Mountains, their resources and risks – common goods or common concerns?

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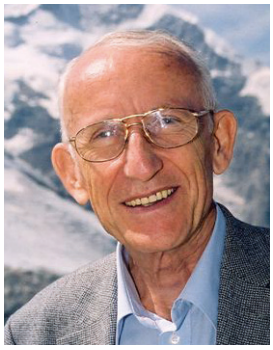

Innsbruck and its mountain university

It is exciting to see how three different mountain research and development initiatives have been established in Innsbruck in a surprisingly short time. In 2006, the Austrian Academy of Sciences founded a mountain research unit, changed into an Institute for Mountain Research: Man and Environment (IGF) in 2009; the University of Innsbruck set up a special research focus Alpine Space – Man and Environment in 2010; the same year saw the launch of the alpS Centre for Climate Change Adaptation Technologies in Mountain Regions. Such a high concentration and combination of different mountain research aspects will create a wide and unique spectrum for cooperation and capacity building. Moreover, Innsbruck will become a centre of competence in mountain research and development, which is urgently needed for the Alps and for the Alpine Convention with its secretariat in Innsbruck. It may also demonstrate to other multinational mountain systems, especially in the developing world, that mountains with their resources and risks need a new awareness and a new research strategy in times of rapidly increasing natural and anthropogenic global changes. It is impressive that Austria with its research policy and Innsbruck with its research capacity have taken the right decision at the right moment.

Mountain research and development trends: from individual and national to regional and global significance

Exactly two hundred years before the UN International Year of Mountains 2002, Alexander von Humboldt (1769–1859) started his fieldwork on Mt. Chimborazo (6 310 m) in Ecuador, which focused on understanding the ecology of the different altitudinal belts. His subsequent studies on the vertically differentiated ecosystem bands in the tropical Andes, in the Himalayas and along a transect linking northern Scandinavia with the Alps and the Pyrenees were published in the mid-19th century and became a stimulus for numerous later studies, especially for Carl Troll (1899–1975) in Bonn and probably also for Hans Kinzl (1898–1979) in Innsbruck. After around 1870, natural disasters in the Alps helped to promote

the natural and engineering sciences but they were considered quite marginal by the leading natural and social sciences in the political centres of the alpine countries, situated as they are just outside the mountains. This status changed suddenly at the beginning of the 1970s with three important global impulses:

June 1972 saw the first UN conference on The Human Environment in Stockholm. In this context, exciting demands were put forward for better international cooperation, open exchange of scientific data, better integration of science and development, a participatory cooperation between richer and poorer countries and for the ever more important protection of natural resources. These recommendations shaped subsequent international conferences on mountains even if cross-border cooperation remained unattainable for many years to come.

The second impulse, in the same year, came from the startling publication of the Club of Rome, *The Limits to Growth*. This book practically introduced the concept of globalization with much debated projections of exponential growth in world population, economy and technology.

The third and in our context most significant impulse was the establishment of the UNESCO research programme Man and the Biosphere in November 1971, a few months before the Stockholm conference but in time to be included in the recommendations of the conference. This programme raised important issues for the future interaction of humans with their environment. It demanded new forms of cooperation between natural and social sciences and, importantly, encouraged interdisciplinary research, even if it took many years before the institutions in charge of funding research recognized that environmental problems cannot be solved without interdisciplinarity and, later on, transdisciplinarity. The vital point was that the sixth project, "Impact of human activities on mountain ecosystems" was dedicated to the world's mountains and for us even more decisive was the fact that the concept for this first global mountain project was developed in an international meeting of experts from 29 January to 4 February 1973 in Salzburg. Let us spell it out: Austrian scientists started international mountain research and contributed to bundling natural sciences and humanities in an interdisciplinary mountain research concept. It is with deep gratitude that I remember to this day this fascinating conference and later excursions to Innsbruck and Obergurgl. We and the alpine countries benefited from the leading role Austria played then!

The following years saw numerous international mountain conferences. What they all had in common was the fact that the time was not yet ripe for cross-border cooperation and open exchange of information. Only in the Alps during the 1970s and 1980s, the MAB programme, which involved almost all alpine countries, created an atmosphere of mutual interest and learning from each other. Excursions took place and debates in the field, one might call it a kind of preparation for the Alpine Convention and its first step towards realization in 1991. In Asia in 1983, a mountain centre for all eight states of the Hindu Kush-Himalayas

was established in Kathmandu (ICIMOD: International Centre for Integrated Mountain Development).

In 1986, the African Mountain Association was established in Ethiopia with the support of UNESCO and the UNU (United Nations University). This was followed in 1991 in Chile by the setup of the Andean Mountain Association, both lose and fragile organizations that nevertheless succeeded in getting an exchange of information and some cooperation on resources and risks off the ground.

These minimal structures in the Alps, in the mountains of Africa, in the Andes and the Himalayas were sufficient to gain the enthusiastic support of the developing countries to the proposal of a mountain chapter in the Agenda 21 at the third preparatory conference for Rio in autumn 1991. At the so-called "Earth Summit" in Rio de Janeiro in June 1992, the mountain chapter (No. 13) "Managing Fragile Ecosystems: Sustainable Mountain Development" was passed unanimously. This meant that the mountains of the world with their resources and problems had achieved global recognition.

However, in the discussions in the corridors it became clear that its significance was not properly understood by many political delegations. Rather, they assumed that natural hazards, agriculture and forestry, conservation and development were part of national policies and national competences that could hardly be classified as having international or even global significance. The critical question was: are mountain problems really global problems? Now we had five years until the 1997 United Nations special general assembly for the evaluation of Agenda 21 in New York to change this perception for the better. The initiatives of the FAO as the task manager for the mountain chapter, the support of UNESCO, the UNU and UNEP, the foundation of the Mountain Forum and numerous local and regional initiatives were essential in encouraging a rethink of the global significance of mountains. With the presentations of the book "Mountains of the World – a Global Priority" and the attractive brochure "Mountains of the World – Challenges for the 21st Century", the delegates began to understand that mountains preserve a series of common goods such as vast treasures of biological and cultural diversity, they act as water towers for an increasingly thirsty planet, as sensitive indicators of climate and environmental change, as vital recreation areas for an increasingly urbanized world population, as sacred places in many cultures and religions and as uniquely privileged regions for protected areas. At the same time they are sites of erosion, risks and disasters with damaging effects on the surrounding lowlands. Based on this new understanding, the UN General Assembly decided on 10 November 1998 that the year 2002 should be the "International Year of Mountains", the same year in which the World Summit on Sustainable Development was held in Johannesburg.

In this, the first decade of the 21st century, the UN International Year of Mountains 2002 certainly was essential for encouraging politicians and scientist to commit themselves to heightening the profile of new research and develop-

ment programmes. Public perception and concern about climate change as well as intensifying globalization processes that impact even on the remotest mountain valleys have added weight to the issue.

If we look at the development of mountain research from Humboldt's time until today, we find that while in former times the scholar was universal, today it is the problems! We also note that the idea of common goods finds its expression in demands for cross-border cooperation and in the establishment of mountain conventions with the aim of a joint use of certain resources. In contrast, common concerns become visible in the uncertainties of our time and of the future, be they natural or man-made, which pose ever new scientific and political challenges at regional and global level and which also mean a commitment to supporting research at national and university level.

Mountain research and development in Austria: interaction between national, regional and global programmes

This volume "Challenges for Mountain Regions – Tackling Complexity" is a record of the work done in Innsbruck, with three mountain research institutions staking out their future fields of action.

First, the former Research Unit, since 2009 Institute, of Mountain Research: Man and Environment (IGF) of the Austrian Academy of Sciences presents a research plan for the future based on the following facts and experiences: internationally recognized national research in this mountainous country; positive experiences and plenty of contacts with Brussels and European research institutions; interesting contributions and successful cooperation with international alpine research; an enriching engagement in the South-American Andes; a recently established international Journal on Protected Mountain Areas Research and Management (eco.mont); and, of special significance, the long-term global monitoring programme GLORIA as an essential contribution to global change research.

Secondly, in 2010 a decision was taken to establish an Alpine Research Focus at the University of Innsbruck. I think one can safely assume that the choice of emphasis was influenced, among other factors, by the long-standing and internationally well received research tradition in this field. The list of researchers and publications of the mountain-based University of Innsbruck includes many famous names. As early as 1966, I received my first impulse in Innsbruck from professor Hans Kinzl for a diverse and interdisciplinary mountain research, which had a decisive impact on subsequent developments in mountain research in Bern. In the publications presented here we can discern the first signs of how the university will expand this research focus in the coming years and how it hopes to shape the cooperation between natural sciences and humanities.

Thirdly, we owe great respect to the management of the alpS Centre for Climate Change Adaptation Technologies for succeeding in the tough competition for excellence and competence as well as for funding and technology. It has undoubtedly made the location of Innsbruck and its university a beacon of mountain research that shines far beyond the borders of Austria. Every reader should follow the individual beams of this beacon to understand what has happened in Innsbruck and what is still to come.

There are mountain research institutes of various qualifications across the alpine countries in the North and South of Europe, but also in the USA, in China, Japan, India and many other mountainous countries, even small ones. If we look at the share of mountains in the total state territory, the socio-economic and cultural role of mountains and the standing of mountain research in a country, then Austria and Switzerland are special cases. Apart from some specialized institutions linked to the ETH Zurich, the much acclaimed results of Swiss mountain research are mainly based on thematically distinct national research programmes of only 5 to 7 years duration. What is missing is a centre and also continuity, which is vital for longer-term cooperation with regional (alpine) and global programmes (GLORIA, global change projects, UN organizations). In Austria, the Academy of Sciences has ensured such continuity in mountain research to date, in future this could be achieved by a cooperation of the University of Innsbruck with the Academy.

It will be decisive for future research programmes at national level (Austrian mountains) to link into the regional level (Alps) and even into the global level (global change programmes).

The most precise and most complex knowledge is created at local and national level and it must stimulate projects at regional level. Key findings should also be recognized at global level. In the opposite direction, many open questions trickle down from the global to the national and even local level and should be included in research planning there. In an age of climate change and globalization, the sciences in their diverse disciplines are called upon to make a contribution and the richer states have a responsibility to take on a special commitment. Working on these different scales will confront us again and again with the question:

Mountain resources and mountain risks: common goods and/or common concerns?

On 11 March 2010, the UN General Assembly passed the resolution "Sustainable Mountain Development" (64/205). In its 45 paragraphs we find countless references to common goods and common concerns, of course in a UN, i.e. cross-border, sense, even if national sovereignty plays a more important role in political

reality. Below, I shall refer to just a few quotes from individual paragraphs referring to common goods and common concerns without explicitly calling them that. Some research policy statements, maybe even the entire resolution might be of interest for the new research programmes of the University of Innsbruck.

On common goods:

P.2: Notes with appreciation that a growing network of governments, organizations …around the world recognize the importance of mountains as the source of most of the Earth's freshwater, as repositories of rich biological diversity and other natural resources, including timber and minerals, as providers of some sources of renewable energy, as popular destinations for recreation and tourism and as areas of important cultural diversity, knowledge and heritage, all of which generate positive, unaccounted economic benefits.
P.29: Encourages the further development of sustainable agricultural value chains and the improvement of access to and participation in markets for mountain farmers…
P.30: Welcomes the growing contribution of sustainable tourism initiatives in mountain regions as a way to enhance environmental protection and socio-economic benefits to local communities…

On common concerns:

P.3: Recognizes that mountains provide sensitive indications of climate change through phenomena such as modifications of biological diversity, the retreat of mountain glaciers and changes in seasonal runoff that are having an impact on major sources of freshwater in the world…
P.6 Notes with concern that there remain key challenges to achieving sustainable development, eradicating poverty and protecting mountain ecosystems, and that populations in mountain regions are frequently among the poorest in a given country.
P.12: Expresses its deep concern at the number and scale of natural disasters and their increasing impact in recent years, which have resulted…

On governments and sciences:

P.7: Encourages Governments to adopt a long-term vision and holistic approaches in their sustainable development strategies…
P.13: Encourages Governments, the international community and others to improve the awareness, preparedness and infrastructure to reduce risks of disasters…
P.14: Calls upon governments, with the collaboration of the scientific community… to study the adverse effect of climate change.

P15: Underlines the fact that action at the national level is a key factor in achieving progress in sustainable mountain development…
P.26: Notes that funding for sustainable mountain development has become increasingly important, especially in view of the greater recognition of the global importance of mountains…
P.31: Notes that public awareness needs to be raised with respect to the economic benefits that mountains provide not only to highland communities, but also to a large portion of the world's population living in lowland areas…

The first UN resolution on the theme of mountains was the decision in 1998 to declare 2002 an International Year of the Mountains. Above, we have summarized the eighth resolution of 2010 in a few sentences. The year 2012 will be the year Rio + 20 (Stockholm + 40) and this anniversary conference is to be held again in Rio de Janeiro. The first preparatory conference, Prepcom, was held in New York from 17–19 May 2010.

The question remains whether the scientific mountain community will again come up with a contribution of its own. Let us not forget: there are moments and events, when science and politics must work together if they want to prevail at regional or global level. In the same way, preserving common goods and overcoming common concerns is both a scientific and a political challenge. For us, this means that science will one day be held responsible for both what it did and what it did not do.