Enhancing Science-Policy Links for Global Sustainability

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STAKEHOLDER FORUM

ABOUT SDG2012

Sdg2012 is Stakeholder Forum's Programme on Sustainable Development Governance towards the UN Conference on Sustainable Development in 2012 (UNCSD), also known as 'Rio+20' and 'Earth Summit 2012'. The programme consists of the following activities:

- **Thought Leadership** – writing and commissioning think pieces on issues relating to sustainable development governance, to stimulate and inform discussion on this issue towards Rio+20
- **Sustainable Development Governance 2012 Network (SDG2012 Network)** – co-ordinating a multi-stakeholder network of experts to produce and peer review think pieces, discuss and exchange on issues relating to the institutional framework for sustainable development, and align with policy positions where appropriate
- **Information and Resources** – publishing informative guides and briefings and hosting an online clearing-house of information and updates on international environmental and sustainable development governance – 'SDG dossier'
- **Submissions** – making official submissions to the Rio+20 process based on think pieces and dialogue.

ABOUT STAKEHOLDER FORUM

Stakeholder Forum is an international organisation working to advance sustainable development and promote stakeholder democracy at a global level. Our work aims to enhance open, accountable and participatory international decision-making on sustainable development.

Stakeholder Forum works across four key areas: Global Policy and Advocacy; Stakeholder Engagement; Media and Communications; and Capacity Building. Our SDG2012 programme sits within our work on Global Policy and Advocacy.

MORE INFORMATION

If you would like to provide feedback on this paper, get involved in Stakeholder Forum's SDG2012 programme, or put yourself forward to write a paper, please contact Hannah Stoddart, Head of Policy and Advocacy at Stakeholder Forum – hstoddart@stakeholderforum.org

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INTRODUCTION

Policy setting and implementation should be based on the best available knowledge. There should thus be an intimate connection between the scientific and policy making communities. Such a connection will help make research and scientific information more policy-relevant, and policy development and implementation more science based.

Efforts to improve the institutional framework for sustainable development at all levels, and international environmental governance institutions, must include strengthening of science-policy links, as existing and new institutions require access to the best scientific knowledge available. This includes knowledge in the social and economic sciences, as well as interaction with research communities worldwide.

CONTEXT

Sustainable development is probably the most daunting challenge that humanity has ever faced, requiring that fundamental issues be addressed immediately at the local, regional and global levels. At all scales, scientific knowledge and appropriate technologies are central to resolving the economic, social and environmental problems that make current development paths unsustainable. Providing a more equitable and sustainable future for all requires novel integrated approaches that fully incorporate existing and new scientific knowledge.

Science has now accumulated clear evidence of how the Earth System is changing and a good understanding of how those changes will affect society and human well-being. A recent report summarizing the state of knowledge, prepared by research communities for the International Council for Science (ICSU), concluded that 'humanity has reached a point in history at which a prerequisite for development – the continued functioning of the Earth System as we know it – is at risk. Without fundamental changes in the human drivers affecting the Earth System, and without actions to enhance the resilience and decrease the vulnerability of human communities, it is now clear that changes in climate, hydrological cycles, food systems, sea level, biodiversity, ecosystem services and other areas will lead to massive human suffering. If unchecked or unmitigated, these changes will retard or reverse progress towards broadly shared economic, social and environmental goals.'

However, despite this clear scientific evidence, the implementation of sustainable development has to a large extent failed so far, and there often seems to be a lack of urgency among policy makers when addressing sustainable development issues. There appears to be a serious disconnect between scientific knowledge and the way that policy is formulated, leading to calls for improvements in the science-policy interface. However, there is also rarely a good understanding of what this interface is, let alone how it could be improved.

In this paper we will therefore seek to explain the current science-policy interface, with examples drawn from interface processes mainly at the global level, and we will investigate the

criteria that are needed to ensure a successful science-policy interaction. We will then outline the main actions that need to be taken for improving the science-policy interface.

MECHANISMS FOR SCIENCE AND POLICY INTERACTION

Scientific advice to existing international environmental conventions and international agreements at the global level is mainly provided through two types of mechanisms: (i) scientific assessments, and (ii) scientific advisory bodies. The objective of international scientific assessments is to establish the-state-of-the-art knowledge on a given problem and its future risks. In order to enhance their policy relevance, most assessments related to conventions have also been called to include assessments of options for action strategies. An assessment has a final product which is its report. An assessment needs to be repeated or updated periodically, in order to reflect the development of the problem and its impact on society, as well as evolutions in scientific knowledge. The best known example is the series of assessment reports prepared regularly by the Intergovernmental Panel on Climate Change (IPCC).

Scientific advisory bodies represent a second modality of science-policy interaction. Best examples of scientific advisory bodies to global intergovernmental processes are the Subsidiary Bodies on Scientific, Technical and Technological Advice (SBSTTAs), established by the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD) and the Convention to Combat Desertification (UNCCD), and the Subsidiary Body on Scientific and Technological Advice (SBSTA), established by the COP to the Framework Convention on Climate Change (UNFCCC). The aim of these advisory bodies is to provide, on a continuing basis, scientific and technical advice for the implementation of a convention. These advisory bodies set their agenda in accordance with the programme of work decided by the international oversight body for the implementation of a convention (i.e. the Conference of the Parties).

Ideally, these two types of mechanism for providing scientific advice should be established, as appropriate, for strengthening science-policy links at all levels and for all policy domains related to sustainable development. The overriding goal for both mechanisms should be to provide independent, policy relevant scientific advice, based on the best available scientific knowledge. Both mechanisms require that a critical number of scientists reach a consensus on the scientific knowledge and related issues at hand, to provide coherent scientific advice to policy makers.

These two mechanisms are not the only ways in which scientific information enters and influences policy processes. Some governments, international organizations inside and outside the UN system, as well as business corporations, have established positions of chief science advisors. Moreover, formats such as policy briefs, white papers, and side events at major intergovernmental conferences are all secondary mechanisms used to communicate scientific research to policy makers, which run alongside the major mechanisms of advisory bodies and assessments. Meanwhile, the media, and its impact on public opinion, also greatly influences the scientific understanding and priorities of policy-makers.

CRITERIA FOR GOOD 'SCIENCE FOR POLICY'

There are a number of criteria that science must fulfil if it is to be integral to policy making, whether at national, regional or global levels:

- Scientific quality and credibility
- Policy relevance and coherence
- Legitimacy in a political context

Scientific quality and credibility

In order for the science-policy interface process to be scientifically credible, it must integrate a truly scientific exercise, involving some of the best available scientific experts on the subject, and including an independent peer review process. While not compromising on scientific excellence and independence, the scientific exercise must be open and transparent, involving scientists coming from all relevant domains of science. For science-policy processes at the international level, credibility will also depend on the involvement of scientists from all or a good number of those countries which will be users of the scientific information and science advice. Processes at the global level require the participation of scientists from all parts of the world, developing and developed countries alike. Particular attention should be paid to developing countries and countries in transition that without help may be prevented from participation by financial constraints or a lack of national experts.

Another key feature of scientific credibility is the independence of the scientists and scientific institutions involved. Scientists must feel free to present the scientific information available, free from bias, and they must not have any conflict of interest or loyalty with positions taken by different stakeholders, including governments or political groups. This may be a difficult balance, as at the same time it is necessary for close interaction between policy-makers and scientists at all stages of the process, from agenda setting through to final formulation of policy options.

Of the two types of science-policy interactions in support of international intergovernmental policy fora, scientific assessments may do better at achieving independence for scientists. Most of the work for preparing global assessment reports, such as the reports of the IPCC, is generally carried out in working groups and through a process which is to a large extent driven by the scientific community itself. While governments are invited to nominate scientists to the assessment panels, including for the working groups, additional nominations of scientists to be involved as independent resource persons and scientific reviewers is generally accepted by the intergovernmental governance of these processes.

The advisory bodies to the conventions, meanwhile, may have a more ambiguous position in terms of independence of the scientific advice given, as these bodies conduct their work in meetings with open-ended participation of experts who are sent by governments that are Parties to the Convention. Most scientists participating in the work of these advisory bodies will

normally feel free to give the scientific advice they deem correct and necessary. However, on issues which are delicate because of policy positions taken by their government, it cannot be discounted that individual scientists may 'hold back' or even that some governments may exert some undue influence on 'their' experts. This then also impacts on perceived scientific credibility. One way to improve this situation could be to include a significant number of leading scientific experts who are nominated by the international scientific community. These scientists, chosen on scientific merit only, would need to be given the same status as government nominated experts, but they would not be accountable to their respective national government. At present, international non-governmental scientific participants are invited as observers only to the meetings of these advisory bodies.

Policy relevance and coherence

Policy relevance can best be ensured through a consensus process between scientific experts, governmental policy makers and other stakeholders. The participation of major civil society actors and the private sector (i.e. Major Groups) is a critical element for successful policy development. As a first step, needs and key questions should be jointly identified from a policy perspective. Preliminary findings should also be reviewed jointly by scientists involved in the assessment, governmental policy experts and other stakeholders. Similarly, the policy relevant conclusions, often in the form of policy options, should be drawn through this consensus process.

Policy makers and practitioners require integrated interdisciplinary information across the natural, social, health and engineering sciences, and integrated scientific advice cutting across environmental, economic and equity problems. Only by presenting existing scientific knowledge in a holistic manner, can science help to develop policy coherence across sectors and the three pillars of sustainable development.

In order to maintain policy relevance, continuing commitment from the scientific community is required so that science incorporates new knowledge, new issues, or new policy needs. Being flexible and able to respond quickly to new challenges will also help to maintain the relevance of an advisory body, while assessments should be updated regularly to maintain their value.

Legitimacy in a political context and trust

Legitimacy at the global level requires that the scientific organizations or the scientific advisory mechanisms involved are (i) representative of the scientific community the world over; (ii) preferably have already some track record of providing scientific advice to policy making bodies; and (iii) the functioning of the organization and/or the process is fully transparent.

Making participation in intergovernmental science-policy processes open, inclusive and geographically balanced is indispensable for ensuring a politically legitimate 'product'. Only on this basis will it be possible to find consensus between governments from all parts of the world, developing and developed countries, on policy development and implementation. Inclusion of major civil society actors and the private sector will significantly enhance political legitimacy and ensure greater transparency for these processes.

The types of open and inclusive processes described above, with dialogue between all actors,

are essential for generating trust and understanding. Good communication by scientists about the processes behind their work and the strengths and limitations of the knowledge with which they are working, is also crucial.

DEALING WITH UNCERTAINTY

Despite great progress in scientific understanding of environmental change, some uncertainty will always be an unavoidable feature of scientific research. This is often used as an excuse for not developing rigorous policies and taking action. However, progress should be made despite scientific uncertainty.

During a scientific assessment, the scientific community should document, for non-specialists, what is established knowledge, as agreed upon by the vast majority of leading scientific specialists in the field, and what are the gaps in knowledge, including the scientific questions on which there are still competing views. Where gaps exist, the scientists should present the scope of scientific hypotheses and define the level of uncertainty. Very importantly, the scientific experts must also assess the likely consequences of taking no action, in comparison to taking action despite some scientific uncertainty. This must then be communicated openly and effectively to both policy makers and the general public, in a balanced way that does not undermine the credibility of the science being presented.

Much has been made of diverging views among scientists, often by some sections of the media in relation to highly visible issues such as climate change. Naturally there are some scientists who continue to affirm divergent views even after the vast majority of leading scientific specialists in a given field have agreed on a joint statement on what is known at present and what is not yet known. From a policy-maker's perspective these continuing dissonances can seem troublesome. But policy-makers need to decide how much weight they want to give to these few divergent views in comparison to an international effort by the scientific community to reach consensus during a large-scale peer reviewed scientific assessment.

In 1992, the international community agreed at the United Nations Conference on Environment and Development in Rio de Janeiro that the only responsible way to deal with scientific uncertainty is to follow a precautionary approach. Consequently, Principle 15 of the Rio Declaration reads: *In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.* This was founded on a recognition that sufficient scientific evidence exists to call for urgent action, despite continuing uncertainties. In the case of existing environmental conventions and international agreements the principle of a precautionary approach has been agreed upon consistently. However, despite this, the precautionary approach is often not implemented in a satisfactory manner, a problem of non-compliance with international law.

With the information from a scientific assessment, policy-makers should therefore develop

rigorous 'precautionary' policy responses to scientific uncertainty on an issue by issue basis. To this end, scientists and policy makers, and other stakeholders, must debate risk assessment and risk management, and the tools available to manage the risk.

EXAMPLES OF BEST PRACTICE

Ozone depletion

The process that led to the signing of the 1987 Montreal Protocol on Substances That Deplete the Ozone Layer is perhaps one of the best examples of a science-policy interaction. An agreement was reached that accepted immediate negative impacts on the economies of numerous countries, in favour of long term gains for the environment and humanity. This was achieved in the face of considerable scientific uncertainty about the magnitude of the problem and the timescales involved, and a lack of conclusive evidence that damage to the ozone layer was in fact occurring due to the release of CFCs.

A number of factors can be attributed to this success. The scientific community was brought together in a coordinated fashion to carry out the necessary research and build a credible consensus. This consensus acknowledged fundamental uncertainties, and risk assessments of different courses of action were presented in a realistic manner. Scientists became fully engaged with the policy process, taking the floor in intergovernmental discussions. Meanwhile, policy makers funded the necessary research, were receptive to the data and conclusions, and applied the precautionary principle when balancing uncertain, distant but potentially catastrophic dangers against short term economic problems. In order to embrace scientific uncertainty and respond to evolving conditions, the protocol was designed as a flexible and dynamic instrument that can be adapted through periodic scientific, economic and technological assessments. It has thus been amended four times since being signed.

Public involvement and interest were also very important. The scientific findings were disseminated to the public in an accessible and coherent fashion, generating public interest and awareness that in turn generated political will and involvement. The media played a key role in this process, informing the public and keeping the issue in the public domain over a long period of time.

Industry and citizen's groups also played a vital role, often taking opposing sides. Environmental groups warned the public of the problem and promoted ozone research, while industry also tried to influence public opinion on the need to act. Ultimately, the technological solutions needed depended on industrial cooperation and research, and this was achieved through engagement and discussion.

Climate change and the IPCC

The issue of climate change is similar in nature to ozone depletion, in that an initially obscure problem identified by the scientific community has become a central issue for policy makers and the public. It also holds the same issues of balancing long-term uncertain risk against short

term economic implications. However, if anything, the science behind climate change is more comprehensive and compelling than it was for ozone. Yet the subject has also generated a great deal more controversy.

Through numerous activities since the 1960s, particularly the major World Climate Conferences, the scientific community came together to reach a general consensus on climate change, and then began to bring climate science into the political and public arena. This process led to the creation of the World Climate Programme and the World Climate Research Programme (WCRP) and also led to the creation of the Intergovernmental Panel on Climate Change (IPCC) in 1988, and the establishment of the UN Framework Convention on Climate Change, signed by 154 states at the 1992 Rio 'Earth Summit' on Environment and Development. Nonetheless, the process has highlighted the difficulties in getting political agreement on how to deal with the problems highlighted by science.

The Intergovernmental Panel on Climate Change is today perhaps one of the best examples of a body which combines full scientific credibility with full policy relevance and high political legitimacy. The plenary of IPCC, with government nominated experts, is in charge of formulating the policy relevant questions and of drawing the policy relevant conclusions. The actual scientific assessments are carried out in working groups through a process which is primarily driven by the scientific community itself. While governments are invited to nominate scientists for the working groups, nominations of scientists to be involved as independent resource persons and scientific reviewers is generally supported at the intergovernmental level. Also in the case of the IPCC, the Panel has consistently made great efforts to involve all leading scientists, also those with views diverging from the 'main stream' consensus. In this way, scientific uncertainty and debate is openly acknowledged within the process.

Recent events connected to climate change science provide valuable lessons on transparency and the loss of trust. While it was concluded that the leaked emails from the University of East Anglia did not represent active attempts to manipulate data on the part of a small number of climate scientists, the issue showed very clearly that without transparency and openness the scientific process is open to accusations of misinformation. This is especially true in an arena as heated and polarised as the climate change debate, where some media and climate sceptics are keen to highlight any perceived flaw in the argument. Even with scientists increasingly called on to advocate for action in light of their findings, the findings themselves must be clearly seen to have been collected through an objective and dispassionate process. This can be a difficult balance to achieve.

Biological Diversity and Ecosystem Services

In December 2010, the international community agreed on the establishment of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). In fact, this represents a new science-policy interface platform on the pressing issue of accelerating declines and degradation of the natural world. IPBES is tasked with bridging the gulf between the wealth of scientific knowledge on the problems and the decisive government action required to reverse these damaging trends. What the IPCC is for the UNFCC, IPBES should become for the Convention on Biological Diversity (CBD). Only time will tell if IPBES will qualify as an example of best practice.

WAYS FORWARD

Define expectations
As advisory processes are highly diverse, evolve over time, include different modalities and focus on increasingly complex issues, there is a need for clear expectations to be established and stated from the outset, by both policy makers and scientists. These should be clear, yet also flexible to allow for evolution.

Dialogue
Dialogue between scientists and policy makers is crucial, in order for scientists to provide policy relevant advice. The case of the IPCC shows that there can be close interaction with policy makers throughout the scientific process, without compromising on the independence of scientists.

Education
Science education is of vital importance for the science-policy process. This has three different focuses. The first is to educate the public and policy makers about scientific processes and scientific findings, so that they will be more engaged and interested in the entire process of scientific research, and will feel more able to draw their own conclusions from scientific research rather than feeling that they must rely solely on the conclusions of experts. The second is to train new scientists, through improving education and capacity-building. Enhanced science teaching at both the primary and secondary levels is central to scientific and technological capacity-building and to a better public understanding of sustainable development issues. The third focus is to educate scientists on how to effectively communicate their findings, the importance of the science-policy interface, and the different ways in which they can engage with and influence the science-policy process.

Capacity building
Scientific advisory processes can also be used as an opportunity for capacity building in the science community, particularly in developing countries. As efforts are made to define research problems and provide funding for needed research into an issue, attention should also be paid to training new scientists to work on these issues.

Duplication
Duplication of efforts continues to be a problem, particularly for the different environmental conventions. This could be avoided by greater communication and cooperation between these bodies. If possible, a more integrated approach should be taken from the outset, with full scoping of existing and similar efforts before a new mechanism is established.

RECOMMENDATIONS FOR SCIENCE

Communication and engagement

A major challenge for science continues to be the communication of scientific research. Scientific research needs to be communicated clearly and succinctly, in language that can be understood by non-experts. This must include the explanation of levels of uncertainty and limitations to methodologies, so that the science process is transparent and easily understood. Engagement and collaboration with policy makers and civil society is essential at all stages of scientific research processes, from defining research agendas to explaining results and formulating policy options. Learning to work effectively with the media would be a great advantage.

Visioning

ICSU and the International Social Science Council (ISSC) have carried out a consultative 'visioning process' with researchers and users of research from across the world, to rethink the focus and framework of Earth system research for global sustainability. This has resulted in a consensus list of priorities for action: five 'Grand Challenges'. These Grand Challenges provide an overarching interdisciplinary framework for mobilising global research efforts now and into the future, and form the basis for the proposed launch of a new decadal research initiative on 'Earth System Science for Global Sustainability'.

Integration

The complex and interlinked challenges of the social, economic and environmental pillars of sustainable development require a truly transdisciplinary approach to scientific research, with all disciplines across the natural, social, economic and engineering sciences involved from the outset in setting research agendas. While a great deal of progress has been made on this front, traditional disciplinary boundaries remain ingrained into institutions and educational processes. Furthermore, more multinational cooperation and collaboration is needed to make full use of existing capacities, reduce duplication of efforts and tackle pressing transboundary and global issues.

Credibility, trust, legitimacy, relevance and coherence

These are the essential elements of the science-policy interface process. They can be improved through: a rigorous peer review exercise; science education for greater awareness of scientific processes; better communication of research processes and results; engagement at all levels with policy makers and society; focusing on research that is clearly practical, useful and responsive to societal and political needs; and building inclusive, open and transparent processes.

RECOMMENDATIONS FOR POLICY AND DEVELOPMENT

Recognise the urgent need for action on sustainable development
There is a need to initiate fundamental shifts from an exclusively growth oriented economic system – based on fossil fuels and depletion of natural capital – to a truly 'green economy'. We must have a strong vision of a sustainable future for humanity with solid economic, social and environmental pillars receiving balanced attention. Good policies for sustainable development will require the best possible science, which needs to be supported in turn by policy makers. Rio+20 represents a great opportunity for policy makers to agree on this type of strong vision.

Engagement with scientists
It is essential that policy makers engage further with scientists about the issues crucial to sustainable development. Policies for sustainable development should be made in close collaboration with scientists, and research processes need to have policy engagement at their very inception and onwards. This is essential for policy relevance, the legitimacy of the process and its outcome, and scientific credibility.

Engagement of other stakeholders
Inclusion of major civil society actors and the private sector will significantly enhance political legitimacy and ensure greater transparency for these processes. It will also help the policies formulated to be relevant and applicable to real-world situations.

Uncertainty and the precautionary principle
Policy makers need to fulfil the commitment to 'precautionary' policy as laid out in Agenda 21. Long term catastrophic risk must be balanced against short term economic implications, and close cooperation between scientists and policy makers, and other stakeholders, is essential in this policy debate. There is enough scientific evidence to call for immediate urgent action, and remaining scientific uncertainties can not be taken as a reason to stall on making strong policies for sustainable development.

Funding mechanisms
Present funding mechanisms can be dislocated and do not form a coherent plan of action for the science community. Funding should be made available for large-scale interdisciplinary, problem-orientated research activities that directly address issues of relevance to sustainable development. Funding should also be made available for research that focuses on science-policy interactions. Observing systems such as the Global Observing Systems should also receive greater support, as these provide the data on status and trends necessary to follow environmental change, without which the information base on which scientific advice rests may become progressively weaker, or may rely on out of date information. Funding is also needed for training scientists at all levels of the education system, particularly in developing countries.

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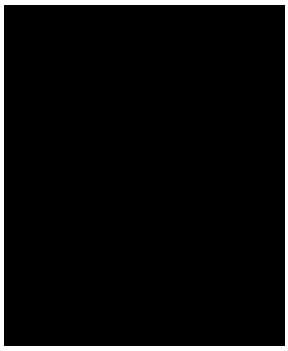

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