

## **SUSTAINABLE DEVELOPMENT FUTURES: A SELECTION OF SWISS ACADEMIC PERSPECTIVES**

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### Summary

In Switzerland as well as in Western Europe environmental security is seen as a global problem, yet one mainly affecting developing countries in the South. Indeed, there is ample evidence for correlations between rural poverty, environmental stress in rural areas, and discriminatory access to resources. These factors coincide with political instability, i.e. non-democratic change in regimes and/or violent conflicts and wars. These findings primarily apply to the least developed countries, secondly for countries with medium development characterized by poor state performance and unstable political conditions. However, the debate on environmental security tends to neglect both the contribution of industrial countries to global environmental change and the regional impact this very change has on Europe in general and on countries in the heart of the continent (for instance, Switzerland). The topic needs to be reframed, because self-perception and reality do not always coincide. The unsustainable lifestyle of highly-industrialized societies constitutes high consumption pressure affecting national and transboundary environments as well as the entire Earth's ecosystem. In other words, Europe is hardly an island producing environmental change but safe from its impacts. Environmental security has to be explored more systematically also in a European context—only then perspectives from North and South will converge. The Organization for Security and Cooperation in Europe (OSCE) can and should play a major role in this endeavor. (Günther Bächler)

Swiss biological resources consist of some unique natural and agricultural landscapes, for which sustainable usage is being sought. The apparent discrepancy between the available natural resources and the consumption of an affluent population in a densely populated country are topics of research, public debate and, eventually political action. (Hans R. Thierstein)

The situation of consumers vis-à-vis questions of ecological sustainability are discussed from a psychological perspective. Attention is paid to the fact that while private consumption is responsible for a large share of overall pollution and resource consumption, people are often unaware of and unable to understand the complex causal relations between their own behavior and environmental problems. In consequence, they tend to feel helpless with regard to the solution of environmental problems, and measures to “empower” them should be considered. (Ruth Kaufmann)

Metabolic studies of urban systems, illustrated with regions of the Swiss Lowlands, show different potentials to reach a status of “sustainable development.” The metabolism is illustrated with essential mass goods, namely water, biomass, construction materials and energy carriers. The key variables with regard to sustainability are the energy carriers. The rate-determining step in achieving a sustainable status is the change in the “architectonic fabric” of buildings and transportation networks. The transformation of an urban system needs, mainly due to economical reasons, a time period of at least two generations and a “strategy of safe practice.” “Sustainability” can become a valuable guiding principle for a regional development concept. For this it is necessary to postulate concrete and quantified

resource barriers, tailor-made for the region in question. This concept is illustrated with the “2000 Watt Society.” (Peter Baccini and Dieter Imboden)

The sustainable development paradigm raises issues of global, intra- and intergenerational social equity, as well as respect for nature, and economic welfare. Switzerland is confronted with these issues within its own country, and has a moral responsibility vis-à-vis the rest of the world. Syndromes of global change are affecting many eco-regions, not only in developing and transition countries, but to a lesser extent also the affluent countries. Switzerland as a nation has an impact on syndromes through its far-reaching economic activities, which are non-sustainable. At the global level, more modest consumption patterns, a considerably slowed demographic change, a non-consumptive but sustainable use of natural resources, and conflict transformation are the main prerequisites for improving sustainability. Switzerland’s current contribution to sustainability is much less than what it could be, hence the need for additional action along general principles in accordance with Swiss traditions and innovative potentials. A number of concrete actions could be taken immediately. These are: labeling the socially and ecologically sustainable production of goods and services, and their negotiation at the WTO level; enhancing international cooperation and research; strengthening education and research for sustainability, and emphasizing energy and material flux efficiency at home and abroad. (Hans Hurni)

Sustainable development has become an international yet not very effective maxim. This might change if humans would give up thinking of themselves as masters and owners of nature. Deep ecology stresses a more adequate view of human dwelling in this world. The ethos it proposes acknowledges the same prima facie right of all beings to exist. Discretion and modesty are required and fairness should withstand excessive use of resources. The sustainable ethos—entailing the belief that whatever exists does have its original being and significance independent of human interest and evaluation—implies a severe change of actual mainstream culture; it can be met if individuals and communities decide to transcend selfish interests. The corresponding turnover within self-consciousness and human conscience is indispensable if we sincerely mean to preserve the natural conditions for the existence of living beings and of liberty. (Beat Sitter-Liver)

The concept of sustainable development verbalizes a rich, complex, yet also questionable vision. Under certain aspects, it even seems to be contradictory. Obviously, it does make sense within the context of the so-called developing countries; but with a view to highly industrialized and wealthy nations, its significance is quite different, some would say it is, at least to some extent, misplaced. However, the concept has gained the status of a universal guideline for international co-operation aiming at securing the natural and cultural preconditions of existence worthy of human (and other) beings. It therefore needs careful analysis and wise implementation. With the following selective reflections, we wish to support that objective. They are the result of a common effort provided by seven authors, all belonging to one of the four national scientific academies gathered within the Council of Swiss Scientific Academies (CASS). Yet CASS must not be held formally responsible for this regional perspective, each author remaining fully responsible for her or his opinions and evaluation.

## **1. Environmental Security, Conflict, and Peace Promotion**

### **1.1. Broadening the Notion of Security**

Throughout history the unsustainable use of natural resources has produced human insecurity, acute conflict, and even the fall of civilizations (e.g. Mesopotamia, the Mayan Culture in Central America, and Aksum in the Horn of Africa). However, only in the twentieth century has the transformation of society-nature relationships reached a global scale that threatens all states and societies regardless of their geographic location and their individual contribution to global environmental change. During the 1990s (between 1994 and 1997) the degradation, scarcity, and mal-distribution of land, water, and forest resources played a significant role in 30 out of 85 wars and violent conflicts.

After the Cold War the newly perceived conflict dimension of global environmental change initially provoked quite some alarmist predictions in the Western mass media such as climatic world wars, mass flight due to rising ocean levels, military crusades by Northern countries against destruction of tropical rain forests, and Atlantic fishery wars. Although the prognosis may remain threatening blusters rather than lead to virulent conflict situations with a high risk of escalation, the topic of environmental security reached a high level of political attention.

This holds true particularly in the aftermath of the Rio Conference of 1992 (UNCED). Research institutions in the USA, Canada, and Western European countries started with impressive research projects which had a substantial impact on the international debate from the very beginning: The NATO Committee on the Challenges of Modern Society provided a pilot study on “Environment and Security in an International Context”; the World Conservation Union (IUCN) elaborated a “State-of-the-Art Review on Environment, Security and Development Cooperation” for use by the OECD Development Assistance Committee (DAC). Both reports indicate a shift from a military understanding of threats and vulnerabilities affecting states and defense alliances. They state an apparent decline in the probability of interstate war within the present international system. At the same time, awareness gained ground that interactive processes of technological innovation, economic globalization, underdevelopment, and environmental degradation pose new challenges to human welfare, peace, and security that require cooperative and innovative responses beyond military defense solutions.

The topic “Environmental Security and Conflict” is also being widely discussed in Swiss governmental agencies and research institutions. Since Swiss society is much more alert to regional impacts of global environmental change than to declining military concerns, the government was urged to design a new security strategy for 2000. The Report of the Federal Council on “Security through Cooperation” of 7 June 1999 provides an entire chapter on economic, social, and ecological developments. The report distinguishes six global and local environmental threats, namely: water scarcity, soil erosion, forest depletion, climatic change, rising sea level, and depletion of the disposal capacity for toxic and hazardous waste. Since many of the perceived problems facing the welfare and security of Swiss society are perceived as external threats, the instruments of national defense have to be complemented with international security cooperation. Given the analytic background, the Swiss government basically aims to

contribute increasingly to multilateral peace promotion to safeguard natural life-support systems, and to mitigate human insecurity as well as the consequences of natural disasters. The Federal Council will also provide a report on “Security and Sustainable Development. Aims of a Coherent Peace Policy” that will be one of the first governmental contributions to the IDA Rio (governmental task force) process that deals exclusively with security aspects.

## **1.2. Environmental Security in the South as Perceived in the North**

In Switzerland as well as in Western Europe environmental security is seen as a global problem, yet one mainly affecting developing countries in the South. The following research findings may support this rather Euro-centric worldview:

There is ample evidence for correlations between rural poverty, environmental stress in rural arenas, and discriminatory access to resources. These factors coincide with political instability, i.e. non-democratic change in regimes and/or violent conflicts and wars. These findings primarily apply to the least developed countries, second to countries with medium development characterized by poor state performance and unstable political conditions.

Arenas of environmental conflicts are most often domestic ones. They encompass distinct strategic groups using and overusing one or more eco-regions, subdividing eco-regions through political boundaries, or migrating across such boundaries. Acute conflicts that tend to become violent constitute a kind of small-scale North-South conflict within the countries concerned. Countries with a high percentage of the labor force in agriculture, limited cropland per capita, and low commercial energy consumption per capita belong to the group of countries with high environmental stress, violent conflicts or wars going-on.

Transformation of landscape leads to violent conflicts and wars if and when it accentuates structural heterogeneity which tends to discriminate chiefly against those rural producers who are victims of bad resource allocations, unequal resource distribution, high dependence on natural capital, and poor state performance outside the federal district or national capital areas. The widening gap between the modern sector, on which state performance concentrates, and the marginal sector, which encompasses poverty clusters in sensitive environments, constitutes a chasm that in many places has become a real front line of violent conflicts caused by the environment.

## **1.3. The Role of the Environment in Escalating Conflicts**

Conflicts about degraded renewable resources manifest themselves as trans-boundary, center-periphery, inter-regional, and group identity struggles exacerbated by migration and displacement, and in some cases accelerated by population dynamics. Actors with access to state power typically have access to the most productive arenas, whereas identity groups facing environmental discrimination are forced to use and degrade marginal arenas with low productivity, thereby perpetuating impoverishment. Additionally, groups against which environmental discrimination works are confronted with environmental deterioration beyond their control: e.g. deforestation by loggers de-

stroys the livelihood of indigenous forest dwellers, dam building degrades land both upstream and downstream, and mining leads to widespread contamination of the landscape.

As a rule, resort to violence occurs only if and when some of the following four key situations coincide: (1) Inevitable environmental conditions that fester when group survival depends on degraded resources for which no substitutes are apparent; (2) scarcity of regulatory mechanisms and poor state performance, to the extent that a political system cannot produce certain social and political conditions, because sustainable resource use is far from attainable; (3) instrumentalizing the environment by using the environment (and its destruction) to pursue specific group interests so that environmental discrimination becomes an (ideological) issue of group identity; (4) opportunities to build organizations and find allies (when actors organize and arm themselves in political settings—often behind a strong leader—and gain allies).

Environmental degradation is of variable significance depending on the specific conflict: In many conflicts it is a systemic background reason; in some other conflicts it is a catalyst leading to channeling along lines between distinct groups; avoidance of degradation also turns out to be a target of parties to a conflict. However, passing the threshold of violence definitely depends on sociopolitical factors and not on the degree of environmental degradation as such. Environmental discrimination against actors is a strong entry point for exploring the genesis of conflict escalation in the arenas analyzed. Other key factors are the high dependence on natural capital coinciding with low resource availability, lack of institutional capacities for peaceful conflict settlement, readiness and/or capacity of authorities and leaders to organize and mobilize collective actors, as well as misperception of alternatives to violence. Environmental conflicts indicate that transition from agricultural to industrial urban societies is at stake.

After having highlighted the main topics of the environmental security and conflict debate in Switzerland and Europe (mainly in governmental and scientific circles), there are two main aspects to be considered:

*On one hand:* The linkage between underdevelopment, poverty, and environmentally induced conflicts cannot be overestimated. First all major actors in the North (including NATO) recognize the adverse impact that global environmental change has on societies in the South, this may help to formulate adequate strategies. The above mentioned report of the Swiss government stresses the urgent need for both, supporting sustainable resource use as well as promoting peace in countries affected by civil war, natural disasters, and resource degradation. Above all, solution of land issues in developing countries is enormously important. Unclear property laws finally lead to disappearance of biological and human resources. Nationalizing land, legal uncertainty, and development by large farming producers poses a considerable potential for conflict that may even increase through further degradation.

A second topic to be addressed is water use in national as well as in trans-boundary contexts. Governments can play a considerable role in this process. Instead of policing environmentally dependent actors or enacting new laws with little consultation in advance, they can offer or at least facilitate participatory ways of sharing and using

resources. Thus strengthening good governance at local and national levels is a further way to foster sustainable development and human security.

#### **1.4. Environmental Security in and for Europe**

*On the other hand*, the current biased debate on environmental security tends to neglect both the contribution of industrial countries to global environmental change and the regional impact this very change has on Europe in general and on countries in the heart of the continent (for instance, Switzerland). The topic needs to be reframed because environmentally caused violence is hardly found in interstate relations, nor within states in Europe. Although climatic change, ozone layer depletion, and loss of biodiversity have created global conflict lines that did not exist until recently, no major catastrophe now threatens the industrialized world.

The European self-perception is that in a highly integrated region with countless bilateral treaties dealing with natural resources such as rivers, a large number of international bodies and regimes, and dense transnational relationships environmental change neither affects national security nor poses a threat to human security comparable to the one that confronts the least developed countries. Working democratic institutions, good state performance, and highly developed technology may keep environmental problems well below the threshold of security threat and acute conflict.

However, self-perception and reality do not always coincide. There are growing concerns about non-implementation and non-fulfillment of international environmental treaties. Despite international regimes, overuse of the earth's absorption capacity, increasing traffic and fossil energy consumption, air pollution, ozone layer depletion, contamination of soils, decreasing agricultural land, and regional consequences of climatic change pose an increasing threat to European societies too. Impoverishment of residential space caused by the anthropogenic loss of bio-diversity is alarming in many parts of Europe. The unsustainable lifestyle of highly industrialized societies, such as Switzerland's, constitutes a "consumption pressure" (WWF) affecting national and transboundary environments as well as the entire earth's ecosystem. In other words, Europe is hardly an island producing environmental change but safe from its impacts. In the Baltic area, in the Danube basin, in parts of Central Europe, as well as in the five Central Asian republics, there have been regional workshops stressing the fact that environmental security is at stake.

Therefore the OSCE plans to organize an international workshop to explore systematically the horizon of environmental security concerns in and for Europe. After having analyzed the major syndromes of global and local change that actually lead or may lead to security concerns, the OSCE asks member countries to assess individual threats and risks related to resource degradation in greater detail (national risk assessments). The OSCE also designs a catalog of principles on sustainable development and human security. Finally, there will be a code of conduct dealing with trans-boundary problems (air pollution, reasonable use of international river basins, transportation of dangerous goods, etc.). The results are to be implemented within the framework of international organizations in Europe, such as the European Union and

the NATO Euro-Atlantic Partnership Council, or by the countries themselves (training activities, projects, awareness, reporting, monitoring, early warning, etc.).

In this broader perspective security has basically two dimensions: a (inter) national and an individual one. Both, national and human security are closely inter-linked. European security deals with all aspects which induce environmental stress on societies, on political entities, and on the biosphere. Therefore, in the normative sense, European environmental security means the absence of threats stemming from major anthropogenic environmental degradation or catastrophes from inside or outside Europe which affect a major part of any European country or its neighbors in such a way that the social life and the well being of the citizens is substantially impaired.

Switzerland, a land-locked country, highly interdependent with its neighbors and dependent on access to natural resources from all over the world, should make environmental security an integral part of its route towards sustainability. Simultaneously, Switzerland and its neighbors dispose of the resources necessary to contribute to a global environmental order that provides security and promotes peace for all human beings.

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### Biographical Sketches

**Beat Sitter-Liver** has been Secretary General of the Swiss Academy of Humanities and Social Sciences for almost 30 years. He has been teaching practical philosophy at the University of Freiburg since 1990. Born on May 11, 1939 in Berne, he took his Ph.D. in philosophy at the University of Berne, after studying also in London, Cologne, and Reykjavik. Years of research and teaching at the local Institute of philosophy followed. Elected Secretary General of the Swiss Academy of Humanities and Social Sciences as well as the Swiss Academy of Sciences in 1972, he pursued research and teaching at the Universities of Berne, Freiburg, and Lucerne. He was visiting professor for one year at the University of Munich. He is also lecturing at the Swiss Federal Institute of Technology in Zurich. Main research interests and publications: general and applied ethics (ecological ethics, bioethics); philosophy of nature, natural law,

social and political philosophy. Lately, bioethics in general and the theory of “dignity of creature” have been the main focus.

**Günther Baechler** has been the director of the Swiss Peace Foundation, Institute for Conflict Resolution since 1988, while also working part-time as a researcher at the Center for Security Studies and Conflict analysis at the Swiss Federal Institute of Technology (ETH) Zurich (1991–94). Trained in art and history of art in Basel (1976–80) and political science at the Free University of Berlin (1980–85), he was a research fellow at the Institute for Peace Research and Security Studies at the University of Hamburg (1986–1988) and completed his Ph.D. in political science in 1997 (University of Bremen). In 1996 Dr. Baechler was a visiting research fellow at the Center for Science and International Affairs (CSIA) at the John F. Kennedy School of Government, Harvard University (1996) and also received training in mediation and negotiation at the Harvard Negotiation Program and at the Center for Dispute Settlement in Cambridge. He is currently active in the field of peace promotion, mainly in the Horn of Africa.

**Peter Baccini** was born in Zurich on 24 September 1939. After studying in the USA, he took a degree in natural sciences at the Swiss Federal Institute of Technology (ETH) Zurich where he later earned his doctoral degree in chemistry. Five years in research and development for the chemical industry, nine years of water research at the Swiss Federal Institute for Environmental Sciences and Technology (EAWAG) in Kastanienbaum (1974–1983). Associate Professor of Environmental Chemistry at the University of Neuchâtel (1974–1991). Visiting Professor at the University of Goettingen and at the University of California Riverside (1981), later at the Technical Universities of Vienna and Stockholm (1999). Since 1991 he is Full Professor of Resources and Waste Management at ETH Zurich. From 1994 to 1996 he was Head of the Department of Rural Engineering and Geodetic Sciences at the ETH Zurich. >From 2001 to 2006 he is President of the Swiss Academy of Sciences. In an interdisciplinary research team (engineers, environmental scientists, economists, architects), Prof. Baccini examines the resource management of heavily populated regions and the long-term behavior of anthropogenic sediments. Current research topics: a) urban development and sustainable metabolism in Switzerland; b) long-term behavior of sediments from thermal waste treatment, to be used as secondary resources.

**Hans Hurni** completed his studies at the Natural Science Faculty, University of Berne, Switzerland, with a MSc thesis on soil erosion, a Ph.D. thesis on climate change, and a Venia Docendi thesis on soil erosion and conservation in agricultural environments, with a focus on Africa and Asia. He lived in Ethiopia for over 10 years, working as a research scientist and program director. He is currently co-director of the Centre for Development and Environment (CDE), professor of geography at the Institute of Geography, and president of the Swiss Commission of Research Partnerships with Developing Countries (KFPE of CASS).

**Dieter Imboden** was born in Zurich on August 22, 1943. He studied theoretical physics in Berlin and Basel and in 1971 received his doctorate at the Swiss Federal Institute of Technology (ETH) Zurich following a dissertation on theoretical solid-state physics. His interest for the environment, particularly water, brought him to the Swiss Federal Institute for Environmental Sciences and Technology (EAWAG), to the Scripps Institution of Oceanography, California, as well as to other American universities. Since 1974 he has been teaching at the ETH Zurich. In 1982 he completed his habilitation requirements in the field of mathematical modeling and environmental physics. In 1987 he was one of the co-founders of the new curriculum in environmental sciences at the ETH Zurich. He became full professor of Environmental Physics at ETH in 1988. From 1998 to 1999 he was the director of Novat Atlantis, an interdisciplinary project on sustainable development within the domain of the Swiss Federal Institutes of Technology, where he initiated the pilot project “2000 Watt Society.” For many years Prof. Imboden’s main research concerned the physics and chemistry of natural water bodies, especially the large lakes of the Earth (Lake Baikal, Caspian Sea, etc.). One of his central aims in research as well as in teaching is to combine the methods of physics with other disciplines in order to tackle complex environmental problems. His textbook *Environmental Organic Chemistry* which he wrote together with two chemists, René Schwarzenbach from ETHZ and Phil Gschwend from MIT, won the “Chemistry Book of the Year Award” of the Association of American Publishers in 1994. Using examples such as global climate change or energy policies, Prof. Imboden attempts to bridge the gap between natural and social science and the humanities. He serves on various professional commissions including the Research Council of the Swiss National Science Foundation

**Professor Ruth Kaufmann-Hayoz** is the director of the Interdisciplinary Centre of General Ecology (IKAOe) at the University of Berne, Switzerland. She holds a Ph.D. in Psychology from the University of Berne (1973), and after a career in Developmental Psychology she has specialized also in Environmental Psychology and Interdisciplinary Environmental Studies. From 1982 through 1992 she was a clinical and research psychologist at the Department of Pediatrics at the University of Berne. She has been a full professor at the University of Berne since 1992. Since 1993 she has been directing interdisciplinary research compounds within the Swiss Priority Program "Environment."

**Hans R. Thierstein** has been full Professor of Micropalaeontology in the Geological Institute of the Swiss Federal Institute of Technology (ETH) Zurich and the University of Zurich since April 1, 1985. Born on May 27, 1944 in Zurich he studied geology at the University of Zurich where he graduated with a doctorate in geology in 1972. With a fellowship from the Swiss National Science Foundation he did research at Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY and at Woods Hole Oceanographic Institution, Woods Hole, Massachusetts from 1973 to 1976. The following nine years he spent as assistant, associate and full professor of geology at the Scripps Institution of Oceanography, University of California, San Diego. He has been a Professor at ETH and University of Zurich since 1985. His main research interests are palaeoceanography, evolution of the ocean plankton and the development of robots recognizing microfossils. His lectures focus on earth history, biosphere/geosphere interactions and the methods to reconstruct them from geological deposits. He is president of the expert group for the Swiss Priority Program Environment of the Swiss National Science Foundation and member of several other scientific committees.