TRANSFORMING GOVERNANCE AND INSTITUTIONS FOR GLOBAL SUSTAINABILITY

Key Insights from the Earth System Governance Project

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Earth System Governance

NOVEMBER 2011

CITATION

This paper can be cited as: Biermann, Frank, Kenneth Abbott, Steinar Andresen, Karin Bäckstrand, Steven Bernstein, Michele M. Betsill, Harriet Bulkeley, Benjamin Cashore, Jennifer Clapp, Carl Folke, Aarti Gupta, Joyeeta Gupta, Peter M. Haas, Andrew Jordan, Norichika Kanie, Tatiana Kluvánková-Oravská, Louis Lebel, Diana Liverman, James Meadowcroft, Ronald B. Mitchell, Peter Newell, Sebastian Oberthür, Lennart Olsson, Philipp Pattberg, Roberto Sánchez-Rodríguez, Heike Schroeder, Arild Underdal, Susana Camargo Vieira, Coleen Vogel, Oran R. Young, Andrea Brock, and Ruben Zondervan, 2011. *Transforming Governance and Institutions for Global Sustainability: Key Insights from the Earth System Governance Project.* Earth System Governance Working Paper No. 17. Lund and Amsterdam: Earth System Governance Project.

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WORKING PAPER SERIES EDITOR

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ABSTRACT

The current institutional framework for sustainable development is not strong enough to bring about the swift transformative progress that is needed. This paper contends that incrementalism—the main approach since the 1972 Stockholm Conference—will not suffice to bring about societal change at the level and speed needed to mitigate and adapt to earth system transformation. Instead, the paper argues that transformative structural change in global governance is needed, and that the 2012 United Nations Conference on Sustainable Development in Rio de Janeiro must turn into a major stepping stone for a much stronger institutional framework for sustainable development. The article details core areas where urgent action is required. The article is based on an extensive social science assessment conducted by 32 members of the lead faculty, scientific steering committee, and other affiliates of the Earth System Governance Project.

SERIES FOREWORD

This working paper was written as part of the Earth System Governance Project, a ten-year research initiative launched in October 2008 by the International Human Dimensions Programme on Global Environmental Change under the overall auspices of the Earth System Science Partnership.

Earth system governance is defined in this Project as the system of formal and informal rules, rule-making mechanisms and actor-networks at all levels of human society (from local to global) that are set up to prevent, mitigate and adapt to environmental change and earth system transformation. The science plan of the Project focusses on five analytical problems: the problems of the overall *architecture* of earth system governance, of *agency* of and beyond the state, of the *adaptiveness* of governance mechanisms and processes, of their *accountability* and legitimacy, and of modes of *allocation and access* in earth system governance. In addition, the Project emphasizes four crosscutting research themes that are crucial for the study of each analytical problem: the role of power, of knowledge, of norms, and of scale. Finally, the Earth System Governance Project advances the integrated analysis of case study domains in which researchers combine analysis of the analytical problems and crosscutting themes. The main case study domains are at present the global water system, global food systems, the global climate system, and the global economic system.

The Earth System Governance Project is designed as the nodal point within the global change research programmes to guide, organize and evaluate research on these questions. The Project is implemented through a Global Alliance of Earth System Governance Research Centres, a network of lead faculty members and research fellows, a global conference series, and various research projects undertaken at multiple levels (see www.earthsystemgovernance.org).

Earth System Governance Working Papers are peer-reviewed online publications that broadly address questions raised by the Project's Science and Implementation Plan. The series is open to all colleagues who seek to contribute to this research agenda, and submissions are welcome at any time at workingpapers@earthsystemgovernance.org. While most members of our network publish their research in the English language, we accept also submissions in other major languages. The Earth System Governance Project does not assume the copyright for working papers, and we expect that most working papers will eventually find their way into scientific journals or become chapters in edited volumes compiled by the Project and its members.

Comments on this working paper, as well as on the other activities of the Earth System Governance Project, are highly welcome. We believe that understanding earth system governance is only feasible through joint effort of colleagues from various backgrounds and from all regions of the world. We look forward to your response.

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1. INTRODUCTION

Global environmental protection has been on the international political agenda since the 1972 UN Conference on the Human Environment. More than 900 environmental treaties are in force. Yet overall these efforts have not been effective in altering the decadal trends of human-caused environmental degradation. Recent studies indicate that human activities are moving numerous planetary sub-systems outside the range of natural variability typical for the previous 500,000 years [1,2]. The nature of these changes, their magnitude and rates of change are unprecedented. At the same time, basic human needs are still not met in many parts of the world.

It has become clear that human societies must completely change course and steer away from critical tipping points in the earth system that might lead to rapid and irreversible change, while ensuring sustainable livelihoods for all [3]. This requires a fundamental transformation of existing practices. The mitigation of climate change, for instance, calls for dramatic change in the way we produce and consume energy and for a decisive shift to a low carbon energy supply, along with substantial improvement of energy provision to the poorest communities.

Our research indicates that the current institutional framework for sustainable development is by far not strong enough to bring about the swift transformative progress that is needed. In our view, incrementalism—the main approach since the 1972 Stockholm Conference—will not suffice to bring about societal change at the level and speed needed to mitigate and adapt to earth system transformation. *Instead, we argue that transformative structural change in global governance is needed.*

The 2012 United Nations Conference on Sustainable Development in Rio de Janeiro should turn into a major stepping stone for a much stronger institutional framework for sustainable development. *We urge decision-makers to seize this opportunity to develop a clear and ambitious roadmap for institutional change in order to achieve much needed fundamental reform of current sustainability governance within the next decade.*

This policy assessment outlines core areas where urgent action is required, based on the state of knowledge in the social sciences in this field. The assessment has been compiled by members of the lead faculty, scientific steering committee, and other

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[1] Steffen W, Sanderson A, Tyson PD, Jäger J, Matson PA, Moore III B, Oldfield F, Richardson K, Schellnhuber HJ, Turner II BL, Wasson RJ: *Global Change and the Earth System: A Planet under Pressure*. Springer; 2004.

[2] Schellnhuber HJ, Crutzen PJ, Clark WC, Claussen M, Held H (Eds): *Earth System Analysis for Sustainability.* MIT Press, in cooperation with Dahlem University Press; 2004.

[3] Rockström J, Steffen W, Noone K, Persson Å, Chapin FS, Lambin EF, Lenton TM, Scheffer M, Folke C, Schellnhuber HJ, *et al.*: A safe operating space for humanity. *Nature* 2009, 461:472-475.

affiliates of the Earth System Governance Project [4,5]. This Project is a ten-year research initiative under the auspices of the International Human Dimensions Programme on Global Environmental Change (IHDP), which is sponsored by the International Council for Science (ICSU), the International Social Science Council (ISSC), and the United Nations University (UNU). The project has evolved into the largest social science network in its field, involving nearly 1700 colleagues along with a core network of twelve institutions in the Global Alliance of Earth System Governance Research Centres.

2. STRENGTHEN INTERNATIONAL ENVIRONMENTAL TREATIES

Social scientists have made substantial progress in identifying the factors that foster the creation and effectiveness of international environmental treaties. This research has led to important insights into how the international governance system can be made more effective. For one, there is significant potential for incremental improvement to get better treaties sooner. Governments can speed up negotiations by conducting them within existing institutions and by splitting up problems into smaller negotiation packages. At times, negotiators can sacrifice substance and stringency to first reach 'shallow' but inclusive agreements that can be built on later, for example in framework-plus-protocol approaches, tacit-acceptance procedures for amendments, and formalized mechanisms that help turn soft law agreements into hard law [6].

In a world of rapid change, treaties must be designed dynamically, not statically. Less substantial adjustments should not require formal ratification by governments but should enter into force upon adoption by majority vote by the conferences of the parties or tacit acceptance (as has been agreed to for the phaseout schedules for ozone-depleting substances) [7]. All treaty procedures must be geared towards advance planning, and include monitoring and early warning systems to make the treaties more adaptive.

Regarding performance, our research has shown that international treaties work more effectively if they precisely state goals, criteria and benchmarks for assessing progress;

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[4] Biermann F: 'Earth system governance' as a crosscutting theme of global change research. *Global Environmental Change: Human and Policy Dimensions* 2007, 17:326-337.

[5] Biermann F, Betsill MM, Gupta J, Kanie N, Lebel L, Liverman D, Schroeder H, Siebenhüner B (Eds), with contributions from Conca K, da Costa Ferreira L, Desai B, Tay S, Zondervan R: *Earth System Governance: People, Places and the Planet. Science and Implementation Plan of the Earth System Governance Project.* The Earth System Governance Project; 2009. Available at: www.earthsystemgovernance.org.

[6] Abbott KW, Snidal D: Pathways to international cooperation. In *The Impact of International Law on International Cooperation*. Edited by Benvenisti E, Hirsch M. Cambridge University Press; 2004:50-84.

[7] Brunnée J: COPing with consent: Law-making under multilateral environmental agreements. *Leiden JIL* 2002, 15:1-52.

if their rules fit the core problem to be addressed (which is not always the case); if their processes are flexible and adaptable to changes in the problem and context; if they have formal procedures that ensure that new scientific information is quickly taken up; and if they systematically collect information about the effectiveness of the treaty and review this information regularly [8,9,10,11].

Such measures will lead to an incremental improvement of the system of international environmental agreements. We urge governments to draw on the lessons of past treaty-making exercises in order to improve their functioning.

However, while the search for incremental change—which has guided much political action and research alike in recent decades—is important, it is not sufficient. More transformative reforms in the manner in which international environmental negotiations are being conducted and treaties designed are needed.

One way forward is stronger reliance on, and acceptance of, qualified majority voting. Political systems that rely on majority-based rule arrive at more far-reaching decisions more quickly. *It is imperative that present and future treaties rely more on systems of qualified majority voting in specified areas. Earth system transformation is too urgent to be left to the veto power of single countries.*

The basis for qualified majority voting in international institutions remains open for debate and further research, since experiences with qualified majority voting in international politics are still rare and need to be further developed. Granting each country the same vote gives high political power to nations with very small populations. This might be unacceptable to larger nations when fundamental global decisions are called for, and might undermine the effectiveness of the resulting decisions. International law currently incorporates only few systems of qualified majority voting that weigh votes according to the size or relative importance of countries. These include double-weighted majority voting that grants equal veto power to North and South (as in the treaties on stratospheric ozone-depletion), and special voting rights to countries with particular interests or resources, such as in shipping (as in the International Maritime Organization) or finance (as in the World Bank; IMF). Overall, qualified majority voting will need to be restricted to specified areas to ensure support of all countries.

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[8] Galaz V, Olsson P, Hahn T, Folke C, Svedin U: The problem of fit among biophysical systems, environmental and resource regimes, and broader governance systems: Insights and emerging challenges. In *Institutions and Environmental Change: Principal Findings, Applications, and Research Frontiers.* Edited by Young OR, King LA, Schroeder H. MIT Press; 2008:147-186.

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[10] Breitmeier H, Young OR, Zürn M: *Analyzing International Environmental Regimes: From Case Study to Database.* MIT Press; 2006.

[11] Miles EL, Underdal A, Andresen S, Wettestad J, Skjærseth JB, Carlin EM (Eds): *Environmental Regime Effectiveness: Confronting Theory with Evidence*. MIT Press; 2002.

3. MANAGE CONFLICTS AMONG MULTILATERAL AGREEMENTS

One major recent concern has been conflicts among different treaties both within sustainability policy and vis-á-vis other policy domains [12,13,14,15,16]. Several political strategies to reduce such conflicts emerge from extensive social science research. To begin with, the requirement to respect and support the objectives enshrined in (other) multilateral environmental treaties must be accepted as a principle. Governments should also strengthen the capacity and mandate of environmental treaties (including their secretariats) to collect, disseminate and exchange information on best practices and on interlinkages with other treaties. Treaties with similar objectives will benefit from formal mechanisms for joint negotiation and management [17,18].

Addressing conflicts between economic and environmental treaties is particularly important. Here it is vital that a reformed institutional framework for sustainable development is brought in line with the second main area to be addressed at the 2012 UN Conference on Sustainable Development, the 'green economy in the context of sustainable development and poverty eradication'. Global sustainability cannot be achieved without fundamental reforms in the global economic system.

One example of concrete conflicts is the different emphasis on 'sound science' under the World Trade Organization and on the 'precautionary principle' in many environmental treaties. Regarding world trade law, it seems that narrow definitions of risks associated with products and technologies that do not take into account broader short and long term effects capture only limited interactions in society and the environment. For economic institutions to support transitions to a sustainable economy, *we therefore support multilaterally harmonized systems that allow for discriminating between products on the basis of production processes.* This is critical to incentivizing investment in cleaner products and services and it does not—if embedded in multilateral agreements—have to result in protectionist measures. Until

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[12] Alter K, Meunier S: The politics of international regime complexity. *Perspectives on Politics* 2009, 7:13-24.

[13] Raustiala K, Victor DG: The regime complex for plant genetic resources. *International Organization* 2004, 58:277-309.

[14] Biermann F, Pattberg P, van Asselt H, Zelli F: The fragmentation of global governance architectures: A framework for analysis. *Global Environmental Politics* 2009, 9:14-40.

[15] Keohane RO, Victor DG: The regime complex for climate change. *Perspectives on Politics* 2011, 9:7-23.

[16] Oberthür S, Gehring T (Eds): *Institutional Interaction in Global Environmental Governance: Synergy and Conflict among International and EU Policies*. MIT Press; 2006.

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[18] Oberthür S, Stokke OS (Eds): *Managing Institutional Complexity: Regime Interplay and Global Environmental Change.* MIT Press; 2011.

such multilateral systems are in place, we support the expansion of voluntary standards for this purpose that are already enabled under international trade rules [19].

Environmental goals also need to be explicitly mainstreamed into the activities of all global economic institutions. This avoids the current situation where the activities of global economic institutions undermine gains achieved by environmental treaties because of poor policy coherence [20,21]. Instead, global trade, investment and insurance regimes, for example, must reflect and embed social, developmental, and environmental values [22].

4. FILL REGULATORY GAPS IN INTERNATIONAL SUSTAINABILITY GOVERNANCE

In addition to strengthening existing environmental treaties, there are numerous areas where new frameworks are needed. One such area is the development and deployment of emerging technologies, such as nanotechnology, synthetic biology, and geoengineering. Such emerging technologies promise both significant benefits and potential risks for sustainable development, and many scholars oppose immediate comprehensive international regulation because of still insufficient knowledge, fear of impeding benefits, and the need for flexibility. *Yet research also indicates that an international institutional framework on emerging technologies is urgently needed*. This framework would support forecasting, transparency and information-sharing on their benefits and drawbacks and on the trade-offs involved; further develop technical standards; help clarify the applicability of existing treaties; promote public discussion and input; and engage multiple stakeholders in policy dialogues. The framework should especially ensure that environmental considerations are fully respected. Transnational private, public or hybrid codes or protocols and inter-agency coordination could then generate formal multilateral action where appropriate. *Initially, multilateral action on emerging technologies could take the form of one or more framework conventions* [23,24].

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[19] Bernstein S, Hannah E: Non-state global standard setting and the WTO. Legitimacy and the need for regulatory space. *Journal of International Economic Law* 2008, 11:575-608.

[20] Newell P: Fit for purpose: Towards a development architecture that can deliver. In *Re-thinking Development in a Carbon-Constrained World: Development Cooperation and Climate Change.* Edited by Paluso E. Finland: Ministry of Foreign Affairs, 2009.

[21] Gupta J, van der Grijp N (Eds): *Mainstreaming Climate Change in Developing Cooperation: Theory, Practice and Implications for the European Union.* Cambridge University Press; 2010.

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A second area where a stronger multilateral framework is needed is water governance. At the global level, despite the creation in 2003 of the 'UN-Water' interagency mechanism, water management is still dispersed over several UN agencies and civil society bodies [25,26]. *We need thus a more streamlined approach to water governance at the global level, including common principles and a strong institutional framework.*

A third area where further regulation is needed is food governance, given recent increases in food prices, increasing market interdependence, and competition with land for biofuels. Despite the many efforts of international institutions, a billion people are still hungry. The number of people in extreme rural poverty, closely associated with hunger, has been stagnant at about 500 million people in South Asia and even in Sub-Saharan Africa increased over the last 20 years by 80% [27]. Regulatory challenges include here international management of food safety and nutrition, the coordination of climate change adaptation in food systems, limits on commodity speculation, and standards to guide private regulation such as certification and labeling schemes.

Stronger global governance is also urgently required in the area of energy. The challenge is here to reconcile the needs of 1.6 million people without access to electricity and a projected 3-5-times increase in energy demand in the developing world over the next 30 years with the need to de-carbonize the economies of richer and rapidly industrializing countries alike. Handling the trade-offs between energy poverty, energy security and climate change objectives in a just and effective way in a highly integrated global economy, requires stronger oversight by global bodies whose activities are currently dispersed and poorly coordinated [28,29].

Regulatory frameworks should also be developed that account for complex ecosystem services in the landscape (such as timber production, carbon sequestration in forests and soils, flood regulation, pollination of crops) as well as in freshwater bodies (such as fisheries, tourism, water supply) [30,31]. Insights from active stewardship of landscapes of the Millennium Ecosystem Assessment as well as the recently established International Platform for Biodiversity and Ecosystem Services should

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[25] Pahl-Wostl C, Gupta J, Petry D: Governance and the global water system: A theoretical exploration. *Global Governance* 2008, 14:419-435.

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inform such frameworks. All these governance challenges are interlinked in various ways and should thus ideally be simultaneously addressed.

5. UPGRADE UNEP AND THE UNCSD

Research on international environmental organizations shows that they play vital roles in governance for sustainable development, yet also need further strengthening [32,33,34]. Many reform proposals have been submitted in recent decades [35,36,37]. Some of the more radical proposals—such as an international agency that centralizes and integrates existing intergovernmental organizations and regimes—are unlikely to be implemented. However, *most of us see substantial benefits in upgrading the United Nations Environment Programme to a specialized UN agency for environmental protection, along the lines of the World Health Organization or the International Labour Organization* [38,39,40,41,42,43]. A world environment organization may not address all institutional challenges, and some scholars remain critical of such a move, arguing that the costs of creating a new organization might outweigh its benefits, and that a decentralized system might promise overall higher levels of effectiveness

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[43] Najam A, Papa M, Taiyab N: *Global Environmental Governance: A Reform Agenda.* International Institute for Sustainable Development; 2007.

[44,45,46]. Yet it could be one step towards a more effective overall governance system.

At the same time, it is important to increase overall integration of sustainable development policy objectives within the UN system and beyond. The UN Commission on Sustainable Development (UNCSD) was originally created to fulfil this role. Yet its political relevance has remained limited, and has possibly diminished over time. *It is important that governments take serious action to support overall integrative mechanisms within the UN system that better integrate the social, economic and environmental pillars of sustainable development.* An upgraded, strengthened UNCSD that includes economic and social branches of governments, might contribute to this goal.

6. STRENGTHEN NATIONAL GOVERNANCE

The shortcomings of international institutions largely reflect the shortcomings of domestic policies. An effective institutional framework for sustainable development also requires critical innovations at the national level. Here, new policy instruments—often involving non-state actors—have become popular in the last few decades to overcome implementation gaps [47]. Voluntary agreements between government and industry are a prominent example. Emission trading is another one, especially in Europe [48]. New policy instruments are often seen as more flexible than regulation, particularly in sectors dominated by few large firms [49]. However, they often regularly require an embedding in regulatory frameworks for their proper functions. Also, questions remain about their transparency, equity implications and effectiveness. Critics maintain that they simply institutionalize the status quo. It is seldom easy to ensure that these new instruments function in an equitable and efficient manner, which often requires difficult political choices. In sum, *new policy instruments offer a promising complement to regulation if carefully designed. But they are not panaceas. Success appears to lie in developing carefully designed packages of different*

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instruments, and in evaluating the effectiveness of these institutions on their own terms as well as relative to alternative institutional options [50].

7. STREAMLINE AND STRENGTHEN GOVERNANCE BEYOND THE NATION STATE

The last two decades have seen tremendous growth in new types of governance, including public-private partnerships, transnational labelling schemes, and hybrid market mechanisms.

There is increasing evidence that the more than 300 partnerships for sustainable development that have been agreed around the 2002 Johannesburg World Summit on Sustainable Development—the so-called 'type-2 outcomes' of this summit—have not delivered on their promise. Overall, research suggests that the partnership approach has not met the high expectations placed on these new mechanisms to contribute to the Millennium Development Goals and to enhance stakeholder participation. Many public-private partnerships represent 'symbolic politics' rather than serious efforts to engage with sustainable development. Some studies suggest that more than a third of registered partnerships are non-operational or have no effect. A lack of funding, underdeveloped organizational structures, an absence of quantitative targets and goals and poor accountability systems often further limit effectiveness. *To strengthen such partnerships, the UN Commission on Sustainable Development or other agencies thus need a stronger mandate and better methodologies for the verification and monitoring of progress* [51,52,53,54,55,56,57,58].

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The findings from social science research on transnational and national labelling and certification schemes are more mixed. Such schemes can advance sustainable development by enabling markets to support environmentally-sound business practices. Yet, to be effective such schemes require the involvement of multiple stakeholders, appropriate national regulatory frameworks, built-in accountability mechanisms, and consumer demand. At present, these schemes cover a sizable share of global markets only for a handful of certified goods, such as timber, fish, and coffee. They seem better able to address more narrow environmental harm arising from commercial growing and harvesting practices than broader sustainability problems such as forest conversion and poverty eradication. One problem is also that private governance mechanisms may reduce pressures on governments to take decisive action. *Overall, the role of governments is crucial for the success of these schemes through regulations that create incentives for firms to seek certification, focussed procurement policies, legitimation of measures, and involvement in monitoring their broader sustainability effects* [59,60,61,62,63,64,65]. *Also international organizations can play a powerful role in catalyzing and steering novel and more effective forms of private and public-private governance* [66,67].

As for market-oriented mechanisms such as the Clean Development Mechanism (CDM), social science research indicates that these new governance arrangements can contribute to sustainable development, as long as they are clearly seen as supplementary to, rather than a replacement for, governmental action. To ensure equitable distribution of benefits and to minimize the risks associated with them (for example to indigenous people or biodiversity concerns), strong institutional oversight is required from international bodies that approve CDM projects and methodologies,

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and from national and local authorities that accept and host projects. Also the asymmetry in such schemes between the global environmental and economic benefits, and local environmental and developmental benefits, must be addressed more effectively. *Governments must thus work towards improving institutional capacity, increasing representation of local stakeholders, changing the uneven monitoring of claimed benefits, and rebalancing global and local benefits* [68].

Social science research has also shown the importance of new types of transnational cooperation of local public authorities, such as cities. Many such authorities have taken significant action towards addressing the causes and consequences of global environmental risks. Important drivers for this are international goals that inspire, direct and guide action on the ground; transnational networks that exchange information on urban best practice; and the availability of funding to create novel urban multi-sector and multi-actor partnerships and activities [69,70]. *Governments must now provide a political mandate to guide action on the ground that recognizes the diverse contexts of local public authorities, supports collaboration between them and other actors, and helps develop local capacity and financial resources* [71,61,62,72,73,74].

In sum, new types of global governance involving a range of actors from industry to environmentalist groups, multisectoral partnerships and cities, has grown significantly in the last two decades. Some benefits and successes of new types of multi-stakeholder governance are discernible. However, given the enormous need for social innovation and public reform, it is unlikely that such institutions will be able to steer the course alone. *New governance mechanisms cannot take away from the urgent need for effective and decisive governmental action, both at the national and intergovernmental level. Governance beyond the nation state can sometimes be a useful supplement especially when they avoid being captured by powerful interests and instead focus on problem amelioration. Yet even for this, it requires support and oversight from national governments.*

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[68] Newell P, Jenner N, Baker L: Governing clean development: A framework for analysis. *Development Policy Review* 2009, 27:717-741.

[69] Bulkeley H, Schroeder H: Beyond state and non-state divides: Global cities and the governance of climate change. *European Journal of International Relations* forthcoming.

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7. STRENGTHEN ACCOUNTABILITY AND LEGITIMACY

Traditional intergovernmental processes face increasing pressures for access to decision making by all affected parties and improved accountability. As non-state and public-private forms of governance proliferate, such pressures increase. For example, standard-setting—whether through traditional bodies such as the International Standard Organization or environmental and social certification systems—requires broad responsiveness to affected communities in North and South, as well as sufficient resources to enable broad participation.

There is no universal formula to increase accountability and legitimacy across all sustainable development institutions [75,76]. For example, market actors may see governance legitimacy to lie pragmatically in its effectiveness [77,78], whereas social and environmental groups may stress environmental integrity or social objectives, and put more weight on procedural legitimacy. *A political reform strategy to improve legitimacy should thus include novel mechanisms to enhance learning and knowledge diffusion across stakeholders, as well as the building of trust* [79].

Governance accountability can be strengthened when stakeholders gain better access to information and decision-making, for example through special rights enshrined in agreements, charters and codes [80], and stronger participation of stakeholders in councils that govern resources, or in commissions that hear complaints. Many of these mechanisms have been used at national and regional levels, and international environmental and sustainability institutions have often been frontrunners in this field. *International environmental, developmental and economic institutions must adopt novel accountability mechanisms more widely. Stronger consultative rights by civil society representatives in intergovernmental institutions can be a major step forward. This requires, however, appropriate mechanisms that account for imbalances between countries and power differentials between different segments of civil society, ensure appropriate accountability mechanisms for civil society representatives vis-à-vis their constituencies, and provide for effective decision-making.*

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[75] Bernstein S: Legitimacy in global environmental governance. *Journal of International Law and International Relations* 2005, 1:139-66.

[76] Rayner J, Buck A, Katila P (Eds): *Embracing Complexity: Meeting the Challenges of International Forest Governance. A Global Assessment Report Prepared by the Global Forest Expert Panel on the International Forest Regime.* International Union of Forest Research Organizations; 2010.

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[78] Cashore B, Auld G, Newsom D: *Governing Through Markets: Forest Certification and the Emergence of Non-state Authority.* Yale University Press; 2004.

[79] Bernstein S: Legitimacy in intergovernmental and non-state global governance. *Review of International Political Economy* 2011, 18:17-51.

[80] Newell P, Wheeler J (Eds): *Rights, Resources and the Politics of Accountability.* Zed Books; 2006.

While greater transparency and information disclosure can empower citizens and consumers to hold governments and private actors accountable, and provide incentives for better sustainability performance, research also reveals that transparency does not always deliver on its promises. Disclosed information is often inaccessible, inconsistent, or incomprehensible. Its political utility is limited when recipients lack the capacity to interpret and use the information or 'drown in disclosure' of too much or irrelevant information; or when there are no intermediaries from civil society who make disclosed information usable. Governments and private actors must also ensure that disclosure obligations are stringent enough to go beyond 'business as usual' and stimulate a change in existing unsustainable practices. *Mandatory disclosure of accessible, comprehensible and comparable data about government and corporate sustainability performance must be a central component of a revitalized institutional framework for sustainable development* [81,82,83,84,85,86].

7. ADDRESS EQUITY CONCERNS WITHIN AND AMONG COUNTRIES

The institutional framework for sustainable development must address questions of justice, fairness, and equity.

This includes, for one, questions of equity within countries. Here, environmental governance often seems to involve a trade-off between effectiveness and efficiency, and equity. Yet in most complex environmental problems, this trade-off presents a false dichotomy. Environmental problems are inherently political in nature. *This increases the need for legitimate and transparent democratic processes that allow societies and local communities to choose policies that they see as both equitable and effective.*

Special attention needs to be paid to the poorest billion of humankind, which is likely to suffer most from global environmental change and earth system transformation. Here it is important to remember that policies are hardly ever made by poor and marginalized people, only for poor people by others who believe they understand or

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[81] Gupta A: Transparency in global environmental governance: A coming of age? *Global Environmental Politics* 2010, 10:1-9.

[82] Gupta A: Transparency under scrutiny: Information disclosure in global environmental governance. *Global Environmental Politics* 2008, 8:1-7.

[83] Mol APJ: *Environmental Reform in the Information Age: The Contours of Informational Governance.* Cambridge University Press; 2008.

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represent poor people's preferences and aspirations. This is particularly problematic because both reasons and remedies of poverty are contested in the social sciences. The poorest and socially most marginalized people are notoriously difficult to reach, which makes it important to design policies in ways that prevent cooptation by others. *Policy processes that affect poor and marginalized people should as far as possible enable poor people's participation in preparation, implementation, monitoring and adaptation of such policies.*

At the international level, equity and fairness need to be at the heart of strong and durable international regimes. So far, lack of a common normative framework that guides environmental and economic agreements has led to competitive approaches that often focus on short-term effects at the cost of long-term equity [87]. Yet in the long term, the institutional framework for sustainable development must be built on global compromises that all participants view as fair and legitimate. While the traditional dichotomy of 'North' and 'South' may be less relevant in some issue areas, it is obvious that extremely high consumption levels in industrialized countries and in some parts of the emerging economies require special and urgent action [88,89], and that many poorer societies lack capacities to take forceful action in mitigating and adapting to global environmental change. Hence, equitable progress towards globally sustainable development requires much more action by the richer nations than they are willing to commit to today [90]. In particular, governments and societies in industrialized countries need to accept that global environmental change has fundamentally increased global interdependence and (further) transformed the international system. Yet also the rapidly developing countries in the South need to actively determine their role and position on sustainable development governance from local through global levels and to redirect their development pathways towards a green economy. *Financial transfers from richer to poorer countries at unprecedented levels are inevitable, either through direct support payments for mitigation and adaptation programmes based on international agreement or through international market mechanisms, for example global emissions markets. Novel financial mechanisms, such as transnational air transportation levies or an international levy on financial transactions for sustainability purposes, could also contribute to addressing this challenge.*

As with most areas of the institutional framework for sustainable development, the organization of global funding for sustainable development also lacks consistency and inclusiveness [91]. Financial resources are generally transferred through multilateral development banks, foreign direct investment, aid agencies, and the Global

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[87] Anand R: *International Environmental Justice: A North-South Dimensions.* Ashgate Publishing; 2004.

[88] Princen T, Maniates M, Conca K (Eds): *Confronting Consumption*. MIT Press; 2002.

[89] Lebel L, Lorek S, Daniel R (Eds): *Sustainable Production Consumption Systems: Knowledge, Engagement and Practice*. Springer Dordrecht; 2010.

[90] Hamilton C: *Growth Fetish*. Crows Nest: Allen and Unwin; 2003.

[91] Abbott KW, Gartner D: *The Green Climate Fund and the Future of Environmental Governance.* Earth System Governance Working Paper No. 16. Lund and Amsterdam, 2011.

Environment Facility. Most agencies and programmes differ in their interests, funding rules, and general policies. Policy coherence is often weak. *We urge governments and funding agencies to revisit existing funding mechanisms in order to increase policy coherence, to strengthen the voice of the recipient countries, and to ensure broader distribution of funding across poorer countries.*

8. PREPARE GLOBAL GOVERNANCE FOR A WARMER WORLD

Given the build-up of greenhouse gases in the atmosphere, complete mitigation of global environmental change is out of our reach. The institutional framework for sustainable development must hence also include governance for adaptation—to allow societies to cope with changes that we may no longer be able to prevent [92].

As for local governance systems, social science research indicates that the adaptiveness of local communities is stronger when the governance system itself is adaptive [93]. Capacities to self-organize and to link different issues and policies are critical here [94,95,96]. Institutional frameworks with multiple centres and levels of authority may foster such capacities [97]. Strong informal networks can help to pool knowledge and other resources to analyze experiences, project future challenges, and build adaptive capacity [98,99]. Deliberation in multi-stakeholder platforms can strengthen local governance on issues with high uncertainty and conflicting interests [100,101,102].

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[92] Stafford Smith M, Horrocks L, Harvey A, Hamilton C: Rethinking adaptation for a 4o C warming world. *Phil Trans R Soc A* 2011, 369: 196-216.

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[102] Young OR: Institutional dynamics: Resilience, vulnerability and adaptation in environmental and resource regimes. *Global Environmental Change: Human and Policy Dimensions* 2010, 20:378-385.

Also downward accountability to local authorities, along with public participation in planning, implementation and review of policies and projects, helps to ensure learning and adaptiveness [103,104]. It is an important role of national governments and international organizations and programmes to support such adaptive characteristics of local governance mechanisms.

In particular in developing countries, limited institutional capacity and traditional governance approaches may reduce the potential for adaptation to the impacts of climate change and climate variability. More research is needed to study whether integrated approaches and polycentric governance, or single, well managed unisectoral approaches, are best for environmental governance at the local level [105,106,107].

Importantly, vital areas of global governance need to adapt to global environmental change, including food, water, energy, health, and migration, and their interaction. Here, the current institutional framework seems ill prepared to cope with the consequences of massive changes in earth system parameters that may occur over the course of this century. Major harm that might occur some decades from now can be minimized if institutional reform is planned and negotiated today [108]. *Global adaptation programmes need to become a core concern of the UN system as well as of governments.*

9. CONCLUSION

In sum, current social science research has indicated substantial shortcomings in the functioning of the institutional framework for sustainable development. Yet there are also major opportunities to improve global, national and local governance, institutions and practices. Incrementalism—the hallmark of the last decades—will not suffice to bring about societal change at the level and speed needed to mitigate and adapt to earth system transformation brought about by human action. *Instead, swift transformative structural change in global governance is needed.* We need a 'constitutional moment' in the history of world politics, akin to the major transformative shift in governance after 1945 that led to the establishment of the

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United Nations and numerous other international organizations, along with far-reaching new international legal norms on human rights and economic cooperation. Earth system transformation calls for similar, if not even more fundamental, transformations in the way societies govern their affairs.

The 2012 United Nations Conference on Sustainable Development must make an important start. Earlier diplomatic summits—notably 1972 in Stockholm and 1992 in Rio de Janeiro—are today seen as major milestones in the development of global sustainability governance. The conferences in 1982 and 2002 have clearly been less influential. The 2012 Rio Conference offers both an opportunity and a crucial test of whether the global community can bring about substantial and urgently needed change in the current institutional framework for sustainable development.

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