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Transforming governance and institutions for global sustainability: key insights from the Earth System Governance Project

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The current institutional framework for sustainable development is by far not strong enough to bring about the swift transformative progress that is needed. This article 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 article 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. 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).

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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 decade-long trends of

human-induced 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 deeply inadequate 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 sustainability governance within the next decade.*

This article outlines nine areas where major reforms are most urgently needed, ranging from how international legal standards are negotiated to questions of legitimacy and equity. It is based on a comprehensive assessment conducted in 2011 by the Earth System Governance Project, a ten-year social science-based research programme under the auspices of the International Human Dimensions Program on Global Environmental Change (IHDP) [4,5••]. 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.

The assessment has been mandated by the International Geosphere-Biosphere Program, the World Climate Research Program, the biodiversity-sciences program Diversitas, and the IHDP as a central policy output of the 2012 London Conference 'Planet under Pressure.' The assessment also serves as a key social science contribution to the 2012 United Nations Conference on Sustainable Development in Rio de Janeiro, which will focus on the institutional framework for sustainable development and its possible reform.

Strengthen international environmental treaties

First, it is important to revise and improve the design of international treaties to make them more effective [6••]. For example, 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 [7]. International treaties also work more effectively if they precisely state goals, criteria and benchmarks for assessing progress; 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 [8–11].

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 [12]. *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 or the International Monetary Fund). Overall, qualified majority voting will need to be restricted to specified areas to ensure support of all countries.

Manage conflicts among international treaties

A second area where reforms are needed concerns conflicts among different treaties within sustainability policy and vis-à-vis other policy domains [13–17]. Several political strategies to reduce such conflicts emerge from 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 [18,19].

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.

Environmental goals therefore 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 finance regimes must embed social, developmental, and environmental values [22]. *We support in particular 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 such multilateral systems are in place, we support the expansion of voluntary standards for this purpose that are already enabled under international trade rules [23].

Fill regulatory gaps by negotiating new international agreements

In addition to strengthening existing environmental treaties and their interaction with economic treaties, there are numerous areas where new frameworks are needed. We suggest five areas where a transformation of the current governance architecture should include new and strengthened international regimes.

One such area is policy to govern 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* [24,25].

Secondly, a stronger multilateral framework is needed in 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 [26,27]. *We need thus a more streamlined approach to water governance at the global level, including common principles and a strong institutional framework*.

Third, further regulation is needed in food governance, given recent increases in food prices, increasing market interdependence, growing competition for land from biofuels, and the environmental implications that arise from these developments [28]. 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 past 20 years by 80% [29]. 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.

Fourth, stronger global governance is 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 [30,31].

Fifth, regulatory frameworks should also be developed 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) [32,33]. Insights from stewardship of landscapes of the Millennium Ecosystem Assessment as well as the recently established International Platform for Biodiversity and Ecosystem Services could inform such frameworks.

Upgrade UNEP and the UNCSD

A transformation of the current governance architecture also requires a reorientation of the system of international organizations and agencies. Research on international environmental organizations shows that they play vital roles in governance for sustainable development, yet also need further strengthening [34–36]. Many reform proposals have been submitted in recent decades [37,38]. 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. Also, a new United Nations environment organization—as is being called for by the European Union and several other countries—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 [39–41]. 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* [42–46].

At the same time, it is crucial to strengthen the integration of sustainable development policy within the UN system and beyond. The UN Commission on Sustainable Development was created in 1992 to fulfill this role. Yet its political relevance as a sub-body to the UN Economic and Social Council has remained limited. It is important that governments take serious action to support mechanisms within the UN system that better integrate the social, economic and environmental pillars of sustainable development. The CSD must be replaced by a new mechanism that stands much higher in the international institutional hierarchy. The most promising route is creating a United Nations Sustainable Development Council directly under the UN General Assembly [47••].

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 [48]. Voluntary agreements between government and industry are a prominent example. Emission trading is another one, especially in Europe [49]. New policy instruments are often seen as more flexible than regulation, particularly in sectors dominated by few large firms [50]. However, they often require an embedding in regulatory frameworks for their proper functioning. Questions remain about their transparency, equity implications and effectiveness. Some critics maintain that they simply institutionalize the status quo. 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 instruments, and in evaluating the effectiveness of these institutions on their own terms as well as relative to alternative institutional options [51].

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 labeling 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 [52–57]. 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. 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.*

The findings from social science research on transnational and national labeling 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. Furthermore, 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 private measures, and involvement in monitoring their broader sustainability effects* [58–64]. *Also international organizations can play a powerful role in catalyzing and steering novel and more effective forms of private and public-private governance* [65,66].

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, 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* [67].

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 [68,69]. *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* [61,62,70–73].

In sum, new types of global governance involving a range of actors from industry to environmentalist groups, multisectoral partnerships and cities, have grown significantly in the last two decades. Some benefits and successes of these new types of multi-stakeholder governance are discernible. However, given the enormous need for social innovation and public reform, it is unlikely that such mechanisms 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 it avoids being captured by powerful interests and instead focusses on problem amelioration. Yet even for this, it requires support and oversight from national governments.*

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 Organization for Standardization 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 [74,75]. For example, market actors may see governance legitimacy to lie pragmatically in its effectiveness [76,77], 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* [78].

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 [79], 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.

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 to 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* [80–85].

Address equity concerns within and among countries

In addition to increased accountability and legitimacy, a transformation of the institutional framework for sustainable development must also 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 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 [86]. Yet in the long term, the institutional framework for sustainable development must be built on compromises that all participants view as fair and legitimate. While the traditional dichotomy of 'North' and 'South' may be less relevant today, it is obvious that extremely high consumption levels in industrialized countries and in some parts of the emerging economies require special and urgent action [87,88], 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 more efforts in mobilizing resources for sustainable development [89]. 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. *Overall, strong financial support for poorer countries is essential, 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 contribute to addressing this challenge [90].

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 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*.

Prepare global governance for a warmer world

A final area where transformative change in global governance is needed is adaptation. 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 [94–96]. 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 [100–102]. 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 [105–107].

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*.

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 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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