

Managing global change

Humans have transformed the planet beyond recognition, and the institutions and governance mechanisms regulating our relationship with the natural environment cannot cope. New, integrated systems of governance, from local to global levels, are needed to ensure the sustainable development of the planet.

The Earth system is changing rapidly due to human activity. The atmospheric concentration of carbon dioxide has increased by a third since pre-industrial times and average global temperatures are rising. Damage to the ozone layer has increased ultraviolet radiation. Marine resources are shrinking and human-made persistent chemicals have spread throughout the world's ecosystems. Human activity has had a negative impact on most other species.

This means that the institutions, organizations and governance mechanisms by which human societies regulate their relationship with the natural environment cannot ensure the sustainable development of the socio-ecological system the earth has become. A new concept or paradigm – earth system governance – describes the political challenges ahead and outlines the main problems that research on earth system governance is facing.

Earth system governance relates to political debates on contemporary governance. Although 'governance' is poorly defined in the social sciences, it usually refers to new forms of regulation rather than traditional hierarchical state activity. It also implies self-regulation, private-public cooperation and new forms of multilevel policy. Earth system governance is not confined to the state: public and private non-state actors, ranging from networks of experts, environmentalists and multinational corporations, to government agencies, are involved at all levels of decision-making.

Five core issues

What issues do researchers and practitioners working in earth system governance need to tackle? The Earth System

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summary

- The organizations and mechanisms by which humans govern their relationship with the natural environment and global biogeochemical systems are not only inadequate, they are also poorly understood.
- New types of governance systems – earth system governance – are needed to cope with the negative impacts of human activities and achieve a sustainable co-evolution of humans and nature.
- Earth system governance implies a transformation towards integrated governance systems that include people, places, networks and organizations at all levels.
- Earth system governance research is pertinent to many public policy areas such as reforming the UN, making sense of the multiple agreements that are failing to tackle climate change and ensuring accountability and legitimacy at every level.

Governance Project, a major component of the global change research community, has identified five core problems that need addressing: architecture, agency, adaptation, accountability and allocation of, and access to resources.

Architecture

What we do not yet fully understand is the macro-level, the architecture of earth system governance – the interlocking web of principles, institutions and practices that shape decision-making at all levels. Nor do we fully understand the interaction between treaties and rules. How is the performance of environmental institutions affected by being part of larger architectures? What are the environmental consequences of non-environmental governance systems, such as the world trade system? We also need to understand non-governance better. Why, for example, are there no institutions, or only weak ones, in some areas that, nonetheless, face major problems?

Most research has focused on single entities, such as particular treaties and how helpful they are. Our



No longer just ships of the desert? Residents of Sehwan, Pakistan, move their camels to safety during the floods of July 2007.

understanding of international environmental regimes has improved and we have better tools to study them. We know, for example, that international standards, verification procedures, compliance management systems, as well as external factors – such as the structure of the problem – all influence regime effectiveness.

Take climate refugees. By 2050, more than 200 million people may have become refugees due to the adverse impact of climate change on their livelihoods: the expected rise in sea levels threatens the existence of some low-lying island states, for example. Climate refugees are not included in the existing UN refugee regime. Some argue the UN Security Council has a role to play here, given the potential threat to security and stability; others favour an amendment to the UN Convention Relating to the Status of Refugees, or a separate, independent legal and political regime under the UN Framework Convention on Climate Change.

The quest for an overarching architecture of earth system governance is thus closely related to policy. Recent debates on strengthening the UN system and proposals to set up a ‘world environment organization’ or a ‘UN environment organization’ are two examples.

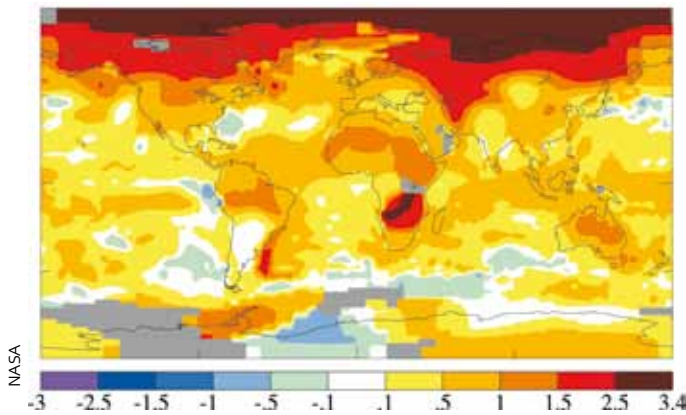
Agency

We need to understand the role of private and non-state actors better, including private and public-private

governance mechanisms, increasingly relevant in governance processes at local and global levels. Many important institutions include or are driven by actors beyond national governments – by environmentalist alliances, business associations, scientific networks or intergovernmental bureaucracies such as the secretariat of the climate convention at the centre of the negotiations in Copenhagen in December 2009. A good example of the new influence scientific networks are having is the Intergovernmental Panel on Climate Change (IPCC) that, through its scientific assessment reports, has become a strong agent in discussions and negotiations concerning climate change.

Non-state actors are not confined to lobbying or advising governments on creating and implementing international rules. Increasingly, they are participating in global institutions and negotiating their own standards. For example, large corporations and environmental advocacy groups established the Forest Stewardship Council (FSC), which sets standards without government involvement. Public-private cooperation has received considerable impetus since the 2002 World Summit on Sustainable Development focused on partnerships (between governments, NGOs and the private sector). As with the FSC, Partnerships for Sustainable Development emerged at a time when states were unable to secure binding international agreements to resolve environmental problems.





Earth system transformation: 2005 was the warmest year on record.

Some private institutions, however, seem less driven by weak public action and more by the incentive that voluntary private regulations could be a mechanism to avoid stricter government regulation. Again, we need to understand how effective such public-private or private initiatives really are.

Adaptation

Current initiatives to mitigate global environmental change are too little, too late. Climate change, in particular, is unavoidable. We have to complement (not replace) the focus on mitigation with a focus on adaptation. Not surprisingly, adaptation is high on the agenda of the climate negotiations in Copenhagen. Adaptation measures, and in particular their funding, may well become as debated as emission reduction targets are for mitigating climate change.

Global environmental change places new burdens on the state. The millions of expected climate change refugees, for example, are likely to raise concerns on national security. Increased scarcity of water resources, falling agricultural yields and the many other negative impacts of climate change may hamper the creation or maintenance of minimal social conditions. A new type of governance – a state that can adapt internally and externally to significant transformations of its natural environment – is needed.

Hurricane Katrina, which destroyed large parts of New Orleans in 2005, is an example of the type of challenge that even the richest countries of the world may face in coping with extreme events. That the US National Guard had to restore public order in New Orleans shows that adaptation is not just about technical measures such as building adequate flood defences.

Governance systems need to be flexible in adapting and reacting to incremental changes in nature and to extreme events like Hurricane Katrina. The uneven geographic distribution of the consequences of climate change, and the massive resources needed to pay for adaptation measures, mean that poor countries are disadvantaged on both counts and require support.

Accountability

The stronger earth system governance institutions become, the more questions will be raised concerning accountability and legitimacy. Stakeholders need to see that governance is legitimate: its actions and representatives must be accountable to their constituencies. The legitimacy of international negotiations and agreements, where international diplomats shape international conventions and agreements with little direct involvement of the parliaments and civil society in their home countries, is often described as weak.

Some see a special role here for large NGOs with global reach. Approximately 1300 civil society organizations have observer status at, for example, the climate change conference in Copenhagen in December 2009. The question then arises: how accountable and legitimate are these private actors?

At the national level, environmental advocacy groups can ensure legitimacy through their members or donors. Internationally, however, it is more complicated, given the wide disparities in the wealth and power of private actors. Most philanthropic organizations are based in industrialized countries and funded by them. With the high financial costs of participation in global policy processes, giving more rights and responsibilities to non-state actors in earth system governance could also privilege representatives of industry and business over other groups, in particular those in developing countries.

Financial support for non-state representatives from developing countries could be a mechanism to vouchsafe a balance of opinions and perspectives. The North-South quotas required in meetings of non-state activists within the UN Commission on Sustainable Development are one way to achieve this. Another way to include non-state actors from poorer nations could be by institutionalizing their participation. The Commission on Global Governance has proposed, for example, setting up an international forum

Earth System Governance Project

The Earth System Governance Project is an international, interdisciplinary social science research project under the auspices of the IHDP, Bonn, Germany. Established in October 2008, it will run until 2018. The project carries out fundamental and applied research on the interrelated and increasingly integrated systems of formal and informal rules, rule-making systems and actor networks at all levels of human society set up to steer societies towards preventing, mitigating and adapting to global and local environmental change. The project is particularly concerned with earth system transformation within the context of sustainable development. It was also designed as the central nodal point within the global change research programmes to guide, organize and evaluate their various project activities. While essentially a scientific effort, the project also assists in formulating policy responses to today's pressing problems of earth system transformation.



Alamy / Ville Palonen

High and dry: a fishing boat at Moynaq, formerly a port on the shrinking Aral Sea, Uzbekistan.

for civil society within the UN to bringing together around 600 self-selected ‘organs of global civil society’.

Allocation and access

Earth system governance must address the question of how to allocate costs and benefits – in financial terms as well as in terms of changing the quality and quantity of resources and ecosystem services. Politics is about distribution, and earth system governance is no different. This is particularly pertinent for the relationship between developing and industrialized countries, which has caused disagreement in many areas of earth system governance, such as global climate and forestry policies. 🗳️ Developing countries naturally demand stronger action from the richer nations that caused the current climate change in the first place, while refusing, for now, to agree to their own quantified commitments. However, with China agreeing to reduce its greenhouse gas emissions and following an EU summit in

October 2009, which recognized that developed countries need to support developing countries financially to adapt to climate change, disagreements could gradually be resolved.

The disagreements are not just between the North and South. While China seems ready to commit to some greenhouse gas reductions, India and many other developing countries appear more hesitant. While the EU agreed on the need for financial support, some eastern European countries rejected the suggested contribution principle, based on actual emissions, favouring a principle based on economic strength. The United States has to deal with the tension between President Barak Obama’s commitment to reducing emissions targets and the political feasibility of ratifying and implementing a binding international agreement.

Compensation for the adverse impacts of climate change and support through the global community for those in the worst affected and most vulnerable regions, such as small



Global Environmental Change Research

At the first Global Change Open Science Conference in Amsterdam in 2001, participants from more than 100 countries signed the Amsterdam Declaration on Global Change. This called for stronger cooperation between the global environmental research programmes and for greater integration across disciplines, environmental and development issues and the natural and social sciences. The declaration also called for greater collaboration across national boundaries and increased efforts to involve scientists from developing countries. In response, the four international global environmental change research programmes – DIVERSITAS, an international programme of biodiversity science, the International Geosphere-Biosphere Programme, IHDP and the World Climate Research Programme – formed the Earth System Science Partnership. Under this umbrella, the research examines the structure and functioning of the earth system including changes taking place and their implications for global and regional sustainability.

island states, will not only be a moral responsibility. It will also be politically and economically prudent.

Mechanisms for allocation already exist in environmental governance. Finance for adaptation and mitigation can be assigned through inter-governmental agreements and implemented using public funds. The 1990 London amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, for example, saw the creation of a multilateral fund to reimburse the agreed incremental costs to developing countries of implementing the treaty. 📖 The Global Environment Facility has a similar function. Alternatively, mitigation and adaptation costs can be allocated through market-based mechanisms. The trade in mitigation obligations through emissions certificates under the Kyoto Protocol is an example here.

Despite the importance of allocation, research in this field is scarce. Empirical work would substantiate the more policy-oriented, philosophical treatises on equity. Social scientists and decision-makers need to explore new allocation mechanisms and criteria.

Earth system governance, as a particular research area within social sciences, needs to connect with other relevant social science areas and the natural sciences. While traditional science builds on developing and testing theories and hypotheses based on experience, earth system governance is inherently future-oriented and relies on new forms of research, evidence and knowledge. It also has to cope with intrinsic uncertainty: we do not know what systems and outcomes future generations will want. Research on earth system governance will often be interdisciplinary, international and multi-scale. This must be reflected in research management that can support and stimulate cooperation between disciplines, research traditions and scholars with different geographic backgrounds. The new global alliance of earth system governance research centres has been designed to cope with this major research challenge.

A new global system

Earth system governance is beginning to appear as a political issue. More than 900 international environmental agreements are already in force; many harmful substances, such as chlorofluorocarbons, are now no longer in use thanks to international cooperation; and climate change mitigation and adaptation projects are mushrooming. Yet greenhouse gas emissions now exceed the most pessimistic scenarios developed by the Intergovernmental Panel on Climate Change. The institutions, organizations and governance mechanisms through which we tackle not only climate change but other environmental problems are clearly inadequate.

Building a global, effective architecture for earth system governance that can adapt to changing circumstances, that involves civil society, that is accountable and legitimate beyond the nation state and that is fair for everyone, is a daunting research and governance agenda. ■

📖 To join the debate on the human dimensions of global environmental change, visit www.thebrokeronline.eu/Navigating-the-Anthropocene

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- Earth System Science Partnership: www.essp.org
- International Human Dimensions Programme on Global Environmental Change: www.ihdp.org

Global alliance of earth system governance research centres

Earth system governance needs to be studied through cooperation between scientists from different disciplines, research areas and world regions. Research groups affiliated to the Earth System Governance Project have therefore set up a global alliance of earth system governance research centres. It currently includes: the VU University Amsterdam; the Australian National University; Chiang Mai University, Thailand; Colorado State University, USA; Lund University, Sweden; Oldenburg University, Germany; the Stockholm Resilience Centre, Sweden; and the Tokyo Institute of Technology, Japan. The alliance is exploring setting up partnerships with leading institutes in China, India and Brazil. It is organizing a series of global conferences and the first is in Amsterdam in 2009 on the Human Dimensions of Global Environmental Change. The Alliance also relies on an international network of around 100 associated faculty members and research fellows.