

## 2. Global environmental change changes everything

### Key messages and recommendations

by  
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*Drawn from the more than 150 authors in the World Social Science Report 2013, the key messages and recommendations call for a new kind of social science – one that is bolder, better, bigger, different. There is a need to reframe global environmental change as a social process, infuse social science insights into problem-solving processes, encourage more social scientists to address global environmental change directly, and change the way the social sciences think about and do science to help meet the interdisciplinary and cross-sector changes society faces.*

*“The fact is that, with the ecological crisis, we are trapped in a dual excess: we have an excessive fascination for the inertia of the existing socio-technical systems and an excessive fascination for the total, global and radical nature of the changes that need to be made. The result is a frenetic snails’ race. An apocalypse in slow motion. Changing trajectories means more than a mere apocalypse and is more demanding than a mere revolution. But where are the passions for such changes?” (Latour, 2010)*

We live in extraordinary times. The environmental challenges that confront society are unprecedented and staggering in their scope, pace and complexity. Planetary and social crises are converging. Knowledge of their interactions is often uncertain and incomplete, and our responses are incomplete at best. While these immense problems may in fact only ever be addressed piecemeal through partial, incremental and adaptive solutions, there are growing calls for grand solutions. These calls emerge from growing anxiety, social discontent, and distrust of precisely those institutions previously entrusted with managing the affairs of society: governments, businesses, organised religion, and indeed science and technology.

This paradoxical situation defines today’s global environment for science. It is a time of urgency and of unrelenting pressure on scientists to make a difference: to provide better understanding and more precise predictions of the challenges societies face, and to accelerate the delivery of relevant, credible and legitimate knowledge that can inform solutions to the world’s accumulating sustainability crises. Yet at the same time, many

view traditional ivory tower science, defined and practised by discipline, as unable to assist with these daunting tasks. Business as usual science is increasingly distrusted and questioned even by scientists themselves. So not only are there ever-louder calls for science to help with real-world problem solving, there is also a demand for science itself to change.

The reality that emerges from the *World Social Science Report 2013* is that global environmental change changes everything. It is the “elephant in the room” that can no longer be overlooked. Global environmental change changes our life support systems, the very basis of life humans depend on. In myriad and differentiated ways, it affects our chances of survival, our livelihoods, ways of life, actions and interactions. It changes everything for those of us making decisions that affect the human-made and natural environment, and for those of us trying to understand, scientifically or not, the profound changes unfolding around us.

### **Transformative knowledge for global sustainability: A new charter for the social sciences**

This call on science to make a difference, to help solve global problems, speaks to the social sciences no less than it does to the natural, physical, human or engineering sciences. The concrete environmental challenges that societies face – water scarcity, the loss of biodiversity, the transition to a low-carbon society, food security, or greater preparedness for extreme events – are shared challenges, requiring joint scientific effort and priority setting. Today’s increasing emphasis on the need for integrated science repeatedly stresses the critical importance of bringing the social sciences more fully on board. Social science knowledge is being recognised as indispensable knowledge. The causes of global environmental change are partly or mainly social; the consequences of such changes affect human lives, livelihoods and well-being, and interventions aimed at addressing them will create complex processes of societal transformation that require further study. Clearly, “progress in understanding and addressing both global environmental change and sustainable development requires better integration of social science research” (Reid et al., 2010).

But what kind of social science is needed? The “transformative cornerstones” framework developed by the International Social Science Council (ISSC) (Hackmann and St. Clair, 2012) articulates the unique contributions that the social sciences – theoretical and empirical, quantitative and qualitative, basic and applied – must now make to the issues at hand. The framework identifies a set of fundamental social science questions that, if answered, should increase society’s understanding of the causes, consequences and responses to the problems of environmental change and sustainability, and help to ensure that decision-makers in all sectors, and ranging in scale from the international arena to local communities, find more effective, legitimate and durable solutions to these problems (see the introduction to this Report for an overview of the transformative cornerstones).

The *World Social Science Report 2013* builds on this framework by providing examples of social science work on different environmental challenges for each cornerstone, from different parts of the world and from different disciplines. It does not present a comprehensive review of social science research on global environmental change, nor does it cover the full spectrum of challenges confronting societies in different regions of the world. Instead it shows examples of social science research that examines, understands and interprets global environmental change, climate change and transitions to sustainability.

It explains them as fundamentally social processes taking place within complex social-ecological systems.

For many, the need to work within the transformative cornerstones framework to view global environmental change and sustainability through the social lens is already a central and self-evident necessity. For many others, however, this shift in perspective remains difficult. Many in the social sciences still consider environmental issues – even those that threaten the very foundation of modern society – as marginal to the core of their disciplines. Others prefer to stay away from what they see as policy-relevant and sometimes politicised issues and subjects, and even criticise colleagues who choose practical engagement in and through their work. Sometimes those criticisms are indeed pertinent; the involvement of researchers in policy and practice necessitates constant reflection and critical self-awareness of their role as experts influencing opinions and outcomes. This self-awareness and reflexivity are not always a given. Meanwhile, many in the physical, natural and engineering sciences still cannot see the importance of social science insights to real-world solutions. And many decision-makers either do not know what the social sciences could bring, or conversely, hold unrealistically high expectations of what they should be able to deliver.

So what is needed? Social scientists and their advocates need to explain why a social science perspective on environmental issues matters, how environmental change and sustainability are deeply and fundamentally social, and what social science brings to the search for solutions. Social scientists working on environmental issues need to engage much more with social scientists whose work in the mainstream disciplines is relevant to the field yet remains untapped. Social scientists must also show the difference that their science can make. They are responsible for contributing social science that helps shape novel solutions, or which makes existing solutions more effective, fairer and more durable. And social science research systems around the world need to grow their strengths. This involves growing in numbers and capabilities to build a more engaged and effective workforce, which in turn can bring the crucial social science perspective to the understanding and management of environmental problems and sustainability challenges.

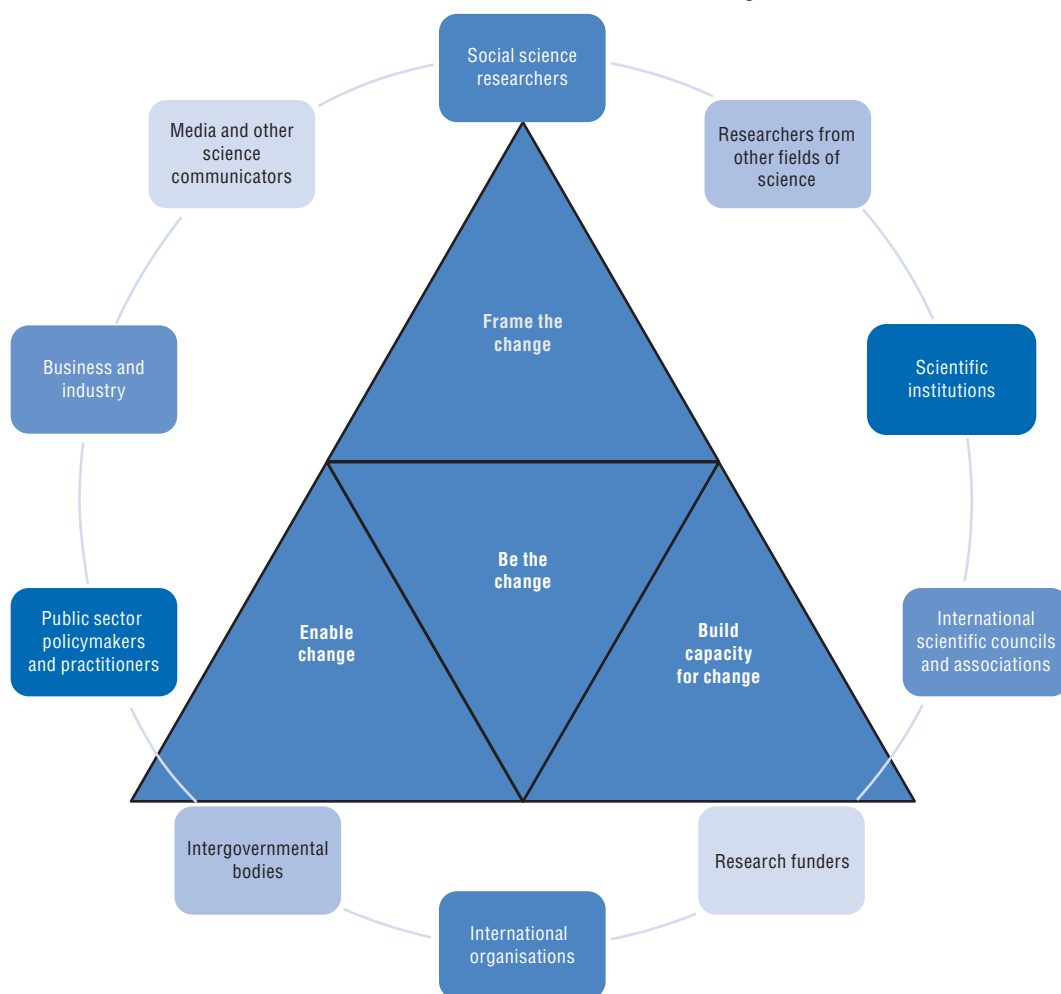
**What is needed, in other words, is a new kind of social science, one that is bolder, better, bigger and different.** This does not mean that the well-honed traditions of classic social science research are no longer needed; on the contrary, such social science will continue to provide an important knowledge-creating function that moves forward our fundamental understanding and ways of thinking. But when it comes to tackling environmental change and sustainability, those working in this tradition should feed into and be complemented by a social science that is:

- **bold** enough to reframe and reinterpret global environmental change as a fundamentally social process
- **better** at infusing social science insights into real-world problem solving
- **bigger**, in terms of having more social scientists to work on addressing head on the challenges of the Anthropocene era
- **different**, in the sense of reflecting upon and changing its own ways of thinking and doing science – its theories, assumptions, methodologies, institutions, norms and incentives – in order to contribute effectively to meeting the vexing interdisciplinary and cross-sector challenges that society faces.

**The Report issues an urgent call to action to the social sciences, and to their supporters, funders, collaborators and users, to make such a bolder, better, bigger and different social science a reality**

The call is detailed in four key messages that have been crystallised out of the Report's many and varied contributions. In setting out each key message, this section highlights selected findings from the Report to demonstrate how the social sciences are contributing, and in some cases to challenge them to step up to the plate more fully. Each key message comes with a set of high-priority actions for social scientists and the stakeholders in social science to take up in response to each call.

**Figure 2.1. The four main messages of the World Social Science Report 2013 and the stakeholder communities to whom they are addressed**



### Frame the change

For the past few decades, the physical, natural, and later the economic sciences have led the way in detecting, diagnosing and framing the challenges and solutions for every type of global environmental change. They have provided a particular lens through which to view and understand the problem, and have shaped the ways in which policymakers and society at large think about its causes, consequences and solutions. The reasons are

at once methodological, epistemological and ontological, and as such are deeply historical and cultural. Yet framing global environmental change as matters of physics, molecules and species, or of unimaginably large or imperceptibly small quantities of far-away or invisible substances, provides a limited perspective that does not capture most people's imagination or attention. Such frames obscure the social, economic, political, cultural and ethical nature of the issues at hand. They obscure the role of people, behaviours, practices and institutions. And they limit which analyses and solutions are deemed possible and relevant (Connell, 2011). For example, social frames of environmental and sustainability issues might point as much to problematic governance, economic injustice, political disenfranchisement, destructive behaviours and social norms as positive levers of change, in addition to the technological solutions that are often sought. Inevitably such reframing involves and makes visible the normative judgements involved in all forms of interpretation and sense-making, and itself becomes an instance of social negotiation among all those involved.

### ***The social sciences must help to fundamentally reframe climate and global environmental change from a physical into a social problem***

Authors in this Report find repeatedly that problems such as biodiversity loss, climate change and changing nutrient cycles cannot fully be grasped without understanding the human drivers of change. Nor can the importance of such problems be judged without understanding what they mean for people and in what contexts they unfold. Sustainability challenges, including the eradication of poverty, cannot be solved without understanding human aspirations, institutional constraints, social conflicts, value choices or power dynamics (and vice versa). The resilience or collapse of systems cannot be understood by measuring temperature increases, predicting earthquakes or tracking tropical storms alone. Regional differences in economic stagnation or development are not adequately explained by climate conditions, the number of species or the quantity of natural resources. Statements about the planet's finite resources will not lead to reduced consumption or to a more equitable distribution of resources without a better understanding of how to transform international markets, more equitable access to them, and a fairer distribution of finite resources. A policy or technology cannot be valued without understanding its social impacts and uses. And technology does not exist in an economic, policy or social vacuum. Indeed, the introduction of new technologies without an understanding of their sociocultural contexts, social consequences and possible risks is at the heart of the troubles society now finds itself in.

A bold first step which many social scientists are now taking is to claim the space of the problem framers. This involves understanding how climate and environmental changes have come about, what they mean for people, and what people can do about them (Box 2.1 below). Causes, vulnerabilities, impacts and solutions are human; they are embedded in institutions, market structures, behavioural norms, social relationships and practices, which enable and constrain the action space for change. This is the focus the social sciences bring.

Beyond the overarching frame of climate and environmental change as a social problem, there will be a multitude of more specific framings. Climate change might be framed, for example, as a symptom of a dysfunctional society; global environmental change as the unprecedented rise of a single species affecting the entire planet; biodiversity loss and resource depletion as a market failure (in other words, as inadequately internalised costs of the human use of the environment); and global change as an opportunity for fundamental transformation and creative innovation. For social scientists, claiming the right to frame these issues through a social lens will involve transdisciplinary approaches that engage

### Box 2.1. Framing the change

Selected examples from the Report show how the social sciences can change perspectives on, questions about, and understandings of global environmental change.

- Social sciences reveal the complex ways in which global environmental change and other social crises including poverty are deeply interconnected, and cannot be understood or addressed separately from each other.
- Social boundaries of social-ecological systems, defined as the limits beyond which human well-being is endangered, complement the notion of planetary boundaries, the maximum amount of pressure humanity can place on critical Earth systems. Together they define a “safe and just space” within which humanity can thrive.
- Visions and visioning are essential tools to frame hopeful, possible, feasible futures, and counteract despair and fatalism. If placed in constructive tension with visions of plausible but darker futures, and accompanied by persuasive measures, they can inspire and move society in a positive direction.
- The humanities and the arts are essential in exploring what it means to be human in the Anthropocene. Communicators and cultural builders can be particularly effective in reframing climate change as a cultural challenge, and in offering critical reflections on the human condition.
- Anthropology and other social science disciplines offer a holistic, long-term perspective on the human story, and an awareness of the importance of local, cultural knowledge as a resource for sustainable living and for climate change mitigation and adaptation.
- As with many resource scarcity issues, social scientists reveal how such crises are fundamentally matters of governance and fairness. The water crisis, for example, has been unmasked as a governance crisis. The most essential features of good water governance are polycentric governance structures, effective legal frameworks, the reduction of inequality, open access to information, and meaningful stakeholder participation.

with stakeholders, decision-makers and other scientists. This approach will allow them to show that this refocusing makes broader and more effective solutions possible, and will ensure that the implications of global environmental change are meaningful to affected communities.

#### Priority action steps

Several priority action steps would help support the move toward framing global environmental change and the difficult path to sustainability as a complex and demanding social process.

- The broader social science community, including researchers, the institutions in which they work, international scientific councils and associations, and research funders, should promote the understanding that global environmental change is a priority domain *par excellence* of the social sciences, and thus, that more social science, and more integrated (multidisciplinary and interdisciplinary) research that includes the social sciences is required.
- Social scientists in academic institutions, civil society organisations, government or business should respond proactively to the ever-growing demand for social science knowledge on global change and sustainability, and take the lead in deepening the understanding of global environmental change as a social problem requiring social responses. This is also a call to those social scientists who may not label their research as being about the environment, but who are nevertheless doing work on cultural

systems and institutions, behavioural change, social transformations, decision-making, or science–society relations, that is relevant to the field.

- Social scientists need to develop new and modify existing concepts, tools and methods to better understand the dynamics of complex social-ecological systems, and reveal the connections between environmental, sociopolitical, economic and cultural vulnerabilities and crises.
- Everyone concerned with designing and delivering research agendas, programmes and projects, including funders, scientific institutions, international councils and associations and research teams, needs to ensure that social scientists are included from the beginning. They are needed to identify socio-environmental priorities and hotspots and to ensure the success of a solutions-oriented, integrated science of global change for sustainability.
- Decision-makers at all levels, in the public and private sectors, international and intergovernmental organisations, and civil society organisations, should prioritise the appointment of social scientists from across all disciplines (not only from economics and geography) to scientific advisory bodies, expert committees and working groups intended to provide counsel on global environmental change and policy options for responding to it.

### **Enable change**

The pace of global environmental change is rapid and accelerating, yet societal responses remain sluggish. Sustainability has become a household word, an industry, and yet most global-scale environmental, social and even economic indicators point to a society stuck on an unsustainable pathway. Path-dependencies in large-scale socio-technical systems, policy lock-ins, behavioural habits, social norms and engrained power structures, all have their role in making it so, mirroring the unforgiving lags in the Earth system.

Many of the articles in this Report suggest a widening disconnect between the pace with which environmental conditions worsen and that with which society tries to slow, halt and reverse these trends, or attempts to keep up with them in preparing for a radically different, more dynamic and less predictable world. Many call for this gap to be closed. The social sciences can and must respond to this call through solutions-oriented research.

### ***A solutions-oriented social science would help society to rethink the shape and course of social systems, to contest them, to connect disparate insights on levers for change, and inform and provoke action for deliberate transformation***

The contributions in this Report begin to point the way (Box 2.2 below). The social sciences reveal the range of forces and historical dynamics at play at different levels of social organisation that create vulnerabilities (Escobar, 2011). They help represent the voices of unheard groups and individuals, and offer social diagnoses of situations that account for the cognitive, affective, interpersonal, systemic and cultural dimensions of human behaviour. The social sciences dissect seemingly intractable political dilemmas and help discern how people make sense of the world around them. They inform behaviour change campaigns and help design effective educational and empowerment programmes. Social scientists also bring to light opportunities for engagement with youth, and ways to break vicious cycles of poverty, marginalisation and environmental degradation. In all of these instances, the social sciences perform a dual role, being a critical observer and independent messenger (in other words, providing explanatory knowledge) on the one hand, and participating in open knowledge arenas to co-design solution strategies together with research users (in other words, providing and testing solutions knowledge) on the other.

### Box 2.2. Enabling change

Selected examples from this Report show how social science insights can make a real difference in solving problems:

- Social science research on innovation and industrial transformation shows that developing countries do not have to follow conventional development trajectories, relying on heavy resource extraction and other outdated technologies. It also shows, however, how replacing old technology with new alternatives is not a panacea.
- Alternative development pathways require instead new conceptions of growth and prosperity, focused on more than material wealth. The social sciences help advance such ideas and show how globalised markets, free knowledge flows and effective governance will be critical in stimulating carbon-neutral, more sustainable development pathways.
- Alternative pathways to sustainability involve different actors, interests and values, and imply different winners and losers, opportunities and risks, choices and trade-offs. Social scientists have proposed three guiding principles to evaluate the consequences of different policy options within a “safe and just operating space”: *direction* – what and who drives action; *diversity* – the range of solutions available; and *distribution* – the equitable sharing of risks, burdens and resources.
- Social scientists reveal the deeply held values, beliefs and worldviews that underpin attitudes towards environmental problems, and towards the policies that address them. This enables policymakers to shape solutions that are more acceptable to those affected by them.
- Social science research is contributing to people’s capacity to anticipate the unknowable future through processes that expose the assumptions we bring to planning exercises and enable us to integrate complexity into our thinking, invent novel frames for thinking about the future and shift our understanding of the conditions of change.
- Economists can help design preferable and better policy mechanisms, by calibrating the costs and benefits of various policy and regulatory measures, by valuing environmental damage and the non-market values of nature, and by providing some perspective on the substitutability of different types of capital and resources on which human development and well-being depend.
- As members of social groups, networks, communities, societies and cultures, individuals are deeply embedded social actors. Their behaviours are influenced by many internal and external forces. Social science insights into why and how people change can be used by change programme designers to ensure that policy interventions are more effective.
- Social scientists have shown that education has a significant role to play in shaping the values of future generations, redirecting societal preferences and inclinations, and instilling the empowering skills to enact them.
- Social sciences document and enable the empowerment of disadvantaged people. For example, social scientists have traced how indigenous peoples in Colombia have become active, visible political actors in ecosystem and biodiversity conservation. In Southeast Asia, indigenous people are now politically and legally recognised along the Lower Mekong River. Communal education and awareness raising have helped mobilise people there to fight for their rights where dam-building damages the environment and undermines livelihoods.



This is not to say that social science interventions will always improve processes, or inevitably lead to better outcomes. Some contributions to this Report ring warning bells. Even when overall vulnerability to hazards is reduced, adaptation choices may not always be socially acceptable or culturally appropriate. Some may turn out to be maladaptive. Another example involves the adverse effects on farmers' adaptive capacities of well-intentioned but poorly conceived and managed communication and engagement between scientists and farmers. Such examples serve as important reminders to social scientists, engineers, weather forecasters, ecologists and public health experts alike: engagement with a world that is not neatly compartmentalised and predictable, but interconnected in complex ways across time and space, will entail uncertainties, surprises and ethical dilemmas. This makes working in open knowledge systems, and at the science–policy–practice interface, at once deeply challenging and rewarding.

Despite these challenges, many argue that social science engagement in real-world problem solving should go beyond what has been achieved to date, say, on recycling, conservation, and climate change mitigation and adaptation. In addressing global environmental change, social scientists should be leading the engagement with decision-makers more often than at present. While engineers and biologists, public health experts and hydrologists will continue to be needed, social scientists have to become central players, as knowledge producers and brokers, in the quest for solutions that work for people and the planet. They should not only study what is, but more boldly and actively help shape what can and will be, in full ethical awareness of the implications of their intervention.

### **Priority action steps**

Several priority action steps would help the social sciences to engage more effectively at the science–policy–practice interface to enable action and change.

- Together with their colleagues in the natural, engineering and human sciences, social scientists must find more effective ways of identifying strategic opportunities to align compelling research with knowledge needs in global change and sustainability. International scientific councils such as the ISSC, and organisations such as UNESCO, should combine their scientific and political convening powers more effectively to create and facilitate such opportunities.
- Social scientists should take on the challenge of getting involved in and leading research, development and demonstration projects and programmes that focus on social transformation and innovative sustainable development. Central to this is the engagement of social scientists in the design and assessment of new technologies, programmes and policies before implementation, to minimise the risk of unsustainable path-dependencies and maladaptation. This can be realised through their participation in research strategy development, placements in industry, and the creation of more social science positions in public sector agencies.
- Collaboration between scientists, policymakers and practitioners, community and business representatives, civil society organisations and the media throughout the research process is crucial to fostering a solutions-oriented social science. Existing efforts should be strengthened and scaled up. It will be important to find new ways for social scientists to become part of and support multi-actor, place-based learning networks addressing concrete global change and sustainability challenges. These processes

should be championed by international scientific councils and organisations, and need to be factored into the funding, management and evaluation practices of research funders and scientific institutions.

- Decision-makers engaged in evidence-based policy-making, whether in international organisations, intergovernmental bodies, or the public or private sectors, must recognise that information derived from natural science and economics contains many uncertainties, and is often based on flawed assumptions about people and societies. What counts as evidence must include context-sensitive and qualitative social science knowledge about the human world, including its cultural, socio-economic and intellectual diversity, as well as the psychological and spiritual significance of the more-than-human world to human well-being.
- Global systems of social science information monitoring, analysis and sharing must be developed and funded sustainably. This will require the joint efforts of scientific institutions, funders and international scientific councils and organisations. This will allow small-scale, place-based social science studies of people's experiences of and responses to environmental change to be used in national, regional and even global contexts for comparative research and policy purposes.

### **Build capacity for change**

Calls for the social sciences to help meet the challenges of global environmental change and social transformation do not ask only for the production of new knowledge. They also involve bringing existing knowledge into the decision-making process, presenting it in ways that are more resonant, and making it accessible, credible and actionable. In addition to requiring social scientists to come forward with such knowledge, this is also about building greater capacity within the social sciences and among users of social science research to make faster progress in using it. As this Report illustrates (Box 2.3), the social sciences already hold profound and extensive relevant knowledge, but all too often it remains invisible and unused. In addition to challenges of communication internal to the social science community, limited human capital and institutional resources are among the deep-rooted reasons why this may be so. Addressing this will go a long way to meeting growing knowledge needs, building society's ability to use what is already known, and showing that when that knowledge is used in policy and practice, it makes a positive difference.

### ***To meet the diverse and complex challenges of global environmental change and societal transformation, social science capacity needs to grow radically across the world***

Thus, an important third message about capacity and scaling up cuts across the pages of this Report. The global challenges which society faces are too big, too numerous, too complex and too difficult to be addressed by a cottage industry of engaged social scientists skilled in interdisciplinarity (working with colleagues from other disciplines), and transdisciplinarity (designing, producing and delivering knowledge in collaboration with decision-makers, practitioners, business leaders and communities). These issues cannot be addressed adequately if most social scientists learn, teach and research in socio-economic, cultural and epistemic contexts that differ from those in which most of the world's population live, struggle and suffer.

To better illustrate the many ways in which greater capacity is needed, where the opportunities lie to build it, and how this can be accomplished, "capacity" is defined here in the broadest sense (ISSC and UNESCO, 2010).

### Box 2.3. Building capacity for change

Selected examples from this Report show how the social sciences need and are building greater capacity:

- There is a wide disparity between regions in the production of social science articles, as a bibliometric analysis of the Web of Science indicates. The regional divide in social science production on global environmental change appears at least as big as for the social sciences overall.
- Funding is an enabling prerequisite for social science research, as is a supportive political environment. Where funding for overall social science research is low, where governments underestimate the potential future consequences of climate change, or where they see these impacts as economic or strategic opportunities, social scientists do not carry out research, despite increasingly urgent problems locally. This contributes to widening regional divides in social science research and to a lack of local studies of local problems.
- The United Kingdom and the United States produce the largest number of publications on global environmental change (both in absolute terms and in terms of publications per researcher), followed far behind by Australia, Canada, Germany and the Netherlands. In China, social science research on global environmental change has increased enormously over the last 20 years. The number of Chinese articles in Chinese journals is considerable, but they remain largely invisible to the broader research community.
- Interdisciplinary research is growing worldwide, as are co-authorship and international collaboration. Social scientists writing on global environmental change are publishing in natural science or interdisciplinary journals, although the extent to which this happens is difficult to measure in bibliographic databases. Articles and books published in languages other than English are also not well measured, thus under-representing contributions from the Global South and elsewhere.
- Many social science research projects on global environmental change, urbanisation, human health and sustainability are strongly committed to building research skills and providing professional development opportunities for young scholars and practitioners.
- Social scientists are calling attention to the challenges and opportunities that radical interdisciplinary and transdisciplinary research processes pose for researchers, and for those responsible for organising, funding, evaluating and rewarding research. This calls for a fundamental transformation of the institutional set-up and practices of science. The social sciences are central to stimulating innovative thinking about the individual and institutional responses such change will entail.

*Capacity for social science research* at the individual, institutional and systems levels involves building critical mass and putting in place the enabling conditions to make environmental change more central to the social sciences. This is required throughout the international social science community, even in comparatively rich nations. Yet particular attention has to be paid to building social science research capacities in countries with less well-resourced knowledge production systems (Box 2.4 and Part 2). It also means addressing underlying knowledge divides and the deeper social forces that affect educational preparation, professional prestige and aspirations among young people.

*Capacity for international, integrated research and development collaboration* must be based on relations of equality and mutual respect. Here the focus is on bringing together

socio-geographic and socio-biospheric agendas, perspectives, approaches, methods and models; incorporating bodies of knowledge from the majority world into the global knowledge repository; and counteracting historically institutionalised knowledge monopolies, hegemonic systems and practices to avoid imposing particular agendas, framings, approaches, methods and theories and ignoring others.

*Capacity for embracing global environmental change and sustainability:* In most of the social sciences, as described above, problems framed as environmental remain marginal to the central canon of the discipline. In unconsciously accepting the imposed natural science framings, the social sciences are perhaps set to miss their greatest opportunity. Meanwhile, a rich stock of incisive social science theories and insights is not always picked up by those social scientists who are engaged in environmental research. This means that relevant social science knowledge is often not brought to bear on the momentous challenges at hand, and that a smaller number of experts is available to address them. To tap into existing expertise and to mobilise a wider social science community drawn from the mainstream social sciences will require effective lobbying and leadership. Leaders from the research, funding and science policy communities can help build capacity by helping social scientists to recognise the stakes and to see opportunities unparalleled in the history of the social sciences.

*Capacity for engagement in solutions-oriented work:* Many social scientists still claim their academic autonomy as intellectual licence to remain distant from societal interests and from politics. A solutions-oriented science, whose knowledge production entails an open, engaged and collaborative relationship with society, clearly breaks with this tradition (Cash et al., 2003). Whether through boundary organisations or a more fundamental change in engaged research practice, greater capacity for solutions-oriented science is needed to co-create credibility, legitimacy and relevance. As the social sciences work to overcome biases against the status of applied and policy-relevant research (without abandoning theoretical, curiosity-driven research, or indeed the possibility of being critical of policy itself), they will find that work on global environmental change and sustainability frequently involves use-inspired, fundamental social science challenges (Stokes, 1997). While these originate in real-world problems, they demand foundational work that is no less challenging and exciting than basic science without immediate application.

### **Priority action steps**

Several priority action steps can help support the building of the different types of social science capacities outlined above around the world:

- Funders, national and international scientific councils, associations and organisations should help build capacity for social science research on environmental change by assisting the development of clear national and regional science policies that prioritise global change and sustainability as a grand challenge, and allocate appropriate levels of funding support to it.
- Universities and other scientific institutions in which social scientists work should develop better support mechanisms, incentive structures, rewards and evaluation systems, to provide enabling conditions for the pursuit of engaged, solutions-oriented research for global sustainability.
- A special focus on young or early-career researchers should be central to capacity building for the kind of social science called for in this Report. Funders, scientific institutions and international organisations should work together to develop educational approaches, from primary education to postdoctoral levels, that prepare students for interdisciplinary

and transdisciplinary research. The aim should be to train people who can communicate across disciplines and fields of science, and between science and other sectors of society. Active participation in ably led projects of this sort has proven to be an effective way to build such skills and capacities among young researchers. Strong project management skills and a grounded understanding of policy and practice are also essential.

- National and international funders, scientific institutions, councils and associations must multiply and sustain mechanisms that support truly global networking and collaboration between social scientists engaged in global change and sustainability research.
- At regional and national levels, funders and scientific institutions, councils and associations should also support the development and maintenance of structures such as centres of excellence or graduate schools to help build the critical mass and communities of practice which are needed to reduce the isolation that social scientists experience in some parts of the world. Such arrangements are essential to realising the longer-term benefits of international networking. They should also draw on the experience of bottom-up approaches to building capacity and networks of researchers, in collaboration with local communities, civic society organisations and development agencies.

### Be the change

The final and central message of this Report is – drawing on the famous words of Mahatma Gandhi – that the social sciences in their attempt to help transform the world must *be the change*. The challenges that global environmental change poses to society call for transformative social change, and this will only be possible if the social sciences themselves change. At stake here is the commitment of social scientists to situate themselves in concrete contexts of application, and to change the practice of their craft in ways that support the production, with their colleagues and with society, of solutions-oriented knowledge for sustainability.

The still-common, self-deprecating image of the social sciences as somehow inferior in the pantheon of scientific disciplines, envying the research budgets, professional esteem and societal mystique of their natural science cousins, remains a stumbling block. Equally undermining of success is the flip side of this attitude, a sense of superiority among some social scientists, who seem comfortable commenting on and theorising about the social world from detached perches, finding fault with the messy work of politics, engagement and action, without actually engaging and acting themselves. As the overwhelming majority of contributions to this Report show (Box 2.4), it is not enough to offer partial answers from the narrow window of any single discipline, and it does not suffice to stay outside the social and political processes that scientists may wish to inform.

How then should, or can, the social sciences change themselves? Social science should not be afraid of taking up space among the sciences. Being the change implies that social science disciplines welcome contributions from other fields of science to deepen understanding, rather than rejecting them as a dilution of fragile, partial knowledge. It also implies that the social sciences need to become expert at integrating across scales and across different forms of knowledge. Social science has to be grounded in theory and understanding of sufficient breadth and depth to engage with specific practices, people and situations. This will involve the social sciences in helping to frame the ethical implications of proposed actions, and in grappling themselves with their engagement in a rapidly changing world.

### Box 2.4. **Being the change**

Selected examples from this Report show how the social sciences are understanding and responding to the need for changing their theories and research approaches:

- Social science research on processes of scientific knowledge production and use has contributed to a better understanding of the complex relationship between science, public debate, policy and practice, and the extent to which power relations and economic interests mediate that relationship. The failure to find political agreement and advance policies to address sustainability is therefore not indicative of a lack of sufficient high-quality scientific information or understanding.
- To advance the role of knowledge – scientific and otherwise – in contributing to real-world solutions, social scientists are not only theorising about, but also participating in, open and inclusive processes that draw policymakers, practitioners, local communities, non-governmental organisations (NGOs) and private sector actors into the co-design, co-production and co-delivery of knowledge. Such processes foster mutual learning and trust, and increase the relevance and use of knowledge in specific social-ecological contexts.
- Social scientists in the South often have more extensive experience with inclusive and participatory research approaches than their colleagues in the North. For example, they link up different epistemic communities, such as climate modelling experts with disaster risk management and bottom-up development processes, at local and regional levels. Social scientists elsewhere have much to learn from this experience as they undertake to work with policymakers, managers and other stakeholders.
- The social sciences increasingly go beyond disciplinary boundaries (within and beyond the social sciences) to advance the understanding of the human dimensions of global environmental change. For example, social scientists are working with ecologists to provide early warnings of disasters, and to assess and recommend conservation and management strategies for communities to help them adapt to climate change more effectively.

### ***If the social sciences are serious about wanting their science to make a difference, they themselves must change***

Interdisciplinarity within the social sciences is just as important as interdisciplinarity among the social, human and natural sciences. Despite progress on this front, it remains no small challenge. In a broad sense the challenge is methodological. It involves statistical competence on the part of social and human scientists, and an appreciation of qualitative research findings on the part of natural scientists. But there are also conceptual and epistemological issues that relate to levels and units of analysis, and to standards of evidence. In particular, integrated science is often about new kinds of systems approaches that are likely to clash with methodological individualism in ways that many social scientists will find uncomfortable, if not unacceptable. Yet the challenge is exactly to illustrate how a systems rather than an individualised perspective fosters a better understanding of the relationship between social, economic, political and cultural institutions and practices, and human behaviour.

But even overcoming these challenges is not enough. Engaged social scientists must test their understanding of the human dimensions of environmental change in transdisciplinary efforts and teams. Contributions to this Report illustrate a number of examples where practitioners, policymakers and decision-makers, civil society and private sector actors are

brought together with academic researchers in the co-design, co-production and co-delivery of knowledge and action (Box 2.4). Such work recognises that there are multiple sources of relevant knowledge and expertise, a plurality of perspectives to be harnessed, and that at different times, all participants are both producers and users of knowledge. Relevant and robust knowledge has never been only in the hands of scientific experts. Scientists are increasingly recognising the folly of that assumption, as well as the limitations it imposes on the possibilities for innovation, and thus on the acceptability and realisation of better solutions.

In transforming how knowledge is produced and used, social scientists will be building what might be called a “translational social science”: one that reaches across campus and community to deliver knowledge that can make a difference to real-world problems.

### **Priority action steps**

Several priority action steps can help support the social sciences in the process of changing themselves:

- Universities and other scientific institutions should be more active in providing creative platforms for dialogue and for the co-framing of research projects, involving natural, social and human sciences, before projects are fixed and teams apply for funding. Involving a greater range of researchers may require a diversification of funding sources for global change and sustainability research.
- Scientific organisations seeking the contribution of social scientists in informing global change policies and management solutions should invest in processes that enable the regular interaction of researchers with decision-makers, practitioners, civil society and private-sector representatives, as well as with the media and other science communicators. Such interactions need to start early on and be sustained throughout the research process to facilitate collective problem framing, knowledge production and mutual learning around solutions for concrete environmental and sustainability challenges.
- Research funders should develop innovative funding practices that support safe spaces for experimentation with open and inclusive co-design, co-production and co-delivery of knowledge. This should include support for identifying and reaching out to relevant stakeholder communities, and developing the requisite communication, management and leadership skills.
- At the same time, scientific institutions, councils and associations at all levels can motivate social scientists to engage in open knowledge processes through recognition and incentive mechanisms. The latter could include career advancement incentives and prestigious awards. Equally important is support in the form of training in communication and engagement, practical and systemic outlooks, ethical sensibilities, strategic and cross-disciplinary thinking, and effective management of the partnerships involved.
- The scientific community, funders, science policymakers in international scientific organisations and knowledge users must support ways of monitoring and evaluating transdisciplinary processes of knowledge co-design, co-production and co-delivery. It is important to understand their implications, usefulness and effectiveness, and their associated ethics, and to develop appropriate guidelines and training modules. Social scientists themselves have a particularly important contribution to make in this regard.

## Conclusions

The *World Social Science Report 2013* uses a number of important and concrete challenges in environmental change and sustainability as case studies or research sites. They illustrate the unique contributions that the social sciences make to this field of research and action. Such contributions lie in addressing a very specific set of questions, answers to which are urgently needed if scientific knowledge is to inform more effective, equitable and durable solutions. These questions speak directly to critical social science concerns – theoretical and empirical, quantitative and qualitative, fundamental and applied – and together comprise the transformative cornerstones of social science research for global change.

The Report draws attention to the variable conditions – constraints and opportunities – under which social science knowledge on global environmental change is being produced, and to the capacities and imbalances in the research systems that comprise the international social science community at the present time.

The action steps proposed are necessarily broad in the way they are formulated here, but if taken seriously and applied in specific contexts, can make a meaningful difference, fill real gaps, and ultimately lead to transformative change within the social sciences. This would allow the social sciences to take the lead in developing a new, translational social science of global change and sustainability. It would be solutions-oriented, integrated, sometimes multidisciplinary and at other times interdisciplinary and transdisciplinary. As the social science community and its stakeholders step up to respond to these calls for action, the real challenge – and indeed opportunity – lies in acknowledging that in any transformative process, there is a need to experiment, to be creative, and to remain open to learning from initial shortfalls and occasional failures.

This Report is intended as a vehicle for mobilisation: a starting point for rallying the engagement of social scientists in all disciplines, in academia, research centres, think tanks, NGOs and government agencies, and in all parts of the world. And it is intended as a basis for the critical discussion and development, by the ISSC and its members and partners, of a longer-term strategy to sharpen the social science knowledge base for sustainability and to support social science leadership in research on global change and social transformation.

This work comes at a time when a unique and robust new institutional framework for advancing integrated, solutions-oriented sustainability research has been secured at the international level. That framework is provided by Future Earth, a new ten-year programme and flagship initiative of the International Science and Technology Alliance for Global Sustainability, of which the ISSC is a member (see Article 1, the overall introduction to this Report, for an overview).

But success in realising a bolder, better, bigger and different social science in this field, and in securing the positive knowledge outcomes envisioned here, will depend on more than having enabling institutional frameworks in place. It will be just as necessary for the ISSC and partner organisations like UNESCO to continue to engage in advocacy and strategic science policy work aimed at securing spaces for social science leadership on the global stage of sustainability research, and in enlarging the visibility of social science knowledge, not least through improved relationships with the media and other communicators.



At the same time, social scientists from all parts of the world need support to work collaboratively on building the social science knowledge base; in taking the lead to bring such knowledge into the framing and execution of global change research; in experimenting with and developing transdisciplinary approaches; and in bringing existing social science knowledge into the research–policy–practice arena. This requires complementary national and regional strategic and lobbying support, right into the hallways of universities and research institutions.

As the capacity of social scientists to frame, understand and help tackle global environmental challenges grows – and the greater their ability to engage with partners in other disciplines, national, cultural and socio-economic contexts, and professional and practical spheres – they will find themselves increasingly in the cross-hairs of fame and blame. As they engage more frequently and effectively with policymakers and practitioners, as well as with other scientists and stakeholders, their increased power and access will entail greater responsibility and the need for reflexivity about this engagement. These are not new challenges, however. For better and for worse, science has contributed to social, cultural, political, economic, technological and environmental change ever since the Enlightenment of the 17th and 18th centuries. Nothing will spare the social sciences the need for ethical practice or societal scrutiny. This price seems worth paying, given the stakes involved and the disengaged alternative. Now is not the time to stay on the sidelines, as climate and global environmental change force society to face staggering human-made crises, and as the world struggles to find a path toward a more secure and sustainable future.

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