

Panels

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2016 Nairobi Conference on Earth System Governance – Inequality Stream

Cohosted by the Copernicus Institute of Development, Utrecht University

Panel 1 – Towards Climate and Food Justice

How Equitable are CO₂ Emissions Entitlements in the Paris Agreement? Evaluation of “Intended Nationally Determined Contributions” Versus CO₂ Per Capita for a 2C Global Carbon Budget and Global Carbon Trading Mechanism

Asim Zia

While the landmark Paris agreement negotiated by 195 countries under the auspices of UNFCCC COP21 meeting provides a bottom-up voluntary framework for nation-states to commit to reduce Green House Gas (GHG) emissions through so-called “Intended Nationally Determined Contributions” (INDCs), these commitments do not necessarily appear to be equitable in terms of allocation of CO₂ emission entitlements in the global atmospheric commons. Although Paris Agreement stipulates measurable, reportable and verifiable nationally appropriate mitigation commitments on a “common but differentiated” basis, the INDCs submitted by the nation states are symptomatic of “grandfathering” decision heuristic, i.e. high emitters like US and oil producing countries will gain a substantially large allocation in the global carbon budget determined through running 2C above pre-industrial policy target in Global Circulation Models. The equity implications of Paris Agreement can be determined by comparing the nationally reported INDCs versus a CO₂ per capita principle to allocate carbon emission allowances across the nation states. This study undertakes a comparative analysis of CO₂ emission allowances that will be available to each country of the world under Paris agreement negotiated “grandfathered” INDCs and CO₂ per capita decision heuristic for assessing the equity implications of the emerging international climate policy under the Paris agreement. A new global carbon trading mechanism will be proposed to “equitably” share the global atmospheric common by enabling a UNFCCC mandated transfer of carbon credits from the countries that claim more than their fair share of GHG entitlements to the countries that can avoid GHG emissions by purchasing these carbon credits. The \$100 billion/year floor for financial transfers from industrialized to developing countries, established under the green climate fund and adaptation fund mechanisms of Paris Agreement, will be compared with the “equitable” share of financial transfers under a 2C global carbon budget allocation on CO₂ per capita basis.

Mapping Spatial Carbon inequality in China: Stakeholder Views on Fair Effort Sharing

Sabine Dauth

China has grown rapidly for more than three decades by following a strategy of high investment, strong export orientation and energy-intensive manufacturing. Hundreds of millions have been lifted out of poverty. Development and its effects on the country's population and environment, however, have been uneven. China's spectacular growth has been accompanied by rising interprovincial inequality. The country's emission patterns are a reflection of socio-economic disparities between provinces. The affluent coastal region is

outsourcing a large part of their greenhouse gas emissions by importing carbon intensive goods and energy from the less developed inner provinces close to the resource bases.

As international climate negotiations between nations at different stages of development have demonstrated the attribution of benefits and burdens associated with emission reduction action is a highly contentious issue. In China the prevailing 'North-South' debate on fair effort sharing and its impact on economy, society and the environment is transposed to a national level.

Inequalities inherent in the tradeoff between access to carbon and the allocation of reduction responsibility have traditionally been evaluated from an economic perspective. This view, however, fails to take into account that inequality is experienced differently by those who are affected by it. The formulation of an equitable emission rights scheme requires a discussion of issues which influence the fair allocation of carbon at local level.

To understand whether stakeholder views on access to sustainable development mirror spatial patterns of carbon inequality, the study is currently implementing a combination of participatory methods in two sites. The city of Shanghai was selected to represent the rich coastal region. The second study site is the central province of Chongqing, an important exporter of coal based electricity and energy-intensive products. A survey seeks to establish the importance stakeholders of civil society, industry, academia and policy in both regions attribute to economic growth, societal well-being and environmental quality. Focus group research intends to explore perceptions on fair effort sharing embedded in the conflicting objectives of sustainable development in more detail.

Based on the preliminary findings of the stakeholder analysis the paper concludes with a presentation of an emission rights framework bridging the spatial carbon divide between provinces in China through creating the possibility for simultaneously achieving multiple stakeholders' objectives. The study demonstrates that by ensuring fair access to carbon locally earth systems governance has the potential to propel emerging economies onto a path of sustainable and equitable development.

Private Sector's Involvement in the Global Governance of Food & Nutrition Security: Accountability Issues and Transformative Potential

Pierre-Marie Aubert, Maria Gabriela Diaz

This paper offers a comparative analysis of the involvement of 15 transnational corporations in three multi-stakeholder platforms focused on food security (Grow Africa, GAIN, SUN). It aims to provide new empirical data that contributes to theoretical reflections on the influence of the private sector on global governance. This data was generated through: (i) in-depth interviews carried out with senior officers of these corporations and representatives of these forums, and (ii) secondary data of the economic organization of these companies. The paper yields three main results.

First, we show that the growing implication of the private sector in food security governance comes from two main factors. The pressure by civil society organizations and consumers has pushed companies to get involved in these initiatives, and raise their corporate sustainability

profile as well as to increase the transparency on how they operate. In addition, the change in the perception of the private sector and the role it can play on food security and nutrition issues in developing countries has had strong implications on the openness in international organizations and platforms towards this actor.

Second, the transformative potential of multi-stakeholder platforms appears quite weak for two reasons: (i) companies join platforms that share the same values and approaches to sustainable agriculture and food security and won't join platforms that would imply a change of direction in their operations, or business strategy; and (ii) platforms need the participation of major leading companies to gain legitimacy, as well as discursive and financial power: businesses are an essential actor to financially support both the platform, and the projects that are being implemented. In addition, platforms need leading TNCs to generate a "pull-in effect" that can attract other actors to join.

Third, we shed light on two patterns of collaborations / coalitions between private companies. First, in platforms where the outcome are guidelines and standards and the role of the private sector is more about policy positioning, companies can collaborate with competitors easily because it's a pre-competitive space and competitors are affected by the same issues and that unites them. This is evident in trade associations and in multi-stakeholder platforms such as the CFS. On the contrary, in platforms where the outcome is a set of concrete projects on the ground, companies tend not to ally with their competitors, instead, they ally with those that operate on their same value chain, particularly their suppliers and customers.

Panel 2 – Conceptualizing Planetary Justice

Conceptualizing 'Planetary Justice' in Global Sustainability Governance: A Framework for Analysis

Frank Biermann, Agni Kalfagianni

This paper develops a framework to conceptualize and analyse justice in the context of profound transformations of the earth system. Scientists argue that crucial 'planetary boundaries' that are keeping the earth hospitable for humans have now been crossed with consequences yet unknown. The magnitude of such changes, largely due to human activities, has prompted academic and popular debates on the emergence of a new epoch in planetary history, the Anthropocene, where human beings have become a major force reshaping the entire earth system on a geological scale. Yet, not all human societies had equal contribution to the Anthropocene origins nor in facing its consequences.

As global decision-makers negotiate and propose responses to address the multiple environmental and social challenges we are facing, there is now an urgent need to understand the normative basis of various alternatives. Indeed, the demand for justice, who wins and who loses and the implications for global ecological sustainability, is turning into the most complex issue of the 21st century. However, the concept of justice is elusive and is often used in political discourses with varying and conflicting interpretations by different actors.

Accordingly, this paper develops a 'planetary justice' framework in order to enable a systematic examination of justice discourses and policy proposals at the planetary level. The framework is informed by existing and divergent theories of justice, in particular, liberal egalitarianism (with an emphasis on 'fair distribution' of resources at the state level), cosmopolitanism (with an extension of the liberal egalitarian argument at the global level), libertarianism (with an emphasis on the market), and more emancipatory approaches, such as the capabilities approach. It brings structure, clarity and comparability among the different theories by delineating (a) the subjects of justice a particular justice theory considers, (b) its principles and criteria, (c) the processes on the basis of which justice is derived, (d) the envisaged outcomes, and (e) the boundaries of each approach. We exemplify our framework empirically by investigating the theories of justice that underline discourses around the formation of the Sustainable Development Goals. Our analysis reveals which justice theories are more dominant or marginalized than others, who represents them discursively, and who the potential winners and losers are, thus bringing a much needed normative perspective to current efforts to understand and foster planetary sustainability.

Diversity Among Epistemic Communities Conducting Environmental Justice Research

Paulita A. Bennett-Martin, Christopher H.S. Broecker, Alexandra K. Cavanaugh, Savannah P. Crowl, Amy Hou, Virginia M. Loeffler, Aspen Ono, Siyue Zong, Murray A. Rudd

Environmental justice is a growing and evolving research domain. The definition and scope of environmental justice remains ambiguous given the diversity of research being undertaken across disciplines and sub-fields. There is thus a need to understand differences among epistemic communities regarding their conceptions of environmental justice, preferred methodological approaches, linkages with other research communities, and policy instrument preferences for alleviating equity challenges. To provide an overview of the field, we conducted a meta-analysis of the existing literature classified as environmental justice, using bibliometric coupling and co-citation analyses of academic articles published since 1986. We used ISI Web of Science to identify peer reviewed environmental justice articles and, after refinement, we finalized a list of 1170 publications that met our search criteria. To those publications, we applied bibliometric visualization tools (VOSViewer and QDAMiner) and identified distinct clusters of scientists who exhibited overlapping co-citation patterns. We found 9 clusters that ranged in size from 15 to 384 articles and that varied in research foci including, but not limited to, hazardous waste, urban planning, urban studies, inequities, case specific studies, and environmental health. These groups also varied in preferred methodological tools, discourse, and potential policy solutions for particular environmental justice challenges. Based on our analysis, we suggest that there are multiple research areas that can be classified as environmental justice and that there may be opportunities to advance the field through a standardization of key definitions and cross-fertilization of methodological tools across sub-fields. Additionally, our results help illustrate the field's evolution and suggests that researchers are beginning to diversify in environmental justice research subgenres of investigation. Our analysis may help identify gaps in the existing body of work and relationships between different topic clusters and epistemic communities. As a multifaceted and rapidly evolving field of inquiry, environmental justice research provides policy and governance researchers with opportunities to theorize and develop innovative transdisciplinary approaches that contribute to equitable environmental problem solving.

Rich Man's Solution? Geoengineering Discourses, Structural Power, and the Marginalization of the Global Poor

Frank Biermann, Ina Möller

Within less than a decade, technologies that intentionally alter the global climate have received an exponential increase of attention. With the 2015 Paris agreement now suggesting a global warming target of max. 1.5°C and a required balance between the sources and sinks of anthropogenic emissions - rather than decarbonization - several observers argue that climate geoengineering technologies have gained sufficient political legitimacy to be seriously explored. Indeed, numerous expert workshops have recently discussed such options, along with a steadily growing body of policy reports. However, this debate remains restricted to experts and policy makers of just a few of the wealthiest countries. As our paper shows in detail, the geoengineering debate is heavily dominated by the major research institutions in North America and Europe, leaving little room for developing countries to participate - and hardly any role especially for the least developed countries. In this paper, we analyze in detail the current discourses on geoengineering with a special focus on the representation and interests of the least developed countries, and the global poor in general. Using detailed participatory statistics, interviews and document analysis, we analyze the (lack of) involvement of least developed countries through theories of international structural power, and explore in depth the numerous obstacles that representatives from least developed countries encounter in their attempts to participate. We include both types of geoengineering technologies - solar radiation management and carbon dioxide removal - as each group might have different, but significant, impacts for the future of developing countries. We then discuss the various institutional policy options - including through the United Nations system - that least developed countries could have to influence the agenda on climate geoengineering, reflecting here also on earlier attempts of developing countries to increase their control over novel technologies and to influence global agenda setting. With our focus on a new, still ill-defined domain in international governance that raises major global equity issues, we contribute to the two conference streams on complexity and inequality. In addition, with our focus on representation of least developed countries in global governance and our interest in global structural power we add to a better understanding of the foreign relations of African countries. Finally, given the rapid rise in attention to geoengineering as a possible technocratic, managerial response to climate change, we add to the current debate on new, also more critical directions for the Earth System Governance research community.

Panel 3 – Inequalities and Injustice in Ocean and Water Governance

Cruise Tourism and the Rights of Coastal States: A Developing World Perspective

David A. Simmons, Michelle Scobie

Cruise tourism is a growing industry that holds promise of economic benefits to many Caribbean Small Island Developing States (SIDS). Can coastal states regulate cruising within their jurisdiction and to what extent? This paper examines the legal and normative issues related to cruising and the law of the sea as they have evolved from the 1982 UNCLOS III to today. It uses the conceptual framework of the changing significance of ocean space in international relations to question whether the changing rights and responsibilities of states

over their space as it relates to the environment and human rights can also apply to their rights over private commercial activities e.g. cruise operationd, within their jurisdictions. States have traditionally regulated their maritime jurisdictions for reasons of health and safety, national security and more recently for the environment. The UNCLOS III extended the economic jurisdiction of states to 200 miles from the baseline of coastal states but left in place the sacrosanct principles of freedom of navigation. This principle has been restricted in recent years as environmental stewardship, security concerns and a greater desire to institute sustainable management of marine biodiversity resources has led States to the creation of marine protected areas. Small Island Developing States (SIDS) face dwindling external aid and are looking to their large marine spaces for economic gain. The exponential growth in cruise tourism over the last decades as has caught the attention of SIDS. Conceptually have the changing meanings and significance of ocean space provided room for a review of what freedom of navigation can mean for cruise tourism? What are the implications under the law of the sea convention and other international agreements under which the regulation of cruise ships and cruise tourism within national waters fall?

This paper examines the debates around the implications of the rights of coastal states to manage economic resources in their ocean space and how the management of such resources intersect with traditional principles such as freedom of navigation in the Exclusive Economic Zone of coastal States.

Supporting Poor Communities in Environmental Complex Problems: A new Approach of Water Parliament

Mahdi Zarghami

Rapid urbanization and climate change - along with ongoing agricultural and industrial water demands - are threatening environment including water resources. When these systems are healthy, they provide valuable ecological and socio-economical benefits to current and future generations. However, in developing countries, particularly in arid and semi-arid regions, water resources are now experiencing deterioration of quality and quantity. Moreover, this situation may have direct health consequences such as some skin-related diseases, threaten existing inequalities and prevent further development. This critical condition requires a robust solution that yet remains uncertain. As long as the ambiguity of the problem persists, it induces conflict between stakeholders that results in further delay on any action to prevent loss of resources. This condition will also lead to injustice in water negotiations and unequal access to water.

Water diplomacy is a new framework that can be applied as a consensus building approach. Its central task is value creation. Value creation involves both understanding each stakeholder's core interests and thinking about how to expand the available water supply so that mutual gains can be attained. However, the general framework of water diplomacy needs some relevant infrastructure in order to be applied. The goal of this research is to propose an effective approach for legislative decision making and conflict resolution. This approach will help to improve the power of watershed committees by proposing a voting framework. Actually by this institutional reform the transaction costs of the decision making will be decreased. To achieve this goal, a new idea of "water parliament" will be presented in

this paper. The approach will be evaluated for real complex cases, faced extreme water shortages in the recent years due to water overuse and climate change.

Fluid Governance: Scalar Politics in the South African Waterscape

Vasna Ramasar

This paper offers a critical analysis of the scaling of water governance in South Africa and its implications for water access and allocation. As the complexity and severity of environmental problems increases, there is a growing tendency to look to environmental governance to offer solutions. I contend that water governance, as with all forms of environmental governance, is never an apolitical endeavour yet the antagonistic and collective decision-making aspect of environmental politics is often subsumed in a drive to foster sustainability. One of the ways that this de-politicisation occurs is through the uncritical application of scalar concepts. Scalar configurations are an outcome of the perpetual flux of socio-spatial and environmental dynamics and scales are therefore transformed through social conflict and political-economic struggle. A politics of scaling is part of social relations. Four mechanisms of scaling can be identified as follows: scale framing, scale jumping, scale bending and scale fixing. This paper focuses on how the processes of scaling embedded in water governance affect prioritization in water access and allocations and ultimately, justice and fairness. The research examines how the production of scale and politics of scaling can be used to manipulate water access and allocation to the benefit and cost of different actor groups.

The intertwined nature of society with water means that ecological, economic and political forces are constantly shaping the hydrosocial landscape. Three formal decisions by the government are examined to uncover how the politics of scaling has affected the access and allocation of water as well as the inclusion and exclusion of actors in governance. These decisions are the approval of the construction of the De Hoop Dam, water service delivery mechanisms employed in the city of Johannesburg and the decision to explore hydraulic fracturing in the Karoo. In analysing these decisions, I show how cross-scalar dynamics; production of scale; and four processes of scaling are used in governance processes as means of empowerment and disempowerment. Three main findings arise out of the research. Firstly, scaling processes are actively used by actors in water governance to empower some and disempower others – thus scaling processes are political processes. Secondly, politics of scaling influences and is influenced by social relations and material practices in South Africa. Thirdly, the theoretical development of scale can benefit from an interdisciplinary approach drawing from the different disciplines such as political science and human geography, working on scaling and governance.

Panel 4 – Inequalities and Injustice in Ocean and Water Governance

Forest Governance, Conservation and Livelihood in Zimbabwe: Shift Needed Away from a Long History of Exclusion

Vurayai Mutekwa

The critical role of forests in providing fuel, shelter, food security and human health is most pronounced in the rural areas in developing countries (Arnold et al. 2011). For forests to

fulfill these community livelihoods requirements there is need for inclusive governance arrangements that prioritize active participation of local communities. There is consensus among scholars that most development initiatives over the years particularly in developing countries have not performed well due to among other factors the exclusion in decision making of the people most affected by the proposed programs and projects. Little attention has been given to the historical review of Zimbabwe's demarcated forests governance and the extent to which they tell the story of perpetual exclusion and deprivation of surrounding communities and how these have impacted forest condition and local communities' livelihoods. This paper reviews the history of six protected forests governance in north-western Zimbabwe namely Gwaai, Mbembesi, Gwampa, Fuller, Kazuma and Pandamasuie in order to reveal its legacy on prevailing governance challenges, forest and human livelihoods conditions. The review locates the notion of community in the protected Zimbabwean indigenous forest sector and presents a disaggregated analysis of the various forms of community exclusion in the governance of the sector. I argue that understanding the governance history is an important step in addressing the current and future governance arrangements in Zimbabwe's forest sector. This is because the historical forest governance arrangements and social-ecological interactions have a strong bearing on the current and future governance challenges, reforms as well as human and forest conditions. Understanding the origin and nature of local community exclusion in demarcated forest is necessary to explain the trajectory of forest condition, livelihoods, relationship between forest officials and local communities as well as informing the stakeholders on the governance reforms that may be required into the future. Research findings reveal that various degrees of community exclusion occurred in both types of governance arrangements during the colonial and post-colonial periods. The main forms of exclusion fell into ownership, benefits sharing, physical, knowledge, institutional, decision making and enforcement exclusion categories. These forms of exclusion led to conflicts between local communities and forest management authorities, poverty and forest degradation. Proposals regarding the manner in which governance arrangements could be improved and the direction future forest governance need to take to reduce problems affecting protected forests in Zimbabwe have been highlighted.

Differentiated Dispossession: Hunter-Gather Responses to Violent Eviction from Embobut Forest Reserve, Western Kenya

Connor Joseph Cavanagh, Milka Chepkorir Kuto

Critical scholarship on global land and 'green' grabbing has begun to examine the variegation of local 'responses from below', or the ways in which socioeconomic characteristics and various other particularities of place influence community reactions to land and resource acquisitions. So far, however, these analyses have generally not adequately disaggregated the concept of 'community' to reveal how pre-existing differentiations such as gender, political status, and prevailing modes of production refract both the impacts of dispossession and the forms of resistance that emerge in its wake. Drawing upon ethnographic fieldwork on the case of violent evictions of the indigenous Sengwer community from the Embobut Forest Reserve in western Kenya, we illuminate the ways in which i) dispossession for conservation entails novel consequences for communities that are traditionally hunters and gatherers, as opposed to agriculturalists or pastoralists, and ii) how these consequences are themselves differentiated, placing unique burdens on women in particular. We conclude

with a discussion of how this local variegation in experiences of dispossession informs ongoing struggles for radically alternative modes of indigenous conservation in Embobut forest.

Does Transparency Mobilize Citizens and Decrease Corruption? A Randomized Field Experiment with Revenue-Sharing Funds in Bwindi National Park, Uganda

Mark Buntaine, Brigham Daniels

This randomized experiment in Bwindi National Park, Uganda offers a strong test of the proposition that transparency causes better governance. Although revenue-sharing has been proposed to address inequity in the establishment and governance of many protected areas around the world, the implementation of such schemes is often difficult. In cooperation with the Uganda Wildlife Authority, we test whether transparency in a national park revenue-sharing program promotes participation by residents in local governance, decreases funds lost to corruption, and improves the quality of community-level development projects. Although Bwindi National Park has long had a revenue-sharing program with frontline communities from the funds derived from gorilla tourism, many of the funds that are intended to benefit these communities are misdirected or misappropriated when they pass through local governments. We test whether providing residents with key information about the revenue-sharing program through their own mobile phones, including disbursement dates and amounts, proposed dates of implementation by local governments, and the contact information for responsible local officials, causes more funds to reach the intended beneficiaries. We also test whether this type of information drives participation in local governance and engagement in decision-making with park management.

To pursue this randomized policy experiment, we collected the mobile phone numbers of approximately 4,000 local residents in all 98 frontline communities near Bwindi National Park. During the first year of this transparency program, which launches in March 2016, the residents of half of the communities are provided with information about the revenue-sharing program by SMS on their own mobile phone. We hypothesize that this information allows these residents to advocate for themselves with local governments and better engage with park management to affect local governance of natural resources. If the pilot program proves successful, the Uganda Wildlife Authority has plans to facilitate the rollout to all communities near Bwindi National Park and other protected areas in Uganda.

Multi-Level Governance versus Spatial Control: Global Conservation Targets, Grassroots Agency, and Sustainability in State-Based Protected Areas

Alejandra Orozco-Quintero, Catie Burlando, Lance W. Robinson

Protected areas (PAs) are widely considered the centerpiece of global conservation efforts. As recently as 2010, state parties to the Convention on Biological Diversity agreed to extend terrestrial PAs from 12% to 17% of the earth's surface. More recently, calls have been made for 50% of land to be put under conservation. Yet, despite significant gains in the number and extent PAs in countries such as Tanzania where PAs cover a third of the national territory, and in PAs worldwide, significant biodiversity loss is witnessed regardless of conservation status. Efforts aimed at spatial targets and state-led control rather than at the underlying institutions and the drivers of biodiversity loss are still predominant, despite

increasing recognition of the role of indigenous peoples and local communities in actively maintaining remaining biodiverse areas, and of the complex human-nature interactions supporting or hindering conservation. As of 2014, only 1% of the PAs reported to the World Database on Protected Areas were governed by indigenous peoples and local communities, with 82% being government-managed. This demands (1) careful examination of whether state-led conservation efforts recognize local level conservation governance and practices and contribute to, or undermine, conservation outcomes, (2) analysis of the discourses and global governance mechanisms that are guiding conservation action especially where governance mechanisms support the infringement on rights in the name of conservation, and (3) how these global factors affect local governance and both social and environmental outcomes. Drawing on a review of documented current trends in global biodiversity conservation, as well as on empirical research, this paper explores the persistent effects of the strategy of spatial reorganization and control on governance, grassroots agency, social justice and conservation outcomes. Through an examination of the relationships between spatial reorganization and environmental governance at Saadani National Park in Tanzania, we discuss the impacts of conservation policy and practice on the participation, representation and influence of grassroots actors at multiple levels, the achievement of conservation outcomes, and the potential for addressing the ultimate drivers of landscape degradation and biodiversity loss. This paper showcases the need to go beyond institutionalized "participatory" governance to focus on enabling multi-level agency in environmental conservation, and suggests spatial, policy and institutional dimensions that could enhance the possibilities of achieving more equitable outcomes across levels of social organization.

Protected Areas and Poverty Reduction: A Canada-Africa Research and Learning Alliance (PAPR): Synthesis of Findings

Leslie King, Grant Murray, Baker Masuruli, Enoch Makupa, Alejandra Orozco-Quintero, Lance Robinson, Bruce Downie, Phil Deaden, Alex Kisingo, Rick Rollins, Emmanuel Acquah, Andrew Agyare

Protected Areas and Poverty Reduction: A Canada-Africa Research and Learning Alliance (PAPR) was a recently completed, innovative five year community-university research project involving academic researchers, government officials, and community partners in Canada, Tanzania, and Ghana. Alleviating rural poverty and ensuring environmental sustainability are two of the biggest issues facing the planet, and they are fundamentally and inextricably linked – extreme poverty inhibits environmental sustainability and degraded natural environments exacerbate rural poverty. While poverty and sustainability are complex, multi-faceted issues that demand concerted attention and a variety of approaches, our Alliance is focused on one increasingly prominent and controversial approach – the use of protected areas (PAs).

Our findings show that the impacts of protected areas on adjacent communities are highly variable and that one of the key factors mediating this relationship is governance. In this presentation we will focus on situations in which locally managed territories have also been declared protected areas by other nodes of governance. This includes traditional territories (Ha'wiih) of the Tla-o-qui-aht First Nations in Canada which have declared Tribal Parks by that Nation, but also as both National and Provincial Parks by other levels of Canadian

government. In Ghana this includes cases of lands held by local chiefs (holders of 'skins' or 'stools') that have been developed into Community Resource Management Areas. Finally, in Tanzania, this includes situations where communally held village lands have been incorporated into Wildlife Management Areas (or WMAs).

In each country we have collaboratively developed robust case studies which center on three key challenges: 1) incorporating community values into PA objectives (which is widely studied) AND governance design (which is less so); 2) building appropriate multi-scalar linkages to multiple governance nodes; and 3) methodological aspects related to governance assessment. Each of these leads to both generic and more case-specific findings in those situations where multiple governance forms interact in the context of sustainably managing the same physical space. In this presentation, PIs and co-applicants from Canada and Tanzania will present findings of the research.

2016 Nairobi Conference on Earth System Governance Africa Stream

Panel 1 – Aligning climate policy and sustainable development agendas: a complex challenge for effective multilevel governance

Conveners: Steffen Bauer, German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE), Germany; Kennedy Mbeva, Africa Centre for Technology Studies, Kenya; Lindsay Stringer, University of Leeds, United Kingdom.

2015 has seen the conclusion of two major multilateral negotiation processes: first, the adoption of the "2030 Agenda for Sustainable Development" by the UN General Assembly in September, second, the adoption of the "Paris Agreement" by the parties of the UN Framework Convention on Climate Change (UNFCCC) in December. A global transformation towards effective and equitable earth system governance hinges on the effective implementation of the goals and objectives that both agendas entail, i.e. the Sustainable Development Goals (SDGs) in the case of the 2030 Agenda and Nationally Determined Contributions (NDCs) in the case of international climate policy. This creates formidable challenges for multilevel governance - especially with a view to achieving coherent policy making and implementation at national levels. While the international processes guiding the implementation of both goal systems are bound to remain institutionally separate, substantive issue overlaps across pertinent policy sectors such as inter alia energy, water, forestry or agriculture suggest that implementation should be aligned at regional and national levels. Guided by concepts of multilevel governance and institutional interplay, this panel considers the complex demands of climate policy and sustainable development with a view to the African region and discusses the challenges and opportunities to align the implementation of climate actions and SDGs at regional and national levels. What determines institutional interplay between the SDG and climate agendas vertically as well as horizontally? How does institutional interplay enhance or undermine the coherent implementation of internationally negotiated objectives at national levels? Ultimately, are institutions across levels fit to deliver transformative governance towards climate-smart sustainable development?

Reconsidering Climate Compatible Development as a New Development Landscape in advancing towards the SDGs in Southern Africa

Lindsay C. Stringer, Susannah M. Sallu, Lisa M. Ficklin, Andrew J. Dougill, Benjamin Wood

Climate compatible development (CCD) is becoming increasingly important to policy makers as a 'triple-win' strategy, combining climate adaptation and mitigation with development and progress towards the SDGs. It characterises a development pathway that is multi-sector, multi-stakeholder and multi-scalar. However, whether CCD really offers a new development landscape that can advance towards the Sustainable Development Goals (SDGs) has not been extensively explored. This paper addresses this gap through focus on Malawi, Swaziland and Tanzania, and considers whether CCD is creating an alternative development pathway or whether it is simply providing a mechanism with which to connect already existing development trajectories to wider mitigation and adaptation initiatives. The paper first unpacks the growing CCD literature to elucidate three challenges and

opportunities that are found in the CCD rhetoric. First, it notes that CCD has multiple conceptualisations, sharing common ground with other approaches such as climate resilient development, and while this can create opportunities to harness co-benefits and triple wins, it can also expose weaknesses in the existing governance and institutional context. These same weaknesses can act as barriers towards SDG implementation and achievement. Second, the paper finds that CCD does not make explicit the current and historical tensions between climate change and development, nor does it demand a global re-evaluation of risk, responsibility and inequalities. Reconciling these tensions is vital in developing the necessary institutional alignment to bring together efforts to address climate and development challenges. Third, while CCD facilitates consideration of trade-offs, it is embedded within a paradigm that reinforces the reproduction of the current political and economic system. This suggests a need to reconsider and repoliticise the relationship between climate change and development in order for CCD to be a useful concept in guiding African countries towards achieving the SDGs.

Aligning national climate policy and sustainable development as a challenge of multilevel governance: the case of Kenya

Steffen Bauer, Kennedy Liti Mbeva

2015 has seen the adoption of both the "2030 Agenda for Sustainable Development" and the "Paris Agreement" under the UN Framework Convention on Climate Change (UNFCCC). An effective implementation of the goals and objectives that both agendas entail, i.e. the Sustainable Development Goals (SDGs) in the case of the 2030 Agenda and Nationally Determined Contributions (NDCs) in the case of climate policy creates formidable challenges for multilevel governance - notably with a view to achieving coherent policy making and implementation at national and subnational levels. Guided by concepts of multilevel governance and institutional interplay, this paper researches the conditions for a successful alignment of climate policy and sustainable development in the case of Kenya. What determines institutional interplay between the SDG and climate agendas vertically as well as horizontally? Whether and how are climate and sustainable development policies aligned across levels of governance, notably including the subnational level? Kenya provides for an interesting case study to explore these questions on several counts. From a multilevel governance perspective Kenya is of particular interest due to its ambitious devolution agenda that seeks to decentralize political authority to 47 counties following major constitutional reform in 2010. From a climate governance perspective, Kenya belongs to a distinct group of "middle countries" whose ambitious pledges helped to overcome the engrained dichotomy between developed (Annex I) and developing (non-Annex I) countries in the negotiation of the Paris Agreement. From a sustainable development perspective, Kenya represents a regional hub in Eastern Africa as a (lower) middle-income country with a fairly robust economy and a dynamically emerging middle class. Against this background the paper will investigate specifically how Kenya fares in aligning its National Climate Action Plan 2012-2017 with its Medium Term Development Plan 2012-2017 in the context of national devolution as well as international engagement in the processes of climate governance and sustainable development.

Multilateral objectives and national implementation: private adaptation finance in Kenya and Rwanda

Pieter Pauw, Adis Dzebo

Global environmental regimes increasingly recognize the private sector as a source of finance. Both the UNFCCC climate regime (and the affiliated Green Climate Fund), and the Sustainable Development Goals (SDGs) emphasise the importance of private finance to achieve their general aims. This is a significant change from only a decade ago, and research is increasingly focusing on the potential and opportunities of such private finance in developing countries.

However, less developed countries in particular have historically benefitted least from international private investments. At the same time, developing countries are among those most vulnerable to climate change impacts, particularly due to their high levels of poverty and underdeveloped infrastructure.

This paper introduces an innovative framework to assess the potential of private finance at a national level. The framework was developed based on a literature review and first presented and discussed with climate finance experts at the recent UN climate conference in Paris. In contrast to previous research, it does not only focus on opportunities for private financing of adaptation: it explicitly highlights barriers and limits to mobilisation of private finance as well as potential maladaptation caused by private investments. The framework was used for case studies in Rwanda and Kenya in February-March 2016, where 47 interviews were conducted with policy makers, civil society, researchers and private sector representatives. These East African countries were selected based on their extensive descriptions of private sector engagement in their INDCs.

The outcome will improve our understanding of the potential of private finance to support developing countries with their adaptation (and development) efforts. Early results highlight the difficulties faced by public actors in creating enabling environments for domestic private investments in adaptation; and the general blind spot for private maladaptation at all levels. Furthermore, there is little and only unsystematic knowledge domestically concerning the overall amount of domestic and international private finance investments in adaptation.

The differences between the aims of the international negotiations and the reality on the ground in developing countries; as well as the differences between public and private perceptions when it comes to adaptation financing highlight the complexities of both multilevel and transnational governance. The research will have implications for both the implementation of the global climate regime and the SDGs.

Operationalizing land degradation neutrality: unraveling the semantics to support synergy between the Rio Conventions and action towards SDG 15

Mariam Akhtar-Schuster, Lindsay C. Stringer, Alexander Erlewein, Graciela Metternicht, Sara Minelli, Uriel Safriel, Stefan Sommer

The world's commitment towards land degradation neutrality (LDN) has been enshrined in various international agreements and decisions throughout the year 2015. The challenge

now becomes one of operationalization, in order to achieve these new policy goals and targets by the year 2030. Advancing LDN demands attention to what the concept seeks to achieve, as well as unravelling the perspectives of the key multi-lateral environmental agreements through which progress can be made. The three Rio Conventions (the UN Convention to Combat Desertification, the UN Framework Convention on Climate Change and the Convention on Biological Diversity) all play key roles in shaping the international LDN governance and implementation context. Their different but related foci create a number of challenges and opportunities for advancing LDN. In this paper we critically analyze the literature to elucidate potential challenges and opportunities in moving LDN towards implementation, taking into consideration the mandates and objectives of all three Rio Conventions. We first unravel the semantics of LDN's aspirations. We highlight the importance of the definitions and terminology used, and the relationships between those definitions, terms and the actors using them, as well as their implications in framing the range of policy actions and synergies that could be delivered. We then examine the LDN pilot project spearheaded by the UNCCD to identify key lessons for LDN implementation. Synthesising these lessons, we then present a portfolio of blended interventions that seeks to address the aspirations of the UNCCD, UNFCCC and CBD in the LDN space, identifying synergistic options for national actions to operationalize LDN. Overall, our analysis provides useful insights in moving LDN from its current position as a policy target, towards synergy and action.

Panel 2 – Implementing International Environmental Agreements in Africa

Africa's path in global environmental governance: How African countries are implementing global environmental conventions

Maria Ivanova, Natalia Escobar-Pemberthy

Africa has gained an increasingly important role in global environmental governance. The 2009 African walkout from the Conference of the Parties of the UN climate change convention reflected countries' concern about environmental impacts on the continent. Yet, little is known about Africa's environmental performance, especially regarding global environmental concerns. Global environmental conventions set global goals and outline strategies for achieving them. Much of the literature assumes that the conventions are mainly instruments for the developed North and that African countries lag in adopting and implementing them. However, there are no systematic assessments of the degree to which any countries implement commitments under the conventions making it impossible to determine whether countries comply and whether conventions solve problems. This paper uses the Environmental Conventions Index, an assessment tool we have developed over the past two years that (to date) measures the implementation of six conventions (Ramsar on wetlands, CITES on trade in endangered species, Convention on Migratory Species, Basel and Stockholm conventions on chemicals, and World Heritage Convention) across all signatory countries. We assess Africa's performance in translating global environmental commitments into national policies and analyze factors that enable and hinder implementation identifying notable case studies of performance and challenges.

The Complexities of Cooperation and Equitable utilization of the River Nile

Winnie Khaemba

Transboundary water bodies are more often than not associated with conflict than with cooperation, peace and stability. The international landscape is littered with a myriad shared water conflicts ranging from the pulp mills case (Argentina v. Uruguay) brought before the ICJ to the Nile river conflicts that exemplify tensions associated with shared water resources. Nile States have not succeeded in delivering a basin-wide regime but in 1999, nine (9) basin states came together to establish the Nile Basin Initiative (NBI) to steer realization of a legal framework among other mandates. This cooperation resulted in the Nile Basin Cooperative Framework (CFA) a product of over 10 years of negotiation. Egypt and Sudan remain opposed to parts of it arguing for recognition of their 'natural and historical rights'.

With the coming into force of the International watercourses convention there is renewed hope that cooperation around transboundary water resources will be enhanced. This paper looks at the complexity of cooperation, and equitable utilization as important principles in transboundary water cooperation and harmonious co-existence but also as tools towards joint initiatives and sustainable development in the face of climate change and other threats.

It analyses the conflicts around shared water resources in the Nile Basin, current application of cooperation and equitable utilization especially their role as tools for governance, how they could be strengthened and what trade-offs including consensus building, compensation, imposition of user fees, joint management and implementation of projects among others can be pursued. It also addresses the challenge of national interests versus regional/international good and/or interests and how this relates to state obligations be they legally binding or based on good faith. All this is presented in a comprehensive framework that basin states can apply. In sum, the principles of cooperation and equitable utilization can lead to mutual benefits, but obstacles towards these have to be overcome and bridges towards implementation put into place. Of importance also is that states and regional governments have to be willing and able to take this path.

Promoting EU Rules and Norms beyond its Borders: The Case of the EU's Voluntary Partnership Agreements in Africa and the Rise of China

Christine Hackenesch

Since the mid-2000s, the EU has sought to negotiate Voluntary Partnership Agreements (VPAs) with timber exporting countries in Africa, Asia and Latin America. VPAs are legally binding trade agreements that seek to ensure that timber imported into the EU is not illegally cut. VPAs are thus one interesting example for a recent trend where the EU seeks to promote environmental sustainability, development and governance reforms through trade agreements. The success of the VPAs has been mixed. Only six out of 15 countries that started negotiations with the EU have signed a VPA. Moreover, in those countries that have signed a VPA the level of implementation varies considerably across countries. The Paper seeks to explain the EU's mixed record in establishing VPAs by focusing on the domestic economic and political incentives in the target country to implement VPAs and China's rise as a timber market. The paper builds particularly on insights from African country cases.

Panel 3 – Governing Energy Transitions in Sub-Saharan Africa

Energy and Political Transformations in East Africa

Christopher Gore

What is the dynamic between global environmental priorities, domestic environmental policy change and political change in sub-Saharan Africa? How are the goals of green or environmental transformation going to be realized in sub-Saharan Africa? What are the political conditions, obstacles, and consequences of these goals? This paper examines the conflict over energy pathways in sub-Saharan Africa. It specifically examines the tension between goals and transformations espoused by multilateral and bilateral agencies and the desired pathway of African national governments. Using the case of Uganda, the paper traces the evolution of energy governance in the country and region over the last two decades. Uganda has one of the lowest levels of access to electricity in the world, yet has been trying to improve its energy sector for decades. The paper examines how the local imperative of energy provision has been shaped and undermined by conflict between national governments and multilateral banks. The paper also shows how the quest to transform access to energy in East Africa has been paralleled by a political transformation whereby the roles of multilateral banks have been challenged and changed. Today, European countries largely fund renewable energy projects and support low-carbon energy development, while non-Western countries, particularly China, are leading large, controversial infrastructure undertakings. In the middle sits the World Bank, which continues to try to guide energy improvements in the country while China's influence and role rises. These changing roles did not come about owing to a negotiated division or responsibility. It was a result of the contest over the roles and responsibilities of various actors in the effort to transform Uganda's electricity sector. The experience in East Africa reveals how complex and conflict laden environmental transformations are and the domestic political consequences of those attempted transformations. The paper is a result of almost 15 years of research on the energy sector in East Africa.

East Africa's Energy Futures: the politics of hydrocarbon extraction and climate compatible development in Kenya and Uganda

James Van Alstine, Ross Gillard

Competing narratives on energy and climate governance are understudied in the new petroleum economies of East Africa. Although member states of the East African Community (EAC) have agreed to a regional climate change master plan, national policy discourses continue to focus on how the extractive industries will catalyse development towards middle-income country status. The extraction and use of oil, natural gas and coal has been prioritised partially as a response to the increasingly unreliability of hydroelectric power due to reduced water levels in feeder-rivers. At the same time national climate change action plans and adaptation strategies have been established in EAC member states to help the region cope with the increased incidents of extreme weather events such as floods and drought. The hardest hit sectors have been agriculture and energy, with frequent incidents of starvation in arid and semi-arid areas as well as interruptions to energy supplies and increased prices.

Kenya and Uganda are appropriate case studies for exploring the possible tension between climate compatible development (CCD) and hydrocarbon based development. Kenya has placed great emphasis on expanding its geothermal industry, framing it as a Nationally Appropriate Mitigation Action (NAMA) to secure state and international donor finance. Uganda has also set ambitious renewable energy targets, seeking to more than quadruple its renewable electricity generation capacity by 2030. However, both countries have recently discovered commercially viable oil reserves and are looking to develop transnational pipelines connecting them to international markets as quickly as possible. National level energy policies in Kenya define a prominent role for hydrocarbon fuels e.g. as an economically and politically appealing way to tackle secure investment and tackle domestic energy vulnerability. As demonstrated in its Vision 2040, Uganda is committed to developing a modular oil refinery to ensure value addition locally, before exporting its oil in crude form via pipeline.

This article explores how the politics and policies of hydrocarbon-fuelled growth in East Africa enables or constrains more climate compatible development plans in the region. We analyse the interplay between these visions across levels (international and national) and between countries (Kenya and Uganda) to illustrate their contradictions and coherence. In particular we identify key barriers to the diffusion and development of clean energy infrastructure, suggesting that inter- and trans-national initiatives for CCD need to do more than just secure donor funding in order to win the political battle for East Africa's energy future.

[The politics of norms in Earth Systems Governance: contesting transparency and accountability in Uganda's oil bearing regions](#)

James Van Alstine

The starting point for this paper is the emergence of a 'transparency industrial complex' in the extractives sector. An international agenda has evolved which seeks to institutionalize key good governance norms such as transparency and accountability in relation to the extractive industries. Transparency in resource governance has risen up the political agenda, and was a key theme of the June 2013 G8 summit, hosted by the UK government. Kofi Annan and the Africa Progress Panel have called for greater transparency to combat the resource curse in sub-Saharan Africa. A proliferation of transparency and accountability soft and hard forms of governance have emerged over the last decade, including: the Extractive Industries Transparency Initiative, the US Dodd-Frank Act, the EU accounting and transparency directives, the Open Contracting Partnership, and the Open Government Partnership.

On the other hand there is a body of literature, often from the field of political ecology and anthropology on community-based issues and extractive industries, such as environmental impacts, human rights, land rights, compensation, displacement and resettlement, and issues of community consent vs consultation. The interconnection between community-based issues and the issues on transparency and accountability throughout the extractive industry value chain needs to be linked. In particular, there is a gap in the literature on the take up, implementation, and impact of transparency and accountability initiatives at the subnational level.

In the context of East Africa, the overriding political economy context is that of resource-led development, that energy and non-energy minerals will catalyse national development towards middle-income country status. It is assumed that if social and environmental issues are well managed then the extractive industries can contribute to sustainable development and poverty reduction within extractive regions. Uganda's nascent oil sector provides fascinating insight into the politics of transparency and accountability within resource bearing communities.

Informed by extensive field work over the past five years, we explore the emergence of transparency and accountability initiatives and the extent to which these interventions can bring 'order to disorder' within Uganda's oil bearing regions. Empirically, we analyse initiatives that have emerged 'from above' through the proliferation of international norms and standards, and those which have emerged 'from below' through community-driven processes. We evaluate the extent to which transparency and accountability initiatives at the subnational level depoliticise or (re)politicise resource politics and contribute to more inclusive modes of development.

Panel 4 – Governing Agriculture and Land Use in Sub-Saharan Africa

Land, Industrial Policy and Earth Systems Governance in sub-Saharan Africa: The Relationship between Land Tenure and Foreign Investment Regime in Uganda and Tanzania

Mark Purdon

Changes in land tenure and agriculture sectors in East Asia are often credited with laying the foundations for successful industrialization there. What are the opportunities for such development in sub-Saharan Africa? This paper contributes to discussion about earth systems governance and industrial policy in the sub-Saharan Africa by demonstrating how land tenure and foreign investment strategy interact to shape the outcomes of foreign investment projects involving land. It is based on extensive field investigation of large-scale forestry and bioenergy projects in Uganda and Tanzania (including 300 household surveys) in conjunction with key stakeholder interviews and review of relevant legal/policy frameworks.

Results demonstrate that land tenure and foreign investment strategy can be effectively combined to boost smallholder incomes, spur domestic investment and allow the state to retain strategic control. While projects in Uganda were more modest in size than those in Tanzania, the risks involved in Uganda's projects were more equitably distributed between investors and smallholders. In Uganda, smallholders were able to secure considerable economic benefits from projects because their Uganda's land tenure system recognizes individual land rights. At the same time, the selectivity of the Uganda Investment Agency and Uganda's foreign investment regime placed important restrictions on foreign investment, effectively putting a brake on large-scale land acquisitions.

Institutions in Uganda promote domestic investors in the forest and bioenergy sectors. In contrast, the institutional framework in Tanzania for rural development places the burden of risk on villagers themselves through a collective land tenure system in combination with an aggressive foreign investment regime that does relatively little to spur domestic investment.

The land tenure system in Tanzania does not allow villagers to engage directly with foreign investors to realize the economic potential of their land, but instead requires that they first transfer it to the central government who then leases it out to investors. This offloads project risks onto villagers who only receive compensation for their lands and not payment that reflects its true market value. At the same time, the Tanzanian investment regime is highly liberalized with the result being that it has created few incentives for domestic investors to become meaningfully involved in forestry or bioenergy.

Overall, these findings suggest that there are ways that the African state can combine liberal economic reforms with its developmental aspirations. Implications of these findings for the debate on elements of earth system governance such as international free trade and environmental regimes are considered.

Effectiveness of the Governance Arrangements in Promoting uptake of Sustainable Agricultural Practices in the Semi-Arid Areas of Ghana and the Low Lands of Malawi

Grace Timanyechi Munthali, Adelina Mensah, Christopher Gordon, Elaine Lawson, Rahinatu Sidiki Alare, Prosper Adiku

The agricultural sector of African economies has faced considerable climatic challenges in the past decades. Like it is true in most Sub-Saharan countries, resource poor smallholder farmers are more vulnerable to the effects of climate change. While agriculture is highly vulnerable to climate change, is also the major cause of it mainly through the greenhouse emissions and indirectly through deforestation and poor land use practices. In this regard, considerable efforts have been made to produce agricultural practices for sustainable land use. However, uptake of these practices among farmers remains questionable. This can be, in part, due to lack of clear institutional framework governing the adoption of the sustainable land use practices. In addition, issues of compatibility of the promoted practices of the farmers are important to be considered. Therefore, this paper presents a case for understanding the institutions governing the adoption of sustainable agricultural practices by smallholder farmers in the Semi-Arid Areas of Ghana and the Low lands of Malawi. First, the study will assess the constraints and opportunities with regard to farmer adoption of the promoted practices. This will help the study recommend compatible and area specific sustainable agricultural practices for farmer uptake. Furthermore, using Institutional Analysis for Development (IAD) framework, the effectiveness of the current institutional arrangement in promoting adoption of these promoted practices will be analyzed. Data on existing sustainable farmer practices, factors enhancing and hindering adoption and supporting policies will be collected in Malawi. The same data were collected in Lawra and Nandom districts in Ghana. These districts represent the Semi- Arid areas of Ghana, where not only climate sensitivity is high but also poverty. Preliminary results show that the major constraint for farmer uptake of the sustainable practices is the lack of money as well as no knowledge of implementing some practices. Institutions are present at both household and community level, though not emphasized. Recommendations from the preliminary results can be made that proper institutional framework that emphasizes on penalizing those making the land more susceptible to future climate change effects and incentives better land users for the sustainability of the environment be adopted. Furthermore, more research should be done on sustainable practices like irrigation and rain water harvest, which farmers

are aware of but have no knowledge on the implementation. Local practices which are good for the environment needs to be combined promoted with scientific evidence and up-scaled.

Outlining a Global Research Agenda for Enabling Effective Rangeland Governance

Lance W. Robinson, Fiona Flintan

The political marginalization of rangelands in developing countries is seen not only in national policies and politics but also in international development programming. This bias is revealed in terminology used in the field of agricultural development, in which arid and semi-arid rangeland areas are distinguished from "high potential" areas. Similarly, "agricultural intensification" is typically assumed to refer to interventions, usually plot-level interventions, aimed at improving yields from cultivation agriculture. Investments in rangeland management tend not to conform to assumptions about what qualifies as intensification.

Within mechanisms of global governance, the UNCCD is a natural "home" for rangeland issues, but is one of the poorly resourced and less impactful global governance mechanisms. Rangelands are considered within other mechanisms and are discussed in other forums. For example, a side event at the 2016 United Nations Environment Assembly in Nairobi is endeavoring to mobilize support for a resolution on sustainable pastoralism from the Assembly. On the whole, however, rangelands and rangeland management have not received sustained and significant attention from global governance and policymaking or from global development spending.

Many of the scientists and development practitioners who work in rangelands, however, believe that rangelands and rangeland management are a potentially effective and fruitful development investment. Making this case to national and global policymakers, however, will require solid evidence-evidence which at present is too patchy and anecdotal. This paper outlines elements for a global research agenda for enabling effective rangeland management. This agenda must include elements of environmental and productivity impact assessment to demonstrate and quantify the benefits of investment in rangeland management. It will also require systematic studies of approaches and strategies to document and cost effective practices and how these approaches and strategies need to be adapted to different contexts. As well as studies of community and project level interventions for rangeland management, insights will be needed into elements of the policy, governance and socio-cultural environment that enable or constrain effective rangeland management. These impact-focused studies, intervention-focused studies, and context-focused studies must be brought together in cost-benefit analysis and other types of syntheses that allow for comparison with alternative development interventions. After outlining this research agenda, the paper considers implications and possible connections for this research agenda with multilateral environmental agreements and other aspects of global governance.

Panel 5 – Legitimacy and Accountability in African Environmental Governance

The questions of legitimacy and effectiveness of transnational partnerships for sustainable development in sub-Saharan Africa: Building a conceptual framework.

Okechukwu Enechi

Legitimacy has emerged as a central issue in the various discourses on sustainability governance, especially regarding the role and relevance of non-state actors participating in transnational partnerships implementing in the issue area of climate change. Research findings reveal that some level of legitimacy of transnational partnerships engenders institutional stability, equity and ownership thereby promoting effectiveness. Accordingly, legitimacy is strongly promoted as a key ingredient in the various proposals on meta-governance of transnational partnerships. In examining the issue of legitimacy, several analytical frameworks have been developed and deployed using an interdisciplinary approach. These frameworks are largely derived from democratic principles and development models obtained in the context of the Global North. Attempts to deploy these frameworks in the study of transnational partnerships implementing in Sub-Saharan Africa (SSA) often expose their inadequacies in resolving critical concerns in the region's specific environmental governance. While the existing frameworks provide templates for analyzing legitimacy of transnational partnerships, the exclusion of the critical peculiarities of the SSA makes it difficult to deploy the empirical findings based on the frameworks in policy formulation. Therefore, this paper seeks to fill this gap, by deriving an analytical framework that is specific to the SSA and recognizes the critical variables peculiar to the region such as national interest, country participation in partnerships, regional and national policies. In more detail, the paper argues that the legitimacy and effectiveness of transnational partnerships in SSA should not be analyzed with a broader global intended framework but a regional specific context that addresses the region's characteristics. From a policy perspective and with a view towards providing options for improved partnership performance, the paper argues that taking into account the SSA-specific context for legitimacy will not only increase the output and outcome, but will likewise lead to ownership, sustainability, replication and scale-up of partnership projects. This will significantly enhance effectiveness depending on the resources available to the partnership and the stability of the state where the partnership is implementing. The paper will thereafter illustrate the framework with empirical analysis of three transnational climate change partnerships implementing in the region.

For the Benefit of All: Explaining the Adoption, Diffusion and Implementation of Free, Prior and Informed Consent in Environmental Governance

Judy Ndichu, Kennedy Mbeva

Free, Prior and Informed Concept (FPIC) has emerged a significantly important normative and policy instrument in fostering transparency and accountability in environmental governance, by enabling marginalised and vulnerable communities to be informed and provide consent to projects affecting them, in particular in forests and extractives industry. This is more profound in countries that are endowed with natural resources but with weak governance. Significant evidence has been generated on how FPIC has been successfully utilised, and this has mainly focused on individual projects / country case studies. Despite this significant amount of evidence, FPIC remains under theorised. It is in this context that this paper seeks to contribute to understanding on what conditions foster the diffusion and implementation of FPIC. In other words, what factors contribute to the adoption and implementation of FPIC? This paper takes a socio-scientific approach by conducting empirical statistical analysis. A number of African countries - those with abundant natural resources but prevalent issues of distributive justice and inequality - were considered as the case

studies. Second, FPIC was conceptualised and attendant proxy dependent variables identified. Third, factors that have been identified as drivers and/or impediments to adoption, diffusion and implementation of FPIC were scoped out from existing literature, and appropriate independent proxy variables identified. Statistical regression analysis was then undertaken to determine which factors foster and/or hinder adoption, diffusion and implementation of FPIC in environmental governance. This paper aims to make a number of contributions: enhance the theory explaining the adoption, diffusion and implementation of FPIC in countries; contribute to understanding how FPIC advances the principle of distributive justice; and finally identify policy options and priorities to foster adoption, diffusion and implementation of FPIC in environmental governance. Keywords: Free, prior and informed consent; distributive justice; environmental governance; transparency and accountability; inequality.

Assessment of governance principles application in protected forests: The case of six state forests in western Zimbabwe

Vurayai Mutekwa

Zimbabwe's protected indigenous forests have experienced significant dynamics in their governance arrangements over the years that have seen varied application of governance principles with implications on forest condition and adjacent communities' livelihoods. Understanding the application of governance principles in history and their impact on forest condition and livelihoods can offer insights into current and future governance arrangements that can foster sustainable forest management and livelihoods. Using historical information from both published and grey literature, interviews with forestry officials and community leaders, I analyzed the application of governance principles at different historical periods between 1920 and 2005 for six forests in north-western Zimbabwe and the corresponding forest condition and livelihoods outcomes. The governance principles analyzed are transparency, accountability, participation, fairness, rule enforcement, legitimacy and capacity of forest authorities to execute their statutory responsibilities. Results show that the application of the principles during both the colonial and post-colonial periods has been generally low with undesirable forest condition and livelihoods outcomes. Ostrom's social-ecological system's external environmental conditions of the economic environment, political stability and interference, market demand and the adoption of quasi co-management arrangements added to the complexity of the application of the governance principles by the protected forest management authorities. Knowledge gaps and future research needs were highlighted as well as the conditions and prospects for collaborative governance arrangements to improve forest conservation and local communities' livelihoods outcomes.

Key words: Zimbabwe, governance principles, livelihoods, forest condition.

Panel 6 – Improving Livelihoods & Enhancing Resilience in Sub-Saharan Africa I

Understanding multiple drivers of behaviour change: how better designed household interventions can lead to improved livelihoods in Kenya

Marie Jürisoo, Fiona Lambe, Henrik Carlsen

The use of biomass for cooking is rising in Sub-Saharan Africa, in contrast to other regions of the world. If current trends continue, 900 million people will be cooking with biomass in 2020, compared to 700 million today. Besides the glaring inequity of how little energy these people can access compared to their developed country peers, the use of traditional biomass also has several negative effects, including health impacts, economic losses from time spent gathering fuel and cooking on inefficient cookstoves, and cementing gender inequalities within households and communities.

Cooking with more efficient technologies is one way to address this problem. In Kenya, over the past decades, there have been several attempts to introduce clean cookstoves, but few have been widely accepted by consumers. For household technologies to take off, the user has to substantially change her behaviour, overcome social and cultural barriers and develop new habits. This undertaking is not trivial, and successful interventions need to consider these complexities.

A person's behaviour is influenced by factors that operate inside and outside the household. While there are several frameworks for understanding drivers of behaviour in relation to technology uptake (e.g. the SaniFOAM framework for sanitation technologies), and how structures influence the relationship between actors and technologies (e.g. Diffusion of Innovations), these approaches do not systematically account for how drivers across different levels operate in tandem to influence user behaviour.

This paper begins to fill that gap by synthesising empirical data on the multi-level drivers of individual behaviour in relation to adoption of clean cookstoves in Kenya. The paper uses a cross-impact balance analysis, a semi-quantitative method for systematic analysis of qualitative expert insights, to synthesise results from 40 deep, open-ended interviews with households, regional and national government, private and NGO actors, in an epistemologically consistent manner. The method allows for a structured, qualitative discussion on the relationship between different level drivers of behaviour, as well as the dynamics and interplay between these. By showing plausible combinations of multi-level drivers of behaviour change, the method also provides a foundation for identifying future pathways for technology uptake.

The insights can support cooking technology professionals, development practitioners, and other stakeholders to design and implement impactful interventions. The findings also inform the development of a multi-level analytical framework for understanding drivers of behaviour change in relation to technology uptake with the potential for wide application.

[Tackling the sanitation enigma: addressing barriers to change sanitation practices and hygiene behaviors in sub-Saharan Africa](#)

Nelson Ekane, Marianne Kjellén, Hans Westlund

The mystery of sanitation and hygiene behavior change needs to be resolved if we are to attain the sanitation target of the Sustainable Development Goal (SDG): adequate and equitable sanitation and hygiene for all by 2030. Only 30% of the population in sub-Saharan Africa (SSA) use improved sanitation. To change this, we must improve our understanding of: What keeps people from adopting healthier hygiene behaviors and sanitation practices?

Which approaches work on the ground to change behaviors and improve sanitation systems? What accelerates progress in sustainable sanitation service coverage? This multi-stakeholder research combines qualitative and quantitative methods to examine sanitation and hygiene compliance and enforcement regimes. Looking at national policy (macro level), program implementation (meso) and household behaviors (micro), it examines the multiple barriers to behavior change in selected rural and peri-urban areas, and investigates how the barriers are tackled by different approaches to sanitation program implementation, e.g. Community Led Total Sanitation and Community Health Clubs. The research addresses root causes of compliance gaps and aims to show what it takes to overcome them i.e. to end open defecation and ensure access and use of toilet facilities and to instill proper hygiene habits. Improving understanding of the above issues and how best they can be tackled in tandem by all stakeholders including households is a major task deserving high priority as we work towards the sanitation SDG. Any headway into dealing with these issues early in the SDG timeframe is instrumental in ensuring meaningful progress.

Livelihood Vulnerability and Time Budgeting for Water and Fuelwood in Rural Nigeria: Some Governance Imperatives

Usman Raheem

There is scanty evidence of empirical studies that explore the implications of the share of productive time of women engaged for domestic no-remunerative activities on the productive livelihood activities. This study examines the vulnerability of the livelihood of rural women that may be accounted for by the time budget for water and fuel wood fetching in rural Nigeria. The data for the study were obtained from a survey of 375 women sampled purposively from 15 villages in the 3 districts of Asa LGA. In each village, 25 women were interviewed using a structured questionnaire designed to elicit information on the socio-economic characteristics and daily activity profile of the women. The proportion of time taken for fetching water and fuel wood was calculated as a proportion of the total active daily hours identified by the women and averaged for the total number of women sampled in each village. A multiple regression method was also used to examine the contribution of selected institutional and household variables to the proportion of time taken for these two activities. Water fetching and fuel wood collection jointly accounted for 55% of about 9 hours available for daily activities with water fetching, loading and purification accounting for about 33% of the time. Between 36% and 55% of daily active hours is available for remunerated activities either on the farm or in markets. Majority of the women indicated that earnings from remunerated activities were strongly constrained by time spent fetching water or gathering fuel wood. Availability of indoor water points and price of alternative energy sources provided significant and positive explanation on the proportion of time women spent in fetching water or gathering fuel wood. Daily activity for 58.4% of women began about 2 hours before the beginning of the official working hours while working hours extend for 3 hours beyond the official working hours. Infrastructural provision particularly improved access to water and electricity could ease the burden on their daily activity schedule. The study draws implications for rural poverty and community based governance initiatives for reducing poverty of rural women in Africa.

Panel 7 – Improving Livelihoods & Enhancing Resilience in Sub-Saharan Africa II

Investigating institutions for effective rainwater harvesting: addressing vulnerabilities and enhancing resilience in semi-arid Kenya

Leslie King, Janet Mang'era

The aim of this research was to investigate how Rainwater Harvesting can be institutionalized in semi-arid Kenya with a view to contributing to water security. Though water scarce, Kenya has a huge potential to be water sufficient and address water insecurities in the marginal lands, such as Makueni County through exploitation of rainwater. Evidence shows that this rainwater potential has not been tapped and that a greater proportion of rainwater in Kenya is wasted as runoff. Hence the water crises experienced in the semi-arid areas of Kenya could be attributed to poor planning and inadequate response but also lack of a supportive institutional and governance framework. Through case studies of communities in Makueni County, major challenges identified included poor technical designs, non-application of standards, portability of rainwater ownership, capacity, focus on mega projects by the government, politicized development, poor coordination, and too great an emphasis on domestic water as opposed to water for production. The study identified gaps in coordination, networking, and inter-play, institutional design and lack of fit and failure of governance and implementation. Recommendations are made for improving rainwater harvesting institutions and governance.

Performance of households in rural and peri urban settings with regard to improving sanitation and hygiene practices.

Amans Ntakarutimana, Nelson Ekane

We conducted a case control study in Rwanda, focused on the sanitation and hygiene performance of rural and peri urban households through the implementation of Community Health Club approach to assess its contribution. Two villages were selected from rural and two villages from peri urban. In each rural and peri urban, one intervention group (6 months CHC approach exposure) and one control group (not exposed, allowed to benefit from usual government and partner activities). In total, 798 households (95%) were interviewed with spot observations carried out. Focus group discussions and interviews were conducted with local leaders, sanitation professionals and opinion leaders from both groups 2 years after the intervention. The performance of households in rural settings was 99.05% (94.28, 100) for toilet with a roof in the intervention group against 14.17% (8.942, 21.61) in non intervention group; 98.1% (92.9, 99.9) for clean toilet inside and outside in the intervention group against 25% (21.31, 33.56) in non intervention group; 99.05% (94.28, 100) functioning hand washing facility in the intervention group against 43.33% (34.81, 52.27) in non intervention group; 92.38% (85.48, 96.29) availability of soap at hand washing facility in the intervention group against 4.167% (1.543, 9.633) in non intervention group. In peri urban setting the performance was 82.69% (78.09, 86.5) for toilet with a roof in the intervention group against 74.17% (68.64, 79.03) in non intervention group; 63.58% (58.01, 68.8) for clean toilet inside and outside in the intervention group against 28.04% (27.17, 38.26) in non intervention group; 74.17% (68.94, 78.79) for functioning hand washing facility in the intervention group

against 12.55% (9.085, 17.05) in non intervention group; 38.41% (33.1, 44.01) for availability of soap at hand washing facility in the intervention group against 7.38% (4.773, 11.18) in non intervention group. The probability of improved sanitation and hygiene practices of households from rural setting varies between 2.18 times and 22.17 times in the intervention group than in non intervention group. In the peri urban setting the probability of improved sanitation and hygiene practices of households from rural setting varies between 1.115 times and 5.912 times in the intervention group for toilet with roof, clean toilet inside and outside, functioning hand washing facility and availability of soap at hand washing facility than in non intervention group. This research showed that CHC approach implementation is associated with households' sanitation and hygiene practices improvement after 2 years after intervention.

Exploring the complexities surrounding sanitation provision and hygiene promotion in sub-Saharan Africa: A theoretical perspective

Nelson Ekane

Why is there still an enormous backlog in sanitation coverage in many countries in sub-Saharan Africa (SSA)? why is it difficult to change sanitation practices and hygiene behaviors in this context? These are just some of many questions that remain pondering. Two major daunting challenges related to sanitation practices and hygiene behavior that practitioners, policy-makers, researchers, and development funders are grappling with in SSA and the developing context in general are to eradicate open defecation where it prevails and ensure access and use of toilet facilities, and instill and maintain proper hygiene habits, notably hand washing with soap. We still do not have a complete understanding of the reasons why the above state of affairs persists. Also, we are still to establish the exact reasons why changing sanitation practices and hygiene behaviors at the household and community levels remain elusive in some places and slow in others. We know that many of the challenges in improving sanitation coverage and promoting hygiene behavioral change are related in one way or the other to governance at different levels of society – macro, meso and micro. Part of the problem is that some of the governance gaps are poorly understood, underestimated and even neglected as a result of their multifarious, cross-cutting, and complex nature. From a theoretical standpoint, this paper explores the complexities surrounding sanitation provision and hygiene promotion in SSA, namely: the intertwined nature of sanitation and hygiene and the impact on human health, well-being and development; contradictions between formal and informal sanitation and hygiene institutions; unclear roles and responsibilities for promoting behavior change and providing sanitation facilities by different stakeholders; little or no coordination between stakeholders; and multiple barriers to hygiene behavior change. Key areas where governance gaps emanate and persist in society are examined, including the process of sanitation and hygiene policy formulation, the policy itself, the process of policy implementation, and compliance with policy.

Panel 8 – Integrated Environmental Management and Planning in Sub-Saharan Africa

Mapping of Ecosystem Services in a Marine Reserve in Kenya: An Initial Step to Integrated Natural Resource Management

Margaret Awuor Owuor, John Icely, Alice Newton, Judith Nyunja, Philip Otieno, Arthur Omondi Tuda, Nancy Oduor

Mida creek on Watamu Marine Reserve is an important socio-ecological system (SES) along the Kenya Coast. Habitats of the creek both natural and human modified like mangroves, casuarina, palm trees and beaches provide the community living around it with different ecosystem services (ES). However, this complex SES faces environmental, economic and social challenges which call for renewed integrated natural resources management. The ecosystem services approach to management provides a framework aimed at sustainable management, and mapping has been proposed as one of the first steps towards its application. This study aimed at: characterizing land use/ land cover (LULC) classes, spatially mapping distribution of ES flow and determining the different opinions of experts on ES flow from the creek. A participatory approach was used to engage different stakeholders and community groups who actively participate in conservation activities in the creek. Datasets on which ecosystem service flow is scored based on expert estimates per land use/land cover class against the selected ES were collected using questionnaires. Data was analysed using statistical and spatial analysis techniques. Results show that while palm trees was the main source of firewood, other vegetation were also an important source for wood products namely charcoal, construction poles and fishing gears. There was high flow of fish from water bodies and mangroves. High flow of regulating services was dominantly from mangroves, while beaches, mangroves and water bodies were preferred for cultural services. Bare areas saline and sand flats scored least for all the ecosystem services. Findings from this spatially explicit approach will allow better interaction between stakeholders and decision makers and also help in the development of spatially relevant management and conservation policies. The approach also gives an opportunity for raising awareness on ecosystem services through the participatory approach.

Using foresight as a process for policy harmonization in the face of transboundary governance challenges in East Africa

Lucas Rutting, Joost Vervoort, Martin Tumuhereze

Many challenges of environmental governance are transboundary in nature and require a policy response that is coherent across national boundaries. However, in the East African context, such transboundary policy responses are a challenge, since regional initiatives on issues of environmental governances are still largely unexplored in practice. Foresight methods offer a systemic, future-oriented approach that that has already demonstrated strong potential for bridging jurisdictional boundaries in planning, because it has allowed for a greater appreciation of the systemic nature of future environmental challenges. In this paper, we report on a participatory foresight process organized by UNEP WCMC and the CGIAR research program on Climate Change, Agriculture and Food security, which was set up to harmonize policy responses to future challenges for nature conservation in the Lake

Victoria Basin (LVB). To this end, the researchers and participants developed different future scenarios, using a participatory approach involving regional stakeholders from governments, the private sector, civil society and academia, with a strong focus on governance. We designed a specific process: 1) We organized an inception workshop for policy identification, in which we brought together key stakeholders from all five countries in the LVB region (Uganda, Kenya, Tanzania, Burundi and Rwanda). They inventoried relevant policies on the country and at the regional level. In addition, they mapped developments with a high impact on biodiversity or ecosystem services within the region; 2) We selected policies to work on, based on a set of criteria (the selected national policies should have a similar policy focus; they should be in the process of revision) and invited policy makers and civil society and private sector representatives for a follow-up workshop; 3) We organized a scenario-guided policy development workshop during which we paid specific attention to cross-country dialogue and strategic harmonization of national policies; and 4) Collaborated closely with the governing bodies responsible for the policies during the formulation process of the new policies after this strategic harmonization process was completed. We report on the successes and challenges of this foresight-guided policy harmonization process, to provide an example of a novel use of foresight which aims to create new structures of inclusive governance at the level of the global region.

Multiple-levels, Multiple worlds: Integrated Adaptation Planning and Implementation in Ghana

Ariella Helfgott, Abrar Chaudhury, Joost Vervoort

Community adaptation to climate change is facilitated and hindered by a range of interrelated processes operating from local to global levels. The entire experience of climate adaptation, what needs to be done by whom and how, what needs to change and what needs to be preserved—varies according to the perspective of different actors involved, and depending on where they are positioned within the system. There are often significant disconnects in perceptions of responsibilities, capabilities, willingness and in understandings of how the system works, across actors, levels and sectors. This results in misalignment of policy and practice, ineffective flow of knowledge and resources across the network of climate adaptation actors, and breeds mistrust that inhibits learning.

This paper describes a multi-level, multi-scale, multi-actor, multi-sector climate adaptation planning and implementation process in Ghana designed to identify and overcome these disconnects. The methodology and lessons learned have broad applicability to complex multi-level planning and implementation processes. As disconnects are rooted in deep misunderstandings of the grounded realities of different actors, an experiential process of mutual discovery is required to build shared understanding, respect and overcome a culture of blame that existed between certain groups of actors.

The process brought together actors from community, district, regional (sub-national), national and regional (supra-national) levels across food, agriculture, environment, climate, health, education, economics and finance sectors, in government, non-government, private sector, academia and civil society. A multi-level 'in-the-same-room' integrated exploration and planning process has not happened before in Ghana. There were a number of unique

challenges due to geographical separation, different tribal languages across the country, large differences in wealth and power and associated issues of symbolic violence.

The results highlight the importance of integrated multi-level participatory processes, rather than participatory activities taking place only within decision-making levels. These initiatives must be designed to create a safe space for interaction, adopt methods that are accessible to all participants, and attend to significant practical considerations. The process identified numerous experiential disconnects, misalignments between policy and practice, and disconnects or misalignments in the flows of knowledge and resources throughout the system that have a significant impact on the effectiveness of resilience, adaptation and development interventions. Through the participatory process, local actors at all levels owned both the diagnosis of issues and the climate adaptation actions. This paper aims to contribute practically towards the goal of systemic, multi-level improvement of complex socio-economic-environmental problematiques.

Panel 9 – Bottom-up Environmental Governance and Stakeholder Engagement in Sub-Saharan Africa

Harnessing the Crowd to Improve Accountability for the Delivery of Solid Waste Services: A Randomized Field Experiment in Kampala, Uganda

Mark Buntaine, Daniel Nielson

This randomized field experiment, implemented in Kampala, Uganda during 2015-2016, aims to generate reliable evidence about the provision, quality, and impact of citizen monitoring of public services. Governments around the world are building communication platforms to collect information from citizens to improve governance, especially about environmental conditions. Yet we know little about how communication technologies are changing citizen engagement with government agencies and to what effect. Existing research — which tends to be conceptual or descriptive — has provided little guidance about whether mobile technologies can enhance public engagement with governments by facilitating regular, high-quality, and useful monitoring of public services. This experimental study of citizen monitoring of solid waste services, completed in partnership with the Kampala Capital City Authority (KCCA), is uniquely suited to answer foundational questions about citizen monitoring of public services. With visible solid waste services as the outcome of interest, we are able to verify the quality and timeliness of citizen monitoring and its impact on governance. We address the following questions:

Question 1 (Provision): Under what conditions will citizens voluntarily report information about solid waste services?

Question 2 (Quality): Under what conditions will information reported by citizens be timely, accurate, and frequent?

Question 3 (Impact): Under what conditions will citizen monitoring of solid waste services overcome seemingly intractable governance problems?

Environmental issues are at the heart of the trend toward technology-enhanced citizen engagement to improve governance. Most of the foundational research on citizen engagement in science and public affairs using new technologies has addressed environmental issues. For example, previous studies on citizen-based environmental monitoring, have addressed the accuracy of amateur monitors (e.g., Bonter & Cooper 2012; See et al. 2014), the timeliness of citizen-sourced data (e.g., Munro 2013), and the representativeness of data (e.g., McCormick 2012). Little evidence exists, however, about citizen monitoring of public services. Our study places the monitoring of solid waste services at the forefront of more general questions about citizen engagement and governance under technological change. We know of no other study that has a strong empirical strategy to understand the content and impact of citizen monitoring through new technologies, despite the wide-ranging implications for environmental governance.'

Inclusiveness development for sustainable value chains: a conceptual framework for assessing the contributions of partnerships

Greetje Schouten, Sietze Vellema, Rob van Tulder

Smallholder farmers, often belonging to the most marginalized groups in society, manage over 400 million small farms and provide over 80 per cent of the food consumed in Asia and Sub-Saharan Africa. These regions face high levels of food insecurity, with almost over 800 million people undernourished. To address these issues many present-day development policies and projects emphasize the need for inclusive development, often through so-called 'value chain collaboration beyond the chain'. These types of partnerships are understood as collaboration between different value chain actors, often combined with other societal actors, including NGOs and governmental actors, in order to reach developmental outcomes. The basic premise of the approach is twofold: 1) by utilizing complementary resources of actors from different societal spheres, societal challenges can be addressed that actors would not be able to deal with individually; 2) businesses need to have an active role in addressing societal challenges as a prerequisite for well-functioning markets and growing economies. Despite positive expectations, the additionality of such partnerships is at best unclear. These partnerships for example have difficulties to ensure equal access to decision-making processes for vulnerable stakeholders, like smallholder farmers. How the interventions of a partnership generate a process of inclusive development is therefore not yet understood. This paper presents an analytical framework, which aims to understand whether, and how, processes of inclusion are triggered by value chain partnerships. The emphasis is on the terms of inclusion, rather than inclusion as such and it takes into account the dynamics of the wider social, economic and political context in which these approaches articulate. The proposed analytical framework encompasses four key dimensions of a process of inclusive development that we assume are triggered by value chain partnerships: more inclusive decision-making processes within a partnership; more inclusive intervention strategies within a partnership; changing business models of lead firms and/or agribusiness clusters; a process of embedding of the partnership and its interventions in local production networks and the public domain. The four dimensions are anchored in theories on: (i) deliberative capacity ; (ii) institutional work changing the terms of inclusion; (iii) business models of lead firms in value chains; and; (iv) embedding newly emerging institutions in local production networks, business systems and public networks. The paper is illustrated with a range of examples of value chain partnerships in East and West Africa.

National Policy Change from Below? Understanding conditions when African cities lead

Christopher Gore, Diana Lee-Smith

City governments in sub-Saharan Africa have historically been beholden to the whims and objectives of national governments. Rare, however, is the case where actions at the sub-national level redefine specific sectoral policies at the national level, particularly in areas that have been the dominant purview of national governments. One such policy area is agriculture. Agriculture has always been the policy domain of national governments owing to its importance in national economic development and the large proportion of national populations living in rural areas in most countries. Yet, in many countries, food production in cities plays a very important role in the nutrition of urban households as well as for income generation. So while the history and benefits of urban agriculture in African cities is well known, what is less understood or recognized is how advocacy for urban food production in some cities has started to produce national policy change. Further, little research has examined the political and policy dynamics of this issue. This paper examines how constellations of citizens, civil society organizations, city governments and national bureaucrats in three cities of East Africa – Kampala, Nairobi, Dar es Salaam – have interacted to advocate, and in some cases produce, national policy change in the area of agriculture. Each city is unique for having a collection of interests who have been advocating for improved support and recognition of food production in their cities. Indeed, in the sub-continent, these cities are rare for having continually promoted and in some cases formalized the role of urban agriculture through local and national policy. While advocacy for urban agriculture is common globally, what is not clear is under what conditions local advocacy produces policy uptake and change nationally. Is policy change a result of endogenous or exogenous forces? What are the conditions when local policy advocacy alters national policy? Drawing from theory and research on policy change and African urban politics and governance, this paper argues that while external knowledge and support have helped initiate national policy dialogue, domestic civil society organizations and their engagement with local and national bureaucrats are key to policy support for urban agriculture at the local and national scales. In short, persistent, endogenous leadership and advocacy matters. This argument is supported by extensive qualitative fieldwork in each city.

2016 Nairobi Conference on Earth System Governance New Directions Stream

Panel 1 – New Earth System Transformations I: Theories

The Economics behind Transformation - A transdisciplinary theory of economic development and earth system transformation

Josue Manuel Quintana Diaz

This paper elaborates on the question what theoretical framework might be abstract, but also simple and fruitful enough to study beyond and across disciplines economic development and earth system transformation towards goals associated with sustainable development. Using a novel transdisciplinary approach, we propose a coherent picture to capture both the interplay and net-effects of four units of analysis to observe and to describe the economy: (1) communication (observing system), (2) organizational rules (institutions), (3) actions (observed system) and (4) organizational outcomes. Outcomes can be assessed according to aspired organizational goals - be it not to transgress the nine planetary boundaries of the earth system (Steffen 2015), promoting the human rights or accomplishing the SDG targets. All four analytical units represent different lenses to analyze the economy and the transformation process economies are undergoing constantly to develop. The relationship between these units is circular-causal: communication establishes organizational rules, rules constrain actions, actions yield organizational outcomes - effecting e.g. the planetary boundaries and the SDG targets, which again feedbacks to communication. All kind of methods, theories and empirical findings across and beyond disciplines can be integrated into this framework. Our approach illustrates first (a) that the economy transforms the earth system and gets transformed according to the governing rules of the game. This can be shown using an Input-Output-Matrix. Moreover, our approach highlights (b) that not only the aspect of (i) governing institutions (rules), but in particular the public choice among and within (ii) the governance institutions (rule-making mechanisms) are paramount to analyze different organizational outcomes of economic development. We argue (c) that governing institutions determine the economic order and governance institutions determine the political order of organizations. Both orders are interlinked by the practiced political economy within that organization, which yields a social order with certain patterns of organizational outcomes. The aspect of governance institutions can be complemented in terms of the conceptual ESG framework and its five analytical problem. Finally, (d) what makes organizational outcomes change is the force of learning. Institutional change can be comprehended as endogenous to beliefs (Greif, Latin 2004), and learning, which make beliefs change. Learning on basis of communication distributes not only knowledge, it determines ultimately which social rules will be believed to be of more utility, and thus get reinforced or undermined over the course of history. (e) The transformation of the economy as part of the earth system is in fact self-regulating.

The Green Decarbonized State and Industrial Governance: How to render transformation of the energy-intensive industry possible?

Roger Hildingsson, Annica Kronsell, Jamil Khan

Future research on the state in environmental and climate politics needs to develop an understanding of industrial governance in conceptualizing a Green Decarbonized State (Bäckstrand and Kronsell 2015). The State retains the authority and capacity to access diverse mechanisms for steering and enabling climate and sustainability transitions and can orchestrate decarbonization of key sectors in the carbon economy (Hildingsson and Khan 2015). Welfare states have been particularly successful, due to their capacity to reconcile different interests in society, by remediating social costs that arise from the externalities of industrial production (Gough and Meadowcroft 2011). At the same time, the welfare state has been inherently dependent on industrial and economic development.

Exploring the new politics of climate change after the Paris agreement, we focus in this paper on the energy-intensive natural resource-based industry (ENRI), associated with intense energy consumption and high carbon emissions. In perspective of the long-term climate policy objectives, these industries are key targets for climate mitigation and decarbonization strategies. Industry accounts for 30 % of global emissions of greenhouse gases of which ENRI sectors including iron and steel, pulp and paper, cement and chemical industries are responsible for nearly half (IPCC 2014). Decarbonizing ENRIs will expose policy makers of a major dilemma; while industrial decarbonization is critical for climate policy, such sectors represent key export industries fundamental to national economies. In comparison to other industrial sectors, they are well-integrated into the global economy and highly dependent on retaining their international competitiveness. Thus, prevailing strategies by state authorities have been to protect these industries from market competition and of late to rely on market forces in anticipation of the risk of carbon leakage. However, market-based policies and market-liberal norms of cost-efficiency are largely insufficient to incentivize long-term decarbonization strategies and transformative change in these industries (Henriksson et al 2014; Hildingsson and Khan 2015).

Theories on the green state, relate these industries to the problematic economic imperative of the state (Eckersley 2005) referring to industrial sustainability innovation as 'greenwash'. Transitions theory considers these old industries in terms of incumbent regimes that resist change (Grin et al 2011), while ecological modernization theory see the potential for innovative industries to establish lead markets (Jänicke and Jakob 2006). Using these theoretical arguments as a starting point, we discuss in this paper how a green decarbonized state can govern ENRIs and ask: how to render decarbonization and transformative change in energy-intensive industries possible?

Insights for sustainability transformations from emerging theory on gradual institutional change

James Patterson

Much of the literature on sustainability transformations to date has remained either highly conceptual or highly normative (or both). For example, large bodies of literature have been built up on sociotechnical transitions and social-ecological transformations, leading to increasingly detailed insights on how sustainability transitions or transformations occur. However, conceptually these approaches are often self-referential, quick to make normative propositions, and arguably weak in appreciating the complexity of politics and governance in practice. Understanding institutional change is a major gap for sustainability transformations

research. The insufficient attention to understanding institutional change is not surprising, because institutional scholars themselves are only relatively recently coming to take a more central focus on institutional change (Hall, 2010). Recent insights on gradual institutional change in the field of political economy (Mahoney and Thelen, 2010) stand to be of tremendous relevance and usefulness to scholars studying sustainability transformations. These insights centre on the key role of actors/agents in maintaining, interpreting/reinterpreting, or contesting institutional rules, which can open up space for gradual institutional change over time via a variety of possible mechanisms.

To further explore these propositions and how they might inform sustainability transformations research, this paper focuses on the major global challenge of climate change adaptation in cities, with a specific focus on water governance. Institutional change is likely to be required not only to adapt to climate change impacts, but also as a crucial aspect of transformations in society and governance (e.g. changing systems of production and consumption, creating more inclusive social and political relations). Understanding how purposeful institutional change can occur for the unprecedented challenge of adapting to climate change in cities a critical area for attention within sustainability transformations research. This paper draws on early evidence from case study analysis of institutional change in urban water governance under climate change in two large cities in emerging economy nations: Cape Town, South Africa, and Santiago, Chile. Findings are explained through gradual institutional change theory to test its explanatory power and draw out insights for sustainability transformations research. Findings overall challenge the common dichotomy made between incremental and transformative change, suggesting they may actually be often closely linked, and open up new ways of analysing complex mechanisms of institutional change and underlying structure-agency interactions.

The paper is a product of the “Transformations and Transitions towards Sustainability Working Group” under the Earth System Governance Conceptual Foundations Taskforce, carrying forward a key priority identified collectively at the 2015 Canberra Conference on Earth System Governance. The taskforce will contribute to building expertise and stimulating dialogue on the governance and politics of transformations towards sustainability, which the earth system governance community is uniquely placed to lead.

An innovative governance model for transformation towards sustainable energy futures

Marcus Lange, Valerie Cummins

Innovation in governance is relevant across society as it grapples with the grand challenges of sustainability in the 21st Century. The objective of this paper is to present an innovative model of governance to address the specific challenge of transitioning towards a new energy future. Developments in marine energy provide a focal point for studying the issue, as a microcosm of the larger energy picture. The study demonstrates that transforming current energy systems is a multifaceted governance challenge.

The need to find transformative approaches towards sustainable futures has been highlighted. Various studies emphasise that research has been focused on resource assessments and technological and environmental aspects, rather than addressing the social and political issues associated with developments in the marine environment. As the pace

and scale of global environmental challenges grow and social problems become more apparent there is a need to develop governance responses that are approached from a science perspective and other knowledge systems, such as indigenous, traditional or local communities.

The new measures for the governance model are built upon two pillars that are namely institutional engagement, which allow for the facilitation of exchange across diverse stakeholders from government, markets and civil society, and fit for purpose institutions, which allow for streamlined processes, coherent policy frameworks as well as clear mandates for regulators, developers and interconnected agencies. Results of this study are based on extensive stakeholder exchange within workshops and interviews with leaders from all sources of Governance, as well as desktop reviews and policy analysis.

The presentation will highlight the findings of a study that sits at the interface of Ocean Governance and the current discussion on Transformations. It aims to provide decision makers from all sources of Governance with a better understanding of how to make better decisions and to incorporate case study learning from best and worse practices examples into decision making. This material is based upon works supported by the Science Foundation Ireland (Grant 12/RC/2302).

Panel 2 – New Perspectives in Earth System Governance I: Norms and Discourses Revisited

A Basic Norm for Earth System Law

Dona Barirani

The Anthropocene raises multiple new political and legal challenges, from global governance to local politics. One major challenge is the need to reinterpret and redesign the existing system of international law, which in many ways still follows basic principles of the 19th and 20th century. But what would be the key tenets of a legal system that can effectively address challenges of the Anthropocene? How could an “earth system law” be conceived? This paper contributes to this legal-philosophical debate by reinterpreting the work of two of the most influential founders of international legal studies, Immanuel Kant and Hans Kelsen, with regard to the novel challenges of an integrated “earth system law”. In particular, the paper provides an in-depth analysis of the concept of Basic Norms (Grundnorm) as developed by Hans Kelsen and Immanuel Kant, and applies it to the modern notion of sustainability, with the final aim of exploring the possibility and necessity of such a Basic Norm for sustainability. Such an examination of a Basic Norm from a legal-philosophical perspective is vitally important for the broader field of global change research, as it may create a firmer basis for current claims, and counter-claims, around calls for the global protection of “planetary boundaries” and the preservation of global “ecological integrity”, which generally have not yet been sufficiently related to international legal studies and philosophy. As legal norms are social norms by their nature, a debate on law is highly relevant for a complete understanding of related processes of international institutionalization. But what is then a Basic Norm in this field? The traditional positivist notion of legal systems premises law to be structured in a norm-hierarchy. Therefore, the existence of a Basic Norm as the ground of a specific norm-hierarchy is a logical

consequence. Here, the paper elaborates in detail how the philosophies of both Kelsen and Kant can be used to assume a Basic Norm as being necessarily given. Recognizing protecting planetary boundaries can be defined as a natural law because only a sustainable treatment of natural resources will guarantee our survival in the long term. For example, such a Basic Norm can help re-construct the Sustainable Development Goals in a norm-hierarchy around a Basic Norm of “sustainability”. This will elevate earth system law to a higher analytical and normative level and improve relevant problem solving processes.

Setting a framework for earth system law: Norms in the planetary boundaries concept

Dona Barirani

The conceptualization of planetary boundaries opens up new analytical ways of understanding earth system governance in the 21st century. As the legal framework of earth system governance has not systematically been explored to date this paper will fill this gap by providing an in-depth analysis of “earth system law”. Some scholars have shown that defining the planetary boundaries is a process of social construction essentially based on normative assumptions, especially when it comes to the definition of risks. This requires integrating the role of norms and norm hierarchies in the concept of earth system governance. Norms are at the crossroads between political science and legal studies as legal norms are social norms by their nature. They regulate social behavior and are codified in law if substantially relevant for the long-term survival of a society. Sustainability is commonly codified in form of “soft law”, such as in Multilateral Environmental Agreements or recently the Sustainable Development Goals. The entire treatment of the sustainability concept in law is characterized by the creation of catalogues of principles that can gain recognition and legal meaning. These often emphasize focusing on implementation while strategic alignments remain broadly untouched. The definition of such general principles is, however, essential for the interaction between international institutions as it helps solving norm conflicts in order to work efficiently and effectively. Overarching principles that set general behavioral standards, and therefore social norms, steer the way of defining and institutionalizing the planetary boundaries. In this regard, the principle of universality in the Sustainable Development Goals can be seen as a milestone of earth system law. As this goal set is now applied to all countries and not only the developing countries it helped overcoming the principle of common but differentiated responsibilities which prevented global justice and efficient sustainability in the past. This paper argues in favor of defining sustainability in the legal form of “targeting” (Zielbestimmung). This is as targets have an abstract-general character demanding for concretion as well as for designing the legal system, yet having a normative content in form of a central idea that has a legally binding effect.

Enough is enough: understanding limits in contemporary environmental argument

James Meadowcroft

The idea of limits plays an important role in contemporary environmental argument. One recent incarnation of limits-talk is the notion of Planetary Boundaries which has sparked fierce debate between proponents and detractors. Proponents have emphasised the importance of defining a 'safe operating space for humanity', noting the dramatically increasing pressures humans have placed on global ecosystems over the course of the past

century. Critics have questioned the scientific foundations of the proposed 'boundaries', argued they are not all 'planetary' in the same way, and/or they have targeted the concept's 'neo-Malthusian' resonance.

This paper sets the recent controversy over planetary boundaries within a broader context of arguments about different kinds of environmental limits and the ways in which they can be 'negotiated' by human societies. It employs techniques of conceptual analysis to contrast different notions of limits including those embedded in ideas such as 'critical loads', 'maximum sustainable yield', 'environmental space' and the 'two degree climate target'. It will argue that ideas of limits play an important role in the discourse of sustainable development and even in relation to the notion of 'decoupling economic growth from environmental pressures' which is associated with discussion of 'Green growth' and the 'Green economy' in the work of international organizations such as UNEP, the OECD and the World Bank.

Contrasting these different approaches reveals the extent to which different approaches to limits underpin many prominent perspectives on environmental politics and policy. More broadly the paper will argue that a more explicit and self-conscious understanding of limits and the ways in which they are to be managed is critical for longer term development of the institutions of global environmental governance.

This abstract is linked to the work of the Taskforce on Conceptual Foundations of Earth System Governance

Panel 3 – New Perspectives in Earth System Governance II: Emotions, Spaces and Movements

Earth System Governance: Knowledge is Not Enough

Ariella Helfgott, Heike Schroeder, Monika Zurek, Joost Vervoort, Sherie van den Wijngaard

Earth System Governance (ESG) research has focused on integrating knowledge across a wide range of disciplines, sectors and social worlds, from local to global levels, in order to create effective, sustainable and equitable governance of the Earth system. However, results to date indicate that knowledge alone will not be enough to achieve this outcome, we also need to deal explicitly with emotions, and to start with ourselves.

This paper explores the role of Emotional Intelligence (EI) in ESG research. Drawing on organisational, critical systems and governance theory, as well as EI competence frameworks, we analysed the processes and outcomes of three major research programs: The Millennium Ecosystem Assessment, CCAFS Systemic Integrated Adaptation Research Program and EU FP7 Transmango; and conducted extensive surveys and interviews of ESG researchers. All programs engaged with actors at multiple levels from local to global in order to co-create knowledge and improve governance of 'the coupled social-ecological system that the Earth has become'.

Such research teams are usually composed of academics compiled for their complementary mix of skills and expertise. This study shows that interactional skills and EI have a large

impact on team behaviour and performance; which subsequently affects stakeholder interactions, research results and external outcomes. An effective team needs both EI and expertise including technical, analytical and social skills.

Working across disciplines, sectors and social worlds requires skills including active listening, willingness to learn from others, the capacity to have our knowledge and values challenged, to accept and deliver critical feedback, willingness to share knowledge, openness, humility etc. These skills are particularly important when the issues addressed are value-laden, polarized and politically loaded issues, as is often the case in ESG. Guidelines are provided for incentive structures and training programs that can support researchers in the capabilities required for collaborative ESG research and practice.

The lessons learned provide broader guidance about the capabilities required for collaborative ESG. Hempel states that the fundamental “role of governance could be in connecting the worlds of thought, feeling, and action for the purpose of sustaining the web of life”. If our own intra and interpersonal dynamics obstruct us from doing this ourselves, how are we to provide models for others? Knowledge alone is not enough, we need to deal with emotions, and in more than a detached way. We need to become emotionally responsible and accountable ourselves, if we are to set the pathway to change.

[Local perceptions of land use change in the Kilombero Valley, Tanzania: Using participatory art to reveal socio-environmental effects of large-scale land acquisitions](#)

Emma Johansson, Ellinor Isgren

In this study we use participatory art as a way to explore local perceptions of land use change and future aspirations for development in two communities in Kilombero Valley, Tanzania. We concentrate on the effects of large-scale land acquisitions on people and the environment in an ecologically important area. Leasing of land to foreign agribusinesses for the production of timber, food and fuel crops has created a politically charged debate with strong ideologies on both sides, and people directly impacted are not typically the ones driving the debate. Local farmers, fishermen, and pastoralists were cued about landscape and livelihood changes through focus group discussions, interviews, and by co-creating paintings of the past, present, and future. Findings reveal that art can make a valuable methodological contribution by comprehensively identifying causalities between key drivers of change, pressures and impacts on the environment and people, as well as desirable future pathways – both of which are crucial from the perspective of sustainability in a complex world. By using art as a way to explore and explain how people perceive changes in and around their communities, this study contributes with a novel way of understanding how local conditions are re-shaped in areas experiencing rapid social-environmental change.

[A Mobilities Lens to Earth System Governance](#)

Ingrid Boas, Machiel Lamers, Judith van Leeuwen

Our world is becoming increasingly mobile. We are facing continuous growth of international and transnational mobility, such as tourism, travel, migration and shipping, driven by actor networks, information and communication technologies (ICTs) and other forces of globalization. This enhanced mobility actively intersects with processes of

environmental change. Like mobilities, environmental change is equally cross-boundary, affecting the planet and human life in various ways around the globe. Transnational mobility systems, such as tourism, rely on a range of environmental resources (e.g. biodiversity, land, energy, water) as well as sinks (e.g. atmosphere, ocean) and thereby contribute to environmental impacts and change. At the same time, environmental change affects the direction and volume of transnational flows, such as in the case of environmental migration or Arctic shipping. Also, resilience or social and environmental inequality is increasingly dependent on the ability of actors to access, or connect to, transnational networks and flows, such as communities' vulnerable to storms and floods whose resilience is dependent on their access to information about environmental events. Questions of mobility and environmental change are thus heavily intertwined.

Despite the interdependency, mainstream academic discussions on global environmental governance do not yet actively engage with questions of mobility. Instead, the predominant focus is on questions of regulation, and related to that on actors, institutions or other entities that steer, rather than on the flows moving between these nodal points of control and direction. However, as we will argue in this paper, global environmental governance is not just about static institutions or about institutional interplay and public-private governance arrangements. It is also about, or at least should be about, environmental mobilities and their regulation.

By means of three examples of environmental mobilities – climate-induced migration, plastic soup and cruise tourism – used to illustrate our argument, our goal is to show the potential of using a mobilities perspective for understanding environmental issues and their governance.

Sharing our Earth: Elaborating on Ecospace, Technospace, and Sociospace

Joyeeta Gupta

This paper elaborates further on 'Sharing our Earth' in terms of ecospace (the natural inputs and outputs needed for development), technospace (the virtual and biological/physical/chemical technologies and infrastructures that are increasingly reshaping our world), and sociospace (the way ecospace and technospace will change development aspirations and possibilities). The paper assesses the upstream ecospace governance questions such as how are the resources including the electromagnetic spectrum mined, owned, shared and distributed; and downstream questions such as how do their use and wastes impact on humans and their ecosystems? The upstream technospace governance questions are on design, ownership, control, use and abuse of technologies; the downstream questions are on how is the data generated or GM seeds developed shared, distributed, and privatized. How are the benefits from labour saving technologies shared between the inventors, owners of these technologies, and those who lose their jobs as a consequence? And how does the way in which technologies operate impact on the ethical rules of social behaviour? The paper develops a conceptual framework. This paper assesses existing governance at all three levels as being highly fragmented with the danger of empowering some at the cost of others. It argues that there is fear that the three spaces will be governed either through neo-liberal capitalist approaches or hegemonic approaches. While the adoption of the Sustainable Development Goals has significantly impacted on the rhetoric

regarding some aspects of ecospace and sociospace, it has barely covered the technospace challenges which may become very serious in the future. Some argue that networked communication and the internet of things can challenge neo-liberal capitalism since it empowers all. The question is whether a new generation of haves (technologically savvy people) and have-nots (people whose jobs are replaced by technologies, people who cannot work with evolving technologies - like senior citizens, people who cannot afford the technologies) will be created and whether we will be living in a society where our lives will be open books to those who can couple online data with gadgets that record our daily behaviour. The paper call for a research agenda on the need for a new set of global values to ensure inclusive global development and preempt loss of agency over a self-replicating, artificial intelligence driven technospace.

Panel 4 – New Earth System Transformations II: Case Studies

Explaining Variation in Fossil Fuel Subsidy Reforms between Countries

Kennedy Mbeva

Fossil fuel subsidy reform is emerging as an important policy instrument for tackling climate change, mainly reflecting the true price of fossil fuels through removal of the subsidies and investing them into renewable energies. This is especially important for countries in meeting their national climate plans, also known as Intended Nationally Determined Contributions (INDCs), submitted to the United Nations Framework Convention on Climate Change (UNFCCC) towards the historic 2015 Paris Agreement on Climate Change.

Emerging literature on fossil fuel subsidy reform has mainly focused on single case study or a limited number of countries, with limited comparative analysis. Furthermore, conditions under which fossil fuel subsidy reform has been undertaken have been put forth, but have not been empirically tested in a broad comparative study. This study addressed this lacuna by empirically analysing the conditions under which fossil fuel subsidy reforms happen. This analysis is undertaken by first drawing theories from existing literature; these theories are then assigned proxy independent variables with data drawn from different datasets and sources. The dependent variable in this case is the implementation (or lack thereof) of fossil fuel subsidy reform. These variables are then tested using appropriate statistical regression techniques.

This study seeks to contribute in three significant ways: 1) advancing understanding on the conditions that lead to fossil fuel subsidy reform; 2) understanding the variations between countries in implementation of fossil fuel subsidy reforms (or lack thereof); 3) understanding how fossil fuel subsidy reforms can be utilised effectively as a policy instrument to address climate change

Globalizing Strategies for Clean-Energy Technology Acquisition: A Case of India's Wind Power Industry

Daisuke Hayashi

International technical collaboration in the clean-energy sector is the key to addressing the rapidly increasing amount of greenhouse gas emissions from the developing world. This

study aims to examine how and why firms in an emerging economy engage in acquisition of clean-energy technologies from abroad. To this end, an interview-based qualitative case study is conducted focusing on the wind power industry in India, the fifth largest wind power market in the world as of March 2013. The interviews were conducted from February to March 2013 with 15 wind turbine manufacturers and 12 other organizations in India. The interviewed manufacturers accounted for 76% of the annual installed turbine capacity in India during the fiscal year 2011-12. The analysis shows that the Indian wind turbine manufacturers acquired technologies mainly from Europe and the United States, with a few emerging cases of South-South collaboration with Chinese manufacturers. The most prevalent modes of technology acquisition were licensing, joint venture and foreign subsidiary; only a few manufacturers managed to acquire innovative capability through merger and acquisition of technology design firms. The creation of sizable, predictable and performance-oriented market demand was a key driver of international technology acquisition. A majority of the manufacturers focused on the creation of production capacity because they considered cost-competitive manufacturing as their key comparative advantage and wind power technologies were available and accessible. Once manufacturers achieved a sizable sales turnover, they started acquiring innovative capability in order to gain control over supply chain. However, the Indian wind power case shows that technology innovation may well happen outside the growing market. The geographical split of manufacturing and innovation processes and the increasing cross-border flows of technologies point to the need for a global approach to understanding technological innovation.

Transformative change through collaborative foresight: scenario-guided design of Costa Rica's INDC

Marieke Veeger, Franklin Paniagua, Felipe de León Denegri, Pascal Girot, Joost Vervoort, Deissy Martinez Baron, Ana Maria Loboguerrero Rodriguez

In this paper, we map the change of the planning paradigm among actors involved in the development of Costa Rica's INDC from a quantitative, forecast-guided approach to a highly participatory, scenario-guided approach. Emissions policy design is often based on extrapolative projections of past carbon emissions through modelling. The use of explorative projections is promoted by international bodies and its content seldom questioned by governments. Participation of key stakeholders in policy design is often mainly considered necessary for reasons of legitimacy, not for substantive reasons, while a selected group of experts frames most of the content of climate policies.

In Costa Rica, pioneers in civil society and government advocated transformative change through ambitious goals for the reduction of emissions. The call for a way to imagine transformative change went beyond what was available in model projects, and this led Costa Rica's interdisciplinary INDC team to consider the limitations of a data-driven, expert-focused approach to INDC development. Instead, Costa Rica developed its INDC through a process of participatory national dialogue guided by multiple methods, sectors and stakeholders. Model-based forecasts were compared and contrasted with future scenarios of drivers of change relevant for the reduction of emissions. These scenarios also identified alternative pathways of low emission development.

Together with a series of multi-sector stakeholder consultations and the exploratory back-casting of transformative pathways, emission reduction measures were further prioritised and milestones for emission reduction goals were set. The process has resulted in an ambitious INDC and set the stage for public, private and citizen involvement in future mitigation and adaptation measures and plans.

Panel 5 – New Directions for Scientific and Indigenous Knowledge

The political authority of science in governance for sustainability: A structured comparison of six scientific institutions engaged in the Sustainable Development Goals

Sandra van der Hel, Frank Biermann

Over the past decades, a myriad of scientific networks and institutions have formed around issues of global sustainability. These science-based initiatives share the objective to contribute to transformations to a sustainable society, and engage in processes of governance for sustainability. With scientific networks and institutions taking an increasingly active role in governance processes, the question arises how science-based initiatives warrant political authority in governance for sustainability.

Extending a framework widely used in the Global Environmental Assessment literature, we understand the political authority of science to be based on the perceived salience, credibility and legitimacy of science-based initiatives. The paper assesses and explains the different ways in which scientific institutions construct salience, credibility and legitimacy in order to enhance and safeguard their political authority in governance for sustainability. We present a structured comparison of six science-based initiatives, all engaged in the process of formulating, monitoring and implementing the recently established Sustainable Development Goals (SDGs). Four of these initiatives have an institutionalized role in the United Nations: the Scientific Advisory Board of the United Nations Secretary-General; the Global Sustainable Development Report under the High Level Political Forum on Sustainable Development; the Global Environmental Outlook organized by United Nations Environment Programme; and the Scientific and Technological Community Major Group. Two other initiatives operate independently, yet are closely entangled with UN institutions and processes: the global change research platform Future Earth; and the Sustainable Development Solutions Network. These six science-based initiatives share a commitment to contribute the SDGs. Yet, they differ in terms of 1) their structural characteristics and formal relationship to the UN system, 2) processes of acquiring and communicating knowledge, and 3) their intended outcome and engagement in international governance processes. Based on document analysis and interviews, we compare strategies for warranting salience, credibility and legitimacy, relating to the different structures, processes and intended outcomes of science-based initiatives.

Our research shows how, in the fragmented scientific advisory system informing the SDGs, political authority of science is understood and constructed in divergent ways. Since salience, credibility and legitimacy are perceived differently across actors engaged in governance for sustainability, different institutions of science advice come to inform and support different groups and perspectives in governance for sustainability.

How do scientists navigate the hybrid space between science and politics? An empirical analysis

Sandra van der Hel

What is the role of science in responding to complex and urgent problems of global sustainability? How should scientific actors approach unprecedented challenges of global change? And what way can and should scientists contribute to societal transformations towards global sustainability? Scientists working in the domain of global change and sustainability are increasingly confronted with normative questions about the relevance of their work and their responsibility in society. Theoretical reflections on the changing relationship between science and society - discussed in terms of mode-2 knowledge production, post-normal science or transdisciplinarity - are abundant. However, little empirical research has looked into the question how scientists deal with new societal expectations and responsibilities in their day to day work. This paper focusses on the normative and political tensions that scientists experience when engaging actively in processes of societal change. The research is based on a survey distributed among 60.000 research engaged in the new major research platform 'Future Earth: research for global sustainability'. Future Earth proposes a new type of research based on principles of interdisciplinarity, co-production and solution-orientation, and aims to contribute to societal transformations to sustainability. Scholars engaged in Future Earth are subject to the same contextual developments; they experience increasing pressures to demonstrate the societal relevance of their work and to contribute to solutions for pressing problems of global change. At the same time, the community is diverse, encompassing scholars with different disciplinary backgrounds, from different geographical regions, and working in different research areas.

This study reveals how the way in which scientists come to grips with new societal expectations and responsibilities differs between communities. New modes of knowledge production take scientists out of their comfort zone of independence and autonomy, giving them an active societal role and responsibility. However, significant differences between communities exist with respect to the extent to which scientists recognize and act upon the normative and political dimensions of their work. In pointing out these different understandings and positions among scientists, this research contributes to an empirical understanding of the ways in which different research communities see their role in societal transformations to global sustainability.

Indigenous knowledge systems and the Earth System governance project's epistemological dimension: moving beyond the nature-society gap.

Cristina Inoue, Paula Moreira

There are two main innovations of the Earth system governance (ESG) research project. One is analytical-empirical. This refers to the systematization of the five analytical problems and the four cross-cutting issues to organize research in environmental governance. They conform a comprehensive analytical framework within which empirical research can be conducted. We call it the analytical dimension. The other is the methodological-epistemological. It refers to the project proposal to promote dialogues between the social, natural and physical sciences as well as how the project recognizes the socially constructed

character of knowledge. We call it the epistemological dimension. This opens the way to epistemological, theoretical and methodological expansion. Biermann et al (2009) assert the importance of considering the social construction of knowledge, the cultural and temporal embedding of the researcher and the reflexivity of social knowledge because of the normative uncertainty that prevails in the governance of the global environment.

Much research within the ESG framework has been done relating scientific knowledge and governance. There have been analytical and epistemological achievements. For instance, the social construction of the boundary between science and politics has been explored. Also, it has been recognized that there is no neutrality in the relation science-policy, and research has been done on the notion of knowledge co-production. However, less attention has been paid to other knowledge systems, particularly, indigenous knowledge systems. Moreover, there have not been many initiatives to move beyond the modernity dichotomies like nature-society, or material-ideal, nor to incorporate worldviews beyond the West.

This paper explores how indigenous knowledge systems could contribute to expand the analytical and epistemological dimensions of the Earth System Governance project. Considering that the idea of nature is a social construction, it will focus on indigenous peoples from Brazil and their notions of “nature” and their relations to “nature”. Our study is based on bibliographical and documental research on indigenous knowledge and indigenous institutions towards nature. We argue that considering indigenous knowledge systems is fundamental because Indigenous ways to conceive “nature” and to relate with “nature” can contribute to go beyond the nature-society divide. Most importantly, indigenous knowledge systems can expand the ESG project epistemological dimension by bringing different notions of nature and ways of relating to nature.

Panel 6 – New Directions for Adaptive and Anticipatory Governance

The ACID (Adaptive Capacity and Inclusive Development) Institutional Analysis Method

Margot Hurlbert, Joyeeta Guupta

The social sciences have many different methods to assess different issues in relation to institutions. However, these have not been integrated into a comprehensive design for assessing how institutions for adaptive governance can be redesigned. This is arguably a necessary tool in achieving the transformation necessary to address the challenge of the wicked problem of climate change.

Hence, this paper addresses the question: How can methods for assessing, analysing and designing institutions be integrated into a comprehensive assessment methodology to understand, analyse and redesign institutions to enhance their adaptive capacity to deal with increasingly complex policy problems while promoting inclusive development? Here inclusive development is development that is inclusive of the anthropocene, inclusive of marginalized people, and inclusive of all people, regardless of deficits in power. What are the advantages and disadvantages of such a methodology?

This paper combines an assessment of different methods into a comprehensive systematic approach called the ACID ‘Adaptive Capacity and Inclusive Development’ Institutional Analysis Method. It concludes that this cumulative comprehensive approach allows for an

assessment of the impact of individual, and combinations of, instruments that aim to address policy problems on the livelihood capitals of people and the adaptive capacity of institutions. The method is like a lego puzzle allowing for different methods to be added on. However, it is complex, time-consuming, and contextual and, hence, not always generalizable.

The Governance of Anticipation in the Anthropocene: A State of the Art Review

Joost Vervoort, Aarti Gupta

This paper explores an important gap in current Earth System Governance research: how the design and execution of a growing array of activities that can collectively be termed anticipation are being governed, i.e. who is steering them, to what end, and through what deliberative or representative processes? How is the accountability of anticipatory governance secured? We define anticipation here as including all planning and research processes aimed at exploring potential futures - including work captured in containers such as 'foresight' and 'futures studies'.

Faced with the complex challenges of the Anthropocene, there has been a perceived need for action-oriented approaches to anticipation – to help imagine and pre-experience challenging futures, to question limiting assumptions about what futures may be possible, and to experiment with strategies aimed at transformational change. This has led to a proliferation of anticipation in research and planning contexts. There has nonetheless been very little critical social science scrutiny of the multiple global, regional and national exercises in anticipation now underway within the domain of environmental change. This has limited, we argue, both their scope and their impact.

In this paper, we review the state of current knowledge about the practices and challenges of anticipation, and anticipatory governance. We do so through (a) undertaking a broad meta-analysis of anticipation processes at multiple levels, through a critical governance lens, i.e. through asking various first-order questions such as who governs, for whom, and why; and (b) drawing on two illustrative case studies to shed light on the challenges of governing anticipation. These are the IPCC's Shared Socio-economic Pathways scenarios, and a set of regional/national scenarios for East Africa that have been applied to a number of policy development processes.

Based on this review, we outline a future research agenda on exploring further the governance of anticipation. In doing so, we are concerned both with the content of anticipated futures, as well as with the design and functioning of anticipation processes. With regard to content, we consider the prospects for, but also the challenges of, governing anticipation to make it more reflexive about assumptions regarding potential futures and/or accommodate more pluralistic futures, based on different discourses, values, and worldviews. With regard to process, we consider the prospects for, but also the challenges of, making anticipation (and anticipatory governance) more inclusive, and/or better integrated with planning cycles.

Evaluating adaptation practices through co-production of knowledge: a transdisciplinarity approach

Paulina Aldunce, Gloria Lillo, Marcela Vidal, Maria Eloisa Rojas, Carolina Adler

Since 2009 a severe drought has affected Chile. Because of climate change, more severe and frequent droughts are expected. Therefore, there is a need to improve how society responds and adapts to droughts. Of pertinence are lessons learnt from past events. In this ongoing study, we apply principles of transdisciplinarity to conduct a participatory and co-produced assessment and evaluation of practices, to learn about enablers and barriers, and co-design recommendations for overcoming these barriers. Through a mixed-methods approach, we used the recent drought event as our boundary object, combined with literature reviews and document analysis, interviews and workshops. For the evaluation of adaptation practices a multi-criteria index was used: the Index for the Usefulness of Adaptation Practices (IUPA).

Preliminary results show that through IUPA, we were able to systematically account for the effectiveness of the diverse practices different actors use. Weaknesses of adaptation practices were mainly in relation to deficiencies in integration with other policy domains, programs or projects; participation of the target population; incorporation of local and traditional knowledge; ensuring environmental protection; and equity. Finally, enabling social learning is a key aspect of transdisciplinary collaborations and for enhancing resilience. We applied "most significant change" as a method to enable and verify social learning as part of this study.

Our results present empirical evidence on co-production of knowledge can be applied in practice to identify salient approaches to address the actual problem and solutions, contributing to and extending resilience theory as well as informing transformative adaptation to climate change.

Evaluation, adaptation practices, Chile, transdisciplinarity, drought, co-production

2016 Nairobi Conference on Earth System Governance Complexity Stream

Panel 1 – Governing Climate Complexity I: Risk

Risk-Reward Nexus in Geoengineering: Implications for Governance

Turaj Faran, Lennart Olsson, Ruben Zondervan

According to the landmark 2009 Royal Society Report, geoengineering, at least in its Carbon Dioxide Removal branch (CDR), is a technologically and economically viable option for tackling climate change. The problem that remains, according to the same report, is “serious and complex governance issues which need to be resolved if geoengineering is ever to become an acceptable method for moderating climate change.” Hence the focus of research on the Governance of Geoengineering. And given the truly global nature of climate change, the problems has become “normal to governance of anything; e.g. collective action, lack of international consensus etc.” (Humphreys 2011). The paper questions this ‘normalcy’ in governance of geoengineering.

By ‘normalcy’ it is implied that, among other things, the economic side of geoengineering is unproblematic. That is to say, market forces (“the invisible hand”) will take care of to whom the costs and benefits will accrue. Hence no need for special adjustment in its governance architecture. But is this really the case? Not really, if one regards, as we believe one should, the radical technology of geoengineering as (Schumpeterian) innovation, and takes into account, as economists of technological change do, the problem of risk and the division of probable benefit (or loss).

There are two broad views in economics of innovation. The traditionalists believe all the rewards should go to the shareholders of the company introducing the innovation. The revisionists maintain that the indispensable role of government-sponsored research and ‘innovative labor’ justifies a different articulation of risk-reward nexus. In line with the revisionist view, the paper argues that geoengineering seems economically viable to private firms, exactly because they have not burdened the full costs of developing the innovations involved.

A new understanding of risk-reward nexus might show that, a) other actors (governments and ‘innovative labor’) who shoulder the costs and risks of innovation should also be included in sharing the benefits, or b) geoengineering is not quite ‘economically viable’ for the private firms, therefore the economic viability of other technological options (or simple mitigation) should be re-evaluated. Either way, the elaboration of risk-reward nexus of geoengineering has great relevance for designing the architecture of global governance of climate change.

Why Govern Climate Engineering? Assessing Functional, Strategic and Normative Rationales for Governance

Sikina Jinnah, Aarti Gupta

Global governance has largely been explored to date through supply-side analyses, i.e. analyses that assess the design and functioning of existing governance arrangements. Scholars ask questions about effectiveness of international regimes, the dynamics of participation, and approaches to reform ailing institutions. Although these questions help us to better understand the dynamics of global governance, they take for granted that global governance is needed in the first place. Building on Acharya's typology of demand-side governance (forthcoming 2016), this paper examines the need for governance of an emerging technology that currently lacks any formal governance structures of its own: climate engineering.

Specifically, we explore three rationales for governance: functional, strategic, and normative, and their manifestation in climate engineering debates. Functional demands for governance are rooted in efforts at rational problem solving and driven by utilitarian calculations. Global governance of collective action problems, such as climate change, is driven at least in part by functional demands. Strategic demands are rooted in national interests, particularly relating to security and economics. Governance of trade liberalization and nuclear nonproliferation, for example, largely reflect strategic demands from great powers. Finally, the desire to strengthen existing or create new norms also fuels demand for global governance, as evident in areas such as human rights and responsibility to protect (R2P). Here, actors, including from civil society, might demand global governance to replace or augment existing norms of sovereignty and nonintervention.

In this paper, we apply this typology to the realm of climate engineering, wherein the very need for anticipatory governance, and the contours of a potential governance field, remain uncertain and politically contested. We focus on two questions. First, we explore whether long-debated and still contested functional, strategic and normative rationales for climate governance, more broadly, are being largely replicated in this realm, or whether these rationales are distinct and/or upended in novel ways in this newest set of debates. For example, the prospects for climate engineering might upend the long perceived collective action nature of climate change governance, if unilateral action becomes feasible in the future, with very uncertain consequences. Second, we explore trade-offs between these governance rationales, given that they are not mutually exclusive and usually co-exist. In sum, in applying this typology to climate engineering, we identify emerging (and contested) functional, strategic, and normative demands for governance, and assess their implications vis-à-vis the need for anticipatory governance in this area.

Climate change contagion? A networked view of transnational climate risk

Magnus Benzie, Henrik Carlsen, Asa Persson

Adaptation research and national adaptation planning have failed to take account of transnational climate impacts (Liverman, 2015), by which we mean those that are expected in one country as the result of climate change somewhere else. There are several reasons for this, but one is the complexity of identifying and assessing risks that cross borders, including those related to trade, migration, finance and transboundary bio-physical systems. A clear gap exists between research into complex systems and the epistemic community that has emerged to support adaptation governance (Persson & Benzie, 2016). Nevertheless, recent studies have begun to use network analysis to understand how shocks that are relevant to

climate change, such as poor harvests, transmit through complex systems like the global food system (Suweis et al, 2015; Gephart et al, 2016).

This paper will present a Global Index that has been constructed at the Stockholm Environment Institute to show country level exposure to transnational climate impacts (Benzie, Hedlund & Carlsen, 2016). The SEI Index suggests that the global distribution of climate change vulnerability is quite different when transnational climate risks are considered. Some wealthy northern countries and so-called emerging economies are more exposed than 'traditional' vulnerability indices imply. Some poorer developing countries are doubly exposed to direct and transnational impacts. There is also a strong regional (cross-border) dimension to many climate-related risks, such as migration, investment risk, transboundary river systems and regional trade.

The paper will explore the results of the SEI Index in light of current studies and methods for understanding climate risk propagation in networks, with a particular focus on climate risks in agricultural commodity trade.

The potential for climate contagion that is revealed by taking a networked perspective of climate impacts presents several challenges – and opportunities – for improved governance of shared climate risks. It raises a number of questions about the role of national adaptation planning, particularly under the UNFCCC, and the allocation and benefits derived from adaptation finance. It also challenges the legitimacy and effectiveness of 'non-climate' governance regimes, including those governing the world trade system. These questions will be examined in light of the results of the Global Index.

Panel 2 – Governing Climate Complexity II: Adaptation

Beyond Mitigation and bypassing the 'Firewall': how INDCs Advance the Global Climate Agenda

Pieter Pauw, Kennedy Mbeva

Countries' national climate action plans, known as Intended Nationally Determined Contributions (INDCs) in the UN climate regime, were instrumental in reaching the historic Paris Agreement. Although much is known about how INDCs help to mitigate climate change, little is known about INDC content on aspects like adaptation to climate change, costs, and climate finance.

Ever since the 1990s, countries' responsibilities to address climate change have been differentiated along the lines of "Annex I" (industrialized) countries and non-Annex I (developing) countries. This bifurcation reflected the global political economy in the 1990s, but was never modernized to reflect global political and economic changes. As much as the bifurcation aimed to address the notion of 'Common But Differentiated Responsibilities and Respective Capabilities' (CBDR-RC), it actually created a 'firewall' that has proven problematic in the climate change negotiations and ineffective to address climate change.

In our paper, we analyse 1) the Paris Agreement on 'subtle differentiation' towards specific sub-groups of countries, on certain issues (such as adaptation or finance) and in terms of

procedures (such as timelines and reporting); and 2) all INDCs, to identify whether the bottom-up formulation of INDCs stimulates countries' self-differentiation of responsibilities to address climate change.

Our research shows that INDCs advance the operationalisation of CBDR-RC. First, it advances differentiation of responsibilities beyond climate change mitigation to include, at least, adaptation and finance. For example, Annex I countries hardly mention adaptation and finance in their INDCs, the majority of the other countries does. LDCs and SIDS in particular include adaptation plans and strategies, and 50% even includes cost indications of adaptation. Similarly, climate finance is extremely important. A minority of the LDCs and SIDS even make their adaptation activities (9%) and mitigation activities (22%) fully conditional to receiving climate finance.

Second, INDCs move differentiation of responsibilities beyond the bifurcation between developed- and developing countries. Our three country groupings unmistakably have cascading priorities and ambitions in, for example, adaptation, adaptation finance, mitigation finance, and Loss and Damage. This reflects the 'subtle differentiation' towards LDCs and SIDS in the Paris Agreement. It helps to move beyond the firewall between Annex I and the non-Annex I countries that has kept UN climate negotiations from moving faster for too long.

The bottom-up setting of ambitions and priorities at national levels thus bypasses the Firewall and advances the global climate agenda beyond mitigation.

Co-ordinating climate change adaptation decision-making in South Australian Natural Resource Management: Building an adaptive governance framework for strengthening the roles of institutional actors

Barry Lincoln

Climate change affects everybody in different ways and extents irrespective of location, wealth, vulnerability and resilience. Actions at all levels of society contribute to impacts on global to local social-ecological systems. Therefore everybody has some role, responsibility and right to be involved in decision-making and actions that affect them and the whole world. But how are decision-making responsibilities and authority shared, delegated or claimed? How is this done equitably recognising roles, capacity, contributions to climate change and proportional impacts? If it is done, how well is it working and from who's perspectives?

Multi-level governance (MLG) coupled with subsidiarity provides one lens to investigate some of these questions. Such investigations can explore: the complexity of roles each level of agency assumes, interactions with 'partner' organisations and how they negotiate (or not) allocation of decision-making responsibilities fairly and equitably recognising differing strengths and weaknesses.

Climate change adaptation in South Australia, the driest state of Australia, is undertaken by several levels of organisations from state government to regional (sub-state) natural resource management organisations, local councils and community groups. While MLG

maybe implicit - the SA Government supports developing Regional Adaptation Plans - it is not a common concept. Historical roles, political imperatives and 'thin' networks result in limited coordination and cohesion between and within organisations.

Current PhD research aims to investigate development of an adaptive governance framework to strengthen actors' decision-making through greater understanding of their place within their networks and therefore better integration and coordination facilitating stronger outcomes. The research draws on, inter alia, governmentality and structuration and uses key informant interviews and participant observation of different activities undertaken by various levels of organisations.

This presentation provides preliminary results, (including increased awareness, as a result of participating in the research, of interviewees' own and partner organisations' decision-making processes) and analysis, using case studies, of the decision-making processes of four organisations at different levels within South Australia. I explore ways of strengthening coordination and allocation of roles based on who is best place to undertake what actions as a basis for renegotiating traditional partnerships and collaborations.

Preliminary discussions are also occurring with colleagues undertaking fieldwork in Tigray, northern Ethiopia, incorporating options for possible comparative analysis between these two regions. This analysis will explore how experiences and lessons can be shared between the north and south. This may include some evaluation of MLG arrangements and decision-making processes.

Are we adapting to climate change? The case of Chile, barriers and enablers

Paulina Aldunce, Gloria Lillo, Roxana Bórquez, Katherine Indvik

Key to advancing in adaption is learning from past experiences. Nevertheless, the literature highlights that little research focuses on evaluating adaptation efforts, particularly within Latin America and Caribbean countries. The goal of this study was to investigate the development of climate change adaptation in Chile and the most salient enablers and barriers emerging from these experiences. We evaluated the achievements and the implementation process of the National Action Plan for Climate Change (PANCC), the first formal instrument created in Chile by the government in responding to climate change. This study employed an interdisciplinary and multi-method approach, including literature review, document analysis, expert consultation, interviews, on-line surveys, and focus groups.

Results also indicate that greater advances were achieved in adaptation as compared to mitigation, and that the PANCC represents an important contribution towards a national policy and practical response to climate change. However, important gaps remain where further progress is required, and that clear opportunities for improvement exist. The most salient of these gaps relates to an absence of adaptive management, the recommendation is, therefore, to incorporate adaptive management in order to provide the flexibility necessary to accommodate the uncertainty of climate change, learn lessons from and overcome the barriers emerging during implementation, while maintaining transparency and ensuring a commitment to public participation.

The most important enablers identified include inter-agency collaboration, political will, concern about climate change and communication, while the most important barriers consist of constant change in personnel and institutional setting, limited financial resources, and short-term vision.

Adaption barrier and enabler; Chile; drought; policy evaluation

Panel 3 – Governing Water Complexity

The politicisation of transboundary water governance—towards a conceptual approach

Carel Dieperink, Kevin Oosterloo

Literature on water governance and hydro politics often asserts that water governance is politicised, e.g. by its context, the actors involved or other factors. However, the term politicisation seems to be used ambiguously and is rarely defined or conceptualised. Therefore this paper sheds light on the concept of ‘politicisation’, specifically in relation to transboundary water governance. Following a literature review we have designed an analytical framework which departs from the premise that transboundary water governance can be politicised through discourse, linkage-politics and institutional arrangements on a continuum between entirely technocratic and entirely politicised manifestations. We argue that the degree of politicisation of these three mechanisms is influenced by the level of water scarcity in a region, the degree of conflict, as well as the existence of geographical and power asymmetries between riparian parties. External events will have an influence too.

In order to refine our model we have conducted a critical case study on Israeli-Palestinian water relations. We assume that politicisation will be manifest in this case since the Jordan river basin is marked by violent conflicts, disputed claims on water and sovereignty, a perceived asymmetry in access and use of the available water resources and ideological ideas about water governance that differ. Both the Israelis and the Palestinians suffer from water stress. A Joint Water Committee has been set up for dealing with this stress. We have done a content analysis of the meeting minutes of 40 sessions (1995-2009) of the Joint Water Committee (JWC).

Our case analysis suggest that even violent events have little politicising effect in the transboundary water regime. We therefore conclude that it is necessary to require more in-depth insight in the relative weight of the drivers for politicisation we have found as well as the cultural conditions that might mitigate their impacts. Comparative case studies on contested basins like the Nile and Mekong but also on non-contested basin in Europe or the US may provide for this more in-depth knowledge.

Can Water Diplomacy Enable a New Future for the Urmia Lake?

Mahdi Zarghami, Seyed Hamed Alemohammad, Shafiqul Islam

Complexity of many water-related problems is rooted in multiple causal forces arising from conflicting views and values related to: Who decides, who gets water and how? Therefore, effective resolution of these problems needs to go beyond only numbers or narratives. One

way to address these types of complex water allocation problems is to reframe them as joint multi-stakeholder decision-making problems - from identifying and defining the problem to innovating and implementing mutual gain options for resolutions that can generate politically legitimate policies and projects based on science with active participation of all involved parties. The water diplomacy framework provides an alternative to traditional technologically- or values- focused approaches to water management. It offers guidance for obtaining mutual gains solutions through a multi-stakeholder decision process.

Urmia Lake is the largest inland saline lake in Iran and is one of the most valuable aquatic ecosystems in the region. The lake has faced extreme water loss in recent years due to overuse and mismanagement. To address complexity of governance and sustainable management of the Urmia Lake, Tufts University Water Diplomacy Program hosted a two-day workshop during July 2-3, 2015 in partnership with MIT (including MIT Iranian Studies Group) - to provide a forum with the following questions as a starting point for an engaged conversation on the Urmia Lake restoration:

- What is the current framing of the Urmia Lake water allocation problem? Is this framing working? If not, what reframing is needed?
- What metrics (numbers, narratives, or both) are used to measure success?
- What are the "bottlenecks" in water allocation for the Urmia Lake Basin?
- How to reallocate water to meet competing and conflicting demands of multiple sectors?

Understanding and managing water challenges in the Urmia Lake basin need to be reframed within a network of variables, processes, actors, and institutions. Characterizing this network and identifying key links and nodes is an essential step to identifying possible strategies for pragmatic and actionable interventions. Mismatches between values (who decides, who gets water? Is water a right or property?), choice of tools (is efficient irrigation technology better than changing crop pattern to conserve water?), and disparity in scales (spatial, temporal, jurisdiction, management, knowledge) was discussed with a focus on finding actionable resolution. This presentation will provide a review of the discussions and also the follow up activities and actionable ideas discussed at Tabriz in March 2016.

Institutional innovation for adapting to climate change in water governance in cities

James Patterson

There is major global research and policy attention on the role of cities in climate change adaptation. One of the most significant ways that climate change will affect human society is through impacts on water systems. Many competing interests and risks linked to water converge in cities (e.g. urban water and wastewater provision, hazards including floods and droughts, and poverty and human development). This creates an urgent need for adaptive urban water governance that can anticipate and respond to increasing pressures on urban water systems. However, to date there has been insufficient attention to adaptation in urban water governance beyond technical measures for accommodating change.

Institutional innovation is crucial for dealing with increasing uncertainties and ambiguities, contested futures, inequalities, and ongoing environmental changes.

Institutional innovation can include changes in instruments (e.g. policies, laws, plans), organisations (e.g. new organisations, changes to existing setups), and coordination arrangements (e.g. inter-organisational platforms, feedback and accountability mechanisms) that enhance the capability of water governance to deal with challenges faced under climate change. The process of institutional innovation is defined in this paper as “purposeful change in institutional rules that significantly alters the functioning, and ideally outcomes, of institutional processes in a particular place”. It is viewed in a contextual and problem-focused way because what is ‘innovative’ will depend on the problem at hand in given context. This paper addresses the key need to better understand the types of institutional innovation that might be needed in cities under climate change, and the mechanisms by which it can emerge.

The paper presents early findings from an ongoing study into institutional innovation for adapting to climate change in water governance in cities, drawing on a database of institutional innovation in 30 cities across the world (combining primary survey data and secondary data), and in-depth case study analysis from two large cities in emerging economy nations: Cape Town, South Africa, and Santiago, Chile. Findings are interpreted through the lens of emerging theory on gradual institutional change (e.g. Mahoney and Thelen, 2010) and evolving literature on governance of climate change adaptation. Findings provide new insights into patterns of institutional innovation emerging in cities across the world, and underlying political and institutional mechanisms by which it emerges. More broadly, the paper contributes to literature on climate change adaptation in complex polycentric and multi-level urban governance systems. The paper addresses the core ESG themes of architecture, agency, and adaptiveness.

Conducting socioecological research for social transformations: Evidence from the urban water sector in Accra, Ghana

Antje Bruns, Karsten Schulz

Water as a natural resource and as an increasingly securitized commodity plays a key role in urban development. Particularly in Africa, many cities are facing formidable water resource management and governance challenges which are further exacerbated by the mounting pressures of climate change, environmental degradation and uneven urbanization. The socially just allocation of limited water resources and the sustainable management of water in the urban sphere thus present key challenges for scientists and policy-makers alike. With the growing prevalence of water shortages throughout Africa, there has been a constant search for more integrated and 'socially relevant' research approaches that would help optimize urban water flows in order to satisfy growing and competing demands, ensure water quality from delivery to use, and simultaneously foster ecosystem preservation and protection. Moreover, there is an urgent need to better understand how asymmetric relations of power shape the complex relationships between biophysical and sociopolitical processes in the urban water sphere. Thus, in view of increasing calls for socially relevant research on urban sustainability and urban transformations, this presentation seeks to illustrate the everyday challenges of applying integrated political ecology perspectives to the

study of water in an urban context. Drawing on evidence from project-based research in Accra, Ghana, it will be shown how research for transformative change might respond to the practical challenges of advancing the transdisciplinary co-production of knowledge that is both socially relevant and solution-oriented, while at the same time retaining a critical distance from existing governance structures and social processes that may inhibit the establishment of more socially just arrangements in the urban water sector.

Panel 4 – Legitimacy in Complex Environmental Governance

Assessing the Legitimacy of the Groundswell of Climate Action: Transnational Climate Change Governance and the Global South

Harro van Asselt, Sander Chan

Alongside the intergovernmental climate change regime, a wide variety of climate actions is emerging as cities, regions, businesses, and civil society groups act on mitigation and adaptation, independently, with each other and with national governments and international organizations. Many have hailed this 'groundswell' of actions as part of the increasing momentum to act on climate change. Transnational climate actions have also been lauded for their potential to engage more stakeholders, and even improve democratic legitimacy in global climate governance. These arrangements have accordingly received increasing recognition in the intergovernmental process, with the Paris outcome explicitly referring to the continuing need to encourage such actions.

However, critical voices in both policy-making and academic communities have argued that the benefits of such actions may be unequally distributed among developed and developing countries, and raised concerns that some actions may even exacerbate existing imbalances in global climate governance, in particular between the global North and South. This inevitably raises questions of legitimacy. In terms of input legitimacy, a key question is: who participates in transnational climate governance, and how balanced is the participation of actors from the global North and South? In terms of output legitimacy, a similar question arises: do the activities of non-state actors serve goals embraced by a wide group of countries and actors, or do they only work for the select few?

This paper aims to empirically test whether these concerns hold true, drawing on a database of existing transnational climate governance initiatives. The paper explores developing country engagement with transnational climate initiatives, distinguishing between initiatives on the basis of their participation (e.g. including developing country actors), focal areas (e.g. mitigation, REDD+, adaptation), and functions (e.g. knowledge sharing, capacity building, standard setting). It argues that the groundswell of transnational actions poses challenges for developing country participation, but it also presents opportunities for developing countries to help shape the transnational sphere of climate governance. The paper concludes that the concerns raised by developing countries in the context of transnational climate governance are not unfounded, but negative distributive effects have been overstated, while opportunities have been neglected. Analytically, the paper highlights the importance to distinguish between different types of transnational climate governance.

Climate Clubs and their Potentials and Pitfalls for enhancing Legitimacy in Global Governance

Steffen Bauer, Clara Brandi, Lutz Weischer

The regime of global climate governance, a key element of earth system governance, is becoming increasingly complex. Within this sphere, climate clubs are one innovative form of governance that has received growing attention among climate policy practitioners and academics. The underlying idea is to bring together countries that are willing to go further faster - i.e. with particularly ambitious climate targets, renewable energy objectives, etc. - and provide incentives and distinct benefits for these frontrunners to implement their targets. While national governments play a central role in such clubs, these can also include sub-national and non-state actors. Proponents of such clubs argue that clubs could complement the formal multilateral negotiations and build new momentum for climate action. However, such unilateral approaches raise new questions regarding legitimacy. Against this background, the purpose of this paper is to discuss the legitimacy of “climate clubs” in the context of an increasingly complex climate governance landscape. Specifically, we ask which factors generally determine the input and output legitimacy of unilateral clubs, how climate clubs affect both the input and output legitimacy of the climate governance architecture, especially regarding established international institutions like the UNFCCC, and which actors or objectives benefit from the changes that specific clubs bring to the existing climate governance landscape, and which ones might be disadvantaged?

In a first step, the paper outlines the present landscape of existing climate clubs. In a second step, we investigate and discuss the idea of climate clubs from the perspectives of input and output legitimacy. From a conceptual perspective, input legitimacy, or who participates in transnational governance, can be expected to cut both ways: On the one hand, climate clubs may offer novel platforms to involve stakeholders, especially if they include not only states as members but also non-state and subnational actors. On the other hand, climate clubs might also foster exclusion by changing centres of gravity towards clubs as exclusive and confined institutions, giving rise to questions of representation and inclusion. From an output legitimacy point of view, the main question is whether climate clubs are effective in terms of raising the ambition and, indeed, outcome of global climate governance. We will also discuss the trade-offs between input and output legitimacy. For example it might be the case that clubs in order to be highly effective (and thus possess high output legitimacy), need to be more exclusive (thereby challenging their input legitimacy).

Access and Accountability: Complex Interactions between Inequality, Conservation, and Legitimacy

D.G. Webster

Governance of international fisheries through regional fisheries management organizations (RFMOs) is a complex process in which feedbacks between political and economic forces can lead to prolonged delays in management response and severe depletion of fish stocks. Some sources of delay, such as the common pool nature of the resource and the role of sovereignty protecting mechanisms, are well understood. Others are not. This paper delves into the perverse consequences of exclusion as a driving force in the five RFMOs governing tuna and tuna-like species. In each RFMO, historically dominant and coastal developing

fishing states formed coalitions to limit exploitation of lucrative fisheries by distant water fleets. This process led to conservation measures that were more closely based on science and to the development of stringent international monitoring and enforcement mechanisms such as the use of trade-based measures. However, these actions also alienated excluded fishing states and undermined the legitimacy of RFMO management measures, which in turn amplified the existing problem of illegal, unregulated, and unreported (IUU) fishing by undermining distant water state's willingness to engage in domestic or international enforcement programs. Even the coordinated efforts of tuna RFMOs to increase compliance through the Kobe Process has had little success and IUU continues to be a major problem. In order to come to terms with this issue, tuna RFMOs will need to re-visit the distributional ramifications of their conservation measures and transparency will need to increase around the world so that consumers can also hold the fishing industry accountable.

Deliberating a Just Future: The Role and Impact of Youth on Climate Governance

Grace Mwaura, Kennedy Mbeva

Climate change is undoubtedly one of the greatest human development challenges of the 21st century; some have termed it as a 'super wicked problem'. As the scientific understanding of the scope and nature of climate change has developed over time, so has the evolution of climate governance. A greater number of stakeholders are now increasingly involved in climate governance. Despite 'youth' becoming an increasingly important stakeholder in climate governance, few studies have explored the implication of their participation in climate governance. Furthermore, the impact of youth, beyond participation, on climate governance remains unexplored. This is of significant concern given the increasing global youth population particularly in developing countries, the increasing and new political formations of young people at the local, national and international levels, as well as the (mis)identification of 'youth' as the most effective proxy for present and future generations.

This exploratory research seeks to address this gap by unravelling the role and impact of youth in climate governance. Through the adoption and use of the analytical concept of deliberative governance, within the context of the principle of intergenerational justice, we draw on 20 case studies of youth organisations and networks in Africa, Latin America and Europe, to address the following questions: How is the role of young people in climate governance understood?; What specific impacts have these youth groups / networks had on climate governance and related decision-making processes at national, regional and international levels?; To what extent do the contributions of these youth groups / networks foster the notion of intergenerational justice? By responding to these questions, this paper shall potentially contribute to three key academic and policy areas: the role and impact of youth on climate governance; the role and impact of deliberative democracy on climate governance; and the influence of intergenerational justice on climate governance.

Panel 5 – Mapping Complex Environmental Governance I: Networks and Triads

Confronting complexity in Earth System Governance using network analysis

Oscar Widerberg, Eduardo Gallo-Cajio, Rakhyun E. Kim, Ina Möller

Research on global environmental governance is increasingly interested in the interactions between different institutions, actors, norms and discourses. Network analysis has emerged as a promising method for studying the emerging complexity of these interactions, providing tools that could enable inferences of relations between structure and agency, and moving beyond examining dyadic ties between institutions. In this paper, we survey the use of network analysis in Earth System Governance (ESG) research over the past ten years, identifying the main trends and application areas. Based on literature from complexity science, international relations, and sociology, we then identify promising challenges and opportunities for using network analysis in ESG research to further develop our understanding of institutional complexity. For instance, how do we combine network analysis with other research methods, what are the limitations of network analysis, and to what extent can we derive useful policy recommendations from understanding network structures? We argue that network analysis could provide a method to test hypotheses and develop theory on the evolution and fragmentation of global environmental governance. The paper suggests a future research agenda for the ESG community to study institutional complexity using network analysis.

Unravelling Institutional Complexity: A Mesoscopic Analysis of Triads in the Network of Multilateral Environmental Agreements

Rakhyun E. Kim

Modern international environmental law and governance is, in significant part, a complex network of multilateral agreements and their autonomous institutional arrangements. In the face of the complexity, scholars have moved beyond the narrow focus on individual institutions to networks of institutions at a much larger scale. We have in the process gained an understanding of how two institutions interact and the polycentric patterns that such dyadic relationships collectively create. However, the whole is not the same as the sum of its parts. The link between the microcosm of single institutions and the macrocosm of the entire governance system – how complexity emerges from local interactions – is missing from the literature. This paper makes a novel exploration of institutional dynamics at intermediate scales. A mesoscopic analysis is critical to understanding what institutional complexity implies for the effectiveness of global environmental governance as a whole, and how to deal with it. Can institutional complexity be actively managed, or should it be rather passively embraced? More specifically, is the management approach to institutional interplay, which pays little attention to institutions other than the two involved, capable of creating system-level synergy? This paper addresses these questions by studying the simplest complex unit, namely triads. Scientists such as physicists, biologists, and sociologists have observed striking qualitative changes that occur when we move from two to three distinct entities. Through a theory-based empirical analysis of various institutional triads in the network of multilateral environmental agreements, the paper illustrates that a group of three interacting institutions is a critical interface where complexity emerges. The analysis reveals what the conventional focus on regime interactions and regime complexes has been unable to capture, and informs how institutional complexity should be approached. It concludes with a new research agenda for confronting the complexity of earth system governance.

Mapping the actor network of coastal carbon governance

Jennifer Bansard

Coastal ecosystems, such as mangroves, seagrasses or salt marshes, provide numerous ecosystem services and their sustainable management has been widely discussed in the context of policy fields such as biodiversity conservation or climate change adaptation. More recent however is the focus on coastal ecosystems for their climate change mitigation potential. With estimates indicating that coastal ecosystems surpass terrestrials ones both in terms of carbon sequestration rates and degradation-related emissions, the interest in this issue will likely continue to grow. Addressing the need for a better understanding of coastal carbon governance, this paper will examine the issue's emergence on the international climate change mitigation agenda with a special focus on mapping its actor network. Using social network analysis it will clarify what type of actors are active on this issue, how they relate to each other, and what institutions have been created in this context. I argue that although the issue only gained attention in the last five years, it already presents a complex actor landscape with various countries, international organizations and non-state actors attempting to shape the governance discourse. Initial observations show that a relatively narrow set of actors dominates the field and that the newly created institutions present significant overlaps in terms of members and goals. This work will constitute the first element of a larger project further taking stock of the network's knowledge claims and interlinkages with other policy fields. In conclusion, by closely examining the actor constellation surrounding coastal carbon governance, the paper will shed light on the complexity of an emerging climate change mitigation issue.

Panel 6 – Concepts and Theories of Complexity I: Systemic and Reflexive Perspectives

Social Fields and Natural Systems: suggesting an approach for interdisciplinary knowledge integration - exemplified by climate induced migration

Lennart Olsson, Anne Jerneck

Differences in ontology and epistemology constitute a main obstacle to knowledge integration across scientific disciplines, particularly across the natural and social sciences. To exemplify, Earth System Science builds on the fundamental ontological assumption that the world is a system and as long as the system is understood in purely natural science terms this is usually uncontroversial. But when ecologists claim that social-ecological systems can be studied in a common frame, the system ontology may conflict with ontological assumptions in the social sciences. In addition, and as seen lately in prolific interdisciplinary research on social change, the use of rational choice theory and functionalism in combination with systems theory may (unintentionally) lead to scientific justification of particular policies and de-politicization of earth system governance issues.

To address this, we suggest an alternative approach for how to integrate natural and social science knowledge to better understand social change. Inspired by American and French sociologists Fligstein, DiMaggio, Bourdieu and Wacquant, we place two ontological assumptions side by side and call that Social Fields and Natural Systems. After a brief

introduction to the general theory of social fields, we show how our suggested approach combines social fields theory with natural systems theory to overcome ontological and disciplinary barriers. In particular, we focus on how to use parallel ontologies to avoid common caveats in integrated research. We do so by using 'climate induced migration' as an illustrative example along with other examples relevant for earth system governance.

Complexity, Self-Organisation and Self-Governance

Henrik Thorén, Lennart Olsson

The concept of complexity in general, and that of complex adaptive systems in particular, are prominently figuring in much of the contemporary literature on how to manage (and control) social-ecological systems. An important associated concept is that of self-organisation. Indeed the presence of self-organising behaviour is often taken to be a defining feature of complex adaptive systems.

Yet, the use of this notion of self-organisation is not always clear, and its implications for important underlying questions, like the relationship between natural and social sciences, are left underdeveloped. In this paper we aim to throw some further light on this consequential concept.

The paper is divided into three parts. First we will provide an overview various uses of the concept of self-organisation in the relevant literature. In this more descriptive part we discuss both the history of the concept and how it is currently used.

In the second part of the paper, we approach the concept of self-organisation in more normative terms; how it should be understood. In particular we highlight the usefulness of distinguishing between self-organisation and self-governance in the context of the social sciences. In short, the former pertains to emergence of coordinated, apparently goal-oriented, macro-level behaviour that sometimes arise out of collections of components that act in a deterministic fashion on inputs from their immediate surroundings. The latter, on the other hand, concerns systems that are governed by some central 'intelligence' that collects inputs from various sources and then steers the system by using an intermediate representation in the form of a continually updated model of the system and its surroundings.

In the final part of the paper we discuss some implications of conflating this distinction in the context of the Earth System Governance project. In particular we focus on the interdisciplinary consequences of seeing self-governance as merely an epiphenomenon arising out of self-organisation. This, we argue, is a possible instance of disciplinary imperialism and should be resisted.

Environmental Norms in the Trade Complex Adaptive System: From Innovation to Diffusion

Jean Frederic Morin

Environmental provisions are increasingly incorporated in bilateral trade agreements. They include exceptions to general trade rules, requirements to ratify multilateral environmental

agreements, measures aiming to promote trade in environmental goods and services, and obligations to implement minimal environmental standards. Yet, these environmental provisions remain extremely diverse and unevenly used. This paper looks at when and where new environmental provisions emerge in trade negotiations and which of them are subsequently diffused to other trade agreements. Empirically, it builds on an original database of 310 different environmental provisions found in a set of 660 trade agreements concluded from 1947 to 2015. Theoretically, it conceptualizes this set of agreements as a "complex adaptive system", reacting to changes in related systems and organically diffusing the most adapted norms. One of the conclusions of this paper is that some of the most environmentally progressive and innovative norms are located at the periphery of the trade complex system. As such, this paper dialogues well with several streams of literature, including on institutional design, norm diffusion, international law fragmentation, institutional interactions, and regime complexes.

Panel 7 – Mapping Complex Environmental Governance II: Adaptation, Land Use and Minerals

A (super-)wide regime complex? Mapping the fragmentation of global governance of climate change adaptation

Asa Persson, Nina Weitz

Recent literature on international/global climate governance - studying climate change as a regime complex (Keohane and Victor 2011), as transnational governance (Andonova, Betsill, and Bulkeley 2009; Bulkeley et al. 2014), as polycentric governance (Jordan et al. 2015) and as characterized by institutional complexity (Zelli and van Asselt 2013) - has almost exclusively focused on the mitigation and not adaptation. As an example, the database of 'transnational climate governance initiatives' compiled by (Bulkeley et al. 2014) includes only two adaptation-related initiatives out of a total of 60. This paper aims to address this knowledge gap, by initially mapping out and characterizing the regime complex at the global level governing climate change adaptation. It can be tentatively expected that the UN Framework Convention for Climate Change (UNFCCC) constitutes the core regime, with substantive programmes on climate adaptation in regimes also on development co-operation, food security, migration, water, nature conservation, and disaster risk reduction. The two research questions are: Are the regimes synergistic or conflictive (Biermann et al. 2009)? Is the regime complex more or less fragmented than complexes in other issue areas of global environmental governance, and why? Two tentative hypotheses are that it is more fragmented due to i) the innate problem characteristics (climate adaptation is multi-sectoral) and ii) the fact that it has not been unambiguously constructed as a global collective action problem, with a 'core regime' (that may or may not spur competing regimes). The paper will draw on concepts and methodology used in the CONNECT project (Pattberg et al. 2014), which maps 'global governance architectures' in several environmental issue areas and offers typologies for actor constellations and governance functions. To overcome the problem of distinct inclusion criteria for such a broad and multi-sectoral issue as climate adaptation, two (partially overlapping) databases will be compiled. First, a narrow working definition of climate adaptation governance will be developed, based on relevant adaptation literature and policy classification schemes (such as the OECD DAC

adaptation marker). Second, a database will be produced based on institutions, regimes and initiatives self-identifying as climate change adaptation governance.

Mapping the Transnational Governance Landscape for Hard Rock Minerals

Michele Betsill, Graeme Auld, Stacy VanDeveer

Global governance scholars have highlighted the changing nature of world politics as globalization processes simultaneously challenge the ability of states to respond to complex, multi-scalar problems and empower a diverse set of actors to participate in decision-making (Cerny 1995; Rosenau 1995; Ruggie 2004; Wapner 1996). The rise of “transnational governance” is often seen to enhance the international community’s ability to address complex global issues by encouraging experimentation with different types of solutions, tackling smaller pieces of multifaceted problems, and filling regulatory gaps where governments are unable or unwilling to establish rules (Hoffmann 2011; Ostrom 2010; Pattberg 2010). However, recent work in global environmental governance challenges the idea of endless possibilities in this “new public sphere” as particular types of actors and governance arrangements come to dominate the transnational governance landscape, institutionalizing particular understandings of who should govern, what should be governed and how (Bulkeley et al 2014; Dingwerth and Pattberg 2009; Hoffmann 2011). Over time, these patterns shape understandings about what counts (and does not count) as legitimate governance, thereby limiting future opportunities for experimentation. In other words, institutionalized patterns raise questions about whether the full potential of transnational governance to address complex global problems can be realized in practice.

Our research explores the patterns and dynamics of transnational governance in the extractives sector, with a particular focus on hard rock minerals such as gold, copper and nickel. In addition to its central position in global and national economies, the extractives sector presents complex governance challenges related to the sheer number of actors involved and the ways in which social, environmental and economic consequences of mining are distributed across time and space, and along the lifecycle of any given mineral. This paper maps the transnational governance landscape for hard rock minerals as a first step toward understanding why particular forms of transnational extractive governance have emerged, the forces driving these developments as well as the broader implications for addressing complex global issues. This research contributes to the global environmental governance literature by focusing on the issue of natural resource extraction, which has received relatively little attention especially compared to the climate change (Dauvergne and Clapp 2016; O’Neill 2009; Auld 2014b). As far as we know, this is the first explicit effort to integrate the life cycle concept into an analysis of transnational governance (see Auld 2014c).

Multi-Scale Modeling of Land-Use Land Cover Change (LULCC) in Social Ecological Systems: An Agent Based Model of Missisquoi Watershed in the Lake Champlain Basin, 2000-2100

Asim Zia, Yu-Shiou Tsai, Scott Turnbull, Christopher Koliba

Agent-Based Models (ABMs) of LULCC provide a bottom-up scalable approach to simulate emergent landscapes that arise out of complex interactions in Social Ecological Systems.

While many ABMs have been developed that simulate LULCC within agriculture, urban or forest sectors, very few ABMs simulate LULCC across agriculture, forest and urban landscapes. In this paper, we present experimental simulations from a novel ABM that is programmed to simulate Rural-Urban-Forest Interface through explicitly modeling interactions among multiple agents (farmers, urban residences, urban businesses, local towns, state and federal agencies) and between bounded-rational agents and eco-system services generated by agricultural, forested and urban landscapes. The ABM simulates 30m x 30m LULCC in fifteen land-use classifications consistent with National Land Cover Database (NLCD) and other remote sensing databases. We present experimental simulations that simultaneously test the affect of retaining and alternating current land-use policies designed and implemented across multi-level governance scales, such as forest conservation policies, agricultural subsidies and urbanization growth rates. Alternate behavioral assumptions drawn from farmer surveys and controlled laboratory games are also tested. The ABM is applied to simulate rural-urban-forest interface in the Missisquoi watershed of Lake Champlain Basin, initialized with remotely sensed NLCD and parcel data in 2000-1, evolving at annual time-step to 2100. NLCD 2011 data is used to calibrate the baseline simulation run. Monte Carlo simulation experiments are undertaken to test the affects of modifying land-use policies by local towns, regional planning commissions and state & federal government agencies regulating water quality and economic development in the focal watershed. This multi-scale ABM provides a policy analytics platform for watershed managers, policy makers and scientists to examine the affects of alternate policy and behavioral response regimes on the evolution of LULCC in Social Ecological Systems. The ABM is generalizable and can be replicated in other watershed settings and Social Ecological Systems, where remote sensing, parcel and census databases are available. In addition, this ABM can be coupled with hydro-meteorological and hydro-dynamic models to simulate the effects of nutrient run-offs on water quality under alternate policy and land use planning regimes.

Panel 8 – Concepts and Theories of Complexity II: Agent-based Perspectives

Strategizing of policy entrepreneurs across multiple boundaries: the case of climate-smart agriculture

Marijn Faling

Policy entrepreneurs contribute to processes of policy integration through their strategizing across governance levels and policy domains. This paper unpacks the dynamics of their strategizing to further understanding of the process of integration from an embedded agency-centred perspective. Through process-tracing methods based on interviews, observation and document analysis this paper analyses the launch of the Global Alliance for Climate-Smart Agriculture (GACSA in 2014). It focuses on the strategies that led to the establishment of the network, the intended and actual outputs of the network, and the interplay between the network and the wider context it is operating in. As such we explain its development, functioning and role in policy change processes in low income countries. Findings show that strategizing is in essence erratic in nature and consists of actors undertaking actions towards various intermediate outputs, with the ultimate aim of policy change; policy entrepreneurs base the selection of strategies on earlier outcomes, contextual conditions, and learning; the GACSA developed as a result of networking and framing strategies of policy entrepreneurs operating at various governance levels and policy

domains; the novelty of the topic of climate-smart agriculture provides room for new institutional structures and influence; both the novelty of the alliance and its particular set-up compromise its legitimacy, which negatively influences its operating power. Room exists for further conceptual development and empirical (comparative) testing concerning the theorization of entrepreneurial strategizing across levels and domains, in particular in interaction with contextual conditions.

The role of 'Goals' and the private sector in confronting complexity in Earth System Governance: Understanding private sector advocacy for the UN Global Goals for Sustainable Development

Matthew Gitsham, Ajit Nayak, Jonathan Gosling

Earth System Governance (ESG) is increasingly marked by complexity, both in terms of the diversity of actors and institutions involved in ESG, including the private sector, and in terms of the interaction of ESG with other governance challenges like trade, development, health and security.

The focus of this paper is on one response to the challenge of coordinating in the context of this complexity: the promotion of non-binding 'goals' as a public policy instrument, such as the Millennium Development Goals (MDGs) and the Global Goals for Sustainable Development (SDGs) (Sachs, 2012). In particular, the paper will focus on the relationship between the private sector and the SDGs. Some parts of the private sector have been an enthusiastic advocate for goals as a governance mechanism - why? What are the hopes and fears of the private sector in relation to the SDGs? What has shaped their thinking? What does this tell us about evolving models of ESG?

Taking a phenomenological approach (specifically critical hermeneutics (Kaplan, 2003)), and drawing on substantial empirical data collected over the period 2012-2015 regarding the role of the private sector in advocacy for the SDGs (documentary evidence, participant observation and over 80 interviews), the paper will offer an analysis of what the private sector was advocating for within the SDGs, and private sector articulations of why time and resources were invested in this advocacy, what value it was hoped a particular kind of goals-based governance framework would deliver, why a goals-based governance framework was aspired to.

The paper will develop a Ricoeurian framework to support this analysis. Currently, two broad positions exist in the literature to understand and account for the role of the private sector in global governance processes. A liberal, neo-pluralist position understands business engagement in such processes as following a bargaining or strategic mode, motivated by profit-related concerns (Falkner, 2008). A Habermasian position understands business engagement as following a deliberative or communicative mode, motivated by legitimacy concerns (Palazzo&Scherer, 2006, 2008, Scherer&Palazzo, 2007, Scherer, Palazzo&Baumann, 2006). The paper will offer a Ricoeurian development of the Habermasian position, retaining the focus on the communicative mode of engagement, but opening the question of motivation to a much wider field of intersubjective processes shaping individual convictions, including the historically-and culturally-embedded meanings received through participation

in specific communities and the role of challenge from specific 'others' that an individual has engaged with through their distinct pattern of intersubjective relationships.

Power, authority and its implications in governance of complex socio-ecological problems: The case of the food system in South Africa

Farai Kapfudzaruwa

The complex nature of the current socio-ecological problems have resulted in the reconfiguration of power dynamics in the governance of sustainable development with varying consequences. More so, the increased influence of non-state actors in global governance has tended to challenge the authority and power of the traditional state to govern. This paper uses the case of the Southern African Food Lab (SAFL) – a social collaborative platform to raise awareness and foster innovation on a sustainable food system – to understand the changing nature of authority and its implications in governing complex socio-ecological problems. Evidence from the research shows that the policy arena surrounding the food system is no longer exclusively within the sovereign authority of the state due to the liberalization of the agriculture sector to meet global standards and the complexity of managing global commons resources such as water within a multi-level context. As a result, the state's authority in the food system has been significantly diminished leaving a contested policy field. Two non-state agents with different sources of authority and legitimacy have emerged. Firstly, as expected, multinational firms have acquired authority without being formally delegated with this authority through their control of commodity chains and centralizing supply chains. This has exposed urban households to food price increases and nutrition transitions resulting in poor health. The dominance of global brands has also undermined locally-based agricultural SMEs and displaced traditional food retailers in poor urban areas. Due to these effects, these global agents' authority and legitimacy is constantly being challenged by local actors. On the other hand, social entrepreneurs have emerged utilizing their innovation potential and local embeddedness as their main source of authority and legitimacy. These entrepreneurs are local farmers and retailers directly exposed to the complex socio-ecological challenges in the country. This has had significant impacts in ensuring sustainable production and consumption patterns, mostly, in peri-urban areas.

Why Engage with Stakeholders in Global Environmental Assessments?

Jennifer Garard, Martin Kowarsch

Dealing with global environmental change in a legitimate manner requires, inter alia, understanding and integrating an incredibly broad diversity of perspectives on issues such as problem framing, what constitutes a desirable solution, and potential solution pathways. One approach to addressing this is through the engagement of multiple stakeholders in global environmental assessments (GEAs), for example UNEP's Global Environment Outlook series or the Assessment Reports of the Intergovernmental Panel on Climate Change.

Under the overarching goal of increasing the legitimacy of an assessment and integrating multiple sometimes competing perspectives, there exist many other more precise objectives for stakeholder engagement (SE) in GEAs. These objectives can be inferred from official GEA documents, for example in scoping documents establishing the overall GEA goals or in

background documents detailing the specific objectives of a meeting. However, this only paints a partial picture. There are also many unspoken objectives for why a GEA would benefit from engaging with stakeholders, why stakeholders might want to engage in a GEA, as well as many different ways of interpreting the official GEA objectives for SE. Understanding these objectives from multiple perspectives is crucial in order to motivate SE (and argue why one should undergo this resource-intensive exercise at all), as well as to design SE approaches which will contribute directly to achieving its objectives while also managing the expectations of stakeholders.

Given the unique nature of GEAs, including their scale, scope, and the power dynamics they often bring to the fore, an analysis is warranted of objectives for SE specifically in GEAs, as opposed to grouping this together with other activities at the science-policy interface. There is currently no comprehensive overview available of objectives for SE in GEAs, which this paper attempts to address by conducting a Grounded Theory Analysis of over 100 interviews with authors, government representatives, and non-involved stakeholders. This qualitative analysis will enable a better understanding of the multiple perspectives on what the objectives are and normatively should be for SE in GEAs, and also allows for a critical reflection on the contribution of different objectives to the overall perceived legitimacy of a GEA. The results highlight four major categories of objectives: contributing to a flow of information, contributing to the influence of the assessment, allowing stakeholders to exert control over aspects of the assessment process, and lastly, establishing a connection between the assessment and broader societal goals.

Panel 9 – Concepts and Theories of Complexity III: Institutional Perspectives

Navigating Institutional Complexity in Global Climate Governance: the Cases of Climate Engineering, REDD+, and Short-lived Climate Pollutants

Fariborz Zelli, Ina Möller, Harro van Asselt

A core phenomenon in global climate governance today is a growing degree of institutional complexity or fragmentation. The UNFCCC operates in a landscape crowded by institutions as different as the biodiversity and ozone regimes, the World Trade Organization, the World Bank, the UN Security Council, the G20 and a growing number of public-private, transnational and sub-national arrangements.

The paper introduces a 3-year research project that analyzes this institutional complexity for three distinct issues of high policy relevance in global climate governance: climate engineering; reducing emissions from deforestation and forest degradation (REDD); and short-lived climate pollutants.

We provide first answers to the following questions: 1) What are the underlying causes of institutional complexity in these three areas? To what extent are the observed degrees of complexity based on constellations of power and interests, cognitive gaps or contestations, and problem-structural aspects? 2) What are the consequences? How do institutions shape, complement or undermine each other's normative development, effectiveness and legitimacy? Which actors benefit from the growing complexity and which ones are disadvantaged or excluded? 3) What policy options are available to governments,

international organizations and non-state actors to address negative consequences, while preserving potential positive effects of institutional complexity?

To address these questions, we develop a novel analytical framework to examine institutional complexity, building on problem-structural and private authority theories. This framework first distinguishes criteria for assessing the degree of institutional integration and the role of transnational institutions and, second, offers potential explanations, including: nature of the issue to be regulated, supply of private authority, demand for private authority.

Regional environmental governance beyond Europe: frameworks and concepts

Karen Siegel

Over the last years the regional level has gained more attention in studies of environmental governance across national borders as cooperation at the global level has often been perceived to be stagnating or failing. The regional level potentially constitutes a more practical or feasible level to address common problems because fewer countries have to coordinate and because it may be seen as more legitimate as countries are more likely to share a common history, culture or language and North-South differences might be less pronounced (Balsiger and VanDeveer, 2012; Elliott and Breslin, 2011). The regional level may also be able to act as a building block towards cooperation at the global level and help in addressing implementation gaps of global conventions (Selin, 2012). Yet, although initiatives exist around the world, regional environmental governance beyond the global North and Europe in particular, has not received much attention. This paper introduces findings from an in-depth study of regional environmental governance in the Southern Cone of South America, a region that presents a fascinating puzzle. On the one hand, regional environmental governance in the Southern Cone has increased significantly over the last two decades, but on the other hand, this has taken place in the margins of political agendas and with little support from regional organisations. Instead, it has been promoted by networks of civil society organisations, researchers, lower-level government officials and international donors who have looked pragmatically for the most promising avenues to work on transboundary environmental concerns. Based on this case study, the paper introduces two concepts, marginality and robustness, and invites feedback as to what extent these concepts are also useful for other regions or how they could be refined based on comparisons with other regions.

Towards an integration of power and practice into conceptual frameworks used in the governance of Social-Ecological Systems (SES): Case study of Canadian oil sands

Akhshy Thiagarajan

Governance of Common-Pool Resources (CPR) in Social-Ecological Systems (SES) requires a study into a complex cluster of interactions between law, policy, communities, individual actors and environmental outcomes. Conceptual frameworks like the Social-Ecological System (SES) framework and the Institutional Analysis and Development (IAD) framework developed by Elinor Ostrom help simplify this complexity and have been used extensively by scholars interested in institutional and governance related issues. The synthesis of the two was envisioned to provide a more comprehensive package for analysis. Consequently, the

New Institutional Analysis in Social-Ecological Systems (NIASES) framework was proposed. The framework provides a blueprint through which the top down IAD and the bottom up SES frameworks could be synthesized to produce a conceptual tool that harnesses the strengths of both.

However, one of the main drawbacks of the NIASES framework is the lack of inclusion of power of social actors over one another and the environment. Using the works of sociologist Pierre Bourdieu and the regulatory overhaul in the Canadian oil sands SES for illustration, this paper is an interdisciplinary theoretical attempt to introduce power within the frameworks. In doing so it proposes a modified version of SES and NIASES frameworks. The modifications are expected to improve their analytical and predictive abilities as well as to open up spaces for further interdisciplinary research in natural or ecological resource governance issues.

Institutionalization of the REDD+ MRV discourse in Indonesia, Peru and Tanzania:
Options for cross-country learning

Robert Ochieng, Bas Arts, Maria Brockhaus, Ingrid Visseren-Hamakers

Reducing emissions from deforestation and forest degradation in developing countries (REDD+) has opened up a new global discourse on forest measurements and carbon accounting (FMCA) in developing countries. This paper analyses and compares the extent of institutionalization of the global discourse and ideas on REDD+ measurement, reporting and verification (MRV) in Indonesia, Peru and Tanzania. To do so, the paper draws on the theoretical claims of discursive-institutionalism, operationalized by means of the Policy Arrangement Approach. A qualitative scale that distinguishes between 'shallow' institutionalization on the one end, and 'deep' institutionalization on the other, is developed and applied to guide the analysis and comparison. The paper shows that in all countries, institutionalization of the discourse and ideas on forest measurements for REDD+ has gone beyond 'policy rhetoric'. In all countries, the discourse and ideas on REDD+ MRV have materialized in new or revised policy aims and strategies for forest measurements, development of new agencies and mobilization of new actors and resources to implement MRV, and development of new legislation to anchor forest measurements in law and procedures to institutionalize the roles of the various agencies and actors. Nevertheless, it is observed that the extent of institutionalization varies across countries, with Indonesia experiencing 'deep' institutionalization of REDD+ MRV, Peru 'shallow-intermediate' institutionalization, and Tanzania 'intermediate-deep' institutionalization. The paper explains the differences in the institutionalization of REDD+ MRV across the countries by reflecting on the theoretical factors for discourse institutionalization and their manifestation in each country. Findings are especially relevant for policy-makers, practitioners and negotiators interested in national-level institutional effects of global discourses and ideas on environmental management and governance.

Panel 10 – Responses to Complexity I: Orchestration and Integration

Strengthening transnational governance – Effectively aligning non-state actor capacity for sustainable and low-carbon development

Sander Chan, Robert Falkner

Orchestration, that is measures to align transnational actors with public goals and international agreements, is increasingly deployed as a mode of indirect governance, in global sustainable development as well as in the climate change area. While recent scholarship has described a growing number of such instances of orchestration, the determinants of successful orchestration are not well understood.

This paper presents research results on two widely noted instances of orchestration. In 2002 the UN presented ‘Partnerships for Sustainable Development’ as instruments to help with the implementation of internationally agreed sustainability outcomes. More recently, ‘climate commitments’ have been launched at the 2014 UN Climate Summit to mobilize ‘leaders’ from governments, the private sector and other groups in support of the international climate process. This paper compares these two instances of orchestrations, focusing on three specific questions: i) have orchestrators achieved a balanced representation of non-state and subnational stakeholders; ii) have orchestrators achieved balanced geographic implementation of initiatives, ensuring efforts where they are most needed; and iii) have orchestrated initiatives produced outputs that match their commitments? It is hoped that the comparison between the two cases will allow for a better understanding of the determinants of successful orchestration.

The research comprises one of the largest research samples of transnational governance initiatives yet, combining the Global Sustainability Partnerships Database (2012), which includes 430 initiatives, and the Global Aggregator for Climate Actions (2015), which includes 52 initiatives.

Theorising about feasible and effective Environmental Policy Integration: a meta-analysis of climate adaptation mainstreaming research

Carel Dieperink, Hannelore Mees, Sally Priest, Kristina Ek, Corinne Larue, Silvia Bruzonne, Pjotr Matczak

Environmental Policy Integration is generally considered as a promising strategy for dealing with complexities in environmental governance related to institutional fragmentation and the variety of actors and interests involved. Environmental Policy Integration can not only remove contradictions between existing governance efforts, but is also potentially more effective and efficient than stand-alone environmental efforts. (Lafferty and Hovden, 2004; Adelle and Russel, 2013; Persson et al., 2016).

Yet, Environmental Policy Integration does not emerge spontaneously. Hence differences across countries, sectors and policy levels are observed. Political support for implementing Environmental Policy Integration goals is often lacking, and instruments such as Environmental Impact Assessment often only modestly contribute to environmental protection. More insight is needed into what factors influence political feasibility and

effectiveness of Environmental Policy Integration. Theory development in this area however still is in its infancy. (Runhaar et al., 2014)

This paper focuses on a specific form of Environmental Policy Integration: climate adaptation mainstreaming. Despite agreements made in December 2015 during the COP21 in Paris to reduce CO₂ emissions, intensified adaptation efforts are needed to deal with the impacts of a changing climate. This calls for integrating climate adaptation objectives into policy sectors such as critical infrastructure, agriculture and urban planning. (Wamsler et al., 2014)

Based on a meta-analysis of research into climate adaptation mainstreaming we identify the factors that influence (a) political support for and (b) effectiveness of climate adaptation mainstreaming. Climate adaptation mainstreaming is measured in terms of the adoption and implementation of mainstreaming goals (e.g. anticipate risk of intensified heat stress), instruments (e.g. reporting requirements) and adaptation measures (e.g. early warning systems and continuity plans). The explanatory factors will be compared with meta-analyses of Environmental Policy Integration (e.g. Runhaar et al., 2014) in order to (a) assess the context-specificity of explanatory factors in terms of the subject of integration, and (b) compare differences in conceptual foundations of various forms of Environmental Policy Integration (cf. Adelle and Russel, 2013).

The results of our analysis do not only inform climate adaptation mainstreaming literature, but also form a key contribution to the Working Group on Environmental Policy Integration, which forms part of the Earth System Governance Taskforce on Conceptual Foundations.

Interaction, Coordination and Competition in the Capacity Building Project Complex:
The Case of Greenhouse Gas Emissions Trading in China

Katja Biedenkopf

This paper systematically maps externally supported capacity building projects on greenhouse gas (GHG) emissions trading in China and analyses their interaction. China has implemented seven pilot projects to experiment with GHG emissions trading and is in the process of designing a national system. A sizable number of external actors support China in various ways in these efforts. The interaction, coordination and competition amongst the projects and the external actors are analysed. The findings of the paper aim to provide an understanding of the design of the system of functionally overlapping, mutually interacting and non-hierarchical capacity building projects (the 'project complex') in the area of GHG emissions trading in China.

The case of GHG emissions trading capacity building projects in China highlights the changing nature and increasing plurality of development cooperation, multilateral cooperation and external governance. Emerging economies are no longer or to far lesser extent recipients of classical developing aid but they still engage with other countries in the form of various kinds of capacity building support and information sharing. Receptiveness and demand from the recipient side are of great importance for the success of these initiatives. They can be one of the channels of external governance and climate policy diffusion and seem to have grown with the complexity of contemporary global climate governance. Interaction, cooperation and competition amongst the financiers of capacity building projects and

amongst the project designs can have significant implications for the effectiveness in achieving their objectives.

Panel 11 – Responses to Complexity II: Building Resilience

Who, how and why 'must' participate in building resilience to disasters in a changing climate

Paulina Aldunce, Ruth Beilin, John Handmer, Mark Howden

Resilience is not passive and stakeholder participation has been largely posited as pivotal for building resilience. Who is involved and how they are involved are crucial aspects in defining the practices and processes for resilience to climate change. Therefore, this study focuses on revealing how practitioners frame the issue of participation within the resilience paradigm, how they construct practices and, in consequence its relevance in the realm of a changing climate. Using Hajer's (1995) 'Social-interactive discourse theory', in this interdisciplinary research, we study the frames and practices developed around a disaster management initiative in Australia: the Natural Disaster Resilience Program in Queensland. Discourse analyses are useful for the examination of multiple and conflicting ideas and narratives that society holds about an issue (Hajer, 2000). This resonates with this research, as resilience, Disaster Risk Management and climate change are controversial issues. The methods used were observation, document revision and in-depth interview for the study of the implementation phase of the Natural Disaster Resilience Program (NDRP), at the state level and local levels (Charleville and Gold Coast) in Queensland, Australia.

What emerges from the research findings as critical and requiring urgent attention is stakeholder and especially local government and community participation, and for this to become socially relevant, challenges such as meaningful communication need to be addressed. What is also critical is to move from experiential learning to social learning. The results presented here offer empirical evidence on how broadening the pool of actors can be implemented.

Key words: resilience, stakeholder and community participation, discourse, social learning

The adaptive capacity of institutions in Canada, Argentina and Chile to droughts and floods

Margot Hurlbert, Joyeeta Gupta

The increasing evidence of global warming calls on all states to enhance their adaptive capacity to deal with climate change. This paper compares the adaptive capacity of two provinces in Canada, Argentina and Chile in relation to the vulnerability of farmers to droughts and floods by applying the adaptive capacity wheel. It concludes that Saskatchewan and Alberta, Canada are particularly weak in terms of double and triple loop learning and in developing adaptive capacity in an equitable manner, probably attributable to strong climate scepticism in society and the weak economy. In the developing countries of Chile and Argentina resources to assist with adaptation are often lacking; in Chile future learning is precarious because of information deficits in relation to data, memory, trust, and responsiveness; in Mendoza, Argentina adaptive capacity is challenged because of

challenges in relation to variety (redundancy of programs), resource challenges, and responsiveness of governance. The paper recommends that institutional weaknesses and lack of responsiveness be remedied by adopting appropriate missing instruments (perhaps, for example, water transfer provisions in Mendoza, Argentina); that all case study areas focus on learning including by encouraging leadership at all levels; and that fair governance be improved by paying more attention to equity perhaps through introduction of an inclusive participatory development tool. The comparative use of the ACW proved useful for a comparative, holistic, structured analyses of institutions.