



Earth System Governance

Science and Implementation Plan of the Earth System Governance Project

Executive Summary

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A New Global Research Programme

Humans now influence all biological and physical systems of the planet. Almost no species, no land area, no part of the oceans has remained unaffected by the expansion of the human species. The four main global change research programmes, affiliated in the Earth System Science Partnership, see evidence today that the entire earth system now operates 'well outside the normal state exhibited over the past 500,000 years', and that 'human activity is generating change that extends well beyond natural variability—in some cases, alarmingly so—and at rates that continue to accelerate'. Given this situation, the Earth System Science Partnership has declared an 'urgent need' to develop 'strategies for Earth System management'. Yet what such strategies might be, how they could be developed, and how effective, efficient and equitable such strategies would be, remain unspecified. It is apparent that the institutions, organizations, and mechanisms by which humans currently govern their relationship with the natural environment and global biochemical systems are not only insufficient—they are also poorly understood.

This is the rationale for the Earth System Governance Project, a new long-term research programme developed under the auspices of the International Human Dimensions Programme on Global Environmental Change. This Science Plan elaborates upon the concept of earth system governance and on the central questions, methods and processes of a global research effort in this field.

Earth system governance is defined in this project as the interrelated and increasingly integrated system of formal and informal rules, rule-making systems, and actor-networks at all levels of human society (from local to global) that are set up to steer societies towards preventing, mitigating, and adapting to global and local environmental change and, in particular, earth system transformation, within the normative con-

text of sustainable development. The notion of governance refers here to forms of steering that are less hierarchical than traditional governmental policy-making (even though most modern governance arrangements will also include some degree of hierarchy), rather decentralized, open to self-organization, and inclusive of non-state actors that range from industry and non-governmental organizations to scientists, indigenous communities, city governments and international organizations.

Conceptual Framework. Based on this general notion, the Earth System Governance Project advances a science plan that is organized, first, around five analytical problems:

1. The first analytical problem—the **architecture** of earth system governance—includes questions relating to the emergence, design and effectiveness of governance systems as well as the overall integration of global, regional, national and local governance. Core questions include: How is performance of environmental institutions affected by their embedding in larger architectures? What are the environmental consequences of non-environmental governance systems? What is the relative performance of different types of multilevel governance architectures? How can we explain instances of 'non-governance'? What are overarching and crosscutting norms of earth system governance?
2. Second, understanding effective earth system governance requires understanding the **agents** that drive earth system governance and that need to be involved. The research gap is here especially the influence, roles and responsibilities of actors apart from national governments, such as business and non-profit organizations, the ways in which authority is granted to these agents, and how it is exercised. Core questions advanced in this Science Plan are: What is agency? Who are the agents of earth system governance (especially beyond the nation state)? How do different agents exercise agency in earth system governance, and how can we evaluate their relevance?
3. Third, earth system governance must respond to the inherent uncertainties in human and natural systems. It must combine stability to ensure long-term governance solutions with flexibility to react quickly to new findings and developments. In other words, we

must understand and further develop the **adaptiveness** of earth system governance. But what are the politics of adaptiveness? Which governance processes foster it? What attributes of governance systems enhance capacities to adapt? How, when and why does adaptiveness influence earth system governance?

4. Fourth, the more regulatory competence and authority is conferred upon larger institutions and systems of governance—especially at the global level—the more we will be confronted with questions of how to ensure the **accountability** and **legitimacy** of governance. Simply put, we are faced with the need to understand the democratic quality of earth system governance. What are the sources of accountability and legitimacy in earth system governance? What are the effects of different forms and degrees of accountability and legitimacy for the performance of governance systems? How can mechanisms of transparency ensure accountable and legitimate earth system governance? What institutional designs can produce the accountability and legitimacy of earth system governance in a way that guarantees balances of interests and perspectives?

5. Fifth, earth system governance is, as is any political activity, about the distribution of material and immaterial values. It is, in essence, a conflict about the **access** to goods and about their **allocation**—it is about justice, fairness, and equity. The novel character of earth system transformation and of the new governance solutions that are being developed, puts questions of allocation and access, debated for millennia, in a new light. It might require new answers to old questions. But how can we reach interdisciplinary conceptualizations and definitions of allocation and access? What (overarching) principles underlie allocation and access? How can allocation be reconciled with governance effectiveness?

Crosscutting Themes. In addition, the Earth System Governance Project emphasizes four crosscutting research themes that are crucial for the study of each analytical problem but also for the integrated understanding of earth system governance: these four themes are the role of **power**; the role of **knowledge**; the role of **norms**; and the role of **scale**.

Flagship Activities as Case Studies. Finally, the Earth System Governance Project advances the integrated, focused analysis of case study domains in which researchers combine analysis of the overall governance architecture, the role of different agents in this governance architecture, the overall adaptiveness of the governance system, mechanisms of accountability, and modes of allocation. Four flagship activities of the Earth System Governance Project have been identified: research on the **global water system**, on **global food sys-**

tems, on the **global carbon cycle**, and on the **global economic system**.

Policy Relevance. The Earth System Governance Project, while being essentially a scientific effort, is also designed to assist policy responses to the pressing problems of earth system transformation. All analytical problems studied in the project have profound policy implications. For example, the problem of the architecture of earth system governance is a key concern of current negotiations and political processes that are often faced with 'treaty congestion' and complex interlinkages between different institutions, for instance between multilateral environmental agreements and the World Trade Organization. 'Fragmented' governance architectures are also an increasing problem for decision-makers, particularly in climate policy. A related concern is the reform of the United Nations, for example with a view to the debate on a United Nations Environment Organization. At national and local levels, architecture is a key concern for decision-makers dealing with policy integration, the comparative effectiveness of policy instruments, and the integration of decision-making from international, national and local levels. Research on agency within the project will generate novel ideas on the integration of civil society actors in earth system governance, and on the advantages and disadvantages of private and public-private governance arrangements. Research on governance of adaptation and the adaptiveness of governance arrangements will inform policy-makers who have to deal with adapting politics and policies to a changing world. The accountability and legitimacy of decision-making, from local to global levels, is equally a key problem for public policy. Finally, the research on allocation and access will help to improve governance outcomes and advance philosophical and ethical discourses on an equitable approach to earth system governance.

Process. The drafting of this Science Plan of the Earth System Governance Project has been mandated in March 2007 by the Scientific Committee of the International Human Dimensions Programme on Global Environmental Change (IHDP), the overarching social science programme in the field. The project builds on the results of an earlier long-term research programme, the IHDP core project Institutional Dimensions of Global Environmental Change (IDGEC). The Science Plan was written by an international, interdisciplinary scientific planning committee, which drew on a consultative process since 2004. Several working drafts of this Science Plan have been presented and discussed at a series of international events and conferences, and numerous colleagues in the field, as well as practitioners, have offered useful suggestions, advice, and critique.