policies are fragmented into extraction, production, consumption and waste stages and still incoherent.

The final conclusions underline the importance of addressing sustainability of construction in a most comprehensive manner. In following emerging governance processes, they also lay down elements for a sectoral action plan on aggregates and sustainable construction.

16:45-17:15

COFFEE BREAK (FOYER)

PANEL SESSIONS F

17:15-18:45

PANEL F.1 – RESOURCE MANAGEMENT: BIODIVERSITY II

ROOM 3

CHAIR: ANDREAS THIEL, HUMBOLDT UNIVERSITY BERLIN, GERMANY

TIMOTHY C. HAAS

University of Wisconsin at Milwaukee, USA

Wildlife Management Using an Integrated Model of Political and Ecological Processes

Long-term protection of biodiversity will need to be politically feasible as well as biologically safe. Currently, most biodiversity research is focused on either biological questions or on political/institutional questions with little attention given to an integrated understanding of political and ecological processes. As a contribution to this need for integrated political-ecological management tools, a system is described for managing a species at risk of extinction across several countries. The description is through an example as follows. First, a set of interacting probabilistic functions is presented that model the wildlife management decisions of the president, environmental protection agency, farmers, and pastoralists in Kenya, Tanzania, and Uganda -- along with a conservation-focused NGO. The decisions of these social groups interact with each other and another probabilistic model of cheetah population dynamics within those countries. Each group's decision making is modeled as the result of that group finding the best course of action that will maximize the group's perceived utility. All of these models are dynamic since they post and react to

each other's actions through time.

Then, a statistical method is presented for simultaneously fitting the group model parameters to observations on group actions, and the cheetah population dynamics model parameters to observations on cheetah presence across Kenya, Tanzania, and Uganda.

Finally, this fitted political-ecological model is used to identify the most practical cheetah management strategy for these three countries. Here, "practical" is defined to be the strategy that would be the most politically acceptable and also the most effective at avoiding cheetah extinction.

ROBERT A. RICE

National Zoological Park, Washington DC, USA

Biodiversity Protection in Managed Lands: Opportunity for Coalitions

Most of earth's terrestrial area consists of lands modified in some way by human agency. Given the global threat to biodiversity, conservation biologists have finally come to realize that such lands warrant attention as supplemental habitats to natural systems. Recent years have seen attempts from private and non-governmental institutions to address issues of biodiversity maintenance, habitat protection, and general environmental health by promoting specific land management practices that link conservation efforts to the market place. The case of shade-grown coffee provides a good example, as evidenced by growing organic certification programs throughout the world (much organic coffee is shade-grown), the appearance of biodiversity-friendly coffees that carry science-based seals of approval, and less rigorous (but nonetheless passionate) initiatives based on general environmental protection. A number of other crops also stand as excellent candidates for similar linkages to be made (e.g., rice, cacao, etc.). Geographically, many of these efforts currently occur in remote areas of less developed countries—areas plagued by drastic landscape change, both physical and social. Yet national governments, whose charge it is to find solutions to help protect biodiversity and promote ecological security for their populations, have been noticeably absent from these innovative initiatives.

It is governments that must get involved in creative ways to protect biodiversity. The non-governmental sector can, does and should play a part in these efforts, but it is national governments that can bring these efforts together and formalize the initiatives that can both protect biodiversity and open markets for rural households to exploit. This paper examines what has been done to date with such efforts, and explores ways in which governments might promote them by acting as a catalyst to coalitions between the various players.

MONIKA BERTZKY / NADINE FRITZ-VIETTA / RAINER SCHLIEP / SUSANNE STOLL-KLEEMANN

Humboldt University Berlin, Germany

Reconciling biodiversity conservation and the sustainable use of natural resources - lessons from biosphere reserves in the Czech Republic, Hungary, Madagascar, Mexico and Poland

Streamlining biodiversity conservation into the sustainable use of natural resources represents the current trend in conservation planning and management. One of several approaches to address this challenge is represented by UNESCO's Man and the Biosphere (MAB) Programme. The herein elaborated Biosphere Reserve (BR) concept with its Seville Strategy explicitly aims at the reconciliation of human resource use and nature conservation, proposing a three-folded zonation scheme to strive for the parallel achievement of devel-

opment and conservation objectives. However, against the background of a very case specific complexity of governance issues, the implementation of the Programme is lagging behind its ambiguous concept.

This paper presents results from the interdisciplinary research project GoBi (Governance of Biodiversity), which evaluates success and failure factors for implementing management structures and processes for the sustainable use of biodiversity. It summarises lessons learned from case studies conducted in BRs in the Czech Republic, Hungary, Madagascar, Mexico, and Poland analysing their institutional and management framework. The different governance systems steering the BRs are evaluated with regards to their effectiveness in promoting the successful implementation of the BR concept. The conflictive area of varying interests and partially diverging concepts and plans on local, national and international level is investigated and comparatively assessed by conducting SWOT (strengths, weaknesses, opportunities, threats) analyses. Recommendations are deduced from lessons learned in order to support the work of BR managers and to unveil potential policy failures of regional and national level decision-making.

Results clarify challenges for protected area managers in the biodiversity conservation and regional development context and intend to foster the improvement of relevant policy frameworks.

17:15-18:45 **PANEL F.2 – EUROPEAN AND NATIONAL STRATEGIES (II)**

ROOM 1

CHAIR: ULF JÄCKEL, FEDERAL MINISTRY FOR THE ENVIRONMENT, NATURE CONSERVATION AND NUCLEAR SAFETY

JUDITH LIPP
Dalhousie University, Canada

Lessons for Success: An examination of the factors affecting renewable energy policy in Germany, Denmark, England & Canada

A range of policies has been developed and implemented to promote the use of renewable energy (RE). The approaches include pricing laws, quota requirements, subsidy programmes, and trading systems. Varying rates of success are evidenced, as measured by the penetration of RE in a country's energy mix. The effectiveness of particular policies for encouraging RE applications is therefore an area of on-going discussion, as is the question of national context (history, culture, politics) in influencing success. Given still limited experience with most current policies, however, the verdict is still out on the best model and the right contextual conditions for policy effectiveness. What is clear is that there are leaders and laggards in the field. Coming from behind, Canada has the advantage of being able to learn from other countries' experiences as the federal and provincial governments develop RE strategies. To this end, the factors that have influenced RE adoption in Germany, Denmark and the United Kingdom are examined in this paper.

Using the arguments given in Canada to explain lack of RE progress as a starting point, the following factors are examined in each of the three European countries: availability of indigenous energy resources; price of electricity; political system; level of public support; institutional capacity; commitment and action towards climate change and other environmental issues; and the type of support mechanisms used. These topics were discussed with RE experts in Germany, Denmark, and United Kingdom to determine which ones explain the state of RE penetration in each country. Focusing on the case of RE for elec-

tricity generation, it is shown that historical context, ideology and culture play an important role in explaining national activities but that policy choice and political will ultimately have the greatest influence.

PHILIPP SCHEPELMANN
Wuppertal Institute, Germany

Resource policy in the European Union

If the rest of the world population was to acquire similar levels of material consumption in the next 50 years this would double or even increase earth movement on global land surface by a factor of 5. This would imply that in the next 50 years overall environmental pressure would rise by a factor 2-5.

A European strategy for the sustainable use of resources can hardly change the most important drivers of resource consumption like global demographic and economic trends. The only way for decreasing environmental pressure worldwide will be to choose technological options.

An important European policy response is the emerging Thematic Strategy for the sustainable use and management of resources, which connects different resource-related policies with three interrelated initiatives:

- a. the Resource Strategy;
- b. the Integrated Product Policy;
- c. the Strategy on the Prevention and Recycling of Waste.

The "hot spots" of resource consumption are influenced primarily not by environmental but other policies. The political bottleneck of progress seems to be the integration of environmental requirements in other policy areas. For achieving this aim special attention needs to be directed towards sectoral integration strategies, but also to overarching, cross-sectoral EU policy processes. The Lisbon process could be a starting point for achieving better policy coherence by exploiting synergies of competitiveness and job creation.

Given the strive for increasing competitiveness from the Lisbon Strategy and the aim of coming closer to sustainability from the Gothenburg Strategy, it seems worthwhile to develop the Thematic Strategy for the sustainable use and management of natural resources into an interface to bridge the gap between the Gothenburg and Lisbon strategies.

JÖRG BALSIGER
University of California, Berkeley, USA

Ideology of place and resource policy effectiveness: Sustainable mountain development in the Swiss Alps and Californias Sierra Nevada

In recognition of their critical importance as foundations of human livelihoods, sources of water, repositories of biological diversity, and hubs of cultural integrity and heritage, globally significant mountain regions emerged from the 1992 Earth Summit as priority areas for policy intervention. The mandate's urgency has been underlined by the designation of 2002 as the International Year of Mountains and growing awareness that negative impacts of global environmental change influence mountain ranges more extensively than other regions of the globe. Traditionally, policy approaches to natural resource management in mountain regions have followed a sectoral logic, addressing forestry, agriculture, water, or biodiversity conservation in institutionally separate domains; increasingly, such fragmentation has proved counterproductive to policy effectiveness, efficiency and equity. This paper examines the alternative espoused by Agenda 21, namely the organization of integrated sustainable

development policies along territorial lines. Using the Swiss Alps and California's Sierra Nevada as empirical case studies, the paper describes the historically contingent rise and fall of regional approaches to the two mountain regions and traces their effectiveness on the basis of an often neglected dimension, namely an institutionalized ideology of place necessary to facilitate and sustain regional cohesion and lend a common interpretive framework for pressing environmental and socioeconomic issues. The paper applies a social network analysis of local ballot results to demonstrate how such cohesion has waxed and waned in close temporal affinity with the respective evolution of mountain policies. It reveals that regional cohesion gradually declines as Swiss mountain policies lose political salience and support, whereas political expression among California's Sierra Nevada counties converges with the development of territorial approaches to the range. The paper concludes that in order for regional approaches to be effective and sustainable, they need to be accompanied by the nurturing of a regional ideology of place.

STEFAN BRINGEZU
Wuppertal Institute, Germany

How material specific should resource policies be designed? Complementary approaches towards economy-wide sustainable resource management

In pursuit of the EU resource strategy a debate is ongoing whether environmental impacts of various material flows need to be studied in detail before any policies could be designed. The paper will present empirical findings of international comparative analysis which show different levels of resource use, decoupling from economic growth and shift of raw material sourcing from industrial to developing countries. With regard to a future sustainable resource use, the major types of material resources (biomass, fossil fuels, metals and industrial minerals, non-metallic construction minerals) are challenged in different ways. In order to reduce non-renewable resource use, adjust renewable resource use to sustainable levels of supply, reduce environmental impacts and increase socio-economic benefits it is proposed to design a mix of materials unspecific and specific measures. A general "conditioning" of the socio-industrial metabolism is required to develop the volume, structure, international performance and growth dynamics in a sustainable way towards maturity. National, EU and international programmes may orientate towards the main material resource groups, considering also energy and land use. Resource intensive industries could be supported by material efficiency programmes (like e.g. Germany, UK) to find options for dematerialization. Demand for resource intensive products could be muted (e.g. by re-visiting subsidies, public procurement, resource taxation and R&D). Regulation and management of specific material flows is further needed to control hazardous or critical substances, and to optimize base material flow systems (e.g. iron&steel). General conditioning and specific regulation are complementary. The former especially requires a broad-scale increase of resource efficiency in the production and consumption system. This will also mitigate environmental impacts and burden shifting between materials and regions. The efficiency strategy will have to be supplemented by approaches which allow sustainable supply of resources. International efforts will be required for globally traded products (esp. metals and non-food biomass).

17:15-18:45 **PANEL F.3 – RESOURCE MANAGEMENT: FORESTRY**

ROOM 4

CHAIR: NANA KÜNKEL, FREIE UNIVERSITÄT BERLIN, GERMANY

LEONIDA A. BUGAYONG
University of the Philippines Los Baños, Philippines

EFFECTIVENESS OF LOGGING BAN POLICIES IN PROTECTING THE REMAINING NATURAL FORESTS OF THE PHILIPPINES

The Philippines has imposed a logging ban in old growth natural forests since 1991. About 20 policy issuances on logging ban and moratorium have likewise been issued on the second growth natural forests in specific provinces and regions of the country over the last three decades (1980s-2000s). An analysis of the content, process and legality of these logging ban policies reveal that the primary objective is to preserve and protect the remaining natural forests in these areas. However, as these policies have been issued mainly as a reaction to various environmental crises such as calamitous typhoons, landslides, destruction and loss of lives and property, and unchecked deforestation, many sectors have been affected. The forestry industry and the forest-dependent communities as well as the buying public have taken the brunt of the decreased supply and increased prices of forest products from the local natural forests. The country has become a net exporter of logs and other processed wood products since the late 1980s.

The paper discusses the findings of the study on the content, process and legality of logging ban policies in the Philippines and how effective these policies have been in the protection of the remaining natural forests of the country. The study forwards some institutional and social reforms in the policy making and implementation process of the country with regards to its forests and natural resources.

CHRISTINE SCHMITT / ULRIKE GROTE
ZEF Bonn, Germany

Wild coffee production in Ethiopia: the role of coffee certification for forest conservation

The Ethiopian rainforests are internationally renowned for their high biodiversity and their wild coffee (*Coffea arabica*) populations, but are severely threatened by deforestation. The remaining rainforests are used for wild coffee production. This study quantifies wild coffee yields from local management systems without artificial inputs, and analyses the impact of wild coffee management on the natural forest vegetation. Subsequently, the role of coffee certification for forest conservation is evaluated. The results show that wild coffee yields from undisturbed forest with low management intensity are extremely small. Intensive management in semi-forest coffee systems removes 30 % of the canopy trees and most undergrowth vegetation. This stimulates wild coffee growth and almost triples coffee yields, while jeopardizing forest biodiversity. Premium prices for wild coffee through certification are seen as one possibility to halt the deforestation process by adding economic value to the natural coffee forests. Particular certification criteria for wild coffee, however, do not exist yet. This study reviews currently present coffee certification schemes under, e.g., Forest Stewardship Council (FSC), International Federation of Organic Agriculture Movements (IFOAM), Rainforest Alliance and Utz Kapeh, and explores to what extent they can promote sustainable use and conservation of the Ethiopian coffee forests.

THANDA KYI / KHIN LAY NANDAR AUNG
Yezin Agricultural University, Myanmar

Reforestation Management and Socio-economic Condition of Landless Taun-

gya Cultivators of Pyinmana Kaing Reserved Forest in Myanmar

The deforestation may lose not only the national economy but also faced the many kinds of environmental problems. In 1995, Myanmar Forest Policy ensures the sustainable development of forest resources and paves the way for prudent use and enhanced benefit from the forest while maintaining ecosystem integrity and environmental balance. Since, Myanmar is an underdeveloped country and over 70% of total population is rural dwellers. Some of them are still heavily dependent on forests for food, fuel, fodder and timber for their livelihood. Several deforestations occurred primarily as a result of land clearing for agriculture. To solve the challenge of deforestation, it needs to find effective ways of using and managing forest land resource on sustainable basis to meet the demands of growing population. The specific objectives of this study are as follow;

1. To understand the management of reforestation in the losses of forests
2. To assess the socio-economic characteristics of Taungya cultivators in selected areas.

Kaing reserved forests, located in the Western slope of Bago Yoma, are considered as a sample area. Total of (37) sample households were randomly selected with the help of local forest officers. Taungya method of reforestation system was the rehabilitation to forest with the collaboration of forest department and Taungya farmers and can provide the national economy. The households got mainly their income from farm, off-farm, non-farm, and Norn from the forest department. The farm income was 52% of total income. Taungya cultivators had grown the groundnut as the major crop. If the profitability of the cultivated crops were compared, the profit of the rice production (upland) has the negative value in unit area. However, it is not assumed as loss because opportunity cost (family labour cost) is used in profit calculation. The net profit of paddy (lowland) and groundnut were not different and that of sesame has incentive to grow.

17:15-18:45

F.4 – LAND USE POLICIES

ROOM 2

CHAIR: KATHARINA HELMING, ZALF, GERMANY

HA THUC VIEN
Humboldt University Berlin, Germany

Land Privatization and Its Impact on Rural Livelihoods: An Examination from the Southern Uplands of Vietnam

This paper examines the process of implementing land privatization and its effects on household livelihoods in the Uplands of Vietnam. The research was undertaken with three upland villages situated in the buffer zone of Cat Tien National Park in the southern uplands of Vietnam where have recently been adopted a land privatization program according to the 1993 Land Law and some other frontier development programs, such as nature conservation, remotely mountainous community development programs supported by the central government. Such policies and programs have ultimately aimed at improving both upland livelihoods and environmental sustainability of the uplands, simultaneously.

The research demonstrates unequivocally that though the land privatization throughout the nationwide has been guided by the unique legal framework, the implementation of land privatization in the uplands, particularly in the

buffer zone communities locating around the protected areas has resulted in the notable divergence across communities, even households. The differences in the result of implementing land privatization in the upland communities were mainly caused by different factors embodied in both land legislation and local practices. Unsurprisingly, the divergence of implementing land privatization among communities and households has actually created differentiation in distributing benefits of land privatization among communities and households. In fact, the empirical findings suggest that land privatization (land titling) served only as initial conditions while households' initial assets play as the determinants factors which determine how households transfer their land title into material benefits. The empirical investigations also suggest that together with land privatization, market liberalization, the government's programs for socio-economic development and nature conservation have strongly influenced on the southern upland livelihoods. Differences in the results of land privatization, households' initial assets ownership as well benefits from such programs which have been enable households to pursue different patterns and tendencies in livelihood makings. In other words, distributing benefits from land privatization and other government's programs was not equal among households and the ways in which households diversified their livelihoods, differently.

FRANÇOIS GUSDORF / STEPHANE HALLEGATTE
Ecole Nationale des Ponts et Chaussees, Paris / Stanford University, France/USA

Rising Transportation Prices - the Amplification of Negative Effects by Housing Inertia

This paper investigates the consequences of a sudden increase of transportation costs in an urban economic system, when the inertia of the housing structure is taken into account. To do so, a theoretical framework is set, able to capture the interactions between transportation costs and urban structure, over the long and medium term. Over the long-run, after a shock in transportation costs, the urban structure adjusts to the new conditions and an increase in transportation costs translates into a more concentrated city, a lower utility level for households and an unchanged return on equity for landowners. Because of buildings' inertia, however, a shock in transportation costs is first followed by a transitory period during which the urban structure is not adapted to the new conditions. During this period, households entail much larger losses than in the final stage. Landowners experience, as a group, an important decrease in the return on equity of their investments and, individually, a huge redistribution of wealth among them. The larger the shock in transportation costs and the lower the initial costs, the larger are these negative effects of building inertia. The significance of this medium-term consequences shows the economic cost of a high volatility in energy prices and calls for the avoidance of sudden changes in transportation costs: if a long-term increase in these costs is unavoidable, because of climate change or resource scarcity, a smooth and regular change must be favoured.

AXEL VOLKERY / YBELE HOOGEVEEN / TERESA RIBEIRO
European Environment Agency, Copenhagen, Denmark

Prospective Evaluation of Land-Use Development in Europe: Searching for robust long-term strategies

As our environment is changing at faster speed than ever the way we use the land at our disposal becomes more and more important. Future generations will have to live with the consequences of the decisions we make today. Roads that are built today will be with us in 50 years and more. Land is, how-

ever, a scarce resource: If we want to maintain and improve conditions for life on earth we have to better understand those long-term consequences. For example, will we be able to maintain living conditions in a depopulating region, or not? Should we change let happen? Or try to adapt? How to weigh the effectiveness, efficiency and equity of different possible solutions?

We have to make decisions under conditions of great uncertainty. Yet we are often not sufficiently prepared for this task. While we have advanced our knowledge about long-term environmental change we are still in the early stages of learning how to identify and effectively implement respective long-term policies.

As we argue in this paper, a promising approach in this regard is developing long-term scenarios. Scenarios are no predictions but describe different alternative futures with the aim of identifying robust long-term policy strategies. Despite a long tradition, scenarios have not found widespread attention from scholars of the policy sciences and economics. Quite often, this task is regarded as impossible since future socio-economic trends are impossible to anticipate.

In this paper, we review according experiences made within the PRELUDE project (Prospective Evaluation of Land Use Development in Europe). The PRELUDE project has developed participatory land-use scenarios for Europe for a time period up to 2035. It combines qualitative information generated by stakeholders and model quantification in an iterative way. The aim of the project is to support strategic long-term discussion.

We start by sketching a methodological framework for developing long-term robust policy strategies. We proceed by illustrating the main scenario findings regarding land use development in Europe and continue by discussing their political implications. While it is not possible to anticipate the future, it is possible to prepare for different alternative futures and thus reduce uncertainties of decision-making. Yet the methodological development needs are still substantial and deserve more attention. They are summarized in the concluding section of the paper.

17:15-18:45 **F.5 – RESOURCE MANAGEMENT: WATER**

ROOM 5

CHAIR: ANDREAS KRAEMER, ECOLOGIC, GERMANY

MUHAMMAD MIZANUR RAHAMAN
Helsinki University of Technology, Finland

MEXICO WORLD WATER FORUM'S MINISTERIAL DECLARATION 2006: A DRAMATIC POLICY SHIFT?

World Water Forum, organised by World Water Council, held in every three years since 1997, is the largest international event in the field of water. World Water Forum's Ministerial Declarations have global significance and contribute noticeably in shaping the national and international water policies worldwide. The aim of this paper is to analyse the scopes of the Fourth World Water Forum's Ministerial Declaration (Mexico, 2006) in the context of globally accepted water management principles. To do so, it scrutinizes two major declarations related to global water policy, i.e. Chapter 18 of the Agenda 21 (1992) and Third World Water Forum's Ministerial Declaration (Kyoto, 2003). This paper identifies nine globally accepted water management principles that were not properly addressed in the Mexico Ministerial Declaration. Even though, holistic and integrated water resources management has been widely propagated

as the best water management practice, Mexico World Water Forum's Ministerial Declaration undertakes a dramatic structural shift in global water policy, which favours non-holistic and fragmented approach of water management.

ITAY FISCHHENDLER
The Hebrew University of Jerusalem

Escaping the "Polluter Pays" Trap: Financing Wastewater Treatment on the Tijuana-San Diego Border

Building and operating infrastructure to address transboundary environmental hazards requires dividing the cost of pollution prevention between bordering states. When cost-burden questions arise, the solution often suggested is the "polluter pays principle" (PPP). However, when political and economic relations between neighboring countries are asymmetrical other cost-burden principles are often adopted. Given the discrepancy between theory and practice, the aim of this study is to identify some of the available cost-burden principles and to examine when they might replace the PPP. The pollution-prevention regime along the San Diego/Tijuana border is used as a case study. It was found that under asymmetrical relations there are several competing cost-burden principles. Some principles are adopted since they are perceived, by some, to be fair while others are adopted since they provide effective wastewater treatment. The ones that were found effective are those that offset, to some degree, existing asymmetries. This explains why the PPP was replaced in the San Diego/Tijuana case with other cost-burden principles that better offset the asymmetries and thus, they provided a more effective wastewater treatment than the PPP.

ANDY SPIESS
University of Hamburg, Germany

Water Policies in the Member States of the Gulf Cooperation Council (GCC): Perspectives on Effectiveness and Political Responses in Light of the Human Dimensions Discourse from Kuwait and Bahrain

While biophysical transformations, driven by human activities and natural processes, affect the quality of human life on a worldwide scale, the consequences of progressive hydrological changes in the GCC region are profound. Research shows that they are due at least as much to the social systems that produce vulnerability as to environmental changes themselves. It has demonstrated that anthropogenic causes, such as overexploitation of water resources, are determined by population growth, economic advancement, cultural forces, values and beliefs, institutions and governance as well as the interactions among all these factors.

While the Arabian Peninsula is facing the most severe water shortages in the world, mismanagement and the continuous degradation of the regions scarce resources is significant. Several GCC member states are already using large quantities of non-renewable fossil groundwater. To meet rising demands, water authorities had sought to enhance water supply and focused mainly on the development and supply augmentation aspects. However this approach has demonstrated its inability to deliver a substantial degree of water sustainability or security. The situation was further aggravated by institutional weaknesses: Multiplication and overlap of agencies, absence of participatory decision-making processes, lack of collaboration, inadequate institutional capacity building and enabled society. While many independent organizations that produce social research are still regarded as antagonists to the government rather than useful collaborators and in this respect often limit their ability to

produce critical information, government decision-making tends to operate in isolation from socio-political research results. The general objective of this paper is to reposition the water policy debate in the GCC within the context of human security. It will outline the implications of socioeconomic uncertainties in regard to water in Kuwait and Bahrain and determine on how it interacts with the complex and rapidly changing socio-political environment that ultimately determines the security of individuals and nations.

PLENARY SESSION VI

18:50-19:30 CHAIR: KIRSTEN JÖRGENSEN, FREIE UNIVERSITÄT BERLIN

MATHIS WACKERNAGEL

Ecological Footprint Network

"One Planet Budgeting with the Ecological Footprint: Opportunities and Limitations"

19:30

ADJOURN

20:30

DINNER IN TRADITIONAL RESTAURANT (CAFÉ ODEON)