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Swedish National
Commission for UNESCO

WORLD SCIENCE DAY FOR PEACE AND DEVELOPMENT 2012

Power over the words – power over the world



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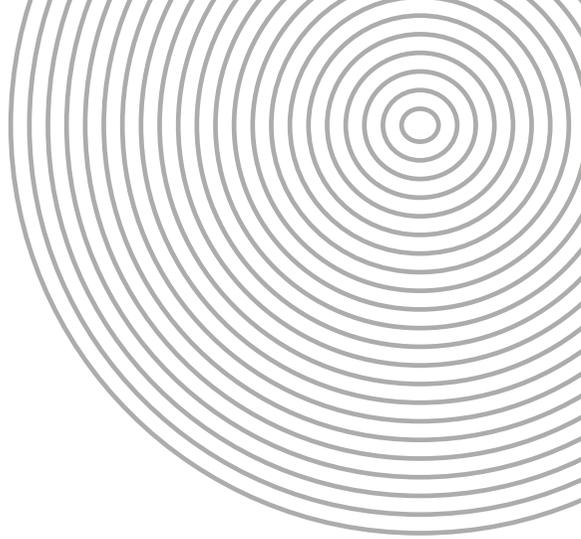
PREFACE

UNESCO has proclaimed November 10 to be World Science Day for Peace and Development. The aim is to renew “the national, as well as the international commitment to science for peace and development and to stress the responsible use of science for the benefit of society” and “to raise public awareness of the importance of science and to bridge the gap between science and societies.”

World Science Day 2012 was the point of departure in Sweden for establishing an interdisciplinary forum to strengthen global developmental research. The forum intends to help to highlight issues shared by various disciplines of relevance to peace and development. This forum is to be arranged annually, and the hope is to create a platform for discussions about

research matters within and across the research areas of UNESCO’s scientific committees and across other operational areas within UNESCO. These discussions and conclusions can also help to further Sweden’s various contributions to UNESCO’s work.

Society is facing a number of problems and challenges, not least regarding climate and environmental matters. In UNESCO’s work for global sustainable development and education for sustainable development, the involvement of researchers is imperative. Researchers in all disciplines need to contribute to finding solutions to several of these questions. Not least in the interface between research and society there is a need for knowledge where an interdisciplinary ap-



proach is virtually indispensable if various solutions are to be achieved.

World Science Day 2012 brought together some 70 invited researchers and research financiers involved in UNESCO-related research work. The focus was on a number of dilemmas that have been identified by UNESCO's various scientific programs. The meeting provided representatives from all of UNESCO's scientific programs in Sweden as well as their financiers with an opportunity to gather and discuss pres-

sing issues. The presentations and discussions showed that Sweden can actively help provide scientific foundations to address UNESCO issues.

This publication is intended for researchers, politicians, decision-makers, and research financiers engaged in the major global challenges. At the same time, it is an invitation to participate in developmental work, so that Swedish research will be able, to an even greater extent than today, to advance UNESCO's efforts for sustainable development.

Inger Davidsson

*Chair of the Swedish National
Commission for UNESCO*

Lars Anell

*Chair of the Board of the Swedish
Research Council*

WORLD SCIENCE DAY – AN INTERDISCIPLINARY FORUM



“2012 must be a turning point towards green societies, built on the inclusive and equitable development of science to the benefit of all”

This proclamation by Irina Bokova, Director General of UNESCO, in connection with the 2011 World Science Day was the point of departure for the theme of the 2012 World Science Day. The intention was to discuss how commitment to global developmental research for peace can be strengthened by interdisciplinary meetings with UNESCO’s scientific programs and what role this could play in involving researchers from different disciplines.

By highlighting issues shared by disparate disciplines, the hope is that peace and development will be promoted in a global context, by building bridges between research and the needs of society.

In a global societal perspective there are conflicts that also impact the ability of scientists to work. These include inclusion and influence as well as rights and responsibilities: “Who has the right to formulate what problems are to be researched?”; “Who owns research fin-

dings?”; “How should researchers deal with conflict hotspots that affect their research?”; “Should researchers take a stand on controversial societal issues?” These are some examples of the dilemmas in the form of choices to be made between desired and undesired and often irreconcilable alternatives. They need to be discussed and debated again and again.¹

UNESCO works in various ways to promote sustainable development and education for sustainable learning with the support of its scientific programs. UNESCO does not fund research, but it does arrange platforms and forums for researchers. Moreover, UNESCO coordinates programs for research in order to promote the organization’s mission to work for peace, for a reduction of poverty, and for sustainable development. UNESCO as an organization wants to show possible ways to move forward.

More interfaces are needed between research and society to make research known and stimulating when solutions are being sought. If UNESCO’s missions to reduce poverty, promote peace, and bring cultures together are to be taken seriously, these issues must be add-

¹ From an address by Elisabet Nihlfors, Swedish Research Council

ressed on a broad front. An interdisciplinary approach is therefore important in this connection, because, as someone pointed out at the meeting, reality is interdisciplinary. The presentations from the various scientific programs were testimonies to this, regardless of whether they were about land and water use or the dissemination of information. Sweden is striving at UNESCO to bring together UNESCO's social science and natural science programs. This is a matter that thus far has been met with resistance from other countries. One explanation might be that there is a fear that the social sciences will not complement but rather be subordinated to the natural-science perspective.²

The International Social Science Council (ISSC)³ works to develop an integrative and cross-disciplinary approach where social-science research plays a central role in research about climate change for learning about sustainable development. ISSC has formulated an agenda – Future Earth – that illuminates the role of the social sciences in work with climate change. From having occupied peripheral areas of research on climate change, the thrust is now for the social sciences to move to center stage and assume an overall responsi-

bility. ISSC maintains that it is necessary to use the knowledge generated by the social sciences to address burning issues and to meet the challenges of global environmental changes. To do so, methods need to be devised to disseminate vital knowledge in society at global, regional, and local levels.⁴

Commissioned by UNESCO ISSC mapped the position of social sciences in society and found that experts in social science are in very great demand among decision-makers, the media, and the general public. Today's complex challenges – economic crises, urbanization, migration, pandemics, global warming – can only be solved by collaboration among several different disciplines, innovative thinking, and policies based on sound evidence.

This is precisely what social science has to offer, according to ISSC: the perspectives of economists, statisticians, city planners, geographers, sociologists, demographers, political scientists, and anthropologists – to mention just a few. They analyze how the world functions, how individuals interact with their surroundings, and they provide us with evidence-based decision-making in all fields, from reducing poverty and improving education to urban migration, gen-

² From an address by Anders Ahnlid, Sweden's ambassador to UNESCO

³ ISSC is a free-standing organization with ties to UNESCO. ISSC's Director, Heide Hackman, was invited to speak at World Science Day but had to decline for health reasons. She has nevertheless contributed the section "Integrated Science" in this publication.

⁴ From an address by Anders Granlund, SIDA (Swedish International Development Cooperation Agency)

”Education alone cannot achieve a more sustainable future; however, without education and learning for sustainable development, we will not be able to reach that goal.”

der equality, and economic growth.

The authors of the report maintain that public policy could not exist today without the social sciences. Every societal challenge the world faces today has deep social dimensions. Climate change is a striking example: policies that do not include social and humanitarian consequences of, for example, the migration of families and communities from their land areas, increase the risk of creating more exclusion and inequality/inequity.

The issue of knowledge gaps and education for sustainable learning has engaged UNESCO in various programs for many years. UNESCO leads the United Nations program “UN Decade of Education for Sustainable Development (2005-2014)”. The program aims to “mobilize the educational resources of the world to help create a more sustainable future. Many paths to sustainability exist (e.g.

sustainable agriculture and forestry, research and technology transfer, finance, sustainable production and consumption) and are mentioned in Agenda 21, the official document of the 1992 Earth Summit. Education is one of these paths. Education alone cannot achieve a more sustainable future; however, without education and learning for sustainable development, we will not be able to reach that goal.”⁵

But it is not only in UNESCO that the gap between research and society can be bridged. The Swedish government writes in its research bill⁶ that our understanding must be enhanced regarding how excellent research-based knowledge is generated, how it is utilized in society and business, what future knowledge needs will be, and how countries shape their policies in an area.

⁵ Education for a Sustainable Development, Building a Better Fairer World for the 21st Century

⁶ Bill No. 2012/13:30 Research and Innovation



UNESCO'S SCIENTIFIC WORK⁷

Science has been of great importance throughout UNESCO's history. From the outset UNESCO has been a leader in the discussion about research ethics, as part of its origin was the misuse of science during World War II. This dimension was included in the formulation of human rights. In the 1960s UNESCO took the initiative for the World Action Plan for Science and Technology for Development, where it was clearly stressed that a larger proportion of the world's research should be directed towards the problems of poor countries and peoples, that developing countries need to be helped to build up their own research capacity, and that international research collaboration must be started to address the problems of poverty. Up to the 1980s global commitments were relatively large, but since then only a few countries, including Sweden, have been advancing research for development.

The concept of Sustainable Development was coined at the Biosphere Conference in 1968. This conference was also the starting point for a series of interna-

tional conferences on the environment and development, the first of which was held in Stockholm in 1972 and the most recent one, Rio + 20, in Brazil in 2012. The initiative for the MAB program also came from UNESCO's Biosphere Conference.

Today UNESCO is far from having the same status and capacity to further science in any particular direction. There is reason to be critical of UNESCO's way of dealing with scientific programs⁸, but at the same time this criticism falls back on the member countries, which are not acting sufficiently boldly and insightfully to enable UNESCO to be a driving force. All too conservatively, they have limited themselves to a handful of programs, which, to be sure, have been developed internally, but the great challenges facing the global scientific community are now being monitored better by other actors, such as ICSU and ISSC, and the societal discussion about science is being carried on better within the EU and similar regional organizations than within UNESCO.

⁷ From an address by Tomas Kjellqvist, Swedish National Commission for UNESCO

⁸ UNESCO's scientific collaboration is divided into natural and social sciences and helps to further science as a tool in work for peace, combating poverty, and sustainable development. UNESCO has five major science programs: International Hydrological Program (IHC), Intergovernmental Oceanographic Commission (IOC), Man and the Biosphere Program (MAB), International Geosciences Program (IGCP) and Management of Social Transformations (MOST). The overarching theme is human rights and philosophy. See further under the heading "UNESCO's five scientific programs."

But there are still key roles that only UNESCO can play:

- i) No other organization has a global mandate and could muster member countries to take part in a discussion of global research policy
- ii) No other organization has UNESCO's potential to take a holistic approach regarding natural sciences, social sciences, and the humanities
- iii) No other organization has the capability to place science in a framework in which human rights are the fundamental principle and in which the ties to education, culture, and communication are so clear.
- iv) No other organization could, like UNESCO, link together researchers from widely separated corners of the earth or from widely disparate academic disciplines in order to jointly contribute to an understanding of and solutions to shared problems.

It is the responsibility of the member countries to demand that UNESCO realize this potential, and it is the responsibility of the member countries to place resources at its disposal, in the form of financial support for the organization, but above all by mobilizing their own national scientists to participate in UNESCO's scientific programs.

Researchers and research financiers in member countries must also become engaged in the discussion about how UNESCO might reformulate its operations in order to address the most urgent global problems more clearly.

In such work the membership of researchers and research financiers in other international bodies is also important. Joint discussions with academic organization within disciplines, within ICSU and ISSC, within the scientific committees of the EU and other regional organizations can also help define a new role for UNESCO.⁹

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⁹ From an address by Tomas Kjellqvist, Swedish National Commission for UNESCO

UNESCO's five scientific programs

INTERNATIONAL GEOSCIENCE PROGRAM (IGCP)

IGCP is an interdisciplinary capacity-building geoscience program with research projects in all aspects of earth sciences. The international research projects link together geological processes with topical environmental issues, such as natural disasters, climate change, and biological diversity. The Swedish IGCP Committee supports projects with Swedish participation and is striving to highlight geology in society.

INTERNATIONAL OCEANOGRAPHIC COMMISSION (IOC)

IOC is an interstate commission for the measurement and observation of the state of and changes in the world's seas. Data collected provides a basis for international marine research, focusing on, among other things, the role of the world's oceans in the earth's climate, marine resources, and the development of global warning systems for tsunamis. In Sweden, IOC is run by a secretariat placed with the Swedish Meteorological and Hydrological Institute, SMHI.

MAN AND THE BIOSPHERE PROGRAM (MAB)

The MAB Program brings together research in the natural and social sciences

in an interdisciplinary research program where the point of departure is the interaction between humans and the biosphere. The program is manifested in the biosphere areas that are pilot areas for testing new methods and new knowledge to achieve long-term sustainable societal development. They are locally initiated and operated as good examples of how use and conservation can go hand in hand. The Swedish MAB Program is devised to encourage interdisciplinary research, to demonstrate good examples locally, and to educate people in sustainable culture and stewardship of natural resources in order to contribute to greater collaboration between science, local knowledge, and regional and local government.

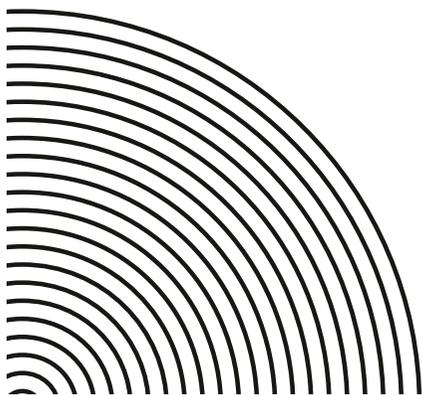
INTERNATIONAL HYDROLOGICAL PROGRAM (IHP)

IHP focuses on research into water-related issues, and the Swedish IHP Committee is the national committee in Sweden. The committee's assignment is to initiate, encourage, and coordinate Swedish IHP activities. One central area for IHP work is to build up capacity regarding water issues in Africa, but the committee also carries out national activities, such as networking and workshops intended to disseminate knowledge. Each year IHP co-arranges World Water Day, where, among other things, the winner of the Stockholm Water Prize is announced.

MANAGEMENT OF SOCIAL TRANSFORMATION (MOST)

The MOST Program supports social scientific research and aims to enhance our knowledge of major ongoing social transformation processes in the world by building bridges between research, policy, and practices. Important MOST research areas are, for example, demographic developments, public health and welfare, migration and transnational relations, human rights, and rights

in working life. The national MOST committee creates platforms, through seminars, workshops, and networks, etc., to increase the dialogue between researchers and practitioners in issues of global development, in particular to combat poverty and exclusion, to promote social change, and to improve the situation for women and children.



“INTEGRATED SCIENCE”

International Social Science Council (ISSC) has started the project Future Earth, which has won acceptance in all parts of the research community. The Swedish International Development Cooperation Agency (SIDA) has decided to support this agenda for a ten-year period.

The Future Earth Project is about what is called “integrated science,” where researchers collaborate across all disciplines and research fields. It is important to work with – not for – society and to work globally by incorporating multiple socio-geographic perspectives and boundaries.¹⁰

Heide Hackman, director of ISSC, presents ISSC’s ideas and work here.

How we can advance science inclusively and equitably for the benefit of all

The recent history of S&T policy comprises a narrative about changes in three areas: Firstly, the way in which we interpret relevance and the intensity of the call for relevance has shifted from a focus on research missions to today’s unprecedented, so-called wicked problems.

Secondly, the way in which we conceive of the science-society relationship has shifted from notions of ‘science and society’, to ‘science for society’ and now increasingly to ‘science with society’. And thirdly, conceptions of academic autonomy have shifted from autonomy being understood as a right unfettered by external constraints to autonomy as a responsibility to collaborate with society in securing the public good of S&T.

We live in extraordinary times of converging planetary and social crises: a time of what has been called post-normal science (e.g. the work of Ravetz), of complex, wicked problems (e.g. Brown et al, 2010). The latter defy definition; blur the lines between science and politics or facts and values. Scientific results are politically charged and uncertain, and solutions are said not to be true/false or good/bad; instead, each resolution raises new issues.

Faced with this reality, researchers are confronted with a new sense of urgency and unrelenting pressure for their work to make a difference, to contribute to real-world problem-solving. Science is called on to provide better understandings of the complexity of the challenges we face and to accelerate the production of relevant knowledge. Science needs to be

¹⁰ From an address by Anders Granlund, SIDA (Swedish International Development Cooperation Agency)

more effective at meeting user requirements, to produce livable, just solutions, and to inform robust policy and its sustainable implementation.

Clearly, business as usual is not an option. We need new ways of producing knowledge and making sure it gets used. We need “integrated science” that works across all disciplines and fields of science, works globally, engaging multiple socio-geographic perspectives and approaches and, most of all, works *with*, not for society.

INTEGRATION ACROSS DISCIPLINES/FIELDS

Taking collaboration between different sciences and scholarly fields to a deeper, more meaningful, constructive and complementary forms does not mean a loss of disciplinary identity or the loss of diverse perspectives, approaches or methodologies in science. On the contrary, it means being confident in one's disciplinary base whilst remaining open to other ways of viewing and studying the world, open to asking new, different kinds of questions and working together on the basis of mutual respect.

Nor does integration in this case mean inviting social and human scientists to join in attempts at addressing problems which have largely, if not solely, been identified and framed by natural scientists (or vice versa). Instead it entails the joint, reciprocal framing, and then design, execution and application of research.

Despite decades of attempts to foster integration across disciplines and scientific fields, significant challenges remain. Disciplines still dominate academic training systems, funding mechanisms, as well as career management and advancement, including publication and evaluation systems. At the same time, different fields have different research traditions, cultures and languages that many still battle to reconcile. And there remain reciprocal accusations of naiveté and knowledge gaps on both sides; whether about the social or the physical world.

Integrated work requires time. It involves building relations of trust (in a competitive environment). It requires the kind of collaboration that cannot be forced; ideally it should be based on bottom-up, emergent processes. In this we do not necessarily have a great track record on which to draw.

When it comes to integrating the social sciences and humanities into global environmental change (GEC) and sustainability research, the challenges are more specific. These fields have typically functioned as closed networks that do not always speak to the full range of social and human sciences. At the same time, it has not always been clear what kind of social science should contribute to integrated GEC research. And some social scientists themselves question the status of research oriented towards solving concrete problems, choosing

rather for theoretical, curiosity-driven research. Beyond this, the advancement incentives for social sciences to get involved is often insufficient. And finally, it has to be acknowledged that much relevant – and excellent – social and human science research that is relevant to issues of GEC and sustainability simply remains invisible. This raises questions about how research is framed and by whom, about what is perceived (often by natural scientists) as being useful, and what is classified as falling outside of the GEC intellectual/academic agenda?

INTEGRATION AS WORKING WITH – NOT FOR – SOCIETY

Integration of science with society can be understood as the process of bringing various practitioners, policy and decision makers, as well as actors from civil society and the private sector together in the co-design, co-production and co-delivery of knowledge, policy and practice. In this understanding we recognise that there are multiple sources of relevant expertise and a plurality of perspectives to be harnessed in addressing societal challenges. At the same time, we acknowledge that, at different times, all of these actors are both producers and users of knowledge.

In practice this aspect of integration means moving beyond instrumental interpretations of relevance (the language of impacts and uptake) in which scientific results are fed into the policy process,

policy makers, practitioners and other stakeholders are basically absent or treated as passive recipients of scientific knowledge, and research agendas are organized around second-hand notions of what these actors need and want.

Moving beyond this linear approach means moving beyond dualistic mechanisms of the production and use of science (incl. science advice, assessments, policy briefs), moving beyond a reliance on research findings percolating through informed publics, the media, and think tanks to influence policy debates. And it means moving beyond dependence on the authority and visibility of 'notable individuals'.

The challenges inherent in doing so are numerous. We don't have many mechanisms for fostering serious, regular, sustained interaction with policy makers, practitioners, civil society actors and private sector representatives. But even when interaction is organised, the necessary motivation and resources for non-academic actors to participate in processes of co-designing and co-producing knowledge are often not made available. An equitable and inclusive science has to start on the basis of changing these conditions.

FIVE CONFLICTS FROM A RESEARCH PERSPECTIVE

At the forum, five different conflicts were presented that researchers in UNESCO's scientific programs have identified. They all started out with the concept of "freedom of expression" and the perspectives of "inclusion and influence" and "rights and obligations." At the same time, this was a presentation of UNESCO's various research programs.

1) The case of land investment and/or land grabbing in Mozambique

Over the past ten years, it is estimated that some 230 million hectares of land in developing countries have been seized in international deals for the purposes of producing food and energy for export. Africa is the prime target of this land rush. During this period, an area of the continent twice the size of France has been sold or leased.

"Land grabbing undermines the land rights of smallholders and could damage the long-term sustainability of agriculture," says Kjell Havnevik.¹¹

The purpose of this session is to discuss conflicts, controversies, and communication with regard to land investment and/or land grabbing, taking Mozambique as an example. The problems or dilemmas can be described from a critical perspective considering and respecting rights of local people, small farmers, and civil society or from an investment and development perspective focusing on sustainable development in a broader view.¹² Another interesting example is represented by Vi Agroforestry, which is supporting cooperative development and networks among small farmers in various countries in East Africa. The economic, social, and cultural conflicts over land investment and/or land grabbing comprise various actors/interest groups with significant differences in power, money, social and intellectual capital, language, etc. They are, in addition to international donors:

- Foreign investors with global networks and high urge for profits
- National enterprises competing with international capital
- Local business – with a restricted market – or a wider market
- Small farmers, local work force, fami-

¹¹ Global rush for land puts smallholders at risk. Interview with Kjell Havnevik.

¹² Africa's Changing Societies: Reform from Below. Nordiska Afrika Institutet 2012.

- lies and communities
- NGOs and civil society organizations, CSOs, e.g. cooperatives, networks,
 - Activists, popular movements, unions, ad hoc actions, local politicians
 - National or regional agencies, “host governments”
 - Scholars from social science, natural science, technology

The big challenge and win-win situation is if land investment can both support sustainable development with benefits and development for nature, culture, and the people and not lead to a profit-oriented “extractive economy” where natural resources are taken away to other continents to be refined and sold at higher prices.

Mozambique belongs to a group of very poor African countries with low longevity and a high disease burden and generally a low level of education along with an underdeveloped system of research. In recent years, however, Mozambique has become part of an economic boom in the context of rapidly increasing foreign investments in ore mining, biofuel, timber, and other fields of natural resources. It is crucial that this development be followed and studied by scholars from various academic fields analyzing ongoing social transformations in a perspective of sustainable development in a broad sense. Core concepts in such an approach are – in addition to social and environmental sus-

tainability – gender equality, and social equity, the right to education and work, freedom of speech, and civil rights as well as strong initiatives of anti-discrimination with regard to race, religion, gender, age, functional impairment, and sexual orientation.

Firstly, we are looking at the issue of land investment or land grabbing. Kajsa Johansson, currently responsible for policy and development issues at “Koope-ration utan gränser/ Swedish Cooperative Development Center,” will introduce this first theme. Secondly, we will discuss the impact of both land investment/ land grabbing and the economic boom in the context of brain drain and brain gain with respect to future development in Mozambique.

As a background to this discussion, part of a comment in Naiforum by Kajsa Johansson, is quoted below (the text and related discussions can be found at www.naiforum.org):

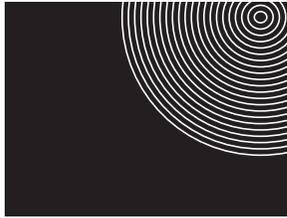
“In Mozambique, overall economic growth during the last two decades has been remarkable. This unfortunately hasn’t brought about a comparable decrease in poverty.

International agencies have reduced support for farming, and left agricultural development to the private sector. The lack of private interest in the peasant sector led to an emphasis on foreign investment, with large-scale concessions to foreign companies.



*Participants at the World
Science Day for Peace and
Development 2012*





The drivers of the increase in large-scale land investment are population growth and ever-increasing consumption by a global minority of rich countries and people. It is cynical to claim that this is meant to decrease food insecurity among poor people.

A common argument is that these investments are better than nothing since they bring about economic growth. Why should we accept this as 'good enough' when in reality it doesn't have a positive impact on poor people?

(---)

Looking at the country's economy as a whole, it has shown a remarkable growth during the last two decades. This growth unfortunately hasn't brought about a comparable decrease in poverty. The Mozambican researcher Carlos Castel Branco argues that the country is characterized by an extractive economy. Asking a person in the street or in the field, she or he would maybe use the term "colonial economy" – questioning what the difference is between the economic development of today and that of the Portuguese colonial power."

With the recent experience from Niassa in mind, taking part in the Swedish discussions on large-scale land investments as a means of poverty reduction, Kajsa Johansson is struck by a number of questions and contradictions, which will be explained at the seminar. A common argument is that these investments, even if they don't correspond to local needs,

are better than nothing since they bring about economic growth, an argument that is questioned by Kajsa Johansson.

"But when it comes to the implementation of laws related to land tenure rights, the optimism with regard to institutions in the same countries, seems endless. This implies that the challenge to guarantee the local populations' right to land and ensure that they are not being dispossessed of land, is underestimated by donors in their eagerness to promote investments."

What opportunities are there for citizens of Mozambique to take part in this development with respect to education, training, and competence development? And what is the role of CSR – corporate social responsibility – in this case? Do we foresee a competence migration to Mozambique from Portugal, other European countries, from African countries, or from other continents? Or can sustainable development have an inclusive function, providing education, jobs, and development opportunities for youth and next generation of the Mozambican work force? And will foreign investors also support the development of a competitive and skilled work force in Mozambique? And finally, will the national government use the opportunity of making competence agreements with foreign investors and thereby use the economic boom for national development?

2) *Conflicts, natural resources and geo-scientific research*

Natural resources are important factors in many violent conflicts of the world today, either as a cause of a conflict or as a source of finance for a conflict. There is a risk that conflicts involving site-specific natural resources, such as geological natural resources, will migrate into those areas where the resources are located and extracted. Common conflict minerals are diamonds (“blood diamonds”), gold, and columbite-tantalite minerals (sometimes referred to as “coltan”). Further examples of geological natural resources subject to conflicts are oil and water resources.

The trade with conflict minerals has emerged the need of international certification schemes in order to regulate the trade and being able to avoid trading with conflict minerals. The Kimberly process is one such example involving the trade with rough diamonds. “Blood diamonds” are known to have financed violent conflicts in countries in west and central Africa such as D R Congo, Sierra Leone and Côte d’Ivoire. However, illegal trade and smuggling may obscure the provenance of the minerals in certification documents; hence further tools are needed as a complement in order to trace the origin. Is it a conflict mineral or not? This is where geoscientific research carries can play a key role, as an important

tool in order to determine the provenance of natural resources. Geological natural resources such as minerals, metals, aggregates, oil and ground water are by nature site specific. They carry a specific geological signature based on the geological environment in which they are formed and when they were formed during the geological history of Earth. Through research these geological signatures can be identified and provide information to traders on the origin of the resource and if they are dealing with a conflict mineral or not.

The need for a traceable system to prove the origin of columbite-tantalite ores was recognized by the expert group for the D R Congo of the UN Security Council as important for the region, since columbite-tantalite ores was subject to illegal trade and smuggling.

Tantalum is a rare metal that is important in modern high technology and medical applications because of its qualities, such as strength, chemical and electronic properties. For example, today’s mobile phones would not be as small as they are, if it had not been for the use of tantalum. Although tantalum today is mainly mined in other countries, estimates have shown that Africa is believed to host $\frac{3}{4}$ of global tantalum resources.

The methodology for fingerprinting columbite-tantalite ores was developed by a group of international researchers from Germany, Canada, and Belgium

and the results from the pilot study were presented in 2008. It is the combination of geological signatures based on mineralogy, geochemistry, and geochronology of columbite-tantalite ores that has enabled the development of a system to trace the origin of ore concentrates from Africa.

The need for systems enabling the tracing of for instance mineral resources appears more and more important. There is a demand for “clean” geological resources that are exploited during sustainable conditions. A traceable system enables the industry to profile themselves and the public to make a choice. Do I want to buy a product that contains earth resources from conflict areas?

3) Roles of the researcher and the decision maker for policy relevant advice

One of the basic pillars of the UNESCO International Hydrological Program (IHP) is “Hydrological science for policy relevant advice”. But what are the roles of the researcher and the decision maker in this interaction? During the presentation from the Swedish IHP committee, the way and by whom problems are formulated is discussed on the basis of Pielke (2007) dividing researchers into groups such as “pure scientists” (no connections to current policy context), “science arbiter” (answers questions in

policy context that can be resolved empirically), “issue advocate” (recommends a specific decision), and “honest broker” (provides a set of options with consequences for the environment, economy, etc. that are developed in dialogue). Based on IHP-related activities, we will discuss how researchers and stakeholders individually or jointly formulate a picture of reality, future scenarios and ways to meet opportunities and problems. We will discuss whose reality is mirrored in research used to support decisions. When is the way research is used for decision support objective and when does it risk consciously or unconsciously favoring one interest group over another? What is required for scientific decision support in order to serve as a platform for dialogue and avoid potential conflict?

Two case studies will be introduced, one on the transnational and one on the local scale. The roles of the researchers and stakeholders will be discussed.

- Who formulated the problems addressed?
- Could they have been formulated differently and thereby had other policy implications?
- Based on Pielke’s division – what roles did researchers involved in these works aim to have and what roles did they have in reality?
- Whose reality and visions for the future do the “research-based” conclusions reflect?
- Is the research (or the way the re-

search has been used in a policy context) objective with regard to different stakes, or does it, consciously or unconsciously, favor specific interest groups?

- In what way has the research assisted in the avoidance of conflicts?
- Is there any risk that the way the research carried out or presented can also be a source of or a contribution to conflicts?

THE TRANSBOUNDARY SCALE – JORDAN BASIN

The Jordan basin is a transboundary river basin shared by four states (Israel, Syria, Lebanon and Jordan) and one "state in the making" (Palestine). The region's relations are characterized by a focus on security issues, even when it comes to the management of their shared water resources. In terms of scientific knowledge about how best to address the situation relating to water, the knowledge is there in terms of IWRM perspectives, techniques for monitoring of flow, data etc. However, joint management is not functioning well at the basin scale. This is not due to lack of knowledge but rather has to do with the political conflict. The political conflict is more important in regions where the focus is on security issues, it appears. It seems rational management of water is subordinate to politics. This and more on the subtle reasons behind it will be discussed in this presentation.

THE LOCAL SCALE – ADAPTATION TO CLIMATE CHANGE IN FARMING COMMUNITIES IN SOUTH AFRICA

Commercial and small-scale farmers in South Africa are exposed to many challenges. Interviews and workshops with these two groups of farmers in the upper Thukela basin, KwaZulu-Natal, were conducted to identify common and specific challenges for the two groups and adaptive strategies for dealing with the effects of climate and other stressors. This work was conducted as part of a larger participatory project with local stakeholders to develop a local adaptation plan for coping with climate variability and change. Although many challenges related to exposure to climate variability and change, weak agricultural policies, limited governmental support, and theft were common to both farming communities, their adaptive capacities were vastly different. Small-scale farmers were more vulnerable due to difficulties in financing the high input costs of improved seed varieties and implements, limited access to knowledge and agricultural techniques for water and soil conservation, and limited traditions of long-term planning. In addition to temperature- and drought-related challenges, small-scale farmers were concerned about soil erosion, water logging, and livestock diseases, challenges for which the commercial farmers already had efficient adaptation strategies in place. The major obstacle hindering commer-

cial farmers in future planning was the lack of clear directives from the government, for example, with regard to issuing of water licenses and land reform. Enabling agricultural communities to procure sustainable livelihoods requires implementation of strategies that address the common and specific challenges and strengthen the adaptive capacity of both commercial and small-scale farmers. Identified ways forward include knowledge transfer within and across farming communities, clear governmental directives, and targeted locally adapted finance programs.

GENDER AND WATER – UNEQUAL ACCESS, USE, AND CONTROL OF WATER DESPITE RECOGNITION OF ‘GENDER’ ISSUES IN POLICIES AND PRACTICES

Water is a basic human need that has also been suggested to be a human right. However, the exercise of this ‘right’ is limited for many, not only by lack of physical availability but also by social, cultural, and gender relations. Access and use of water is linked to gender in several ways, where the role, responsibilities, and rights being different between men and women. Traditionally, women have been regarded as the domestic water managers. The need to increase women’s involvement, influence, and control in developing the water supply and the water management process has been acknowledged by international and national policies for several decades. However, despi-

te the recognition of the importance of gender in relation to water and in contrast to claims of successful projects, research on the outcomes of these policies and practices shows that the inequalities remain or have even been reinforced. A major problem is that gender is too often simplified as being equated with women and that women are regarded as a homogeneous group, a group that in reality is divided by class, religion, geography etc. Policies and practices are therefore often focused on increasing the involvement of women, but with no regard paid to the context, which may be much more important for women’s access to and use of water. The emphasis is more often on the practical needs of women in their traditional role, rather than on strategic issues of woman’s subordination and lack of representation at different levels of decision-making.

4) Information access and benefit sharing

In recent decades the debate has intensified over the right of ownership concerning information and physical objects related to natural resources of various kinds. The interest in acquiring exclusive rights to essential physical commodities, like access to fresh water, minerals, and fossil fuel, and to information on prospective and existing utilities is not only a potential source of conflict. There are examples where different parties

have not easily come to terms in regard to national borders, company interests, etc.

At the same time the means to collect, organize, and disseminate information regarding such elements of human welfare have increased dramatically. Methods to extract and utilize biochemical information from the tiniest of biological organisms and from the DNA of humans and other organisms, for instance, to finding and handling the most obscure and remote bodies of mineral deposits are continuously being developed. Ideas on the possible adoption of evolutionarily successful ways to support and sustain life are being added to the toolkit of man, one after the other.

Although it is ultimately the result of the ingenuity of individual or groups of researchers, the success of applying this information is a matter of combining infrastructure building and policy making. The expenditure of resources creating functioning gateways to information is vast and increasing but:

- How efficient can this effort be in the face of increasing protectionism regarding the necessary basic information?
- How are the conflicting demands of science and politics treated in the era of large-scale informatics development?
- How are different informatics initiatives structured to cope with unwilling providers of information?

- How likely are scientists and other service users to search for relevant information?

Initiatives like GEOSS, GEOBON, and GBIF, to name a few serving scientists, civil servants at national, regional and local authorities, and the general public (!) with information on physical, chemical, and biological traits of the surrounding world, rely on providers to present accurate data. Trustworthy individual databases must be available, but in order to encourage such delivery the initiatives must at the same time be able offer the necessary information and to give ample credit to providers, and they must not compromise the interests of those supporting data collection and dissemination.

By making use of its unique insights into the cooperative ambitions aimed at building sustainable development practices the Man and the Biosphere Program may play a significant role in the interplay between different parties as above, and by taking part in the provisioning of data by teaming up with the LTER, LT-SER and other initiatives, it promises to offer a good opportunity to be a part of the process of developing answers to the above-mentioned questions.

5) *Power over information = power over the world?*

How can word power relate to IOC – the Intergovernmental Oceanographic Commission?

There is an old saying that Knowledge is Power. In the marine sciences knowledge is contained not only in words but also in data – data from observations and measurements in the sea and in laboratories.

Who plans the studies and research in the sea and about the sea? Who carries them out? Who has the right to access these data, which, at least in Europe, are primarily financed by taxpayer money?

There are at least four different types of marine studies:

A. Specific studies of the resources in the coastal zone. These can have several similarities to the studies of the continental shelf (B), but are geographically much more limited, as the wording ‘coastal zone’ indicates. These studies are frequently focused on describing environmental quality and monitoring changes for the better or the worse.

B. Studies to describe the continental shelf of a country. These studies are under the responsibility of national authorities, often planned and carried out together with universities. The aim is to describe the continental shelf and its living and mineral resources in a way that fulfills the requirements of

the Law of the Sea. Without this kind of mapping and description a nation cannot claim its rightful ownership of the resources of its continental shelf and establish its Exclusive Economic Zone (EEZ).

C. General investigation of a sea area to describe e.g. its physical, chemical, biological, or geological characteristics and resources. This is done to increase the knowledge of the sea, and the studies are usually financed by governmental agencies or universities.

D. Studies of the same kind as above but focused on specific issues, e.g. a biological or chemical process. These studies are very often planned and carried out by universities. Other studies concentrate on fish resources to assist decision-making concerning allowable fish catches. These studies are planned and carried out by national fisheries administrations.

The coastal zone is of vital importance to all societies both in industrialized and in developing countries. Many activities such as fishing, aquaculture, shipping, energy production, sand and gravel extraction, and tourism take place in the coastal zone. Consequently there are many conflicting interests between development and conservation. One example is the establishment of wind farms in shallow sea areas and the resulting conflict with fishery interests. Proactive national or regional authori-

ties can carry out physical marine spatial planning for the coastal zone in which they assign different areas to specific purposes, e.g. locating industrial installations outside of areas suitable for recreation. It is essential that stakeholders and other interests are involved in this planning process and can contribute to formulating the problems that the planning is meant to resolve.

The majority of data used in the planning process are usually from investigations financed by taxpayer money. Open access to the data is regulated in the European Union by the INSPIRE Directive (establishing an infrastructure for spatial information in the Community). However, specific studies for the establishment of new industrial plants may be carried out by consulting companies, and the data are not always available to the public.

IOC, together with MAB, has published handbooks in Marine Spatial Planning and also held courses on this subject in developing countries.

Studies of type B can be a mixture of type A and type C. In general the data would be available for public access. However, subsets of the data may be regarded as sensitive either because they give a detailed description of valuable resources, or they describe the bottom topography in such detail that they are

sensitive for defense reasons. Such data may be classified as secret and withheld.

Studies of type C are not necessarily carried out to answer a specific question or problem; instead they aim at enhancing our general knowledge of the sea, and the data can be used for many different purposes. If carried out under the responsibility of a governmental agency the data are stored in national and often also in international databases, and various written reports are generated. Open access to the data is regulated in the INSPIRE Directive. Data collected by universities are not always reported to national and international databases, at least not until the scientists have written their publications or other reports. The data from type C studies are rarely of public interest, but the reports are.

For studies of type D carried out by universities, the scientists formulate the problems they plan to investigate, and the open access to data is similar to the type C studies. Studies of fish resources are typically defined and carried out by national fisheries administrations with or without international cooperation. Data are sensitive and kept in databases and usually not publically available, at least not until the fishery scientists have formulated their advice about maximum fish catches in the framework of sustainable fisheries.

FOUR DILEMMAS TO DEAL WITH IN GLOBAL RESEARCH POLICY

World Science Day for Peace and Development 2012 was the springboard for a discussion about how Sweden and the Swedish research society can be part of and more active in the global research policy discussion in UNESCO and its member states, in Sweden, and in other global organizations connected to UNESCO's field of work.

The purpose of the group discussions was to identify key issues that should be

on the agenda in a global science policy context. Questions to be answered were: "What role can the Swedish research community play in bringing the issues to the fore?" and "What role can we ask UNESCO to take?"

The forum was presented with a sample of the various common problems and obstacles facing research, all with a conflict perspective. They were summarized in four dilemmas.



Who has the right to formulate research problems?

Global development research is sometimes exposed to tensions between stakeholders, practitioners, and researchers about the right to formulate the research problem to be addressed and resolved. Who has the right to influence research with direct implications for people in the local community?

Who owns the research results?

Research related to global sustainability, interconnectedness, collaboration, and transformation is often based on the participation of countries with different prerequisites and willingness to participate. If a country does not want to participate in efforts to collect data, then what right does this country have to use and benefit from the results of the research?

Whose rights and obligations should be considered in potential conflicts?

Natural resources of water and mountains are becoming increasingly important and are a potential conflict that researchers need to consider. Whose rights and obligations must be taken into account in the research?

What role does research play in picking a fight over controversial issues?

What role can researchers play in criticizing a society's development or in fighting about controversial issues, such as conflicts between economic development and environmental concerns, or minority rights in connection with major societal changes?

Based on these issues, the forum was divided into groups to discuss how the researcher and research can relate to these complex dilemmas and problems, which appear to be more complex in a global perspective. The discussions resulted in a number of proposals for areas that the research community and UNESCO, respectively, can and should become involved in if research and science are to help achieve UNESCO's goals.

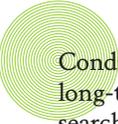
WHAT ROLE CAN THE SWEDISH RESEARCH COMMUNITY PLAY IN BRINGING THE ISSUES TO THE FORE?



The Swedish research community must set up goals for sustainable development and learning for sustainable development. A clear declaration would have consequences for everyone working in academia and spark a debate within the research community.



Access to knowledge can be misused by those who have the knowledge to use it. The research community must strive to make knowledge available regarding conditions at the local level both in Sweden and globally, where this is suitable, and to work forcefully for Open Access, nationally and globally.



Conditions should be put in place for long-term time and data series in research on sustainable development. This is the only tool available to determine whether society is becoming more, or less, sustainable.



The Swedish National Commission for UNESCO should develop guidelines for how holders of UNESCO professorships can be ambassadors for the entire Swedish research community and what to do to support Swedish scientists working with UNESCO's scientific programs.

WHAT ROLE CAN WE ASK UNESCO TO ASSUME?

In some parts of the world, research freedom is constrained by a country's values and rules. A precondition for research that can support UNESCO's goals is that researchers must be able to work freely, without interference. UNESCO should therefore work globally for academic freedom.

The role of UNESCO in the future could be to bridge the gap between science and politics. A successful example of bridging is the UN climate panel (IPCC). The world could also benefit from the work of UNESCO subcommittees, for instance the kind of networks that are operated by MAB to develop local ecosystem services.

The OECD/EU have defined what are called the "Grand Challenges" of the future. UNESCO should bring together representatives of research and civil society to discuss how research can be applied and help further global development.

UNESCO should also identify issues that are not subsumed by the Grand Challenges. One such issue is security, everything from data security to personal security, which is a critical problem in many third-world countries.

UNESCO's values, among others, are transparency, accessibility, and information. UNESCO should pursue the issue of the ownership and stewardship of common goods. Are publicly financed goods available to everyone? If everyone has access to material and databases, who will be responsible for updating the information? How should we deal with access to and digitizing of already existing (but not yet digitized) databases?

Who should own research findings? UNESCO should perhaps work to purchase discoveries that are beneficial to the entire planet. If a company cannot see a future profit, they may not pursue research. Perhaps UNESCO should make unclaimed findings available and take up controversial issues for further pursuit.



FUTURE WORK

In future, World Science Day is to be a forum arranged each year where issues involving sustainable development and learning for sustainable development in a global scientific perspective are clearly manifested.

World Science Day is backed by the Swedish Research Council and the Swedish National Commission for UNESCO. Within the framework of a scientific network, where the five scientific programs are included, in future years questions concerning the – often complex – preconditions for global research

will recurrently be featured. The goal is to increase the interest and involvement of Swedish researchers in UNESCO's work in matters of science. The hope is that the collaboration across UNESCO's five scientific programs and other research, as well as collaboration between Swedish public authorities and research financiers, will be strengthened in such a way that Swedish research will contribute even more to the achievement of UNESCO's goal of a greener and more equitable society.



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Swedish National
Commission for UNESCO

Program World Science Day for Peace and Development 2012 POWER OVER THE WORDS – POWER OVER THE WORLD

Time:	November 9, 11.30 – 17.00 (begins with lunch and ends with mingle)
Location:	Centralposthuset, Master Samuelsgatan 70, Stockholm
Registration:	Swedish National Commission to UNESCO, u.infounesco@education.ministry.se , no later than November 2.

11.30 LUNCH

12.30 WELCOME AND OPENING

Tomas Kjellqvist, Vice Chairman, Swedish National Commission for UNESCO
Elisabet Nihlfors, Secretary-General, Swedish Research Council

PRESENTATION

How to build an inclusive and equitable development of science to benefit all?
Heide Hackmann, Executive Director of the International Social Science Council (ISSC)

FIVE DILEMMAS IN DEVELOPMENTAL RESEARCH

- Land investment or land grabbing in Mozambique – new challenges for social scientists and CSR?
The national MOST-committee (Management of Social Transformation Programme)
- Conflicts, natural resources and geoscientific research
The national IGCP-committee (International Geoscience Programme)
- Hydrological science for policy relevant advice. What are the respective roles of the researcher and the decision maker in this interaction?
The national IHP-committee (International Hydrological Programme)
- Information access and benefit sharing - Correctly structured and used, informatics initiatives will revolutionize the development of ideas and resource use
The national MAB-committee (Man and the Biosphere programme)
- Power of information = power over the world? Who is responsible for planning marine studies; who performs it? Who has the right to the results?
The national IOC-committee (Intergovernmental Oceanographic Commission)

15.00 GROUP DISCUSSIONS AND COFFEE

Which are the core issues in the five dilemmas presented? Introduction to group discussions
Heide Hackman, Executive Director of the International Social Science Council (ISSC)

16.30 CLOSING REMARKS

Some final thoughts
Anders Ahnlid, Swedish Ambassador to UNESCO

17.00 END OF SEMINAR AND MINGLE

WORLD SCIENCE DAY

UNESCO observes World Science Day for Peace and Development every year in November. The aim is to renew “the national, as well as the international commitment to science for peace and development and to stress the responsible use of science for the benefit of society” and “to raise public awareness of the importance of science and to bridge the gap between science and societies.”



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