



Background Paper for Session III: Sustainable Development

Making Progress Within and Beyond Borders

Chair: Ernst-Ulrich von Weizsäcker
Rapporteur: Johan Rockström
PIK Contributing Authors: Katrin Vohland, Wolfgang Lucht,
Hermann Lotze-Campen

1 Transformations of the 21st Century

Climate change is now almost universally recognized as one of the gravest threats to life and wellbeing on this planet. Unfortunately, any potential response to this threat is complicated if not hobbled by four other factors.

First, there is another unfinished global policy agenda, the eradication of poverty and global inequality whose only widely accepted solution, economic growth, conflicts directly with climate stabilization.

Second, climate change has emerged as part of a complex mosaic of challenges, some of which are closely related to it. A short list of these challenges includes trans-national epidemics (HIV/AIDS, SARS, and Avian Flu), environmental degradation and biodiversity loss, accelerating water stress, increased frequency and/or intensity of various catastrophic events (floods, droughts, hurricanes, cyclones, tsunamis, and earthquakes), and threats to global security (especially from terrorism). Moreover, economic globalization has revived the specter of runaway financial epidemics; at the same time, it has eroded the capacity of states to cope with financial or other epidemics, or more broadly to protect social welfare and environmental resources by regulating financial and corporate capital.

Third, the human impacts of climate change are determined by the social and ecological resilience of human societies and the natural capital that supports them. Dramatically, the “hockey-stick” pattern of temperature and greenhouse gas accumulation in the atmosphere from anthropogenic emissions that we are now so familiar with, applies to virtually all critical ecosystem service providing systems (be it land degradation, loss of biodiversity, deforestation, overfishing, or air pollution). Over half of the cumulative anthropogenic GHG emissions have been absorbed by terrestrial ecosystems (in forests and soils) and the oceans. We can expect unforeseen positive feedbacks from climate change, but we do not know what surprises we are facing as a result of synergies from a broad spectrum of hockey-stick patterns. A key element of this unknown is the global degradation of ecosystem functions (e.g., carbon sequestration) and services (e.g., food

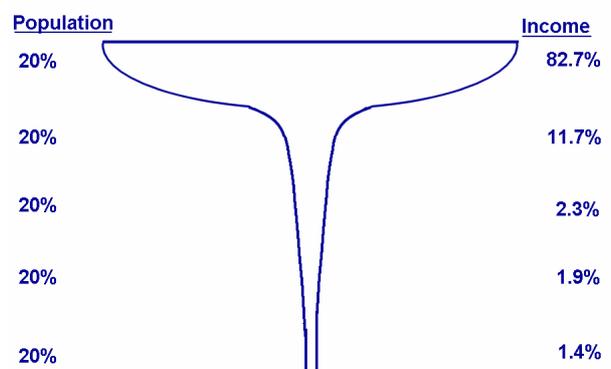
and fish production). The UN Millennium Ecosystem Assessment, presented in 2005, was the first global health check on the state of the planet’s ecosystems, concluding that we have degraded 60 % of key ecosystem services, which are not only fundamentally important for human wellbeing, but particularly critical for poor communities, and a key feature of our capacity to adapt to climate change.

Fourth, climate change upsets the very foundation of modern society. The growth momentum of the industrial age since the middle of the 18th century has been built upon the harnessing of energy from fossil fuels, and the bulk of modern physical infrastructure and corporate profitability is premised on the continued availability of fossil fuels. An effective resolution to the crisis will imply a radical transformation of the technological as well as corporate basis of industrial activity. This, in turn, will only occur if pushed by a fundamental social transformation.

But the problem goes deeper than fossil fuels. Climate change is the thin end of the wedge of an irresolvable conflict between finite resources and unending growth. Continued and unending economic growth has become the very definition of progress and the basis for social solidarity in industrial society. At the end of the day, the resolution of this conflict would be possible only by weaning post-industrial society from its continued reliance on growth, and as such by questioning of some of the core values that underpin it: competition, entrepreneurship, consumption, and growth itself.

The result is that climate change is the visible face of an absolutely unprecedented challenge to the international community. This challenge forces us simultaneously to ask (a) how to sustain the process of economic development in poor countries (both fast and slow growing ones), (b) how to transform existing infrastructure and economic institutions away from their virtually exclusive reliance on the availability of fossil fuels, (c) how to continue to enhance social welfare while weaning modern society from its dependence on unending growth and resource use, and (d) how to strengthen the conventional locus of policy making, the nation state, while creating effective institutions for local and global governance, and (e) do all this while simultaneously addressing other areas requiring immediate attention—health, environment, financial instability, and political conflict.

This will require novel instruments and institutions of global governance, a dramatic change of direction of technological progress towards resource productivity, and strong incentive structures locally and globally for all actors to abandon unsustainable technologies and habits and to work towards a sustainable future. Most of all, it will need enlightened and responsible global leadership that serves to unite people from all nations in a common cause rather than create divisions, frictions, and distrust.



2 The Climate Challenge: Crisis and Opportunity

The climate community has long articulated the max 2° target (namely an average temperature increase of no more than 2 degree Celsius over pre-industrial levels) as the safe threshold beyond which irreversible, costly and even catastrophic change becomes likely. This temperature target implies stabilizing carbon concentration at 450 parts per million CO₂e, which in turn means drastic reductions in global carbon emissions. The background for these findings is outlined in the Session I and Session II discussion papers.

As mentioned, this goal has emerged at a time when the pre-existing common agenda of humankind, namely poverty eradication and reduction of global inequality is still unfinished. The well known champagne glass figure (see above) from the cover of the 1992 Human Development Report depicts this issue vividly. The poorest 20 per cent of the global population earned only 1.4 per cent of the global net income, while the richest 20 per cent received 82.7 per cent, a ratio of 1:60. This inequality appears to be widening rather than narrowing. In 2004, the corresponding ratio was estimated to be 1:90.

The only sure solution to reducing this inequality, and therefore also addressing associated social ills—poverty, unequal access to basic human needs (nutrition, health, education, and right to due process and participation), and protection from predatory behavior—is economic growth in poor countries. A few countries, especially in Eastern Asia, have taken off into what appears to be a robust growth pathway, but they still face enormous challenges for which global cooperation is needed: how to protect the momentum from getting derailed by external pressures, how to make it compatible with resource limits, and how to extend it to areas where poverty continues to persist? Other countries and regions show low or intermittent growth, and there too the need for global cooperation is paramount in order to raise the growth momentum by addressing familiar obstacles of governance, institutions, and human resources.

Economic growth, however, is a need not only for developing countries. It provides the very foundation for the successful operation of a modern economy. By now it is becoming clear that this love affair with growth has to come to an end, but the means of achieving this transition are far from clear.

All this, in other words, is an unfinished global responsibility. The only hope of obtaining the requisite political support in rich countries is to gradually de-couple welfare from growth so as to accommodate social needs within the resource portfolio of a finite biosphere. Likewise, the only hope of marshalling the energies of four-fifths of the world behind newer challenges that are now assuming equal importance is that the sustainable development agenda in poor countries continues to be viewed as a common global agenda until such time as the most glaring inequalities have been whittled down.

In the absence of concerted global action, climate change, the foremost among the newer challenges, will remain on a collision course with development and growth. With the existing technological portfolio, continuing growth in rich as well as poor countries would

lead to a threefold increase in carbon dioxide emissions by the end of the century, with consequences that can only be described as catastrophic. On the other hand, without additional measures, many of which require visionary action, any serious response to the climate challenge will disable the growth process, undermine societal welfare in rich as well as poor countries, and cast a severe blow to prospects of global solidarity.

3 Crises as Springboards for Collective Action

The Chinese pictogram for “crisis” is a combination of two characters, threat and opportunity. The current crisis represents not only a threat but also an opportunity. In the past, great crises have often served to unite people by creating a common cause of action. Through enlightened leadership and an engaged populace, crises have often regenerated societal trust and collective action on the basis of new visions, new institutions, and new laws and agreements. The example of the economic crises of the inter-war period, leading to the emergence of the welfare state, is often given. At the international level, acute problems have similarly served as springboards for testing and improving means of international coordination, balancing of interests, sharing of burdens, learning about and management of impacts, and expanding scientific understanding.

Such exploitation of opportunity is evident in recent crises. Global epidemics have stimulated unprecedented international cooperation between countries and institutions that otherwise are not closely linked. Global dissemination of information on violent genocides has provoked the international community into developing new institutions to ensure dignity and human rights for everybody. The increased frequency as well as awareness of natural disasters (including earthquakes, floods, droughts, and storms) has led to charitable actions and solidarity as well as the beginnings of investments in institutional coping capacity. All of these have been pushed, supported, and monitored by global social movements in environment, human rights, women’s rights, and the rights of indigenous communities.

However, other crises have led to more regressive responses. The rapid increase in international migration in the recent decades, driven by economic, political, security, or environmental factors, has led increasingly to a fortress world response. Similarly, while the cold war created a stimulus for the peace movement and arenas of international cooperation, the so-called war on terror has given rise to a more paranoid response in governments as well as civil societies. Finally, globalization has weakened traditional institutions for protection of the vulnerable, including the organs of the welfare state, and undermined social solidarity—although the response of affected countries to the Asian financial crisis helped balance some of these trends.

4 The Great Transition or the Fortress World?

This then is the challenge for the leaders of the 21st century: How to pilot the world towards unity of action and common purpose, on a sustainable pathway that builds

resilience and steers away from undesirable tipping points, rather than to the erection of divisions, barriers, and fortresses?

The pursuit of sustainability is embedded deeply in the agenda of global solidarity. Actions within borders impact and are impacted by those beyond borders, and all foreign policy has become nothing more than global domestic policy. Actions within one sphere affect and are affected by actions as well as omissions in others, and the grand questions regarding the basis of human welfare have been reopened.

What follows is a brief list of issues thrown up by this challenge. Although there are powerful forces that seek to divide and fragment, there are also equally powerful visions of a world that enable the overcoming of differences and the coming of all people into one future. These visions include at least the following elements.

4.1 Democracy and participation

One of the most powerful forces both in bringing people together and enabling a search for collective solutions is the institutionalization of democracy and participation at all levels from the ground up. At local and national levels, it means the participation of the whole population, including women, children, poor, elderly people.

At the global level, it means strengthening the United Nations system, making it more effective, transparent, and responsible.

It also means ensuring that markets work fairly in the service of global prosperity, welfare, and sustainability, and that market institutions support rather than subvert the functioning of democratic ones.

Finally, in the 20th century we have also learned of the power of an engaged civil society to harness entrepreneurial energies, provide common visions, challenge conventional wisdom, and monitor and render transparent the workings of governments.

4.2 The development agenda

After a long period of unfulfilled promise, there is evidence that the development momentum has picked up sufficiently to address the concerns of large numbers of poor people, especially in Asian countries. It is matter of tremendous import that this momentum be sustained and expanded.

Growth is a necessary but not sufficient condition for eradicating the worst aspects of poverty. The world community had sought to address this through a targeted approach under the Millennium Development Goals. The initiative needs to be sustained until the targets are achieved. This involves investment in innovative options to meet the needs of the poor for whom traditional approaches are not appropriate, including community development and micro credits. There is also a need to shift to more integrated approaches, which lead to sustainability in both resource management and service delivery systems.

4.3 The energy system revolution

The climate challenge is associated closely with the energy system. The industrial revolution is based ultimately on the harnessing of increasing volumes of fossil fuels. The challenge now is to engender a transformation to a radically new structure, which is not dependent on fossil fuels. However, the first energy revolution has yet to reach the vast majority of the world's population. But while the energy systems of industrial countries have reached a stable stage, those in developing countries still have to grow rapidly.

The bulk of the instruments being considered at a global level to address climate change are indirect in nature. They include national emission targets, trading schemes, and support for the emergence of an emissions market. All these have found much greater acceptance in industrialized countries than in poor countries, mainly because they are at best silent on and at worst inimical to the development agenda.

An early idea to incorporate development concerns into the emissions trading framework was that of equitable emission rights; it remained on the sidelines until the recent courageous endorsement by Chancellor Angela Merkel. The idea of equal rights to the global commons represents the spirit within which a consensus solution could be found. However, by itself, the assignment of rights will not result in a miraculous transformation of existing energy systems and infrastructures. They will require an immediate infrastructure investment in alternative energy systems that can set such a transformation in motion. On the other hand, they will need the development of institutions that can help poor people to defend and benefit from their new rights.

For purposes of immediate action, it might be necessary to shift from the language of rights and targets to the language of investment and action aimed at engendering a new energy revolution.

4.4 Value change: long-term thinking and sustainable lifestyles

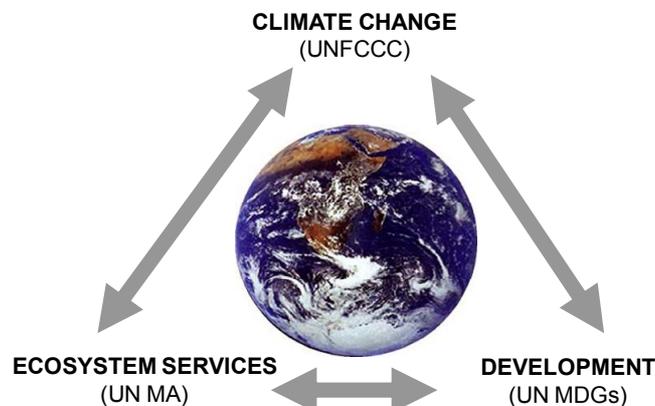
Beyond government regulation and institutional settings, individual values will shape future developments. Teaching our own children new ways to view the world may even have the strongest impact in the long run. A transition to more sustainable values and life styles will take place gradually. The example of the demographic transition is highly relevant. It represents a fundamental revision of the entire bases of traditional society: the notion of family and kin relationships, the basis for economic organization, the relation between men and women, parents and children, and between citizens and the state. This transition occurred within the space of one generation in many developing countries.

5 Placing Climate Policy in Context

A number of elements of a potential response are being debated in the policy community. These include political/institutional interventions, and ecological, economic, technological, and discursive instruments.

5.1 Linking three disconnected UN processes

Climate change, as clearly pointed out in the IPCC 4th Assessment Report, is already today impacting on the lives of poor communities. The most vulnerable are most hardly hit, and expected to bare the largest burden of a climate crisis they have not caused. Already the 2015 UN Millennium Development Goal (MDG) targets of halving hunger, poverty and health threats are at risk due to climate change. At the same time, nowhere are ecosystem services so fundamental for human wellbeing as in the fight against poverty, and these ecosystems are negatively affected by climate change. Despite these close inter-relations between climate change, ecosystems and development, there is a disconnect between the three UN processes supporting the governance and management of these domains – the UN Framework Convention on Climate Change (UNFCCC), the UN Millennium Ecosystem Assessment (UN MA) and the UN Convention for Biological Diversity as well as the UN MDG process.



There is an urgent need, and possibility for a comprehensive policy-coherent effort to connect these processes within the framework of the UN system.

5.2 Political/Institutional instruments

The challenge of global sustainability requires investment in institutions of democratic governance at all levels: local, national, and global.

At the global level, the overriding imperative is to invest in the United Nations system.

At the national level, a key goal is build political constituencies in all nations for effective and fair global engagement, expanding the reach of participatory and democratic

institutions, and channeling support for strengthening the developmental state in developing countries.

At the local level, there is a need to establish participatory institutions of self governance. In the rural areas, there has been considerable experience with community organization programs led by visionary leaders from civil society and government. These programs must be expanded in order to address the livelihoods needs of the majority of poor and undernourished people from rural areas.

An increasing share of the world's population lives in mega-cities that are difficult to manage. There is a need for concerted investment in the governance institutions of urban areas, and also for improving the bases of rural-urban exchange.

Other areas where institutional investments are needed comprise education (including higher education), economic justice/income distribution, law enforcement, property rights, damage compensation, (international) burden sharing, and political transparency and participation.

5.3 Technological instruments

Technology is a broad term, which includes not only the machines used in the production of goods and services, but also the infrastructure and knowhow for the organization of society.

Much of the discussion on climate change has focused on the deployment of renewable energy technologies on a large scale. However, the instruments that are being used to stimulate such deployment are indirect in character. The very ambiguity of global policy makers provides conflicting signals to the private sector and the research industry. The time has come for the global public sector to show its hand by committing itself to a large scale infrastructure investment program, along the lines for example of the Manhattan Project, to help realize the potential of the technological portfolio. Such an investment would provide a clear and unambiguous signal to the private sector and spur both the development and deployment of technological options.

However, the idea of technology goes far beyond renewable energy infrastructure. It includes concepts of ecological efficiency, social organization, and social control of technology.

The investment in energy efficiency will not take place without adequate public support. The nature of urbanization and urban infrastructure development represents the current incentive schemes, and alternative pathways will need clear and unambiguous support from the governments. Finally, the idea of social control of technology assumes even greater urgency in a situation demanding extensive and sustained intervention. It is absolutely critical that technological choices be subjected to sustained and persistent criticism from civil society, parliaments, mass media, and academia. Chances and risks of new technologies have to be assessed in a broad and continuous social discourse.

A final issue is with regard to technological extension. A good example in this respect is that of the Green Revolution, which saw the transfer of the knowledge of an emerging technological system from a few hundred scientists into the hands of several million farmers (most of them illiterate) within a span of a decade. This revolution was engendered by support for an expertly crafted and interlocked system, which included education, research, policy, extension, input supplies, credit, and a marketing infrastructure. Compared to this highly professional system, the new technological transition is being handled in an ad hoc and unprofessional manner.

5.4 Ecological instruments

The tragedy worldwide is that under massive pressure from investors and market fundamentalists, many states have more or less given up on regulating resource use, water and energy markets, and even pollution. One of the biggest problems, if not scandals, is biopiracy and other private appropriations of biodiversity. The ecological agenda is linked inextricably with the agenda of revival of the developmental state, which can forge political consensus for sustainability, implement environmental regulations, and protect biodiversity against piracy.

For example, a case could be made for placing a significant proportion of the world's land area (say 15 per cent) under protection. As the conversion of land into agricultural uses is the most important factor for losing biodiversity, economic and political means have to be improved to make agriculture more ecological.

Ecological instruments are based increasingly on solid and reliable research. There is enormous variation in research capacity between countries and regions. Indeed, the areas that are richest in biodiversity as well as in traditional knowledge of husbandry are often the ones with the least support from the organized research industry. There is a need to build organized research capacity at national and local levels, and provide support for continuous investigation of impacts in priority areas: the maintenance of freshwater resources and soil functions, conservation of biodiversity, the management of environmental conflicts, and the protection of indigenous knowledge.

5.5 Economic instruments

There is considerable controversy over the strength and limitations of economic instruments. On the one hand, it is clear that measures that go against economic common sense are difficult to sustain over long periods. As such, it is widely accepted that policy measures should incorporate the "ecological and social truth" into economic activities by internalizing unwanted environmental, health and distributional impacts.

However, economic instruments suffer from some major shortcomings in regard to the agenda of sustainable development. First, economic instruments are often found to be in conflict with the goal of equity. This is clearly visible in the controversy over climate change. Most economic instruments (and indeed the current trends towards higher oil prices) are highly regressive in nature and subversive of the development and poverty

agenda. In this case, it is wiser to rely on more direct policy approaches for engendering the transition in a fair and effective manner.

Second, the issue of equity pertains especially to access to energy, industrial resources, financial markets, global public goods, and social infrastructure. A number of initiatives (e.g. micro-credit organizations) have tried to overcome the barriers created by the unfettered functioning of markets. These need to be supported.

Third, market volatility and a focus on short-term profitability have to be turned into longer-term perspectives and higher predictability.

Fourth, and as mentioned already, in the absence of strong legal and political safeguards against the expropriation of the rights of poor and vulnerable groups, the exclusive reliance on market instruments will prove to be far more harmful than even the absence of policy.

5.6 Discursive instruments

Communication is essential for mastering the challenges of the 21st century. This requires access to information exchange channels, together with expanded and improved observation systems in the social and environmental spheres. The internet and mobile telephone networks have already started to improve this access in areas which were until recently excluded. Remote parts of poor African countries enter “online Humanity” (Schellnhuber). For the information and empathy gain not to remain virtual, a global discourse on ethical and power issues is of vital importance for sharing values with respect to nature, justice, and the human position.

This is of particular relevance in regard to the need for value change. The building of a global political constituency for a transition to a sustainable pathway requires going beyond the current situation in which people seem to be concerned only about very narrowly defined parochial interests. Current evidence suggests that the willingness to cooperate internationally in rich societies strongly depends on two things: (1) direct involvement and impact, and (2) available methods and technologies to react.

6 Conclusions: A Strategic Vision

Today's challenges provide the chance to develop global mechanisms for sustainable development. They can act as springboards towards higher resource productivity and efficiency, environmentally friendly technologies, and sustainable habits and lifestyles.

The above discussion brings up a number of issues that require thorough considerations. However, these are still on the nature of individual components of the policy framework, not on the framework itself. It may be useful to provide a brief reflection on the strategic vision that can hold these diverse thoughts together.

It has to be recognized that the response of the global leadership to the current crisis has matured extremely slowly. Even now, there is skepticism both with regard to the commitment and capacity of the global system. The strategic issue is to respond in a manner that brings together a global constituency for change. This will not happen through piecemeal or desultory interventions.

What is needed is a bold and strategic vision that can address the two goals—economic development and climate stabilization—directly and in an integrated manner instead of indirectly and disjointly. For this, it may be necessary to shift from the language of targets and trading to the language of investment. A concrete example of a direct and integrated approach to climate and development is the launch of a globally funded public investment program in four areas: deployment of renewable energy technologies, institutions for promoting energy efficiency, infrastructure for carbon capture and storage, and institutions and structures for enhancing adaptation capacity.

However, such a program will test the limits of current governance arrangements. Existing means of international exchange and cooperation will have to be improved and new global governance structures developed. Since large social and political transformations are unavoidable, the world needs blueprints for action to sustain its struggle for universal goals—the eradication of poverty and inequity, reversing environmental degradation, protecting human security, and ensuring interregional and intergenerational justice. If these transformations are managed with skill, empathy and foresight in a globalizing multi-polar world, they can drive a broad agenda of sustainability and development within borders and beyond.