

An aerial photograph of a coastline, showing a mix of blue water and green land. The land features some buildings and a road. The water is a deep blue, and the overall scene is captured from a high angle, looking down at the coast.

After Johannesburg - Challenges for the Research Community

Summary of a conference on the 5th of December 2002 in Rosenbad, Stockholm



Human activities have an increasing impact on the global system. Humankind faces enormous challenges to reverse unsustainable trends during the coming two decades.

How can research support sustainable development?

Summary

Research that is to contribute to sustainable development cannot confine itself to merely analysing the problems. It must be able to help answer the question of how these problems are to be solved. This requires a change in the focus of research into the environment and development; from the narrow limits of traditional scientific disciplines to much broader analyses of the interaction between human society and the environment, in different time-scales and at all levels, from the local to the global. This necessitates in turn multi- and interdisciplinary efforts within environmental research with much greater focus on social science than has previously been the case.

Current government systems provide good support for traditional and disciplinary research, which is also important for the future. But the system is not ideally designed for the new challenges that sustainable development research is about to face. Aspects that need to be developed in order to promote new research include academic qualification standards and reward systems, institutional structure, funding principles, etc. In order to cope with the challenges we now face, we must further develop the research system that has helped us obtain our current level of prosperity and knowledge. Greater integration of research into the social process is also called for.

These were some of the overall thoughts that clearly emerged during the conference in December 2002: After Johannesburg - Challenges for the Research Community. The conference was organised by the Swedish Environmental Advisory Council and the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas), in cooperation with the Swedish Research Council, the Swedish Council for Working Life and Social Research (FAS), the Swedish Agency for Innovation Systems (VINNOVA), the Swedish International Development Cooperation Agency (Sida), the Swedish Environmental Protection Agency (Swedish EPA), the Foundation for Strategic Environmental Research (MISTRA) and the Swedish National Space Board. Around 120 scientists and representatives for universities, politicians, research funders and authorities gathered together for the event. The aim was to focus on the challenges faced by the research community from a Swedish perspective to achieve the objectives established at the UN World Summit on Sustainable Development in Johannesburg.

The most important outcome at the Johannesburg summit was the Political Declaration and the Plan of Implementation. The Political Declaration establishes that all development shall integrate ecological, economic and social perspectives in a mutually reinforcing partnership. Sustainable development has hence become an overarching objective. The two speakers who analysed the Johannesburg summit in a political perspective, the former Speaker of the Parliament and former Minister for the Environment, Birgitta Dahl and State Secretary, Krister Nilsson, emphasised this as significant progress. Even though the Johannesburg summit did not manage to reach consensus on concrete, time-framed objectives in all areas, we can still claim that the meeting threw down the gauntlet to the governments of the world to progress from words to actions regarding sustainable development. The requirement for politics to merge the ecological, economic and social dimensions of development implies that models other than traditional economic ones are needed for us to understand society. Above all, models are needed that provide support for long-term decision-making. Not only is it a question of analysing the systemic errors upon which industrial countries are partly based, but also of finding inter-sectoral solutions that, not least on the local level, can bring about change and break new ground.

One proposal, from Birgitta Dahl, was to implement model projects in the worst-hit countries and regions of the world and focus all our conceivable strength, including leading-edge research, in order to achieve sustainable solutions from not only an ecological but also a social and economic perspective.

Almost the entire Plan of Implementation from Johannesburg has a bearing on research. Scientific facts are the first step towards sustainable development in almost every area. Paragraphs 107-113 in the Plan are devoted specifically to research. They are worded in general terms and focus primarily on the transfer and sharing of knowledge among scientific institutions, among countries and between the scientific community and the civil society. According to the Plan, inter-sectoral and multidisciplinary research efforts are needed to provide a basis for making decisions on sustainable development. It also contains general wording on strengthening political decision-making based on scientific facts.

The Plan of Implementation emphasises in particular the importance of involving developing countries to a greater extent in knowledge sharing and of strengthening the research capacity of developing countries in particular.

Today we have a much better idea of the nature and complexity of the problems than we had at the UN Conference on the Human Environment in Stockholm 30 years ago. The political focal point has now shifted to the implementation level. The research community has not shifted its focus from problems to action to the same extent as politicians - a change that would lead to a considerably greater contribution from the social sciences.

Two directors of international research organisations, professors Roger Kaspersen and Will Steffen, painted a concordant picture of the challenges faced by the research community in their addresses. Social science in particular has lagged behind when it comes to developing the knowledge base necessary for being able to deal with the global problems we face, not least in the South. People experience a complex of problems in their everyday lives, some of them environmental and some social, and this complex must be analysed across borders, between different fields and different scientific disciplines. We must look at the entire spectrum of environmental impact and environmental changes. Since they do not occur individually, they cannot be studied separately either. We must also find out to what extent the changes to the environment are human-induced and to what extent they are natural variation.

Both natural science and social science are important on their own, but we must also develop the scope for combining knowledge from different fields. Research must be performed more on the systems level, at the same time as we continue to build up and reinforce our knowledge within the various research disciplines. The problems of "scale" must be broached: scientists have to learn how to alternate between the global and local level, and not forget the difficult levels in-between. Research must also tackle the time-scale, being aware of the fact that what we do now will affect unborn generations.

One can see this as developing a new discipline - sustainability science - which, without detracting from traditional scientific values, could actively contribute to sustainable development. It will implement more holistic analyses than traditional research. It will be carried out to a greater degree

on a local or regional scale and will try to analyse problems on-site and in the contexts where they occur. It will also try to involve all actors not just in solving the problems but also in creating the knowledge base we need to tackle them.

The seminar discussed how the Swedish research community should meet these challenges in five working groups focusing on different problem areas, and in a final panel discussion. Here, some of the answers that emerged to the four questions that were the subject of the seminar discussions are presented.

1 *The role of research: In which areas does research play a central role for sustainable development?*

There is a long list of gaps in our knowledge and of pressing research tasks, stretching from traditional basic natural science research to social science in the interface with the political sphere.

Knowledge as to how the earth's life-support systems work is still insufficient in several areas. We don't know enough about the processes that control the earth's climate. Our knowledge of natural variability is equally poor. Research into biodiversity and ecosystems provides us with basic knowledge. But we need to look more at the link between time and space, not least regarding functional biodiversity. In addition, there is still a need for basic inventories to be carried out.

One important area is water research, which is traditionally fragmented among many different scientific disciplines. Integrated water management, both on the catchment area level and the national level, requires a complex and as yet inaccessible scientific knowledge base, with a fundamental need for method development.

Research into how different trade subsidies affect the development towards a sustainable society or impact assessments of global institutions, their regulatory framework and policies are examples of proposed issues in another part of the research field. We also need research into how human behaviour can be changed by information, economic instruments, administrative instruments and support structures. How people value natural resources is also important knowledge and necessary in order to implement measures. Research into how different target groups react to different instruments is important. Comparative studies among

countries are interesting when it comes to analysing different instruments and their impact.

Research on the theme of environmental justice and environmental rights is also interesting. Defining rights can mobilise people socially, even if we lack the systems that allow these rights to be implemented.

Research must be inquisitive of social experiments that are carried out. It must also take an interest in contrary forces - the enemies of sustainable development.

A recurring conclusion is that sustainable development research must be long term, and that the currently dominating forms of research funding - with their short-term, project-oriented grants - constitute an obstacle.

Sustainable development is rendered more difficult without information on the state of the global environment. An important tool for rational, global environmental monitoring is remote sensing by satellite, something that was also stipulated in the Plan of Implementation from Johannesburg.

2 *Interaction between research and politics: How can we improve the dialogue between research scientists and decision-makers in these areas?*

Everyone agrees that there is inadequate dialogue between the research community and the political sphere. Several reasons for this were pinpointed. There is a lack of resources for taking care of and disseminating research results. Current reward and funding systems do not promote dialogue between research and politics. A higher premium is paid to basic research within both the natural science and the social science field, while applied research is not valued as highly at all. In addition, research often avoids politically controversial issues.

Dealing with knowledge is a special activity that requires special skills and resources. Many provide the jigsaw pieces but few put them together. Decision-makers must also improve their skills to be able to turn research results into good practical implementation.

The discrepancy between the proposals for solutions made by scientists and by politicians can be reduced by bridging the gaps between groups and by creating neutral arenas

where they can meet.

It is important to tackle the problem of knowledge transfer between the research community and politicians in a European perspective. The agenda is set very much on the EU level.

More synthesis research is needed as a basis for political decisions; for example to help instruments to synergise rather than to pull in different directions. Syntheses can also contribute to creating consensus by helping politicians to understand what are "truths" and what are hypotheses. Synthesis research requires more generalists.

More research is also needed into positive links that point to sustainable solutions, rather than identifying negative relationships.

The need for a closer association between research and politics must not, however, be allowed to undermine the independence of research. Research must not be under the direct control of politicians or political interests. The importance of independent research councils was underlined.

The central role of education as the conveyor of scientific knowledge in society was also underlined.

3 *The North/South perspective: Which issues have a clear North/South dimension and how can Swedish research help in a global perspective?*

Under the Plan of Implementation from Johannesburg, the proportion of the world's population that does not have access to safe drinking water and basic sanitation shall be halved. To achieve this objective, national plans for integrated water management and efficient water supply should be developed in parallel in all countries. This is scientifically complex work.

Energy systems must be developed in partnership with the developing countries. Sweden could, for example, initiate research into solar energy in countries such as Mali, Senegal and Burkina Faso. This would create new opportunities for development in these countries, for a global partnership and for success on a potentially massive market for new energy technology.

There is a great deal left to do when it comes to analysing

biodiversity in the South. There is considerable scope for efforts in this regard.

Support-oriented research efforts that can help utilise the surplus labour force in the developing countries in a way that assists the reconstruction of devastated environmental and supply resources would be enormously beneficial at several stages of the process.

In general, the most acute problems are to be found in the South, whilst the majority of scientists and research results are found in the North. The research section of the Plan of Implementation from Johannesburg focuses mostly on capacity-building in the South and research cooperation between the North and the South. It is important that the South is able to pursue its own development agenda and its interests in international negotiations in an informed way. This should be a central aspect of Swedish international development support. In addition, there are many research issues involving the South that are pursued by the North but not prioritised in the South, and in this case it is not necessarily a question of development support. If Sweden is to be able to provide increased support to research within these areas, more research funding must be made available, i.e. not just development aid. Providing more opportunity for scientists from the South to apply for funding is necessary if we are to achieve active participation in research projects in this part of the world.

It is currently difficult to fund projects that have a North-South focus. Swedish research funding puts a higher premium on research that basically only has a national perspective.

Perhaps we need to create a Swedish institute with the task of and capacity for developing an intersectoral system approach with a clearly global view.

We need to broaden the research concept and provide scope for more civil society research. Such research can be supported by the provision of a research infrastructure, for example access to remote analysis data on the global environment. This would enable and stimulate research outside the traditional environments, for example connected with NGOs. Some changes occur as a result of activities by actors other than researchers and politicians. This is one reason for providing them with good information.

4 *Inter-/multidisciplinary research and a systems approach: What challenges does an interdisciplinary approach and partnership need? Can a systems perspective help?*

There was large-scale consensus on the central importance of adopting a systems perspective to sustainable development and that this in turn requires much more widespread and systematic inter-disciplinary efforts than is currently the case.

Within the field of sustainable development, there are large unknown areas that must be defined as basic research within both the natural sciences as well as the social sciences, but not least within fields that break down the boundaries between the two cultures. In the latter case, this transboundary approach must bridge over the differences in approach to what can be researched, what is interesting and relevant and not least how good research should and can be pursued. It is a question of a modified approach to the concept of basic research. More effective interdisciplinary research therefore also requires fundamental methodological studies.

At the same time, we must work with system prerequisites. Creating rules is not enough; we have to consider how political, economic, institutional and social systems should be changed in order to promote sustainable development.

Research can help to find synergy effects of our sustainability efforts. One angle of approach might be to see the workplace or the housing area as an arena for practical sustainability efforts, where we integrate the "three legs" (ecological, social and economic sustainable development).

The incentive for performing multi- and interdisciplinary research at Swedish universities is weak. The causes of this are rigid structures, strongly disciplinary cultures and identities as well as an external funding system that is basically disciplinary in nature. There is, however, some tendency towards change: changes in management styles at all levels, less importance attached to faculties, more emphasis on research groups and a greater impact on the different areas of research in the allocation of research funds, performance indicators as a basis for how resources are invested, mobility among scientists, etc.

It is quite clear that increased multi- and interdisciplinary cooperation is needed, but there are differing opinions as to

how this best can be achieved. One strategy is to create interdisciplinary structures, such as institutions, centres or institutes; another is to promote partnerships between researchers from different disciplines who at the same time maintain their base in their respective scientific disciplines. Current systems are in any case not designed to meet the challenges of the future. It must also be possible to pursue a research career within interdisciplinary research.

Closing comments

The conference moderator, Ambassador Bo Kjellén, expressed in conclusion that the entire discussion can be seen in almost a dizzy perspective. We are slowly beginning to realise the whole breadth of changes that are required if we are to achieve global sustainability. It is a question of a paradigm shift and research has a central responsibility in our joint efforts to create the necessary prerequisites for this development.

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The aim was to inform on the results of the World Summit on Sustainable Development in Johannesburg 2002 and to discuss how Swedish research can contribute to a sustainable development.

This is an English summary of the report (in Swedish) from the conference. Both this summary and the report is available on the website of the Swedish Environmental Advisory Council www.mvb.gov.se and the website of Formas www.formas.se. Hard copies can also be ordered from The Swedish Environmental Advisory Council, e-mail: mvb@environment.ministry.se, tel +46 8 405 2183, fax +46 8 20 43 31.

