

Benno Werlen *Editor*

# Global Sustainability

Cultural Perspectives and Challenges for  
Transdisciplinary Integrated Research

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# Preface

We live in the age of the anthropocene. Nature is no longer nature, but everywhere bears the deep imprint of human activity. Of course, human beings have long influenced the habitats in which they live. Some of the early civilizations, for example, by felling forests, or causing watercourses to dry up, created deserts where none existed before. Yet none intervened into the natural world by more than a small fraction of the degree to which our civilization does, and on an everyday basis. Climate change is perhaps the fundamental example of this transformation, caused by the burning of fossil fuels on a massive scale. The speed with which we are using up the world's oil reserves, for instance, contrasts in an extraordinary way with the length of time it took for them to be laid down – which happened over many millennia. At current rates of consumption, we will burn our way through most of them in less than 200 years from the first time at which their commercial exploitation began.

It is an awesome thought that we are busy changing the world's climate – and on a permanent basis, since we know of no way of getting the greenhouse gases that are causing the world to warm up out of the atmosphere once they are there. Some will persist for centuries. If left unchecked, current trends will produce more and more volatile and extreme weather patterns the world over. As I write, a typhoon with gusts of wind reaching more than 100 miles per hour has just hurtled through Japan, leaving a trail of destruction in its wake. In the future, without practical policy intervention, such storms will increase in average intensity. To be sure, there are uncertainties around just how extreme changing weather patterns will be and over what time period. The climate change skeptics fasten on this and declare that the risks are exaggerated. Yet uncertainties cut both ways. The risks could just as well be greater than the majority of climatologists believe, and develop at a faster pace. James Hansen, from NASA, one of the world's pre-eminent climate scientists, believes such to be the case. He sees some truly terrifying possibilities waiting down the line if greenhouse gas emissions are not curbed, and in relatively short order.

There are three models of the impact of human activities upon the natural world – or what used to be the natural world. The skeptics argue that the earth is robust. Nothing human beings can do will influence it very much. Nature will go its own way regardless of what we might do. Those in the green movement, to the contrary, see the planet as fragile and vulnerable in the face of the human onslaught. Such a perspective is worrying enough. Yet there is a third view, associated with authors such as Hansen. This is that the earth is like a wild beast, and we are busy prodding it with sticks. It will react with increasing violence to our interventions. Every typhoon, hurricane or large earthquake is a reminder of the awesome forces in play and we toy with them at our collective peril.

So far, in spite of endless conferences organized by the UN, policy interventions by some governments and a proliferation of bottom-up approaches, we have had very little success in bringing down the level of carbon emissions globally. As measured by the Mauna Loa Observatory in Hawaii, the level of  $\text{CO}_2$  in the atmosphere is increasing relentlessly year upon year. In 2014, it passed 400 ppm for the first time – the highest level observed for at least 800,000 years and probably far longer. The Arctic ice is melting at a rate not thought possible by most observers until recently. Some scientists believe that the Arctic could be ice free in the summer within some 15 years. On the face of things, the visible shrinking of the Arctic ice should be a wake-up call to the world to take more radical action to cut emissions. Not a bit of it. There is a rush on the part of nations and companies to exploit the mineral resources that become accessible as the ice retreats.

It is a similar picture with broader issues of sustainability. The destruction of the world's rain forests is one of the sources of climate change, since that process releases large amounts of  $\text{CO}_2$ , and the capability the forests have to absorb it is being eroded. That destruction has consequences for many of the world's flora and fauna too. Here is another battle we are losing. The oceans are becoming increasingly acidified, with an accumulating threat to many of the life forms that exist in them. Species are disappearing. These wider ecological disasters overlap with other sources of stress and strain the world's ecosystems – such as the radical and continuing increase in the world's population. There are likely to be ten billion people on earth by 2050. Only about a century and a half ago, in 1850, there were less than one billion.

Why are we finding it so hard to take effective action against burgeoning climate change and environmental degradation? A cluster of reasons exists and it is important to see how powerful these are when added together: (1) There are powerful interests opposing the necessary policies – such as some of the most powerful fossil fuel companies. (2) These are global issues. Yet there is no effective system of global governance. Nations very often have different short-term interests from one another and collaboration over a longer time-span is especially difficult. Developing states are more vulnerable to the changing climate than the richer nations, who can spend more to defend themselves. Yet the richer countries are reluctant to transfer needed resources to the developing world on anything like the scale needed. (3) We are dependent upon the work of scientists to diagnose the risks we face and how severe they are. Most non-specialists – and especially the lay



public – have no chance at all of mastering the detail of the scientific work involved. The climate change skeptics and those who say that proclamations of imminent ecological disaster are exaggerated step into this gap. (4) These are risks of which we have no previous historical experience, certainly on the scale they exist now. Many people find it hard, therefore, to treat them as real, since their worst consequences lie in the future. So far as climate change is concerned, the worry is that little will be done until there are cataclysmic disasters that can be unequivocally attributed to the warming of the world. Yet by this time it will be too late. For we have no way of getting the greenhouse gases out of the atmosphere once they are there. Some – like CO<sub>2</sub> in fact – will be there for centuries.

In trying to cope with these problems, more innovative policies will be needed than those that have dominated thinking up to the present. Moreover, a certain level of climate change is inevitable whatever happens now. As well as radically upgrading the struggle to reduce emissions, we shall have to think about how to improve environmental resilience and take proactive action to adapt. My preferred outlook for doing so is within the framework of what I call ‘utopian realism’. A dose of utopianism is needed because policy thinking must go well beyond the parameters of the here and now if a more sustainable world economy is to be created. However, if not coupled to realistic modes of achieving them, such goals will remain mere aspirations.

This book is a significant contribution to the rethinking that will be necessary. It is global in scope, encompassing studies from a range of countries around the world. The work quite correctly focuses upon the need to bring the social and natural sciences much closer together. The task is a formidable one because the same holds true of different sectors of within these categories. For instance, economists have to work with sociologists, anthropologists and human geographers; climatologists have to collaborate with biologists and earth scientists. Younger researchers – such as represented in this volume – perhaps more able than their elders to think in radically new ways – should be in the vanguard.

Achieving greater sustainability must be grounded in the transformation of local practices, including in some of the poorest societies on earth. There causes for optimism alongside the entrenched problems. In the digital age, ideas can be directly discussed, and strategies developed, without the traditional limitations of time and space. The pace of change has accelerated, but so have the opportunities for positive innovation. To take the core example: the Internet barely existed 20 years ago. Now it is more or less universal, and embedded both in the largest global institutions and in the conduct of everyday life. Perhaps the same could happen with radical advances in renewable technologies? Perhaps the famous inertia of the fossil fuel industries, which seems to be condemning us to such a disturbing and dangerous future, could be less implacable than it seems? Think what happened with mobile phones in large parts of Africa. A whole stage of technological evolution was simply skipped.

We live today in what I like to call a high opportunity, high risk society. The biggest risks we face, as collective humanity, come not from nature but from ourselves. They derive from our newfound global interdependence and the fragility

of the systems that are driving it. The level of technological innovation is so high that we do not know where it will lead. The very same research that could produce breakthroughs in genetic medicine, for example, might also inadvertently create lethal pathologies. A previously unknown virus, for instance, could produce a pandemic. As we saw in the financial crisis, the global electronic economy is inherently vulnerable and the effects of that crisis are as yet far from being fully resolved. We don't know in advance how the balance of opportunities and risks will pan out, simply because we have little past historical experience to go on. No previous generation has lived in a world as highly globalised as that of today. Some of the risks we face are existential. Yet the opportunity side of the equation is equally huge and we have to make it count.

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# Introduction

Sustainability has been one of the keywords in the sciences, as well as in local, regional and global policies, since at least the United Nations Conference on Environment and Sustainable Development (also known as the Earth Summit) in Rio in 1992. It is also at the center of the latest – and probably one of the biggest – joint research initiative of the world’s umbrella organizations for the natural and social sciences: Future Earth. With this initiative, led by the International Council for Science (ICSU) and the International Social Science Council (ISSC), sustainability is also at the heart of the Belmont Forum’s activities, which is an association of some of the world’s most important national research organizations, including those of the US, China, the UK, Germany, India, Brazil, Japan, France, Norway and others.

Although sustainability is of core importance for so many dimensions of human action, the concept lacks a convincing integration into the social and natural sciences. In addition, it is particularly important that our recognition of cultural dimension should be enhanced to achieve a shift towards sustainable lifestyles. We suggest that the social and natural sciences’ contribution to achieving sustainability on a global scale may be to work towards a truly transdisciplinary approach: An approach that overcomes the merely additive logic of inter-disciplinary cooperation.

The adverse impacts of climate change, as well as earthquakes, hurricanes, and bush fires, are commonly reported as ‘natural disasters’. It is, however, important to understand that there is a distinct social dimension to these events. Because they are very often primarily the outcome of inadequate knowledge and actions, they are above all social disasters. Basically, they are the unintended consequences of social actions and therefore as much a social as a natural problem.

These and other events demonstrate, however, that we need to better integrate natural and social-scientific research, as well as the insights from the cultural sciences and the humanities, in order to better understand the so-called natural disasters or ecological crises. This book, and the more encompassing initiative of