forum '14 alpinum

Alpine Resources

Use, valorisation and management from local to macro-regional scale

Conference Proceedings

Darfo Boario Terme

17-19 September 2014

Edited by Anna Giorgi, Axel Borsdorf, Günter Köck and Thomas Scheurer

BIBLION edizioni
ÖAW AUSTRIAN ACADEMY OF SCIENCES

Organisation:

UNIMONT Università della Montagna

UNIVERSITÀ DEGLI STUDI DI MILANO

Città di Darfo Boario Terme

ISCAR International Scientific Committee on Research in the Alps

Support:

RegioneLombardia

Presidenza del Consiglio dei Ministri Dipartimento per gli Affari regionali le Autonomie e lo Sport

Impressum

Organisation:
Anna Giorgi & Elena Gatti, UNIMONT
Thomas Scheurer & Marion Regli, ISCAR

English editing and layout:
Erin Gleeson, SciencEdit.CH

Translations:
Sabina Bernardi, Marco D'Ippolito, Roger Gibson

Published by: Austrian Academy of Sciences
Printed by: Biblion edizioni srl, Milan, Italy

ISBN online: 978-3-7001-7855-2
ISBN print: 978-88-98490-30-1
DOI: 10.1553/forumalpinum2014

Cover photo: © Diego Occhi

Contents

Welcome!

ForumAlpinum 2014

Now in its eleventh edition, ForumAlpinum 2014, a biennial international scientific conference, focused its debate on the use, development and management of Alpine resources at local and macro-regional levels.

The background to the discussion was the creation of a macro-regional strategy that meets the challenge of the future management of such resources.

ForumAlpinum 2014 provided a platform for dialogue between the worlds of politics and science through the participation of policy-makers from the Alpine Countries and regions, who debated prospects for the integration of policies relating to Alpine resources.

Introduction

Anna Giorgi, ISCAR President

The 11th edition of ForumAlpinum was held in Darfo Boario Terme (Italy) and organized by ISCAR in collaboration with the Department of Regional Affairs, Autonomous Powers and Sport of the Presidency of the Council of Ministers, the Lombardy Region, the Municipality of Darfo Boario Terme and the Mountain University of Edolo, a branch of the University of Milan. The collaboration of these institutions made possible an extensive discussion regarding ***"Alpine resources – use, valorisation and management from local to macro-regional scale".*** From this discussion, a picture of the Alps as a single, cross-border territorial entity with its own specific characteristics emerged. This unity and specificity are the main elements that can be leveraged to promote the development of the Alpine space.

ForumAlpinum is an international meeting with a special format. On one hand, it is a typical scientific conference in that it promotes discussions, cooperation and research on Alpine issues. However, it is also a forum for a wider discussion between the scientific community and civil society in general, including the residents, policy makers and other stakeholders in Alpine areas. The challenge of such a meeting is thus to encourage interaction and collaboration between these different groups. Diverging languages, backgrounds and priorities often thwart the sustainable development of mountain regions. The goal of ForumAlpinum is to overcome these differences by providing a multilingual space for exchange both amongst scientists and between scientists and various Alpine stakeholder groups.

Dialogue amongst stakeholders is needed to ensure that research and innovation promote development that prevents the depletion of Alpine resources by taking into account the specificities of the Alps. However, ForumAlpinum 2014 demonstrated that Alpine areas are not "marginal" or "disadvantaged", although they are often characterized as such in laws and regulations. On the contrary, Alpine areas are complex systems endowed with specific resources that need to be studied, utilised and managed in a targeted and appropriate way. This concept is based on the paradigm that knowledge is the key to appropriately detecting, utilising and managing resources.

During this three-day conference, the Alps were presented as a resource that can and should be used to increase the competitiveness of a flagging European system that is in dire need of new social and economic mechanisms to foster development and the well being of its communities and citizens. An Alpine macro-regional strategy is currently being developed for a territory at the heart of Europe that is characterised and united by the Alps. How can the Alps contribute to this strategy? What opportunities do the Alps offer? What are the challenges, and what can be learned from earlier experiences?

These topics were covered at the 11th edition of ForumAlpinum through contributions from the main Alpine countries. The conference was enhanced by **five plenary sessions** with **19 international presentations** that were simultaneously translated into all Alpine languages and English. **37 workshops** were organised by universities, academies, research institutes and associations of the Alpine countries. The workshops were run by outstanding academic institutions, including the Universities of Lausanne, Milan, Trento, Geneva, Vienna, Turin, Bergamo, Venice and the Boku of Vienna; research institutions and academies including Enea, the Austrian Academy of Science, EURAC of Bolzano, the Edmund Mach Foundation of S. Michele all'Adige, the Federal Institute for Less-Favoured and Mountainous Areas, evk2cnr and the International Association for Alpine History; key international institutions, including the Alpine Convention, EUSALP and Alpine Space; and local powers such as the general directorates of the Lombardy Region, the Milan Chamber of Commerce, the Alpes cooperative in Trento, the Il Leggio cooperative, MUSIL, Cervim, the local Healthcare Trust and others.

The numerous presentations given at ForumAlpinum 2014 reflect the diverse experiences and best practices that bear witness to the vitality of the Alpine areas. Despite their classification as "marginal areas", Alpine areas clearly represent valuable current and future assets. For the first time in ForumAlpinum's history, a round table discussion involving both policy-makers and scientists was organised. Modern communication tools including social networks, streaming technology and live participation via Twitter were used to extend the discussion to the largest possible number of participants. The importance of technology for the Alps as a means to overcome factors limiting the development of their intrinsic potential was one of the key messages of ForumAlpinum 2014.

Young scientists also made an invaluable contribution to the Forum through their sheer numbers and with their manifold and qualified scientific inputs, the best of which were awarded bursaries. The Presidency of the Council of Ministers awarded ten bursaries for outstanding poster contributions via the "ForumAlpinum Poster Award 2014". The Alpine Convention awarded three students with excellent thesis papers with the "Alpine Convention Young Scientists Award". A multitude of students from local schools, including students from the Zanardelli Regional Vocational Training Institute and the Mountain University, also actively attended the presentations and workshops and used the opportunity to come into contact with scientific research that directly concerns them. The diversity and cooperation of the participants is a testament to the fact that mountain areas provide a culturally rich and proactive environment that is open to modernity and innovation, well accepted by the young, and valuable to the entire community.

Several words of thanks are due to the institutions that contributed to the organisation and success of this edition of ForumAlpinum. A special thank you is due to Alida Bruni for her attention to young people and to the future, which has given a special impulse to this initiative. Many thanks are also due to Thomas Scheurer for his passion, determination and perseverance in drawing the scientific and institutional communities' attention to the mountains, which, in the words of Tiziano Terzani, "Remind us of a dimension of greatness which can inspire and uplift us. That same greatness is also in each of us, but we find it difficult to recognize. This is why we're attracted to mountains. This is why so many men and women over the centuries have come here ..., hoping these heights would reveal the answers that eluded them while they were down in the valley. They still come."

Alpine resources: Assets for a promising future

Anna Giorgi & Thomas Scheurer
ISCAR

The ForumAlpinum 2014 gave a broad insight into ongoing and planned research, concepts and actions focusing on the use, valorisation and management of Alpine resources. Sixteen keynote talks, 37 workshops, 20 posters and numerous discussions showcased the great range of Alpine resources, from the natural and tangible to the cultural and intangible. The diversity of talks and participants also revealed a large spectrum of activities focused on the Alpine region, from grassroot initiatives to trans-national governance approaches. Alpine resources, and the sense of identity and ownership they inspire, are the basis of technological, social and cultural innovation. Alpine resources encompass natural, social, cultural and economic aspects, so the sustainable, balanced management of these resources will play a key role in the future of the Alpine region. With this in mind, the main results of the ForumAlpinum 2014 can be summarized as follows:

1. Alpine resources create assets relevant to (sustainable) regional development.
2. Additional efforts are needed to ensure a sustainable use of Alpine resources.
3. Alpine-related resource policies are needed.

Alpine resources create assets relevant to (sustainable) regional development

The relative importance of "historical" Alpine resources such as minerals, timber and water has shifted over the last few centuries as human populations have become more developed and interconnected. The last few decades in particular have witnessed especially rapid changes in the relative importance of Alpine resources. Today, as numerous talks at ForumAlpinum 2014 demonstrated, the cultural and intangible resources in the Alpine region have a large potential for socio-economic development. The large number of natural, cultural and combined UNESCO World Heritage sites in the Alps is evidence of the growing importance of intangible values for economic development. Other examples include the valorisation of geo-heritage sites, the use of local architecture (traditional and modern) to attract tourism, and offers that link landscapes with health, (local) remedies, or creativity and emotion. Similarly, mountain communities are creating value by re-assuming ownership of traditional gastronomies and other products that make use of local plants, animals and traditional skills. In general, the tourist sector will profit most from the valorisation of cultural resources, and especially from the promotion of local identity and authenticity.

Of the classical Alpine resources, the production of heat and electricity based on renewable energy from water, biomass, sun, wind and ground heat is a topic of growing importance. As a consequence, mountains are likely to be key areas of technological progress and education. However, it is important to remember that another classical resource, the Alpine landscape itself, is very sensitive to socio-economic development. Preserving the Alpine landscape will require striking a careful balance between social, cultural, natural and economic values. A third "classical" resource, Alpine farming, forms the economic, social and cultural backbone of many mountain communities, especially where summer farming of cattle takes place.

The Alpine area is characterized by a system of multi-resource use: agro-tourism is a classical example of using one resource to achieve multiple benefits. Similarly, many Alpine inhabitants combine part-time or seasonal employment in different sectors. For example, it is quite common for a single person to hold jobs in the agricultural, tourism and industrial sectors over the course of a single year. At ForumAlpinum, many examples of initiatives that use a resource for multiple purposes were presented, including projects that link agriculture, food, traditional crops, biodiversity and cultural heritage, and projects that integrate landscape, health and tourism. Various concepts and approaches were discussed with regard to how resource uses can be combined, e.g. by creating (regional) value chains, by practicing multifunctional land use (agriculture, forestry), or by considering ecosystem services as a part of resource use and pricing. Such integrated approaches are needed to build up a coherent regional economic policy while safeguarding Alpine landscapes.

Additional efforts are needed to ensure a sustainable use of Alpine resources

Most of the contributions to the ForumAlpinum addressed the efforts needed to ensure sustainable and continuous resource use in the future. A first challenge is to find new applications for cultural and traditional practices and local knowledge. Second, legal and economic efforts have to be strengthened to ensure that the local people and the local economy benefit from the use of the resource. This is a challenging task because these benefits should not increase the disparities between communities or regions. Third, the branding of Alpine resources has to be promoted commonly by producers and providers to generate higher economic values for authentic Alpine products. Fourth, research and education have to provide younger generations with the skills and knowledge to use Alpine resources to develop sustainable livelihoods. This last point seems to be the most promising with regard to the creation of future innovation and entrepreneurship within or related to the Alps, as it encourages intergenerational transfer and the development of innovative solutions.

Alpine-related resource policies are needed

Different policy approaches were discussed during the ForumAlpinum. The main objective of mountain-specific resource policies is to create benefits from the use of Alpine resources for the regional economy. To achieve this, models of multi-level governance have to be adapted to mountain regions. Clear goals are needed to ensure that existing resources are shared among concerned stakeholders and to enable local enterprises to exist in global markets. Mountain-specific resource policies will need an overarching framework for regulation and cooperation. With regard to cooperation, the Alpine region can benefit from existing entities such as the Alpine Convention, the European Macro-Regional Strategy for the Alpine Space (EUSALP), and regional communities such as Arge Alp. The EUSALP Action Plan and the multi-annual working programme of the Alpine Convention should be used to develop transalpine or macro-regional cooperation concerning the use of Alpine resources. However, a couple of bottom-up initiatives discussed at the ForumAlpinum showed that strategy development, participatory planning, shared experiences and policy dialogues can also contribute to an transalpine resource policy. Such community-based initiatives should be supported and integrated into the larger planning schemes.

In conclusion, ForumAlpinum 2014 emphasized the fact that the use of Alpine resources results from complex interactions between valuation and management practices, property rights and governance. The Alps are rich in natural and cultural resources that are important for all people, whether they live in the mountains or not. Future developments of the Alpine region need to use sustainable innovation to ensure regional development that simultaneously conserves natural and cultural heritage resources and ensures a high quality of life for local inhabitants. These resources have to be recognised, valued and used in a sustainable way if they are to benefit local communities and regional economies.

Session 1

Alpine branding – The valorisation of Alpine resources

Moderator: Axel Borsdorf, Institute for Interdisciplinary Mountain Research of the Austrian Academy of Sciences, Innsbruck, Austria

The Alps are rich in resources, both natural and socio-cultural, that offer clear benefits to large parts of society. This session will address questions such as: What are the specific values of Alpine resources? What opportunities exist for better valorizing or capitalizing on Alpine resources in the future?

In the plenum, Christian Vogl will focus on a key Alpine resource: local knowledge. Generations of families living in the Alps have developed an intangible but invaluable understanding of their environment that represents both a rich cultural heritage and a marketable resource. Bernard Pecqueur will then discuss how such resources can be developed into unique selling products. Finally, Mauro Masiero, Nicola Andrighetto and Davide Pettenella will examine the challenges of branding and marketing natural and cultural Alpine resources. The keynotes should be regarded as impulses for the subsequent workshops.

Keynote

Local knowledge in the Alps about traditional crops and local varieties: Examples from Eastern Tyrol (Lienz district), Austria

Christian R. Vogl & Brigitte Vogl-Lukasser
University of Natural Resources and Life Sciences (BOKU)
Vienna, Austria

The Alps are a managed mosaic shaped by dynamic change, including changing land use by human communities. The horizontal and vertical diversity of Alpine ecosystems, with their diversity of plant and animal species, allows for various ways of satisfying the needs of people living both within and outside of the Alpine region. Centuries ago, farmers converted mostly pristine forest into agroecosystems and managed forests to produce food, fibres, feed and timber, as well as tools and handicrafts. The diversity of Alpine plant and animal species also allowed for the development of small and medium enterprises and industries offering goods and services based on resources inextricably linked to Alpine (agro)biodiversity.

Figure 1. Cultivating and harvesting hemp, linen, cabbage and other crops traditionally grown in the Alps in Eastern Tyrol

The Eastern Tyrol in Austria (Lienz district) is a highly mountainous region. Adaptive management of natural resources by Alpine small farmers has created a typically diverse, multifunctional landscape. The historical form of agriculture in this region can be described as "mountain cereal grazing". Farming (cereal cultivation, field vegetables, fibre crops) and animal husbandry (with a high species diversity) were the main components of the Alpine subsistence system until the 1970s. While the majority of land cultivated close to the homestead was used for the production of food, a patchwork of lowland and highland plots was required for feeding animals throughout the year.

Over the past four decades, the cultivation of cereals, fibre crops and field vegetables has declined or almost completely disappeared due to changing economic, social and political circumstances. Locally adapted crops grown for subsistence in earlier times have largely been abandoned, as has the related knowledge specific to the local management of those crops. In Eastern Tyrol, once-traditional crops like turnips and broad beans are now nearly non-existent. Today, the landscape is dominated by meadowlands at lower elevations, where hay is produced for winter fodder, and by pasturelands at higher elevations, where some cattle remain throughout the summer.

Home gardens played a minor role in Eastern Tyrol until the 1970s. Only a few species, mainly spices, were grown in these gardens. However, the role of home gardens has changed significantly. Since the 1970s, home gardens have grown in size and species' diversity, and may include species used for food, drink, medicine, ornamentation or for customs. Traditional crops and local varieties were introduced from abandoned arable plots around the homesteads into these home gardens. The species composition in home gardens includes weeds (agrestals) from former arable plots that do have a use value (e.g., as ornamentals) and cannot be harvested at these abandoned plots any more. Farmers also introduced species like raspberry and St. John's wort from surrounding ecosystems into their home gardens due to the new patterns of seasonal mobility.

In Eastern Tyrol, the management of the Alpine mosaic of agroecosystems and forests has traditionally depended on the constant presence of farmers. In these areas, farmers developed an intimate local ecosystemic knowledge about the various habitats, their characteristics, and the presence and uses of certain plants. Fewer visits and shorter stays in remote areas create fewer opportunities for observation and collection; as a result, knowledge about useful (and harmful!) plant species is lost.

The abandonment of traditional management practices, crops and local varieties in the Alps is not a phenomenon observed only in Eastern Tyrol; it is also occurring in other Alpine regions. Nevertheless, there is a growing movement to reverse this trend. Apart from attempts to conserve the Alpine heritage ex situ in museums, books or exhibitions, the number of initiatives working for the in situ revival and innovative development of the Alpine food culture is increasing. These initiatives are often linked to movements such as seed saving, organic farming or slow food. Eating and using endangered elements of agrobiodiversity, including their contemporary interpretation, is an increasingly successful strategy for the dynamic in situ conservation of traditional Alpine crops, their varieties, food traditions and related local knowledge.

Figure 2. Home garden in Eastern Tyrol (1999).

References

- Vogl-Lukasser, B. (1999): Studien zur funktionalen Bedeutung bäuerlicher Hausgärten in Osttirol basierend auf Artenzusammensetzung und ethnobotanischen Analysen. Endbericht zum gleichlautenden Forschungsprojekt L 1044/96 im Auftrag des BMLF, BMWF und des Landes Tirol.
- Vogl-Lukasser, B., C.R. Vogl, M. Bizaj, S. Grasser & C. Bertsch (2006b): Lokales Erfahrungswissen über Pflanzenarten aus Wildsammlung mit Verwendung in der Fütterung und als Hausmittel in der Volksheilkunde bei landwirtschaftlichen Nutztieren in Osttirol. Endbericht zum ProjektNr. 1272, GZ 21.210/41-II1/03, gefördert vom Land Tirol und dem BM:LFUW.
- Vogl-Lukasser, B., G. Falschlunger, P. Blauensteiner, & C. R. Vogl (2007): Erfahrungswissen über Lokalsorten traditioneller Kulturarten in Ost- und Nordtirol (Gemüse, Getreide). Endbericht zum Teilprojekt „Sicherung und Beschreibung des Erfahrungswissens über Saat- und Pflanzgut lokaler Sorten traditioneller Kulturarten im Bereich Gemüse und Getreide in Tirol" i.A. des Amtes der Tiroler LR. Teilprojekt im Projekt „Gene-Save" gefördert im Rahmen von INTERREGG IIIA.
- Vogl-Lukasser, B., C. R. Vogl & H. Reiner (2007): The Turnip (Brassica rapa L.subsp. rapa) in Eastern Tyrol (Lienz district; Austria). Ethnobotany Research and Applications, Vol.5: 305-317
- Vogl-Lukasser, B., C. R. Vogl, M. Gütler & S. Heckler (2010): Plant species with spontaneous reproduction in homegardens in Eastern Tyrol (Austria). Perception and Management by women farmers. Ethnobotany Research and Applications. Vol. 8:1-15
- Van Der Stege, C.; B. Vogl-Lukasser & C. R. Vogl (2012): The role of homegardens in strengthening social-ecological resilience: Case studies from Cuba and Austria'. In: Plieninger, T. & Bieling, C. (eds.) Resilience and the cultural landscape: Understanding and managing change in human-shaped environments. Cambridge University Press. chapter 15.
- Vogl-Lukasser, B. & Vogl, C.R. (2012): Bäuerinnengärten und ihr biokulturelles Erbe. In: Zoll+, Österreichische Schriftenreihe für Landschaft und Freiraum 21: 66-69.

Keynote

Territorial resources and sustainability: What does post-Fordism have to offer?

Bernard Pecqueur
University of Grenoble, France

Introduction

The crisis of the dominant system of economic production, known as the Fordist model, is characterised by the end of the domination of the industrial paradigm as the determinant mode of representation of the value-creation process. In particular, it is the the end of a productive model based on the individualisation of mass production and the general production of standard, replicable products. The current phase, which for the sake of convenience is referred to as Post-Fordism, offers no resolution to the problem of decreasing resources in a world of increasing demand. This imbalance between resource availability and demand has existed since the Industrial Revolution and is now at the root of simultaneous crises in globalisation, production and finance.

Globalisation is the order of the day, which generates an initial paradox: it would appear that the drivers behind territorial development are trying to adapt to a global market, a „David and Goliath" situation. As a second paradox, we can see that territorial development is inextricably linked to sustainability (through territorial resources in particular). Indeed, sustainable development is frequently seen as a global response to global issues, while territorial development is constrained by its sub-territorial scale and by groups or 'communities' whose dimensions and issues are more local.

The aim of this talk is to show that a comparison of these two paradoxes offers insights into the challenges of the Post-Fordist phase. On the one hand, I shall offer a global, systemic introduction to resource management (sustainable development) and, on the other, an introduction to the process of creating and sustaining resources (territorial development). I shall seek to identify the most salient features of this kind of Post-Fordism, which has a strong territorial inflection and which suggests the need for a 'new geography of capitalism'.

Tangible versus intangible goods and services

In popular imagination, a tangible good offers greater reassurance to elected representatives concerned with economic development than does an intangible service (e.g., tourism offerings). The material object is at the heart of Fordism in the sense that it creates specific 'technical systems' that have a cumulative impact on consumption. Material production also makes it easier to calculate individual productivity, which is the basis for calculating economic performance. Similarly, certain types of production, and particularly those linked to the production of material goods, are taken more 'seriously' than others. This gives some idea of the links that bind Fordism to material production.

The disjunction between sites of consumption and sites of production

Fordism fixes workers to their sites of production: the worker should not have to cover any great distance, nor spend a great deal of time, to get from home to work. The system succeeds because an employee can become a consumer in the same place that s/he lives and works. From this perspective, an economic territory can be represented in much the same way as a micro-nation, and enjoys the same accounting equality as the national model. In this specific instance, all production at a location gives rise to revenue that is spent in full at the same location (in consumption or savings).

Territories are therefore small production systems where there is scarcely any room for any other stakeholders (consumers in particular). In other words, what is good for the company is apparently no longer automatically good for the host populations of the company concerned. In these circumstances, territories could be argued to enjoy relative autonomy, and a proliferation of initiatives and manoeuvres aimed at tackling the economic crisis would emerge. This trend, as it increases, will radically alter stakeholder strategies and bring into question, in a variety of different ways, traditional levels of public policy (European, national, regional).

The end of macroeconomics?

Individual relocation, which is a salient trend of globalisation, would appear to be driven by a typically Fordist mechanism of cutting down on production costs and once again separating producers from consumers. This projection, in a world where trade frameworks increasingly resemble not so much the United Nations, but rather 'regions' or 'territories', calls into question the Ricardian theory of international trade based on comparative advantage. In this view, the representation of the world as several interconnected 'wholes' no longer holds. Indeed, the easier it is for stakeholders to access the global market, the more important it becomes to establish mediating bodies, by which we mean 'territories'.

Consequently, our hypothesis is that a comparative advantage, under globalisation, has become a 'differentiated advantage'. Territories should no longer specialise under a comparative arrangement, but rather seek to bypass competition and aim for a type of production where they (ideally) are in a monopoly. This kind of behaviour brings into question the current division of productive systems by nation (set areas) because these initiatives are not generated by a centralised policy at the level of a Nation-State. Rather, they are generated by groups of stakeholders involved in resolving a production problem. These groups exist at an intermediate level between the individual and the 'whole', essentially working at a 'meso-economic' level. If this trend continues, stakeholders will be hit by 'multiscalar' arrangements and complex spatial combinations. The relationship between global and local will be seriously affected.

Awareness of the finite nature of productive resources

One of the foundations of the Fordist model is the notion of infinite resources, which assumes that resources are either inexhaustible or replaceable (e.g., nuclear power). Thus, for nearly two centuries, we have more or less helped ourselves to resources ad infinitum, encouraged by the belief that we can overcome limitations and push the boundaries of scarcity. However, we are increasingly becoming aware of that fact that the uncontrolled and unmanaged abundance of resources provided by nature will come to an end. If the world continues to operate on this business-as-usual trend in resource consumption, issues are increasingly going to arise about how to manage these clearly finite resources.

Fortunately, we are starting to see the emergence of a Post-Fordist model for adapting to capitalism, which involves new relationships between the local and the global, new cognitive processes that concern the territories, and a new geography of production. The opportunity to shape this future model awaits us.

Conclusion: Territory and sustainability as a twin-track approach

In the emerging Post-Fordist model, the issue of sustainability is arguably crucial to the renewal of resources. This notion of resources provides the link between sustainability and territory.

Territorial resources are distinguished by their specificity. This is a quality of a resource or a production process rooted in a particular place, history and culture. It is the idea that a product made in one particular place cannot be made elsewhere and still retain the same characteristics. The Eiffel Tower might be a typical example of a clearly specific production pro-

cess. It is fully bound to (and dependent on) the city of Paris, and cannot exist as such outside Paris. We can find another very clear example in the certification awarded to certain European food and drink products (PDOs and PGIs). In this instance, specificity is attached to a cultural product, a terroir, and the history of a place. This notion reflects the value created as a result of an attachment to a particular territory. It does, however, overlook another dimension of specificity, namely territorial dependency. In other words, specificity is a territorial characteristic that may have positive connotations in the sense that it adds an aura to local production, affords it a degree of distinction, and justifies a willingness on the part of the consumer to pay more for it. However, it can also be viewed negatively, as a kind of dependency that locks an economic activity into a particular place and prevents it from benefiting from the kind of mobility that it might need to cut production costs.

Keynote

Branding of natural products and the mountain regions

Davide Pettenella & Giulia Corradini
University of Padova, Italy

Branding can be defined from two perspectives: the supply side and the demand side. From a supply side perspective, a brand is a name, term, design, logo or label, or other features that distinguish products and services from competitive offerings (American Marketing Association). From the demand side, a brand represents the consumers' experience with an organization, product, or service (The Chartered Institute of Marketing). Branding is not a modern invention: as the logos of Alpine carpenters from centuries past in figure 1 testify, branding has been used for centuries. Today, brands and branding techniques are much diversified (table 1) and brands are more than just names and logos identifiable by a limited number of local users. In a globalized market characterized by a plethora of products and services, brands are important instruments for communicating and marketing a product's identity. A strong brand name inspires loyalty and is therefore crucial to a product's success on the market.

References to the Alps, a region rich in nature and traditions, can be a powerful part of the communication and marketing strategy of an organization. A brand (i.e. a name, logo or label) perceived to be linked to the Alpine environment can be an effective tool for differentiating products or services because the consumer immediately links the product or service with the positive values he/she associates with the Alpine environment (e.g., pristine environment, remote mountain tops, rich forests, clean water and colourful meadows, traditional farming techniques, small-scale artisan products, nature-based tourism, areas free of pollution, traffic, congestion, noise, etc.). These attributes are of fundamental importance for an emerging consumer segment: the so-called LHOAS (Life Style Of Health and Sustainability). LHOAS consumers associate "alpine" brands with the sort of premium, high-quality lifestyle they seek and are more likely to invest in brands that reinforce their values.

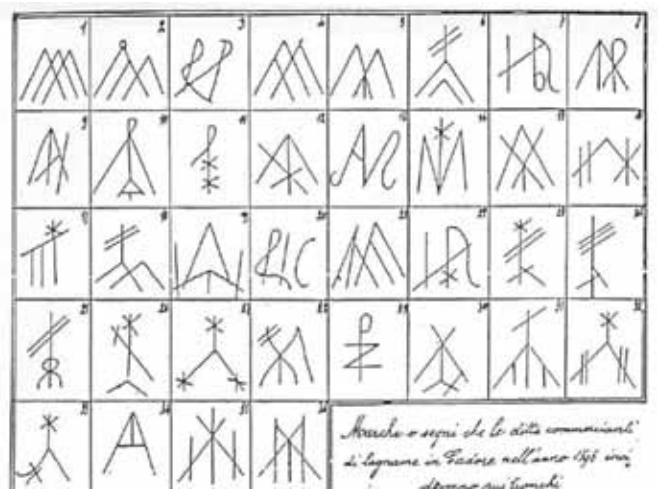


Figure 1. Logos used by carpenters in the past to mark wooden roofs in an Italian Alpine region. (Laner, 2006)

In the Alps, as in other mountain regions, small-scale farms and industrial companies play a crucial role in providing environmental and social services associated with the sustainable use of natural resources. Among the instruments used to support these small-scale activities, collective or umbrella brands (see table 1) play a leading role. Unfortunately, words like "Alpine", "mountain" and "natural", as well as the names of mountain regions and traditional products from the mountain areas, have been heavily exploited. Such words are now commonly used to brand products with no or very weak links to the real values and concepts associated with mountains. A simple search on the web shows that the "alpine" label has been used by industrial companies to name products ranging from cars and robots to lawn mowers and electronics - products with no relation to the Alps or mountains. Figure 2 presents some of the most recognized examples of branding based on attributes associated with nature, mountains and the alpine environment.

There is, however, a positive trend to reduce the arbitrary use of some words and attributes in branding in order to increase market transparency and to create fair marketing opportunities for producers. This is the case for "organic" farm products, for the food products and drinks traditionally associated with some regions and processing techniques (see the EU legislation on Protected Designation of Origin – PDO, Protected Geographical Indication – PGI and Traditional Speciality Guaranteed – TSG), and for GMO-free products. Recently, an important step in this direction was made by the EU with Reg. 1152/2012, which will protect the agricultural "mountain product" denomination. Unfortunately, labels like "sustainable" (with its sub-categories "environmentally sustainable" and "socially sustainable"), "natural", "biological", "carbon neutral" and "carbon free" are still largely used without a clear meaning of the attribute. ISO, the international organization for standardisation, has officially recommended avoiding the use of "sustainable" and similar words when defining standards in order to reduce misunderstandings.

Collective branding can be developed and approved by public institutions, as is the case for the PDO and PGI labels, as well as by private organizations. The Forest Stewardship Council (FSC) and the Program for the Endorsement of Forest Certification (PEFC), both of which identify responsibly managed forests and the chain of custody of forest products, are good examples of corporate brands developed by private organizations.

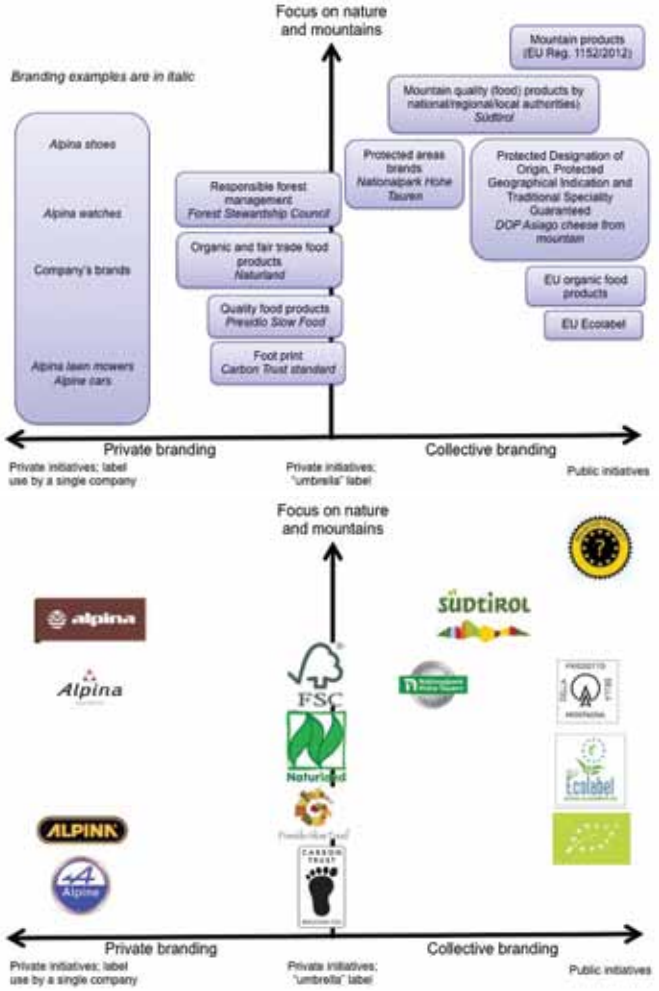


Figure 2. Brand examples by the attributes related to nature and mountains, and by brand owner (public vs. private). Top: brand names. Bottom: brand logos

Collective branding can be based on attributes related to specific territories, an option often used in the Alpine region. Collective brands may identify specific provinces, valleys or localities, such as the successful South Tyrol logo, or identify protected areas, such as the National Parks. The Alpine places of origin are used in branding to emphasize the identity of farm products, tourist attractions, recreational and sport facilities and special events, just to name a few examples.

To reinforce the value and communication strength of territorial collective brands, quality standards are used. A second party that provides the assurance that a product meets certain standards, as in the case of some National Parks or agri-tourism associations, may control standards associated with brands. In the most advanced cases, controls are based on third party verification. Third party certification

Type	Definition
Premium brand	A brand for a product typically more expensive than other products in the category
Family brand	One brand name is used for several related products
Collective or umbrella brand	One brand name is used by many operators, normally under a licence contract
Economy brand	A brand targeted to a high price elasticity market segment
Corporate brand	A company's name is used as a product brand name
Individual branding	All of all a company's products are given different brand names
Fighting brand	A brand created specifically to counter a competitive threat
Brand leveraging	The practice of using the brand equity associated with an existing brand name to introduce a new product or product line within the same company
Private (store) brands	Are created when large retailers buy products in bulk from manufacturers and put their own brand name on them

Table 1. Different types of brands and branding techniques

provides the highest level of assurance because an independent organization, which is entitled by an accreditation body, certifies that a product meets a publicly available set of standards. Quality standards (and their logos or labels) associated with specific Alpine territories are quite common for food products, agri-tourism facilities, hotels and B&Bs.

From this brief overview of branding techniques used in the Alpine region, it is clear that the use of brands is pervasive, the attributes associated with brands are often overlapping, the transparency and quality of the attributes may vary widely (from misleading messages to high-quality standards), and that the systems in place (if any) to guarantee product quality may differ considerably. It is therefore not surprising that brand recognition of Alpine-related products is extremely variable. Unfortunately, due to the large number of branding initiatives, collective brands promoted by public institutions in the Alpine region also suffer from low brand recognition. There is much room for improvement with regard to the coordination of Alpine brands, particularly among public sector initiatives. There are plenty of examples in which the same product or service is covered by collective brands promoted by a region, a province, a local group, a municipality, etc. It sometimes seems that promoters of new brands lack basic marketing knowledge, particularly in relation to consumer critical mass, product critical mass, targeting, and advertising investment.

The new EU Regulation 1152/2012 on the special denomination of mountain food products will probably support a much-needed process of simplification of collective brands. As has occurred in many other economic sectors, Alpine brands have proliferated to such an extent that the consumer is simply overwhelmed. To ensure sustainable, high-quality Alpine products, superfluous brands need to be weeded out, leaving only the most recognized and effective brands. Public operators should support this process by providing correct information with regard to brand contents and by not flooding the market with brands with minor market recognition potential.

Workshop 1-1

Valorisation of natural and cultural heritage for local development

Engelbert Ruoss
Global Regions Initiative
Morcote, Switzerland

Contributions

- *Local heritage resources as assets for future development*
  Engelbert Ruoss, Global Regions Initiative, Switzerland
- *Mercury Mine Heritage plays a key role in the future of the mountain area in Slovenia*
  Bojan Sever, Mayor of Idrija, Slovenia
- *Valcamonica's rock art as a resource for regional identity and economic development*
  Thomas W. Wyrwoll, Rock Art Research Center, Frankfurt am Main, Germany
- *Sustainability profile matrix: Screening local development processes*
  Clemens Mader, Leuphana University, Germany

From certification to valorization and development

Natural and cultural heritages are considered key resources in the ever-growing sustainable tourism market. A number of recently studied sites evince a strong potential for positively stimulating local and regional development. Others represent interesting types of Hit and Run Tourism with considerable impact on natural and cultural heritage. So-called "Hit and Run Tourism" leads to mass tourism in short periods, producing negative socio-economic and environmental impacts. Expressions such as 'in and out', 'if it's Tuesday, we must be in Rome', 'eat and run', 'quick trip' or 'touch and go' reflect the nature of this phenomenon.

During the workshop, discussions focused on the opportunities for and the limitations of valorising natural and cultural resources. Key Success Factors, Carrying Capacity Analyses and Sustainability Profile Matrices can be used to improve the management of the heritage and to plan, evaluate, monitor and lead sustainable development processes.

To foster sustainable development and ensure the success of a project, it is important to establish participatory strategies that involve public institutions, local people and stakeholders. Some steps for achieving a balanced holistic approach, protecting heritage and fostering socio-economic development should be considered before initiating a development process.

In order to clearly target the steps, some key questions should be answered:

- How can heritage contribute to local development as a resource or as capital?
- What are the pre-conditions for using natural and cultural heritage resources to contribute to development?

– What are the key success factors for cultural and eco-tourism destinations?
– How can development be evaluated and used to facilitate learning and support the planning, management and implementation of sustainable transformation processes?

"Hit and Run" tourism destinations

Day tourists usually create very little added value during their short visits and thus contribute little to the general management and maintenance of the sites they visit. Statistics show that day tourists spend around one-fifth to one-third of what overnight tourists spend. Reducing "Hit and Run" tourism and increasing overnight tourism would create more job opportunities and contribute to the economic development of a region. This would also create new possibilities for enhancing financial support for the maintenance and restoration of cultural heritage, such as through overnight taxes or increased revenues (Ruoss & Alfarè 2013). The four types of Hit and Run Tourism are identified and discussed:

- Cultural city: Venice (Italy)
- Historic city museum: Dubrovnik (Croatia)
- Historic village: Hallstatt (Austria)
- Archaeological park system: Aquileia (Italy)

Venice (Italy), the Old City of Dubrovnik (Croatia) and Hallstatt (Austria) represent instances in which the heritage resource was not properly valorized. As a result, tourism demand exceeds the carrying capacity of these sites (see Fig. 1) and negatively impacts the value of the site. Venice and Dubrovnik, two top tourism destinations in the Mediterranean, need to clarify their tourism targets and limits and create a plan for identifying sustainable heritage conservation and development solutions.

Local authorities in Hallstatt estimate that the city, with a resident population of 800 people, receives over 800,000 day visitors per year. As a result, the World Heritage nomination is considered to be more of a burden to the city than a boon. Preserving the value of a site that has such a large and transient tourist population poses significant challenges. The restrictions imposed by World Heritage status also create challenges for local people in the absence of adequate financial support. Hallstatt recently elaborated a management plan (2014) in which a shared strategy was defined and funding sources for the maintenance of the site were identified.

In contrast, Aquileia is an example of a Hit and Run destination that has succeeded in managing its resources such that the Carrying Capacity has not been exceeded. Visitor numbers at this archaeological park are controlled by visitor cards and entrance fees, which help to protect the cultural heritage, generate new jobs, and increase local incomes.

Sites with successful transformation

Bilbao's (Spain) profound transformation over the last 25 years shows that it is possible to convert a traditional industrial city in crisis into an attractive cultural destination with a strong knowledge economy (Alfarè & Ruoss 2014). Bilbao´s urban revolution is the result of a wide range of initiatives developed with an intelligent long-term vision. The building of the Guggenheim Museum has been a flagship project for the city and a key part of the transformation process. However, factors such as a broad, future-oriented vision, detailed planning and transparent management of the change processes have been essential to ensuring the success of the museum as a catalyst for transformation. Public-private partnerships, participation processes and strong leadership have also been major success factors.

Idrija (Slovenia) has already undergone a considerable transformation from a mining town to a small high-tech centre, and will further develop its cultural and eco-tourism offerings (Nared, Boyle & Razpotnik Viskovic 2014). The discovery of mer-

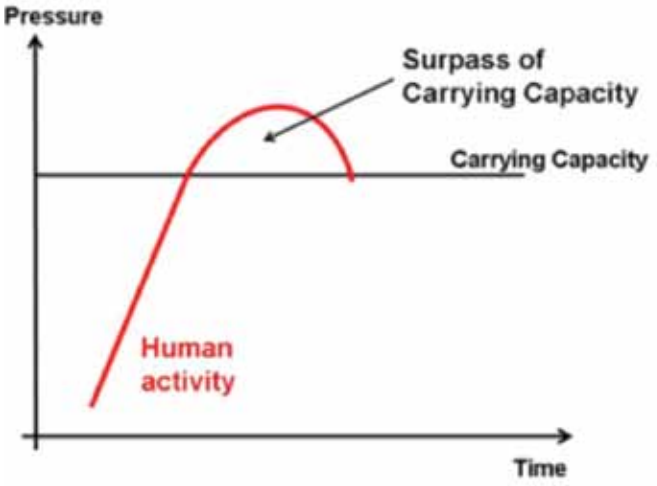


Figure 1: Carrying Capacity versus human activity. Source: CHERPLAN Regulatory Framework – CTI (www.cherplan.eu). When human activity surpasses the Carrying Capacity, the heritage resource and the socio-economics of the region are negatively impacted.

cury ore in 1490 and its exploitation were decisive for Idrija's industrialization. After the Second World War, mining operations declined until the mine was finally closed in 1990. Since then, Idrija has undergone a smooth transition into one of Slovenia's most successful centers for electronic products and is well-known for its global high-tech firms. Over the coming decades, Idrija will face three challenges with significant risks: a mono-structural economy, a lack of space, and poor accessibility.

In order to promote the technical heritage and values from the mining era, Idrija was inscribed in the UNESCO World Heritage list in 2012. An influx of tourists due to Idrija's status as a UNESCO World Heritage site will allow the surrounding rural areas to help drive social and economic development. Thus, Idrija's inscription offers the city an important opportunity to diversify its mono-structural economy. In 2013, Idrija also became a member of the European and Global Geopark Networks, a factor that will help draw additional tourists and contribute to the region's economic diversity.

Idrija confirms that culture is a source of territorial capital that can be used to develop a tourism market. Cultural values are an important component of regional development, and their conservation and development must be closely connected with the planning and development of the entire region. Governance and management frameworks, as well as public-private partnerships and strong leadership, should be considered key success factors.

The Valcamonica – A site with unused development opportunities

A series of sites with unused development opportunities have been studied within the framework of the EU CHERPLAN project and the Global Regions Initiative with the aim of enhancing local development based on cultural heritage (Mader 2013). These include Berat (Albania), Cetinje (Montenegro), Nafpaktos (Greece), Bitola (Macedonia), and Idrija (Slovenia). The Valcamonica (Lombardy, Italy) also exhibits the characteristics of a World Heritage Site with unused development opportunities.

The rock drawings of the Valcamonica World Heritage Site have the potential to contribute significantly to local development. Up to 350,000 rock engravings exist in this unique open-air site. Since the retreat of the ice after the last glaciation, local people have used the perfectly abraded valley flanks in an unrivalled manner, producing rock engravings through almost all of the subsequent prehistoric and historical ages. Dancing, hunting and fighting human figures, various animals, buildings, and the first maps of mankind give a unique impression of cultural development over thousands of years, making this area one of the key rock-art sites in the world. Historic monuments from Roman times, medieval castles and churches, ancient mines and quarries, and picturesque villages add to the rich cultural heritage of Valcamonica, which is further enhanced by the region's natural beauty.

Despite of its archaeological importance, rock-art tourism in Valcamonica is in decline. Parco Nazionale delle Incisioni Rupestri, the main rock-art park in the area, received about 42,000 visitors in 2013, only a quarter of which were paying guests. With such a low visitation rate, cultural tourism contributes little to the local economy. Although certain efforts to ameliorate this situation have been made by the Lombardian government, regional bodies and a few dedicated individuals, an overall lack of both co-ordination and fresh ideas is evident.

A major obstacle for the development of Valcamonica is its current division into the two provinces Bergamo and Brescia. Efforts are underway to reform the administrative territories of Italy; eventually, the municipalities of the valley will be united into a single province known as Valcamonica, or "Camunia" in dialect. This represents an excellent opportunity to coordinate efforts in favour of the valley's development and combine governance with regional identity. The valley's rock art heritage should play a central role in the development of a new regional identity, and can even be a source of symbols representative of the new political and administrative entities. In addition, a "Camunian Institute" should be established to provide a qualified joint scientific and administrative basis for the necessary study, conservation, dissemination, and valorisation of the region's unique cultural heritage.

Thanks to its geographical and historical setting, the Valcamonica is a natural place of reference for all Alpine peoples. The natural and cultural identify of Valcamonica could, however, also be commercialized beyond the Alps and target, for example, the growing tourist markets of Arabia and East Asia.

By concentrating on the following tasks, the World Heritage Site could significantly enhance its contribution to local development:

– Develop an integrated strategy for the whole valley, including all economic sectors
– Establish public-private partnerships at all levels
– Introduce and promote a joint brand and corporate identity policy
– Enhance private co-funding (donation, sponsoring, investments)

Current reforms of the territorial administration and recent initiatives to better promote the archaeological parks in Valcamonica may help advance the development of the magnificent and special "Camunian" rock art as a key source for the valley's cultural and political identity, as well as for its future economic development.

Screening local development processes
Key success factors for heritage destinations

In the report "Sustainable tourism based on natural and cultural heritage", financed by the European Commission, 10 strategic success factors are identified as instrumental for sustainable tourism (EC 2002: Chapter 3, p.11):

- Significance
- Distinctiveness
- Clustering
- Branding and networking
- Access
- Seasonality
- Partnerships
- Strategic planning
- Accessibility
- Sustainability

Besides these success factors, the complementary development of tourism businesses, infrastructure, products and services need to be considered. Tourists travelling today combine learning, fun and recreation; the development of tourism infrastructure and offerings are therefore strongly interlinked. Developing new infrastructure and services should go hand in hand with the promotion of heritage sites. Standards regarding accommodations, energy availability, clean water, clean air, security, sewage and waste management systems, modern telecommunication systems, easily accessible booking tools and public transport should be part of a development strategy.

The Sustainability Profile Matrix (SPM)

We all live and work in environments that are framed by locally specific cultural, natural and economic capital, as well as by global influences and opportunities (Mader 2013). The Sustainability Profile Matrix (SPM), developed at Leuphana University Lüneburg (Germany), is a new tool for assessing regional or institutional initiatives according to their specific contexts (Mader & Leitenberger 2014). Although sustainability is a normative concept, it is

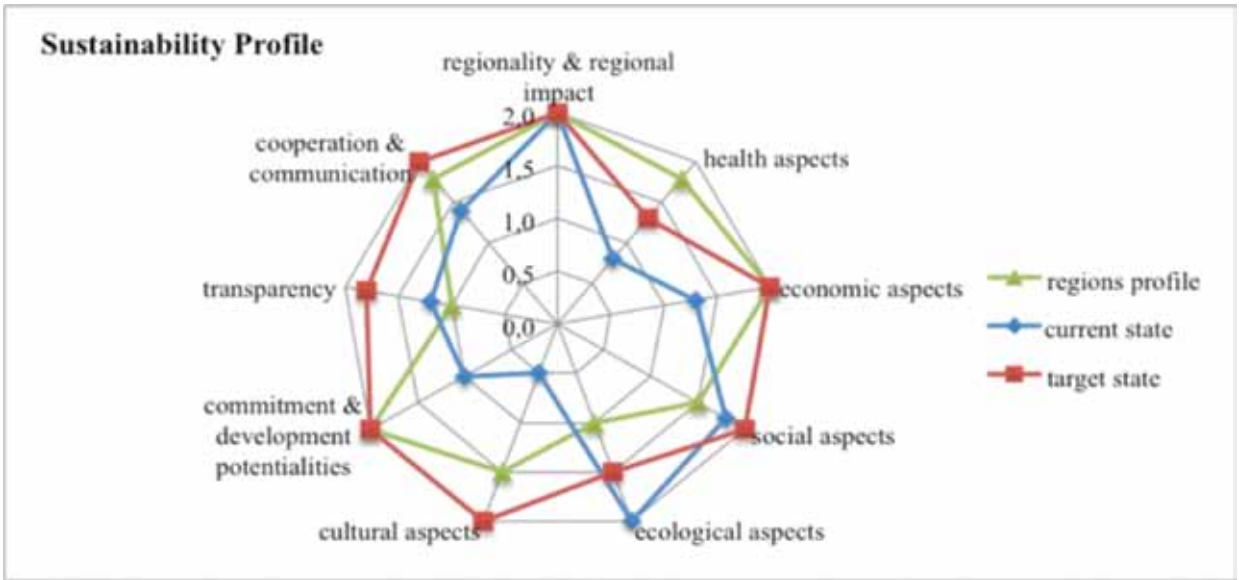


Figure 2. Sustainability Profile Matrix – visualization of the SPM as a web diagram. It shows nice categories that summarize the three indicators. The indicators are developed by the region's stakeholders through a common consultation process.

difficult to assess due to site-specific contexts and complex interrelationships. For example, people from regions with strong traditions in mining or heavy industry (e.g. Eisenerz, Austria) may have a very different understanding of natural capital than people living in regions that are traditionally sites of recreation, spa and services. SPM can be applied either in self-reflection processes to gain a holistic understanding of existing sustainability issues, or in multi-stakeholder consultation efforts to inform the assessment of present and future states (Fig. 2).

By screening indicators and reflecting on what they actually mean for a particular region, stakeholders exchange their understanding of the current state and share ambitions for the target state. Through this process, aspects that have not been considered in detail gain new relevance and the system is considered as a whole. Thus, stakeholders learn to make use of the potentials of the region in a way that promotes sustainability strategies and facilitates sustainable development.

Conclusions

The examples given above show that there are basic site planning factors that facilitate the successful implementation of sustainable development based on natural and cultural heritage values:

- Clear orientation and leadership
- Attractiveness
- Realistic planning
- Measurable development
- Accepted strategy with shared vision
- Fair benefit distribution
- Learning facilitation and reflection
- Efficient promotion
- Thinking globally - acting locally

Achieving a win-win-win situation by conserving heritage, creating benefits for local people and guaranteeing a high-quality visitor experience is the optimal outcome when local development strategies are based on natural and cultural resources.

References

- ALFARÈ, L., RUOSS, E. 2014: Kulturni objekti kot gonilo oživitve mesta: primer mesta Bilbao / Cultural Structures as Driver of Urban Renewal: the Town of Bilbao. In: Nared, J., Razpotnik Visković, N.: Izbrani primeri upravljanja območij s kulturno dediščino (CAPACities 3: 139 - 146). ZRC Publishing, Ljubljana.
- EC 2002: Sustainable Tourism based on natural and cultural heritage. Report of the European Commission, Chapter 3.
- NARED, J., BOYLE, D & RAZPOTNIK VISKOVIC, N. 2014: Tradition and development: the case of Idrija, Slovenia. Regions Magazin 2014/1: Cultural Heritage as Driver of Regional Development. P. 17 – 20.
- RUOSS, E. & ALFARÈ, L. 2013: Challenging Hit and Run Tourism in Cultural Heritage Sites. Proceedings of the International Conference on Sustainable Cultural Heritage Management "Societies, Institutions and Networks" of the University Roma Tre, Department of Business Studies, October 2013.
- RUOSS, E. & ALFARÈ, L. et al. 2013: Sustainable Tourism as Driving Force for Cultural Heritage Sites Development. Planning, Managing and Monitoring Cultural Heritage Sites in South East Europe. CHERPLAN Report, 169 p.
- MADER, C., LEITENBERGER, A-T., (2014) Die Nachhaltigkeitsprofilmatrix – Die Werte des Eigenen Unternehmens steuern und kommunizieren. Lebensart Verlags GmbH, BusinessArt, 4: 22 - 23.
- MADER, C. (2013) Sustainability process assessment on transformative potentials: The Graz Model for Integrative Development. In: Journal of Cleaner Production, Elsevier, 49: 54 - 63.

Workshop 1-2

How to better use and conserve the Alpine geoheritage resource?

Géraldine Regolini, Bureau Relief, Aigle, Switzerland
Emmanuel Reynard, University of Lausanne, Switzerland
Paola Coratza, University of Modena, Italy

Introduction

Since the late 1990s there is a renewed interest in geoheritage (geological structures and geomorphological landforms). In the Alps, as in the rest of Europe, initiatives for the assessment and conservation of geosites (= sites of geological interest) have blossomed and include national inventories and the inscription of geological sites in the World Heritage list of UNESCO (e.g., Aletsch/Jungfrau, Sardona Tectonica Arena and Monte San Giorgio, Switzerland; Dolomites, Val d'Aosta and Piemonte, Italy). The Alpine geoheritage is promoted through a wide variety of projects such as the Via GeoAlpina (www.viageoalpina.eu) and other geotourism products. The Geoparks (www.europeangeoparks.org; e.g., Haute-Provence, Lubéron, Bauges and Chablais in France, Glarnerland in Switzerland, Beigua, Apuan Alps and Adamello-Brenta in Italy, Swabian Alps in Germany, Steirische Eisenwurzen and Carnic Alps in Austria, Karawanken and Idrija in Slovenia) are good examples of how this resource can be used to enhance the sustainable development of a territory.

Earth scientists have developed numerous studies aimed at improving methods for assessing and mapping geoheritage, developing tourism promotion and environmental education projects, as well as increasing knowledge regarding the links between geo- and biodiversity. However, these efforts have seldom been co-ordinated in conjunction with tourism, educational and nature protection specialists.

Goals of the Workshop

This workshop was proposed in order to bring together all stakeholders and institutions concerned with and interested in geoheritage (geoscientists, policy makers, territorial planners and promoters) to discuss possibilities for creating synergies to ensure the optimal use of this resource.

We wished to discuss:

- Possibilities for taking geoheritage into account in protected areas and linking it with bioheritage resources;
- Opportunities for enhancing or creating interdisciplinary research in order to improve the quality of geoheritage promotion (environmental education and geotourism).

Format and program of the Workshop

The workshop was divided into three parts: two input speeches (2 x 20'), a group discussion (30') and a final discussion (20'). The organisers of the workshop invited two input speakers to open the workshop.

The first input talk was held by Dr. Paola Coratza, Chair of the Working Group on Geomorphosites of the International Association of Geomorphologists and permanent researcher in geomorphology at the University of Modena and Reggio Emilia (Italy). Her talk focused on the main achievements and gaps in geoheritage research. Dr. Coratza defined the concept of geoheritage, presented the main characteristics of geomorphosites, talked about assessment methods and discussed different fields of application (conservation, promotion). She also showed how geoheritage can serve as a starting point for tourist activities (for example, geotourism) or for regional development (for example, geoparks). Thanks to this input talk, people with little familiarity with this concept gained insight into the main issues of geoheritage research and the use of geoheritage as a resource.

Guido Trivellini, from the European Alpine Programme (EALP) of the World Wide Fund for Nature (WWF), gave the second input talk. He presented two methodologies for biodiversity assessment developed within the EALP. The first, based on an algorithmic approach, consists of superimposing different information layers (e.g., landcover, elevation, distribution of certain species) to define priority conservation areas. The second and participatory approach is based on expert knowledge of the area. In neither of the presented methodologies are geological and geomorphological features taken into account. Guido Trivellini gave also some examples of how geoheritage influences biodiversity, a topic that was discussed at length in one of the discussion groups.

Figure 1. Paola Coratza and Guido Trivellini, the two input speakers of the workshop.

For the group discussion, participants were divided into three groups and received a prepared statement as a starting point for their discussion (see below). Participants were encouraged to discuss the statements, to exchange experiences and to identify new means of interdisciplinary and transnational collaboration. The participants presented the main results of their discussions during the final discussion.

Main results of the group discussions

Statement 1: Is geodiversity as important as biodiversity? Is geodiversity only a support or a condition for biodiversity?

Participants agreed that there is a strict link between bio- and geodiversity: "Geosites are also biosites", "Dynamic geosites are important for biodiversity". They also established that there are common conservation issues: "The strict link between bio- and geodiversity should be used to better manage the resource." However, they also pointed out that biodiversity and geodiversity operate on fundamentally different time scales. Although biosites are generally perceived as dynamic and vulnerable on human time scales, geosites are generally thought of as more stable and enduring. This fact may require different conservation strategies. Furthermore, participants called attention to the fact that the valorisation of geosites may lead to negative impacts for biodiversity and that promotion activities should be carefully planned. The concept of landscape was discussed as a key element in managing both bio- and geodiversity: "By conserving the landscape, we preserve biological and geological elements". Some geosites, especially the most active ones, are also very sensitive to climate change and could be used as key sites for enhancing awareness of environmental changes in mountains.

Statement 2: Heritage comes from (socially recognized) crisis: The fear of losing something. Are geological features threatened? Is geoheritage recognized by society or only by specialists?

The participants contested the statement that heritage is only derived from crisis and gave the example of establishing heritage (patrimonialisation) for economic or political reasons. However, they agreed that geological features might be exposed to natural or human threats, such as acid rain and infrastructure development (examples given by the participants). No opinion was expressed regarding

whether geoheritage should be better protected. Concerning the recognition of geoheritage, there was broad consensus amongst the participants that geoheritage is recognized almost exclusively by specialists. The younger participants expressed the opinion that older people know more about the importance of some sites and that they may consider them "heritage sites".

A political scientist proposed considering geoheritage as a common natural resource and studying the questions related to the regulation of it as such: who are the owners, producers, distributers, and users of geoheritage? How is it managed?

Statement 3: "Geoheritage promotion has negative impacts on highly sensitive ecosystems and should therefore not be developed in protected areas." versus "Well-planned and sustainably designed geoheritage promotion contributes to the conservation of natural areas."

The third group, composed of students from a local technical high school with only basic English knowledge, had serious difficulty understanding the statement, so the discussion concentrated on the issue of what is allowed and prohibited in protected areas. Besides the prohibitions (for example hunting, construction activities), they recognized parks as territories that provide new jobs and opportunities, thanks to, for example, tourism or the marketing of local products. Consequently, we can conclude that the use of the geoheritage resource in protected areas may be beneficial for the local population. The question of possible negative impacts on ecosystems was not discussed.

Discussion of the results and participation

The moderators were glad to see people from different age groups, professional backgrounds and countries attending the workshop. Unfortunately, the participation of specialists from the Alpine environments (as NGOs, nature protection specialists, Alpine tourism specialists) was rather poor.

The opinions of students from the local high school were particularly welcome, as they reflect a part of the "next" generation point of view. However, it is not clear if their presence was just a coincidence or if it reveals that geoheritage is becoming increasingly popular. The discussion showed that for them geoheritage is yet a rather abstract concept that only concerns specialists or older people. But they indirectly recognized its value for regional development. Geoheritage research and promotion should therefore not forget this specific target group. To our understanding, formal education about geoheritage mainly takes place at the university level. It may be useful to develop pedagogical units at lower levels (high, secondary of even elementary school) to help foster recognition of this kind of heritage. As for geoheritage promotion, planners should also consider this target group and offer products tailored to its needs and interests. The conservation of geoheritage, as is the case for other types of heritage, is likely to be dependent on broad social recognition.

Figure 2. Participants during the group discussion.

The presence of people from different professional backgrounds enabled interdisciplinary discussions about the link between geodiversity and biodiversity and different research approaches (see above). Our impression that geoheritage is rarely considered outside the geosciences was confirmed during this workshop and its preparation. On one hand, we had trouble finding input speakers willing to discuss the specific framework and conditions under which Alpine geoheritage could be used as an economic resource (for regional development), or how it could be integrated in nature conservation strategies. People who were asked to intervene in this workshop (from both the tourism and conservation sectors) felt either insufficiently qualified or suggested that we should contact geoscientists. On the other hand, few concrete projects or methodologies concerning geoheritage were mentioned during the discussions. It was therefore a good opportunity to discuss the possibilities for taking geoheritage into account in protected areas, which was one of the goals of this workshop. A landscape approach appears to be a promising opportunity for rousing both the inter-

est and the collaboration of different stakeholders. Landscape indeed concerns various levels, from biotic to abiotic and human factors, permitting a holistic conservation approach.

Conclusion and perspectives

The Forum Alpinum was a great opportunity for the Working Group on Geomorphosites to discuss the use of Alpine geoheritage resources with different stakeholders. It was important for us to better understand how this topic is perceived outside of the geosciences, and to gain a better understanding of how geoheritage can be integrated into protected area management. The workshop gave us partial answers to both these questions. We would have wished for more participation to better measure interest in Alpine geoheritage resources, especially from people in the tourism sector. Although the lack of participation may be a sign a lack of interest in geoheritage outside the geoscience sphere, it may also have been the result of an overabundance of concurrent workshops. Nevertheless, the idea of a landscape-based conservation approach, which emerged during the discussion, should certainly be developed further. The workshop was also useful for networking with inter- and transdisciplinary professionals. Although there was insufficient time to develop concrete plans for collaboration, the workshop helped us identify people who may be interested in future collaborative research efforts.

We conclude that the different stakeholder groups are insufficiently aware of Alpine geoheritage resources and that their potential is therefore largely unexploited. Disseminating the concept of geoheritage and promoting the use and preservation of this Alpine resource remain challenges. The Working Group on Geomorphosites will continue to enlarge its network to encompass a wider range of stakeholders in order to lay the foundations for future partnerships.

Workshop 1-3

Alpine branding and mountain branding: Preliminary research and good practices in food and non-food mountain products

Elena Di Bella
Euromontana
Turin, Italy

Contributions

- *The European mountain branding scheme: A short framework and the Euromontana survey*
  Elena Di Bella, Euromontana, Turin
- *The Alpine pasture: A Slovenian good practice in Alpine branding*
  Andreja Borec (University of Slovenia)
- *Economic and cultural revival of Italy's marginal areas: Empirical assessment of strategies for sustainable local development*
  Marco Brusati, Carlo Cattaneo-LIUC University, Castellanza
- *Branding quality: Italian mountain labels and brands and their replication potential*
  Andrea Petrella (University of Trento)

During the workshop some themes and problematic issues emerged that are useful for a more comprehensive and in-depth analysis of this subject. The branding practices that can be found all over the Alpine region share some common features that the workshop speeches tried to outline.

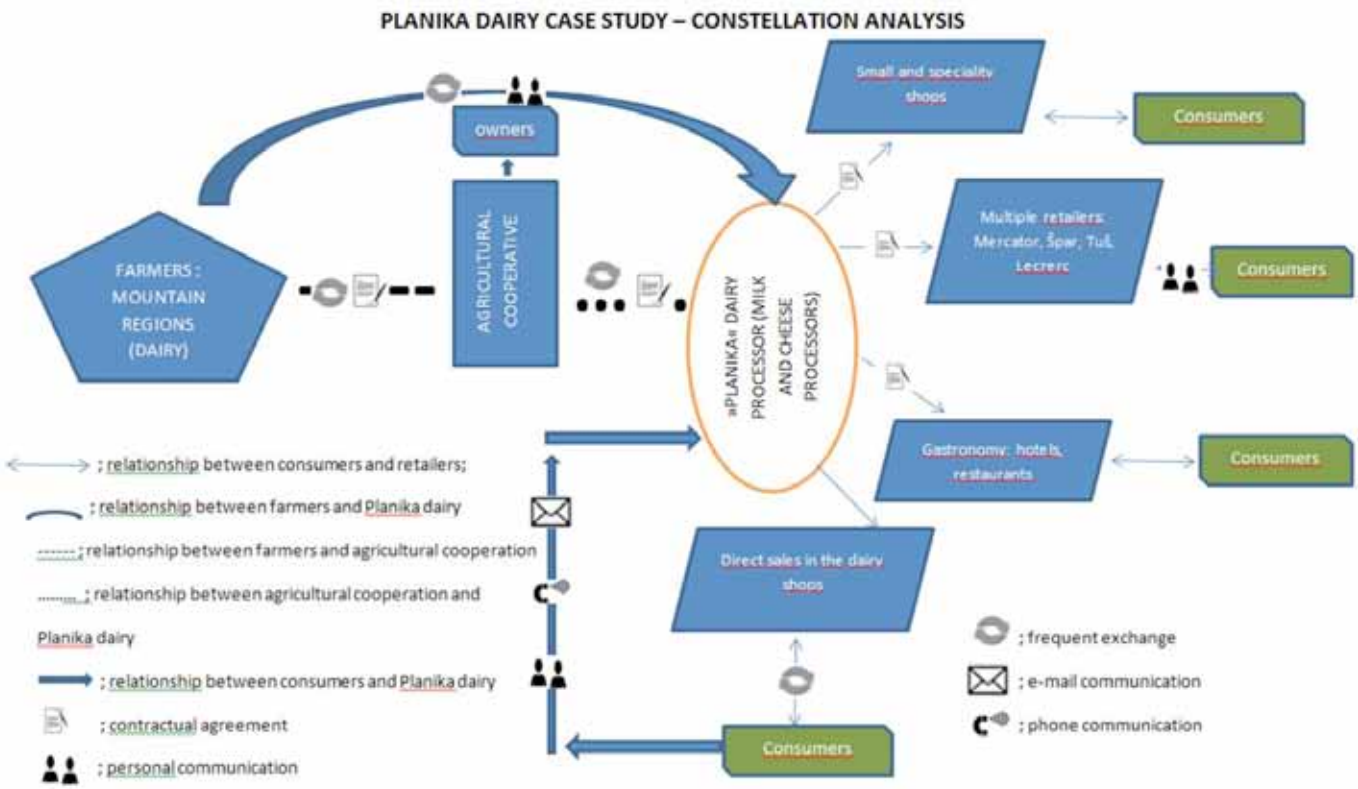
First, we need to reflect on which brands are the most effective tools for ensuring quality and traceability in the mountain agri-food sector. A possible approach is represented by territorial brands, i.e. referred to specific areas, or with recognisable peculiarities (protected areas, mountain ranges). One of the speeches, in particular, illustrated the example of the "Trentino" territorial brand, which was created in 1989 as a distinctive element for tourist communications and then extended until it was associated with an extremely wide production range. By meeting a few pre-requisites, an agri-food product from Trentino can use that label and thus convey some values, in addition to ensuring some traceability. The "Planika" brand was also described by analysing its evolution and success: it is a brand applying to dairy products from the north-west of Slovenia (Alps). Some twenty different products are obtained from the milk supplied by local breeders and, despite its slightly higher price than conventional products, "Planika" has increased its sales, showing that consumers reward short agri-food supply chains that can guarantee some compliance with quality specifications, with regard to raw materials and methods of production alike.

Another effective instrument to associate an Alpine product with its territory is the construction, participatory and synergistic, of a 'place brand' that can arouse in consumers (but also in residents, or in potential tourists or investors) the values that characterize the place of production, processing or holiday. It is a process that must be shared at each

stage with the local population and institutions and with the locally active economic players. A mountain context may thus be effectively enhanced by differentiating it from other locations based on its healthiness, but that's not all: the reduction of human vulnerability and the values that local players attribute to their own context are aspects that, together, contribute to positively "brand" a location, whether a valley, a region or a single country. A brand, as a consequence, becomes important, both externally and internally, since it is a quality label that reflects the distinctive elements of a given context. Local players, in this case, have greatly contributed to create a positive and attractive image of the place itself. During the workshop the case of Marzio came up: a small mountain village near Varese, it has relied upon these elements to identify a process of development and rebirth of its own.

In institutional terms, instead, it was the European Union which introduced a quality label for mountain products. Regulation 1151/2012 of the European Parliament and of the Council established the optional quality label "mountain product", which guarantees the mountain origin of agricultural products and foodstuffs meeting certain requirements. Thanks to the actions undertaken by Euromontana and other agricultural organizations, this brand entered into force in 2013, although with a few problems and unresolved issues, such as the possibility for foodstuffs processed up to 30 km from a mountain area to have the "mountain product" label.

Among the shortages of this and other labelling systems, the workshop mentioned the absence (or the great delay) of types of brand identifying quality mountain products outside the food, wine or agricultural sectors. The new challenge of territorial brands might be rewarding, after a close inspection, production processes adhering to tradition or capable of guaranteeing some specific, territorially delimited, modi operandi. Therefore a brand thus characterized would be a tool capable of conveying and proving not only the traceability of a product or service and its local origin, but also the added value deriving from being selected, designed, created and supplied by a player from the territory. Many mountain contexts, more specifically Alpine, have developed over centuries peculiar modi operandi in the manufacturing/industrial and in the agri-food sectors. This is the outcome of layers of skills passed on from generation to generation, improved and refined and surviving to this day. Differentiating on the market such a product would certainly be convenient both in economic terms and in terms of consumer choice, however the following should be defined beforehand: what is traditional and what is



not and which tradition should be referred to. The step to be further developed is linking the finished product or service to its territory not only in terms of "buying locally" or of a strictly local provenance (which, for some products, would be impossible to guarantee), but in terms of selection, design, processing, workforce and skills.

Another topic that was debated at the workshop is the importance of the values associated with a product and with the emotions and feelings it arouses. Associating a specific geographic context, which may be little known to the general public and scarcely attractive, to a local brand is a winning option – in a few cases an obligation – given the need to promote the territory by linking it to a clearly alluring brand. Over the last few years, furthermore, the handicraft and industrial sector also woke up to the potentials of territorial brands as tools to increase their competitiveness in non-local markets.

Generally, thanks to the use of the brand, players can convey the image of their own territories of origin and benefit from it in terms of sales and placement in non-local markets (both national and international). But what image of the territory does the brand evoke? It is an image that may pre-exist the brand or that is promoted and reinforced by it. As a result, it would be a good practice to analyse brands in order to understand which values consumers associate with them (according to the look & feel model).

In conclusion, we can assert that the success of a territorial brand depends on concomitant factors that should occur simultaneously. The institutions, first of all, should envisage, as in the case of the "Trentino" brand, an accurate regulatory and administrative co-ordination of initiatives, while delegating to third-party organisations the inspection procedures regarding quality requirements and protocol compliance. Socially, a certain awareness of the value of the brand is also essential: a brand that is not shared and not felt as an expression of the territory would encounter obstacles, would not be promoted convincingly and, in the long run, would be counterproductive. The role of local communities also consists in contributing to recovering traditional practices thanks to the knowledge and skills accumulated over the years. Finally, the economic-productive level, i.e. farms, the agri-food sector, restaurants, handicraft, tourism and industry must see brands as opportunities to grow both individually and as local systems that can co-operate and jointly promote the territory in which they are active and from which they draw their resources.

Workshop 1-4

The role of mountain cultural and landscape heritage in economic development and quality of life

Claudio Gasparotti
Centro Camuno di Studi Preistorici
Capo di Ponte, Italy

Landscape emergency between reversion to the wild state and land consumption

Annibale Salsa

Landscape is a social and cultural construction. Every landscape therefore represents the culture and society that shaped and experienced it. The landscapes of the Alps, despite a some territorial differences, bear many affinities due to the peoples who lived through very similar economic and social phases. It would be wrong to compare the alpine landscape with other landscapes. When we talk about wildness, we refer to a well-defined landscape, i.e. the American landscape, which is merely natural, without culture, unlike that of the Alps, which boasts an important history.

Preserving the identity of a people is a form of active protection, for landscape as well. The real challenge to fight both the reversion to the wild state – which over the last 10 years has increased by 20% – and excessive land consumption is being able to "govern the territory". The presence in alpine valleys and areas in general of "mountain towns", i.e. of strong and aggregating inhabited centres and of "valley main towns" is, based on clear observations, a positive factor for the life of the valley itself and of the reference territory in general.

Mountain landscape: how to preserve its strategic value for development

Luigi Zanzi

One of the most significant resources for mountains is certainly their landscapes: however, in my view, a serious misunderstanding of the meaning of the term "landscape" is commonly found. It is mostly believed that the landscape has an exclusively cultural (more precisely, aesthetic) value. I, for one, reckon instead that the notion of "landscape" has cultural roots that transcend man's own viewing or configuration ability. I believe that an objective notion of landscape is essential, as opposed to a subjective one.

I thereby wish to consider the emergence, in some place, of a form creating tension and linking multiple vital factors that intervene and intertwine in the life of that place. In the history of that place (every natural place should be understood as the outcome of actual developments of various morphological events, not just an unalterable land arrangement) an "eco-history" nexus gradually emerges, varying from one place to another, that contributes to define the morphology of the place itself.

As has been increasingly found in the theory of the so-called "landscape ecology", a place has distinguishing traits of formal links that define, from an

ecological viewpoint, not only its width, but also its development with reference, primarily, to different life forms (mainly, but not only, animal and vegetal) that are dominant in the place itself. Mountains are extremely rich in these "eco-landscapes": the typical bio-diversity richness of mountains comes from them.

For reasons linked to its geo-morphological structure, the mountain is a treasure trove of different landscapes which, in their progressive isolation from the world of plains (as the altitude increases), manage to stay intact. This landscape resource is essential for the development of mountains, which are regarded as locations with significant environmental values. The landscape thus observed from an "eco-historic" point of view, obviously does not always coincide with the landscape regarded as a cultural – mainly aesthetic – value typical of man.

With this subjective value, concerning man's intervention in all its various ways, the mountain landscape may surely be a resource, but it also entails serious ambiguities to the extent that that value is structured for enjoyment purposes. The risk is that the structure of the enjoyment of landscape, thus intended, may prevail over its very integrity. This is certainly one of the roots of the serious troubles that the landscape value has caused in some mountain areas. The exploitation of mountains by the city-centred world has also brought about this catastrophe of mountain landscapes being ruined by measures aimed at enjoying the subjective value of landscapes, without caring to protect its objective values.

I will not consider those problematic aspects here and I conclude by illustrating an "eco-historic' paradigm that, I believe, is extremely important for an appropriate interaction of development with the mountain landscape considered in all its objective values (i.e. as "eco-landscape"). In the history of the mountain the beginning of rural civilisation is of great significance: in the past men were able to invent a kind of rural life that may interact with the "eco-landscape", so that rural life itself may care for those "eco-landscape" values. I believe that, even today, the relaunch of appropriate initiatives for a new kind of mountain rural life becomes extremely significant again, both in order to protect landscape from the serious risks of reversion to the wild state, and to defend it from the robbing exploitation of the urban world.

Landscapes of war in Lombardy: the historic streets of WWI, their history and their need for protection
John Ceruti

The speaker gives some examples of salvaging and enhancing the many findings available in the Alps that date back to the first world war. They include the trenches of Montozzo and the Skoda cannons. The presence on the Alps of those signs is impressive: Two hundred kilometres of trenches, as well as forts and artillery posts scattered all along the Lombardy Alps, between Colico and the Adamello. These are the battle scenes where history was written. The history of the Great War, a "widespread heritage": mule tracks, passages, walkways, bridges and war sites, often salvaged and available for visits thanks to the commitment of volunteers. Military architecture and roads that wind along the 170 kilometres of the then high-altitude front (above 2,000 m), from the Stelvio Pass to the Lake of Garda, a fire line along which Italian and Austrian soldiers fought between 1915 and 1918. Ceruti demands that only war places that can be reached and visited be salvaged. We should focus on the preservation of outstanding landmarks: it is pointless to rebuild a small trench if it cannot be maintained. This is a great resource for the future of these alpine valleys, which today are already combed by numerous visitors who may become many more with a smart type of recovery and enhancement.

Alpine novelty: The architecture of hydroelectric power stations
Giorgio Azzoni

The 'energy transformation of the landscape' that struck the Alps at the start of the 20th century is a typical example of the technological-productive mobilization that affected mountains, bringing about epochal transformations. The mountain, after becoming decisive within the new geography of resources, was affected by new aesthetic notions oscillating between the functional attitude expressed by hydroelectric plants and the need to transfigure, through the aesthetics of power stations, the exploitation of natural water systems.

Today, through a critical interpretation of building designs, it is possible to reconstruct a sense of cultural heritage that can be seen as mountain novelty, a sign of both technological progress and of the symbolic value ascribed to architecture.

Fashion in Alpine valleys in the frescoes of the 15th century: the art of recreating clothing
Miretta Tovini

Prof. Tovini shows the Forum some of the clothing resulted from her research at the Brera Academy and from the dissertations of some of her students. After accurate studies of dressmaking techniques and of the kind of fabrics used, the inspiration for these clothes was taken from 15th century paintings found in some churches of the Val Camonica. During the Forum, many could admire the men's and women's clothes, as well as touch textile swatches, objects and processing methods, all accompanied by the comprehensive explanations given by the professor.

The project, apart from recovering techniques related to women's work in Alpine valleys and material resources (wool, hemp, silk and dyeing plants) in a happy combination of handicraft and art, also represents a search for interesting developments in youth employment, starting from mastering old knowledge, but with ultimate goal of developing the potentials and opportunities of the mountain economy.

Workshop 1-5

Feeding the Alps: An intangible heritage and a cultural asset to be preserved

Renata Meazza
Regione Lombardia
Milan, Italy

Abstract

The Alpine region has a territory and a landscape characterised by a vast, tangible and intangible cultural heritage made up of distinctive products and knowledge, of great quality and tradition, but increasingly weak in their supply. Alpine valleys suffer increasingly from the abandonment of their vocations and from the risk of definitively losing their own social, cultural, landscape identities and the creative potential deriving from them.

The new EU programmes for the period 2014-2020, the new policies introduced by the UNESCO and Council of Europe conventions may stimulate new visions that focus on the intangible cultural heritage, which is rooted in the Alpine communities. Development and re-activation processes of typical knowledge may be tested by creating new thematic and territorial links and by mixing creative languages, including those of the authors. "Feeding The Alps" aims at meditating on new visions for accessing knowledge and re-using tradition. Many experiences have already been successfully launched (projects E.CH.I., E.A.T., etc.) and should be communicated.

Workshop structure

The workshop is moderated by Renata Meazza who will introduce the topic starting from the international legislative framework, the Lombardy regional policies and from the experience of the Intangible Search Inventory. There follow three interviews to as many professionals, who were invited to speak about the topics of the creative reuse of Alpine culture, delving into methodological questions, exemplifying cases, personal visions.

Intangible search, the transmission of local knowledge in the UNESCO "spirit"
Renata Meazza, Ethnography and Social History Archive of the Lombardy Region

UNESCO approved in 2003 the International Convention for the Safeguarding of the Intangible Cultural Heritage. The Intangible Cultural Heritage includes the living expressions passed on from generation to generation and constantly recreated by communities. It is an expression of the cultural diversity of peoples and testifies to human creativity.

The Convention, ratified by Italy with Law 167/2007, binds the signatory Countries to adopt the necessary measures for safeguarding their own intangible cultural heritage and to promote regional and international co-operation. The Lombardy Region (with Regional Law 27/2008) launched an identification, safeguarding and enhancing process for its intangible cultural heritage through specific projects favouring their recognition, circulation, and

transmission. The AESS – the Ethnography and Social History Archive of the Lombardy Region – is actively working along these lines. AESS is a permanent cultural service available to schools, to the public and to scholars. Since 1972 it has conserved, classified, computerized a continuously updated corpus of traditional culture expressions around the region. A number of important instances of the most significant expressions of the living heritage.

Among the projects launched, a priority of measures devoted to the Alpine cross-border space has emerged, which concretely translated into the E.CH.I. project Italian-Swiss Ethnographies for the Development of Intangible Heritage Cross-border Co-operation Operational Programme Italy – Switzerland 2007-2013 (www.echi-interreg.eu). The partnership between regions and cantons identified as its goal the "testing" of a shared strategy supporting communities to respond to the standardizing pressure that globalisation is exerting on specific features, on cultural and language differences and on the preservation of some traditional activities, particularly in border areas.

In line with the measures to ensure the vitality of the intangible cultural heritage specified by the Convention, one of the results of the E.CH.I. project was the Intangible Search Inventory (www.intangible-search.eu). The online inventory makes accessible and spreads knowledge about the "living assets" that express themselves through oral traditions, language, performing arts, technical knowledge, social practices, ritual and festive events. It is constantly updated and implemented by communities, holders and key players of the intangible cultural heritage. In addition to a clear "documenting" function of the cross-border heritage, the Inventory also offers the possibility to access a body of knowledge (objects, tools, processes) that lends itself to be investigated and interpreted for project purposes. Development and re-activation processes of typical knowledge may be tested by creating new thematic and territorial links and by mixing creative languages, including those of the authors. Thus a perspective of methodological and operational debate opens up, which is summarised in the title's metaphor: "Feeding The Alps". A purposeful attitude that, through a multidisciplinary approach, meditates upon new visions for accessing knowledge and re-using the Alpine traditions. Thanks to the evidence provided by three professionals in creative disciplines who collaborated with the E.CH.I. project, we wish to point out emerging questions: what are potential development paths for a real enjoyment of territories? Can these accounts effectively redefine the image of the Alpine cultural heritage?

Design for a creative re-use of frontier Alpine culture
Ilaria Guglielmetti, Milan Institute of Technology

Design and territories: what does "designing the Alpine identity" mean for a designer?

The complexity and the new territorial requirements suggest the need to include into enhancing processes professionals with designing skills, who can contribute to defining the "portrait" of a place and of its attracting potentials. If actions are taken within the specific field of the intangible heritage, a quality of that heritage should be singled out that significantly conditions a designer's approach: the presence of a community, rooted in a territory, that selects and negotiates the dynamics of persistence, within the contemporary context, of its own traditions. It follows that every project action requires "shared designing processes" shared and approved by the community (or by the single holder) so that they feel "represented" in new scenarios. In order to apply this process, the typical vocation of design for 'multiversatility', mostly experienced in humanities subjects (www.humanitiesdesign.org), becomes essential. By reinterpreting methodological instruments borrowed from ethno-anthropology and transferred to the designing process (both in the analytical and in the application phases), mixing them with co-design processes taken from socio-economic branches, the right methodology for a really effective and shared cultural re-use can be identified. The very definition of "cultural design" affirms a designing practice driven by "culture" in which the designer's goal is to put at stake his/her communicative abilities and his/her perspective vocation by using visualizing, visioning, communication-exhibition design tools.

Can a methodology for the re-use of the Alpine culture be defined?

The cultural production process is, by its very nature, an expression of a specific historic and geographic context that cannot be ignored, in fact it needs to be understood and mastered. A methodology aimed at re-using cultural elements, therefore, requires, primarily, field work. Overall, we can identify 5 phases:

1. Documenting
2. Giving back

3. Interpreting
4. Narrating
5. Hybridization with contemporary languages/ aesthetics.

With the involvement of a network of players focusing on the community, the prospects for re-use can be classified into dynamics of: 1. activation, 2. translation, 3. setting in a new context through cross-creativity and fusion-creating tools.

Which enjoyment models can be used to favour cultural experience?

Acting within the Alpine cross-border area, the priority was identifying a communication process (media planning) that might strengthen the sense of belonging to the "frontier" community, beginning from "affinity" groups. The goal was to construct some "cultural traceability" to favour the experience of Alpine culture through cultural links between territories and communities. Five work matrices have been identified (partially tested within the E.CH.I. project):

- Documenting
- Access to knowledge
- Territorial narration systems
- Shared design actions
- Authors' narration paths.

By observing the Alpine territory, some positive signals of developing cultural resources have been found, although the emergence of a real awareness of the role of the project and of the interesting impacts that the re-use of territorial traditions may have on local economies is still difficult. 5 clusters have been identified that show, in turn, 5 types of output in which a few significant projects have been assembled (illustrated in case studies):

– Communication design/branding Logos and posters from Alpine territories, Maps of Living Traditions in Switzerland
– Service design web platforms The wine road in Valtellina, Valtellina Che Gusto!, Val di Susa, a journey through Alps
– Enjoyment of museums and territories From the field to the table: the cooking tradition of Valposchiavo; MAV
– New craftsmanship / cultural merchandising The soapstone today; Sabotier d'Ayas and the "chaussettes en laine" in the Aosta Valley; The craftsman's sign: territory, culture and enterprise meet
– E.CH.I. project routes through design, photography and illustration Design with bobbin lace: project of a twist; E.CH.I. Map: knowing the cross-border area

The Alpine tale of two artists
Stefano Torrione, photographer

What is your idea of a visual narration of the Alps? Does the relation with the local community affect the outcome of a photographic work?

The photographic image of the Alps is marked by deeply entrenched "stereotypes" that meet the public's expectations with postcard-style images that are still much sought after by the specialised market. This production certainly prevented opening up to a "different" language, persevering on an easily reproducible trend (e.g. "view with a cow and a blue sky") without ever really understanding local aesthetics, in the forms whereby communities choose to represent themselves. My experience, on the contrary, investigates closely, enters local dynamics to photograph with extreme accuracy phases, views, faces, manual skills, details and the wide open spaces of Alpine territories. I'm particularly interested in ritual expressions and, although I don't consider myself a documentary photographer, I use the photographic tool to do some "ethnographic research" without forgoing a personal poetics that drives me to construct images with a strong impact. I accurately choose routes, meetings, often following a ritual calendar that leads me to walk through cross-border areas. A complex narration, in which the links that keep all areas together are clear, is the outcome.

Does the relation with the community affect the outcome of a photographic work?

Photography is centred on human presence and is the outcome of my personal need to establish human ties that allow me to "access", "reach", "assist" and, finally, to photograph up close the "living" witnesses of a rooted culture, sometimes jealously guarded.

Can photography contribute to create a new kind of enjoyment of territories?

The space granted by the dominant communication for this sort of research is still modest. The image of Alpine culture suffers from a "romantic and nostalgic" legacy devoid of real study and aesthetic research more consistent with our times. The power of photography in providing new use models is in fact seen in the proposition of different processes that span from the understanding and the respect for a community to the authors' own creative interpretation that bears witness to that very community.
3. The Alpine tale of two artists: cartoonist Paolo Cossi
Paolo Cossi was born in Pordenone in the May of 1980. He attended comics courses and since 1997 has taught cartoon drawing technique in schools, as well as in courses raising awareness for this medium. In 2002 he won the 1st prize at the Jacovitti contest, which allows him to attend the Comics School in Milan free of charge. In the same year he published his first book: "Corona. L'uomo del bosco di Erto." Thus he began his career as a writer and cartoonist. Today Paolo Cossi collaborates with the ALP magazine, for which he draws short comics to Andrea Gobetti's texts. He lives and draws in a small mountain hut in Valcellina, near Pordenone, a few miles from the Erto wood, and in his works this bond to the nature of woods and mountains, especially of the Alps, is felt deeply.

What relation can be established between the contents of an ethnographic study and the script of a comics?

My comics grow out of a real immersion into the locations, the customs, the histories of the men and women I really meet. The study of territories, the emotional experience and a personal flair for listening are the preliminary stages for constructing a character, the script of a story or for outlining the aesthetic traits of a face, often "caricatures" of real facial features. This particular practice clearly shows that the concept of re-use can also be translated into the authors' expressions, which becomes "document" and "creative act" at the same time. The overlapping of these two registers exerts some power on the reader, on the public, particularly the young, whose cultural experience often passes through a "remote" emotional immersion requiring strong, credible stimuli, although transferred into a story.

What power does the language of comics have in spreading Alpine culture?

In the specific case of the comic Il Burattinaio delle Alpi ("The Puppeteer of the Alps"), the young leading character leaves the city feeling a deep call, an attraction to less urbanized areas that encourages her to explore her vocation. Thanks to the magic meeting with the Puppeteer of the Alps, she embarks on a journey that not only leads her through territories and inside rites, but also exemplifies the meeting of new generations with the intangible heritage. Indeed, by using the language of graphic novels, an interpretation of Alpine resources is proposed that meets the tastes and the reading practices of the youngest, but also contains some sort of "life proposal", urges them to travel as a chance for discovering and meeting other people. As the story shows metaphorically, this might encourage forms of migration to areas that are thought to be no longer "liveable" and that may represent instead a thrilling and viable alternative, as occurred to the comic's heroine. This is an example of re-using Alpine culture which, apart from the pleasure of reading, lets us meditate on new prospects for life that those Alpine areas might offer.

Workshop 1-6

Walking and dreaming in "minority" Alpine valleys: Proposals for an emotional tourism before Expo 2015 and beyond (Emozion-Alpi)

Andrea Cottini
Assoziazione ARS.UNI.VCO
Domodossola, Italy

Introduction

The workshop was organized by the ARS.UNI.VCO Association of Domodossola, which focuses on the training and development of mountain areas and oversees the Domodossola Help Desk of the Alpine Convention. ARS.UNI.VCO is an Association of the Verbano Cusio Ossola area. It considers itself an integral part of the Alpine space, with which it shares customs, habits, resources and problems. The goal of the workshop was to identify possible routes for a viable and sustainable development for a few western Alpine valleys by studying and implementing a number of theme-based proposals of emotional tourism, of projects to be launched, of possible networks that could leverage, by enhancing and pooling them, on the specific identities and landscape features of those "minority" lands.

In order to do this, we asked the following experts to identify and develop some concepts for development: Giuseppe Dematteis (Politecnico, Turin University – Association Dislivelli), Marco Onida (EU Officer, former secretary of the Alpine Convention), Stefania Cerutti (University of Eastern Piedmont; ARS.UNI.VCO), Nadia Fontana-Lupi (Director of the Tourist Board of Mendrisiotto and Lower Ceresio), Gianluca Papa (Director of VAOL.IT – Valtellina), and Daniela Fornaciarini (journalist). Marco Onida and Gianluca Papa were unable to attend the meeting.

The logic of the sustainable development of a territory, although with all possible concern for the environment, must however contain the sense and logic of development potentials, otherwise the risks are a gradual reduction of services (e.g. those related to citizenship rights) and depopulation (cuurently ongoing), which can certainly be reversed, but only if concrete economic and social development policies are identified and implemented.

The points raised by the speakers were all built upon a shared consideration, i.e. the idea of "minority" valleys not as reserves aiming to receive welfare funds and coverage, but as territories that are aware of "suffering" from lower economic, social development etc., and that wish to organize themselves to share their natural resources and production and social factors through networks, in order to postulate a shared growth that may develop within a "bottom-up" strategy. The considerations and proposals of the single speeches make up an important track on which researches and meetings may continue, in order to involve the areas least frequented by mountain tourism with a view to share a territorial development linked to the experience of emotional tourism. The following summaries of the speakers' contributions explore ways in which emotional tourism may be used to contribute to the development of minority valleys.

Keywords for "minority" valleys
Daniela Fornaciarini, Journalist

When defining the notion of minority valleys, emphasizing the minority element, the cultural issue always comes up. The Italian dictionary of public law, 4th tome, 2006, 3651 edited by S. Cassese gives the following explanation of minorities: "…groups that identify themselves through peculiar ethnic, language or religious ties, thereby setting themselves apart from the rest of the community of the Country under consideration…". Founding assets and values emerge, but they are intangible, since the pre-condition for a geo-physical territory is missing. It is indeed complicated to identify a triangle-shaped model comprising minority valleys, connecting them and leading them to relate with a centre on an equal footing. In this case, the Expo.

In short phone interviews about the first meaning of "minority" Alpine Valleys that came to their minds, nine academics, journalists, writers and experts, after some initial uncertainties, all gave accurate examples of minority valleys. In every conversation, the words that the respondents repeated most often during the interview were considered as important elements to better identify or qualify them. These were the keywords: panoramas/water/villages/houses/churches/peoples/traditions-innovations/craftsmanship/animals/work/technology/transport/training and communication/sports/polenta. Out of nine respondents, eight concluded the conversation by asking a question: how to save minority valleys from majority valleys, considering that the latter are getting increasingly close to the specific features of pre-urban or urban areas? Using these words and our photographs, we made a video that could arouse emotions and allow to meditate on the potentials of minority valleys.

"EMOZION-ALPI" Emotional tourism itineraries and routes along some Alpine "minority" valleys
Stefania Cerutti, University of Eastern Piedmont

The development of post-tourism and the emphasis on the local dimension have contributed to feed a new hybrid, complex and interesting form of tourism, which specialist literature calls "emotional". Emotional tourism embraces those travel experiences that are no longer closely linked with tangible factors and elements, but offer the opportunity to experience different emotions related to the proximity to other people or territories.
In the Alpine region initiatives and proposals may be found that, for a few years now, have moved towards emotional experiences, particularly in the sports field. But emotional tourism may represent many other things, in terms of both proposals and impacts. In view of the studies carried out, the contribution has shown that qualifying/renewing the tourist offering of Alpine environments means focusing our proposals on motivations, emotions, experiences, accounts that allow local places and heritage to be put in contact with tourists, undertaking an operation - at a local level - that is first and foremost cultural in nature.


At the workshop's opening – from left to right: Andrea Cottini – Daniela Fornaciarini

Along "minority" Alpine valleys there are already numerous structured itineraries and routes that follow a logic of "emotional quality" for tourism. They are not adequately interconnected. It might be appropriate to find a common fil rouge (e.g. food and surroundings), to offer them to a targeted public, wider as to potentials (rather than flows), focusing on the issue of emotional quality. Expo2015 should be an important showcase. But other strands might also be explored in the short time. A concrete and viable example of emotional tourist path on the Alps (Emozion-Alpi) is the Walser history and areas of the Ossola valleys in Piedmont ("A round of Walser").

Trenhotel: A project to offer emotions linked to a territorial vocation and to the Expo theme
Nadia Fontana Lupi, Tourist Board of Mendrisiotto and Lower Ceresio

The southernmost tourist region of Switzerland, as well as the Canton of Ticino, includes the District of Mendrisio and Lower Ceresio. Among the outstanding features of the region, we can name the most famous outlet in Europe, Monte Generoso and Monte San Giorgio – a cross-border World Heritage

From left to right: Stefania Cerutti, Andrea Cottini, Nadia Fontana-Lupi, Giuseppe Dematteis

of Mankind – shared with Italy. A country with which this region has intense daily exchanges, given its proximity. A region rich in outstanding features, but too often visited too rapidly, owing to its geographical position. A region that, with the Gotthard, contributed to the history of goods transport through the Alps. Sensitive to the EXPO theme, an exhibition that will take place only 40 km away from the region, from 2009 to 2014 the regional tourist board has developed an ambitious and peculiar project that aims to draw attention to the town of Chiasso and its region, as well as for food transport through the Alps. The project of TrenHotel, supported by the Swiss Federal Railways, wished to draw attention to the role of Chiasso and of Gotthard, to speak about history and the future and envisaged installing an enormous frame tent under which 4 coaches would have to be used as reception, exhibit hall and lounge bar and 6 sleeping cars, with 324 beds, would have have been fitted. TrenHotel should have been the point of departure for excursions around the region and a reference point for those who would have wished to reach EXPO directly with the special trains that will depart every day from Chiasso. The project was submitted to the popular vote and rejected. The region however is still the closest in Switzerland to EXPO and presents itself as such.

A network for a different kind of tourism in the western Alps

Giuseppe Dematteis, Dislivelli Association, University of Turin

The Project Sweet Mountains, prepared by the Dislivelli association, aims to create a network of hotel and quasi-hotel structures (shelters, farmhouses, multi-building hotels) that can meet the new demand for "sweet" tourism, i.e. slow, aware, sustainable.

The owners of these reception sites mutually undertake, under the assessment of Dislivelli, to treat visitors as guests, to share local identities, their values and problems through services and initiatives that could be a "key" to access the peculiar characteristics of the area. Each of these reception sites functions as the hub of a "production chain" of sweet tourism, i.e. of a local network of "satellites" (mountain and naturalistic guides, farmers and breeders, typical restaurants, artisans, parks, ecological museums etc.) that "open up" their territories to visitors. The network, comprising some 30 reception sites so far, aims at covering the whole North-Western mountain, making it accessible and receptive for its increasingly numerous visitors, both Italian and foreigners, to generate "territorial added value" based on a heritage that has been rather neglected and on a concept of tourist supply and demand that corresponds to the recommendations of the World Tourism Organization: "Tourism (...) when practised with a sufficiently open mind, is an irreplaceable factor of self-education, mutual tolerance and for learning about the legitimate differences between peoples and cultures and their diversity" (Article 2 of the Code of Ethics for Tourism).

The project shall be launched in October 2014, after its official presentation at the Slow Food - Terra Madre Show in Turin. It will have as its main technical support a communications structure (funded by participants) that will take care of the initiative's marketing and will connect the increasing demand for "sweet" tourism with reception points (and their satellites) ensuring an adequate supply, also to extend the seasonality of mountain tourism, now limited to one or two seasons.

Workshop 1-8

The management of architectural heritage: The co-evolution of landscape and society in the contemporary Alps

Luana Silveri
Scuola per il governo del territorio, Trento, Italy

The Alps are a very complex and diversified environment: castles, villages, refuges and sanatoriums are tangible evidence of the history of the Alps and its peoples. Today, these places often fail to meet the needs of a changing society and are now at the centre of a lively debate about whether they should be restored and, if so, how they should be managed. The revitalization and management of this architectural heritage represents a complex and costly challenge for local governments.

During the workshop, we discussed issues pertaining to the preservation and management of the Alpine architectural heritage including:

- *Evaluation methodologies and decision support systems for local authorities*
  Alessandra Oppio, Politecnico di Milano
- The reconstruction, reorganization and revitalization of Alpine refuges and old sanatoriums
  David Del Curto, Politecnico di Milano,
  Roberto Dini, Politecnico di Torino
- *The inclusion of all these measures in an innovative vision of sustainable mountain development*
  Luana Silveri, Scuola per il governo del Territorio Trento

Mountain refuges are typical examples of an architectural heritage resource with historical, cultural and economic value. Existing refuges need to be renovated to increase energy efficiency, reduce fuel consumption and sustainably manage waste in these often fragile environments. It is necessary to design best practices for interpreting, conserving, reusing and managing these assets. As an example, we suggest creating specific routes for backpackers and mountaineers that utilize networks of existing mountain refuges. This will help encourage the renovation, use, appreciation and conservation of this special architectural heritage.

During the discussion, Roberto Dini showed examples of how mountain huts have been renovated and reclaimed for new or expanded purposes. In many cases, mountain refuges have been modernized to accommodate guests; others have been converted

into exhibition spaces and laboratories to test new technologies for energy efficiency. As pointed out in the discussion, there are many positive examples of refuge reclamation, but many mountain huts are still in need of assistance. It is important to consider how existing huts can be renovated and reclaimed for a broader diversity of uses that capitalize on their cultural and architectural value.

Following the same trend, David Del Curto presented a project focused on the revitalization of the old tuberculosis sanatorium "E. Morelli", located in Sondalo, Italy. Del Curto discussed the participation process that helped define new means for protecting and enhancing the historical, architectural and landscape values of the sanatorium. The project is the result of a partnership between the Hospital Valtellina and Chiavenna, the Department of Architecture and Urban Studies at the Polytechnic University of Milan, and local authorities and partners. Within the workshop, this project represented a great opportunity to talk about how a cultural project can be the sum of studies, publications and local community involvement. It was also an interesting example of how old buildings can be readapted for new purposes, and prompted a discussion about the uncertain fate of sanatorium assets (buildings, history, etc.) located throughout Europe and especially in the Alps.

In the Alps, signs of innovation have increased. Many projects now encourage communities to re-discover their historical spaces in accordance with the principles of environmental and social sustainability. The work of Luana Silveri showed new possibilities for re-evaluating local development according to harmonic principles, in which the community is vital and strong. A good example is Dolomiti Contemporanee, an art project that revitalizes industrial buildings in the Dolomites that are no longer used or have even been abandoned. Art becomes a means by which a

community can rediscover its territorial capital and reconsider its development model towards greater goals of environmental and social sustainability.

In the complex Alpine world, it is crucial to develop a long-term vision that can balance the protection of a region's cultural heritage with the modernization required to ensure the region's future. As Alessandra Oppio showed in her discussion about castles in the Valle d'Aosta region, Multi-criteria Analysis Space can be a useful tool for the construction of participatory development strategies. In fact, the integration of spatial analysis and multi-criteria analysis (MCA) allows a systemic reading of the relevant variables. All information can be combined to create thematic maps that provide:

- a highly effective analytical framework for decision makers;
- an instrument for enabling the comparison of variables directly and indirectly involved in the development of cultural heritage;
- a platform for the integration of multidisciplinary approaches and methods.

The workshop achieved the goal of proposing new methods for analysing and enhancing the architectural heritage of the Alps that integrate environmental, economic and social considerations. Ancient villages, industrial buildings, sanatoriums, castles, refuges and other structures of architectural and cultural value can be used to promote sustainable economic and social development. They can also serve as strategic points for the monitoring and protection of landscapes and local communities.

Session 2

The use of Alpine resources: From past to present

Moderator: Patrick Kupper, ETH Zurich, Switzerland & University of Innbruck, Austria

Session 2 asks how past uses inform our present understanding of Alpine resources and therefore contribute to how we conceptualize future challenges. Three keynote speakers provide different perspectives on this issue. In the first keynote, economic historian Aleksander Panjek asks how patterns of resource use in the Alps have changed over time and what drove the changes. Ethnographer Valentina Porcellana then explores how resource use affects the social texture of Alpine communities, and vice versa. Finally, forest scientist Andreas Rigling takes us into the future with the Mountland Project and discusses how modelling the future helps to create visions of a multifunctional Alpine landscape.

Keynote

Natural resource use in the Alps: A historical perspective

Aleksander Panjek
University of Primorska, Slovenia

The issue of access to natural resources has become increasingly topical in the contemporary world. The discussion addresses the aspect of natural resources as sources of energy, as well as sources of sustenance and production. This is a subject that relates, on one hand, to the growing attention being paid to environmentally sustainable forms of exploitation. On the other, it is also related to the socio-ethical-political dimensions of management and governance. These issues are also discussed by historians, who seek answers to today's questions by examining the relationship between man and the environment in the past.

For various reasons, the Alps are an ideal observatory and — so to say— laboratory for dealing with these issues. Natural resources have always been at the core of Alpine life and economy, perhaps more so than is the case in other, less resource-constrained environments. Throughout history, the Alpine environment has confronted people and their activities with specific problems and challenges, forging a peculiar relationship between them. Special forms of resource governance, particularly collective forms of natural resource management and exploitation, have characterized Alpine environments throughout history. Again unlike other environments, a large portion of Alpine land is used collectively. These forms of use are, and have been, typically combined with the relatively important presence of public authorities charged with protecting and preserving natural resources. In some instances, these authorities have also been charged with (or have sought to) maintain a monopoly over specific resources. Natural resources of special importance in the Alpine area include forests, pastures, water, and ore.

The **forest** is one of the most important natural resources in the Alpine area. Forests are a source of energy and raw materials, of potentially arable land if deforested, and a place to hunt and gather additional resources. The legal status of forests in the Alpine area has changed from collective to state ownership; as a rule, forests are subject to the use rights of a range of entities. Especially in the pre-industrial era, forests attracted numerous and diverse interests that often led to conflicts between village communities and state authorities, feudal lords, neighbouring towns, merchants and/or entrepreneurs. Although forests were, indeed, frequently subjected to measures taken by public authorities for their preservation (forest regulations, etc.), they were constantly exploited by a range of actors.

Pastures were connected with another basic activity in the Alpine economy in the pre-industrial era, cattle farming. This often involved a complex system of exploiting grasslands, meadows and mountain pastures that continues to shape the Alpine landscape today. Pasture represents a key Alpine resource,

partly as a natural phenomenon and partly as a result of human activity, the importance of which reaches far back into the past. Grazing took place in forests, too. Pastures generally constituted a good part of the community lands that were administered by village communities. Like forests, pastures were subject to disputes that could last decades, especially between neighbouring villages communities.

Water in the pre-industrial Alpine economy was a source of energy as well as a fundamental means of production and transportation. This was especially true for industries in which it represented a localisation factor. In addition, lakes and rivers are home to many plant and animal species suitable for human consumption. The use of these water bodies not only affects upstream users, but also downstream lowland users and the lowlands in general (floods). Access to water resources has been subject to different regulations, depending on the form of exploitation.

Mineral resources are a somewhat special example among the natural resources of the Alpine world. Even more so than other resources, ores are unevenly distributed throughout the Alps and their management and exploitation is more often governed by private interests than by local communities. However, the exploitation of mineral resources affects other natural resources (forest, water).

Industrialization and agricultural modernisation, as well as the demographic "revolution", have had a strong impact on the Alpine economic system and on the balance between highlands and lowlands. Many Alpine areas have experienced a strong depopulation since the 19th century, as people emigrated to industrial centres and new job opportunities. As traditional Alpine occupations became less feasible, natural resources gained new meanings and ways of exploitation, like the production of electric energy from water, and the development of mountain tourism. However, these changes have not had the same results throughout the Alpine region: while some areas have flourished as tourism destinations or even industrial centres, for example, others have been unable to adjust to the new economic reality and continue to experience depopulation and abandonment.

Historians address all of the above-mentioned aspects, processes and questions, as well as others. One of the most interesting and relevant questions historians can help answer is the question of the

historical environmental (and social) **sustainability of natural resource exploitation** in the Alps. It is particularly interesting to study sustainability from the viewpoint of local communities and individuals in the past, as such insights are directly related with current issues regarding the accessibility of natural resources and sustainable forms of exploitation In fact, it also addresses the question of whether past ("traditional") forms of management were sustainable. If not, why? Do traditional practices and knowledge help ensure the conservation of a resource, or are they powerless to prevent its impoverishment?

I believe the answers to such questions must be sought by starting with the basic realization that Alpine village communities have never been isolated oases making a self-sufficient living in an idyllic relationship with their environments. Throughout history, they have had strong functional relationships with lowland communities, and their economies were far from being based solely on agriculture and husbandry. The Alpine economic system has been referred to as an **integrated economy** because mountain communities and people used to integrate various sources of income (from the primary, secondary, and tertiary sectors) to make a living. And I believe that the more diversified the sources of income were, the less unsustainable were the pressures on natural resources. Although the "integrated peasant economy" underwent serious challenges during industrialization and modernisation, it may yet be key to understanding (and achieving) successful development in the contemporary Alpine region.

Keynote

Changing resource uses, changing Alpine communities

Valentina Porcellana, Giulia Fassio,
Roberta Clara Zanini, Pier Paolo Viazzo
University of Turin, Italy

The inhabitants of mountains, and of the Alps in particular, are going through a renovation process: from 1871 to 1951, Alpine communities experienced a wide variety of regionally dependent demographic evolutions. These changes have been due to a number of factors (political-institutional but also socio-cultural) that have generally favored a stronger rooting in the Eastern Alps, especially the Germanic region. Around 1980, the French Alps began showing signs of economic recovery; in contrast, the Italian Alps were suffering a strong trend in depopulation. In fact, in the last two decades of the 20th century, a large part of the Alpine Arc (particularly in the Bavarian Alps) demonstrated an unexpected economic persistency that resulted in actual growth in many municipalities of the French and Swiss Alps. Nowadays, a demographic trend reversal is apparent even in the Italian Alps, due primarily to migratory movements towards the highlands.

Various social, economic and cultural phenomena linked to these changes can be observed. Social phenomena, for example, include changes in the composition of the resident population, such as whether immigrants are EU or non-EU residents, and the proportion of pensioners versus families and people who work in large towns but prefer a rural lifestyle. Economic factors include the revival of old handicrafts and traditional products, new forms of tourism, and other innovative activities connected with the Alpine environment. Cultural changes may comprise new associations, sustainable consumption groups, and the use of the Internet for communication and work.

The demographic and economic processes impinging on the various Alpine communities are closely interwoven with the social and cultural characteristics of a place (Viazzo, 2012). There is therefore a strong need to look beyond mere numerical data and to explore the social and cultural dynamics through qualitative investigations that are capable of bringing to light the specificity of each context. In particular, an intensive ethnographic approach allows the researcher to delve into the local context in order to understand the complexity of the social and cultural dynamics of the community and to provide a "thick description". This kind of analysis permits researchers to capture crucial factors such as the way in which new inhabitants enter the community and how this affects their ability to influence the political life and decision-making processes of the community. Moreover, it is possible to detect those elements that favor – or discourage – the tightness of the community.

In such a complex and fluid situation, it seems legitimate to wonder who should be entitled to learn about and transfer, then promote and valorise, the tangible and intangible resources of Alpine com-

munities (Porcellana, Diémoz, 2014). Recent investigations show that, in the past, the transmission of knowledge and cultural elements proceeded vertically, from the elderly to the young. Today, such transmission is often extra-familial and takes place horizontally or even "obliquely", from the elderly holders of local knowledge to young new residents who long to carry on these traditions. The very same considerations apply to material resources (land properties, buildings, or entire villages) and to their transmission and management.

A careful observation of local dynamics in different Alpine areas has allowed us to spot different patterns in the use and transmission of resources. The demographic processes concur to determine this array of different patterns ranging between continuity and discontinuity. As suggested by Mauro Varotto, demographic decline and depopulation are not the same and do not necessarily occur together. Episodes of demographic decline can be detected even without depopulation or abandonment, and conversely abandonment can be found without demographic decline or perceptible movements of population (Varotto, 2003, p. 105).

Discontinuity is not always – or only – due to a change in resources. Rather, discontinuity can be attributed to different models of resource selection resorted to by the community at different times. This selection, along with the depopulation that has emptied mountain communities for decades, leaves what Cognard (2006) has called "blanks", or areas of intervention that can be filled by new inhabitants or new generations. Continuity, by contrast, can be understood as an exploitation of the same resources through a series of changes and innovations that enable the community to fill in any "blank" by relying mostly on its own economic, social and cultural resources.

Two case studies, investigated using an ethnographic approach, help to pinpoint two different patterns – located at different points along the continuum between discontinuity and continuity – in the use of tangible and intangible resources.

The case of Macugnaga, a Piedmont municipality of about 600 inhabitants located on the eastern slope of Monte Rosa, and thus situated along the border between Italy and Switzerland, is a particularly interesting case of discontinuity in the management of community resources (Zanini, 2013). At various points in its history, Macugnaga was affected by migratory movements that have significantly changed the structure of its population, beginning with the very first settlements by German-speaking populations from the Saas valley in Switzerland (Walser) during the Middle Ages. Moreover, Macugnaga has an intense mining history that began in the eighteenth century and continued until the closure of the mine in 1961. The emergence of mass tourism provided an avenue of escape from the ensuing economic crisis, and from the 1960s on the Macugnaga community focused almost exclusively on tourism. However, elements of discontinuity can be detected even during this "touristic phase". At first, touristic promotion focused mainly on winter sports. During the 1980s, the Walser characterization of the community became a tool for touristic valorization, especially with the support of Law 482/99 "Norme in materia di tutela delle minoranze linguistiche storiche [Rules on the protection of historical linguistic minorities]". In Italy, this law has helped minority speakers regain their language and "sense of place", thereby contributing to the attraction of some mountain destinations.

In recent years, due to the crisis that is sweeping the tourism sector, the community of Macugnaga is starting to show signs of needing to rethink its touristic offerings. The community needs to reflect on how to repackage the resources at hand to remain competitive in the tourism market. The "blanks" left by the contraction of mass tourism have become an opportunity for younger generations to imagine new ways to valorize and transmit knowledge and traditions.

In contrast, the high Pellice Valley in the western Piedomtese Alps, and in particular the communities of Bobbio and Villar Pellice, represent a case of local resource continuity. Today, as in the past, mountain pastoralism is one of the distinctive features of the local economy and culture (Fassio, 2014). Between the 1960s and the 1980s, during a period of massive mountain depopulation, this sector experienced considerable difficulty and transformation. However, the "resistance" of some breeders and the intervention of the municipalities that invested in their mountain pastures have played a decisive role in enabling the continuation or resumption of pastoral activities. Today, the majority of mountain pastures in the valley belongs to the communities of Bobbio and Villar Pellice, whose residents have a sort of preemptive right to them. This system has favored the pastoral families who, although affected by important socio-demographic changes, maintain

a central role in the management of the agro-pastoral economy of the two communities and in the preservation of local and family traditions.

References

- Bätzing W. (2003), Die Alpen. Geschichte und Zukunft einer europäischen Kulturlandschaft, München, Beck.
- Bender O., Kanitscheider S. (2012), New immigration into the European Alps: emerging research issues, in «Mountain Research and Development», 32, pp. 235-241.
- Borsdorf A. (2009), Amenity migration in rural mountain areas, editorial to «Die Erde», 140, pp. 225-228.
- Cognard F. (2006), Le rôle des recompositions sociodémographiques dans les nouvelles dynamiques rurales: l'exemple du Diois, in «Méditerranée», 107, pp. 5-12.
- Corrado F., Dematteis G., Di Gioia A. (eds.) (2014), Nuovi montanari. Abitare le Alpi nel XXI secolo, Milano, FrancoAngeli.
- Dematteis G. (ed.) (2011), Montanari per scelta. Indizi di rinascita nella montagna piemontese, Milano, FrancoAngeli.
- Fassio G. (2014), Une plurilocalité verticale. Le cas des ménages agro-pastoraux dans la vallée du Pellice, in «Cahier de Démographie locale. Multilocalité et démographie locale», forthcoming.
- Fourny M.C. (1994), Nouveaux habitants dans un pays de moyenne montagne, in «Études rurales», 134-135, pp. 83-95.
- Perlik M. (2006), The specifics of amenity migration in the European Alps, in Moss L.A.G. (ed.), The amenity migrants: seeking and sustaining mountains and their cultures, Wallingford, CAB Int., pp. 215-231.
- Porcellana V., Diémoz F. (eds.) (2014), Minoranze in mutamento. Etnicità, lingue e processi demografici nelle valli alpine italiane, Alessandria, Edizioni dell'Orso, forthcoming.
- Steinicke E. et alii (2011), Autochthonous linguistic minorities in the Italian Alps: new legislation – new identifications – new demographic processes, in «Revue de Géographie Alpine/Journal of Alpine Research», 99/2.
- Varotto M. (2003), Problemi di spopolamento nelle Alpi italiane: le tendenze recenti (1991-2001), in Varotto M., Psenner R. (eds.), Spopolamento montano: cause ed effetti, Belluno-Innsbruck, Rete Montagna, Fondazione Giovanni Angelini e Universität Innsbruck, pp. 103-117.
- Viazzo P.P. (2012), Paradossi alpini, vecchi e nuovi: ripensare il rapporto tra demografia e mutamento culturale, in Varotto M., Castiglioni B. (eds.), Whose Alps are these? Governance, ownerships and belongings in contemporary Alpine regions, Padova, Padova University Press, pp.184-194.
- Zanini R.C. (2013), Dinamiche della popolazione e dinamiche della memoria in una comunità alpina di confine, «Journal of Alpine Research | Revue de géographie alpine» [En ligne], 101-3 | 2013. URL: http://rga.revues.org/2243.

Keynote

Future paths of Alpine regions: Lessons from the Mountland project

Andreas Rigling, Robert Huber
Swiss Federal Institute for Forest, Snow and Landscape Research
WSL, Birmensdorf, Switzerland

Mountain regions provide essential ecosystem goods and services (EGS) both to people living in the mountains and to people living outside mountain areas. The capacity of mountain ecosystems to provide key services is, however, at risk. Global warming is expected to have rapid and critical impacts on ecosystems in the coming decades. In addition, changes in political decision-making at different levels and in socio-economic boundary conditions are driving rapid land-use changes.

The MOUNTLAND project examined three case study regions in Switzerland: a pasture woodland landscape in the Jura, a drought sensitive inner-Alpine region in Valais, and the temperature sensitive high Alpine region of Davos. The aim of the project was 1) to analyze the impacts of climate change and land-use changes on forest dynamics, forest management and agriculture and 2) to improve land-use practices and 3) to develop innovative policy solutions that warrant the provision of EGS in a changing future.

An integrative approach was applied that combined methods from natural sciences, economics and political sciences. MOUNTLAND profited from existing long-term monitoring data and ecological field experiments in all three case study regions. These data and results served as input for mechanistic models of landscape dynamics that simulated the effect of climate change on tree development and forest composition on a landscape scale. The outcome of these simulations was used as input for a spatially explicit socio-economic land-use model. This model combined the natural science findings with market and policy scenarios to simulate the effect of climate and land-use changes on the provision of EGS. Policy network analyses for the agricultural and forest sectors were used to assess alternative policy solutions. In all case study regions, an institutionalized and regular stakeholder involvement took place.

In general, the experimental studies and simulation models imply that forest EGS will be strongly influenced by the direct impact of climate change. In contrast, changes in agricultural EGS were found to be primarily due to shifts in economic conditions that alter land use and land management. With respect to the three study regions, we found the following results to be of specific importance:

The **pasture-woodlands of the Jura Mountains** will undergo significant changes in forest structure and forest cover due to climate change. Simulations imply that the population of currently dominant Norway spruce will collapse due to increased drought, and that spruce will be slowly replaced by beech. This shift in tree species dominance will result in landscapes of less structural richness than exist today,

Photo 1: Study area Jura: a pasture woodland landscape (Photo by A. Rigling, WSL)

with negative consequences on forage production as well as on landscape diversity and hence biodiversity. These EGS can only be provided in a drier future if there is sufficient insulating tree cover within the grazed pastures. To maintain a mosaic structure of future pasture-woodlands, farming with unchanged or even increased cattle stocking on these mountain pastures is needed. Thus, pasture-woodlands are a specific case in which biodiversity conservation and corresponding policy measures demand an increase in land-use intensity rather than a decrease.

In the **high Alpine region of Davos**, the density of forest structures is likely to increase, with potential positive effects on avalanche protection. However, effective protection may decrease as a result of an increase in natural disturbances such as fires or bark beetle outbreaks. Quantification and overlay of five selected EGS (avalanche protection, recreation, CO2 sequestration and storage, capercaillie habitats and timber production) suggest a general increase in the value of most ecosystem services. For the agricultural sector, a longer vegetation period represents a potential increase in forage production, which would allow an increase in the number of animals. However an expansion of animal production is not profitable today or in future scenarios.

Our results suggest that at dry, low elevation sites (below 1200 m a.s.l.) in the inner Alpine area of Valais, the drought tolerance of today's tree species will be exceeded. Thus, a transition to more drought-adapted species must be considered in the longer term. At mid-elevations (1200-1800 m a.s.l.), drought and bark beetles are projected to be important drivers of forest dynamics, while high elevation forests (above 1800 m a.s.l.) are projected to grow and expand. All EGS are projected to be impacted by changing forest conditions, with the specific impacts often being elevation-dependent. In the medium term, forest management that aims to increase the resilience of forests to drought can temporarily help maintain forest EGS.

The **agricultural sector in the Valais region** is dominated by part-time farming. Our analysis implies that this structure guarantees a certain stability in the provision of agricultural EGS. However, the model indicates that more open agricultural markets and changes in the Swiss direct payment systems are likely to strongly increase farmland abandonment, with a corresponding loss in EGS. In this context, the analysis of the agricultural policy network showed that a production-oriented agricultural policy still has strong political support and, consequently, a status-quo protection scenario is very likely.

Surveys, experiments, and model results from MOUNTLAND revealed that climate and socioeconomic changes are likely to increase the vulnerability of the analyzed agricultural and forest EGS. In addition to these region-specific results, our analysis on climate change impacts revealed nonlinear dynamics and thresholds, time lags and legacy effects in all regions. In general, climate change increases the vulnerability of the analyzed EGS. The heterogeneity of impacts was even more pronounced when socioeconomic changes and feedbacks between human-environmental systems were considered.

Our analysis suggests that the institutional framework should be strengthened in a way that better addresses these characteristics, allowing for (1) more integrative approaches between sectors, namely the agriculture, forest and landscape plan-

Photo 2: Study area Davos: a temperature sensitive high Alpine region (Photo by A. Rigling, WSL)

Photo 3: Study area Valais: the drought sensitive inner Alpine region of Visp (Photo by A. Rigling, WSL)

ning sectors and (2) a more network-oriented management and steering of political processes that integrate local stakeholders. Thus, to maintain and support the future provision of EGS in mountain regions, policymaking should focus on project-oriented, cross-sectoral policies and spatial planning as a coordination instrument for future land use.

References

- Special feature in Ecology&Society provides a synthesis of the project findings. http://www.ecologyandsociety.org/issues/view.php?sf=75
- Special issue of the Swiss Forestry Journal (12/2012; in German) summarizes our findings with respect to forestry. http://www.szf-jfs.org/toc/swif/163/12
- Special issue of the Journal Agrarforschung (7-8/2012; in German and French) summarizes the main findings with respect to agriculture. http://www.agrarforschung-schweiz.ch/archiv_11de.php?jahr=2012&band=3&heft=07%2B08
- For more information about Mountland: http://www.cces.ethz.ch/projects/sulu/MOUNTLAND/%235

Workshop 2-1

Small ski resorts: Conditions for being competitive in a mature market

Andrea Macchiavelli
University of Bergamo & Gruppo Clas, Italy

Contributions

- *A ski resort for a proximity market*
  Massimo Fossati, ITB Valsassina e ANEF Lombardia
- *Youth as a potential market for mountain resorts*
  Marco Rocca, Mottolino SpA Livigno
- *The policy of Ticino for the small ski resort*
  Charles Barras, Ticino Tourism
- *Strategies and perspectives for small ski resorts in France.*
  Jean-Marc Silva, France Montagnes

It seems that recently something is changing in the snow tourism market. Up to about 10 years ago all skiing destinations marketed themselves by selling mostly the same product, Alpine skiing, possibly backed by a few other more recent activities; few were the differences in marketing policies between large and small destinations. After all, the good performance of the market ensured that all of them had their space. But over the last twenty years, the changes with deep implications for the sector of snow tourism were several. In addition to those now well-known to skiing operators (climate change, population's ageing, fierce competition by other forms of tourism), over the last few years other phenomena have occurred, significantly altering the attitudes of skiing resort operators, especially those of the managers of ski-lift facilities.

First of all, ski market saturation: in western countries a drop in mountain presences in the winter months has been clearly felt, even in the years with abundant snow-falling, and only the best equipped resorts with a wide range of services have managed to keep substantially stable; part of the demand of western markets has been replaced with new demand coming from East European countries (in particular Russia, Poland and the Czech Republic), but we cannot forget that even in these countries new resorts for winter sports are being developed. In most European countries a significant reduction of public funds is being felt which, especially in the Italian regions with special statutes, largely contributed to finance the Alpine tourist offering in the past. This is creating an urgent need for priority choices supporting skiing resorts. Finally – and this is perhaps one of the aspects that has the greatest consequences – the demand for snow tourism is strongly diversifying; in addition to descent skiing in winter and to hiking in summer, the activities demanded by customers have increased, becoming as many motives to frequent the mountain. The mountain, thus, is becoming a background over which different experiences can be tried, with little continuity and unsystematically. Part of them involve physical activity (snow rackets, ski mountaineering, snow-

boarding, e.g. in winter, mountain biking, fixed-aid climbing routes etc. in summer), others belong to the realm of entertainment and pleasures, such as gastronomy, the search for typical products and, particularly, the quest for physical well-being. This demand for flicking through many possible activities creates for skiing resorts the need to satisfy tourists by offering a wide range of services that not all mountain destinations can provide for budget, resource, or simply skill reasons.

Based on these recent phenomena, a tendency is beginning to emerge in small resorts to find a place of their own in the market through characterization and specialization. These considerations, propped against the observation of reality, have defined the concept of workshop 4.1, which had indeed the goal of presenting the ongoing strategies of some skilled tourist operators, in addition to some innovative entrepreneurial cases.

Jean Marc Silva is the director of France Montagne, the French national agency that represents mountain tourism operators that operate some 300 skiing resorts, half of which are considered "small-sized". The problem is therefore particularly felt because the main French resorts are really large and a few of them provide most of the turnover. Silva, during his speech, presented three cases of small-sized resorts which, through their own specific placing in the market, have managed to be distinguished and appreciated by customers.

The first one is Sainte Foy Tarantaise in the Isère Valley, a resort with around 40 km of ski slopes, surrounded by larger and well-known resorts (Les Arcs, La Plagne, Tignes), which seems to have found its own room by placing itself in a high end of the market through high-quality hotels and accommodations in particular (3,500 beds overall) that put up foreign customers in 80% of cases, mainly from the UK. The resort has made this positioning in a high-end category of customers its strength, in its communication campaign as well, establishing some good collaboration with the neighbouring communities, thus promoting the integration of services at a local level.

The second case is Autrans, a low altitude village (1,000 - 1,600 m) near Grenoble with around 6,000 beds and 10 ski-lift facilities, which has specialized in Nordic skiing (not just cross-country), to which it has reserved no less than 130 km of slopes. As a result, if Autrans may be defined a "small-sized resort" for Alpine skiing, it is one the first 5 destinations for Nordic activities in France. In this case the collaboration with other resorts (Vercors and Méaudre) is also strategic: thanks to them it presents itself as the specialization component of a network.

Saint Pierre de Chartreuse is also near Grenoble and is a low-altitude resort (900-1800 m) with only 35 km of alpine ski slopes. Here, drawing on old traditions, they aimed at enhancing the trail running activity, which is related to physical well-being, so much so that it has become the 1st resort for trail running in Europe. Trail running (both in the summer and in winter) complements conventional alpine skiing, but it specializes the resort, having business activities and services (clothing, training, healthcare) revolve around this theme. In conclusion, Mr. Silva pointed out that the strategy of small-sized resorts today is linked to finding peculiar elements that may emerge more transparently today, thanks to the "democratic" visibility offered by IT networks.

Charles Barras is deputy director of Ticino Turismo, in the Italian-speaking canton of Switzerland. His participation in the workshop was particularly significant because Ticino has 13 micro skiing resorts, with 19 chair / gondola lifts and 21 ski lifts: an obsolete offer, no longer available in other countries. Furthermore, those resorts do not collaborate at all.

Since all resorts are facing serious economic losses and have hitherto been supported by the federal government, the issue is outlining a strategy that allows enhancing the destinations that have some prospects of success, concentrating the available resources on them. Mr. Barras thus emphasized a political issue: after a comprehensive review of the

The skiing resorts of Ticino

situation, the State Council put forward a strategy aimed at concentrating resources on the Airolo resort, which offers the greatest opportunities, but the Parliament of the Canton asked that the other 4 main resorts be funded as well, considering it essential to tap resources for the benefit of all areas. The real crux of Barras's report, however, is that there is no marketing strategy for small Ticino villages, neither in terms of specialization, nor in terms of integration, i.e. of a unified policy for all resorts.

The two entrepreneurs attending the workshop showed two cases of specialization in Lombard mountain destinations. Massimo Fossati is the CEO of ITB Servizi (Imprese Turistiche Barziesi), which acquired the ownership of the facilities of 4 Valsassina resorts (Piani d'Erna, Piani di Bobbio-Valtorta, Piani d'Artavaggio, and Pian delle Betulle) near Lecco, around 50-70 Km away from Milan. In the past these locations offered a few skiing opportunity, but, as they are not at high altitudes, have gradually weakened and 10 years ago did not seem to be bound to survive. A smart product management and marketing policy seems, instead, to have opened new opportunities.

First of all, skiing was concentrated in only one of the four resorts purchased by ITB (Piani di Bobbio), the one offering the best potentials due to the variety of its supply and its altitude, whereas the others were left to fulfilling a recreation function for families, both in the winter and in summer. The Bobbio-Valtorta skiing resort, with some 35 km of slopes, has catered, right from the beginning, to the local market, since in around 60-80 minutes it can be reached by car by around 6 million people and that the valley has only a negligible amount of hotel beds, while there are numerous holiday houses. Therefore the management of the resort, the services provided and its communication strategy were decidedly oriented to meeting the demand of the Milan metropolitan area. Thanks to the large amounts of snow fallen in the last winters, today the skiing offering of Piani di Bobbio-Valtorta is among the most frequented of Lombardy, almost exclusively at weekends.

The case of Livigno, presented by Marco Rocca, CEO of Mottolino SpA, one of the two ski-lift facility companies of Livigno, is completely different, Livigno has some 100 km of slopes and around 40 km are in Mottolino, but they are not connected with the other 60 km. The resort, therefore, is not small but it is an interesting case of corporate strategy, since

A photo of the Mottolino snow park in Livigno

winter and summer offerings (MTB) have been oriented towards the youth segment.

Without neglecting the other market segments, which guarantee nonetheless the high presences in the resort, the Mottolino company obtained a strong company awareness level thanks to a product policy that organized spaces dedicated to the entertainment of young people (snowboard slopes and for descending on fresh snow, snow parks, freestyle spaces, etc.) through a policy of high-level sports and performance events, strongly youth-oriented, and a strongly focused communication policy. Today Livigno has an extremely high rate of international presences, thanks to its proximity to Switzerland and Germany, but also thanks to a product policy that attracts a large amount of young people from abroad.

In conclusion, the workshop has emphasized the statements made in the introduction, i.e. that something new is beginning to emerge in the field of snow and mountain tourism. Small-sized resorts are beginning, though timidly, to look for specificities of their own that they can market, this however requires all the more to identify forms of collaboration and integration with other resorts in the perspective of territorial offerings that are wider than those of the single tourist destination.

Workshop 2-2

Natural assets in the Alps: Social and environmental sustainability of communities of the past

Luigi Lorenzetti
University of Southern Switzerland, Mendrisio

The Alps have always been a complex and sensitive point of interaction between Man and Nature, with the latter imposing restrictions through climate, morphology and elevation. However, the mountains have also provided human communities with several opportunities by making a wealth of natural resources such as water, forests, pastures and mineral ores available to them. Reliance on these resources meant that mountain communities could escape the "crop hegemony", i.e. the Malthusian trap into which several one-crop economies had fallen. More than in other geographical areas, natural resources have always been central to the Alpine economy. This is also the reason why the Alps make an ideal place to observe the relation between resources and sustainability in its multifaceted aspects (environmental, economic, social, political, etc.).

The workshop ***Natural asset in the Alps: Social and environmental sustainability of community in the past*** addressed this issue and highlighted the importance of the historical context in which a sustainable use of resources is made. In other words, the historical perspective is an interpretation key and helps understand the practical implications of the otherwise abstract concept of sustainability and its environmental, economic, social and political or institutional impact.

The workshop was the result of a number of historical studies conducted in several areas of the Alps and summarised in the monographic issue of "Histoire des Alpes – Storia delle Alpi – Geschichte der Alpen" published by the International Association for Alpine History. The workshop was designed to explore and summarise the different issues and themes that are at the core of a broader research programme focussing on the history of the sustainable utilisation of resources by Alpine communities in the past as well as in the present time. During the workshop, three key issues were identified.

Resources, sustainability and marketability

Natural resources and their utilisation were historically influenced by the demand for certain goods. In other words, resources are useless, unless there is a demand for them. The importance of a resource thus depends on space, cultural aspects as well as time. The extension of Alpine pastures that have progressively replaced cultivated fields starting from the modern age should be seen as a consequence of the rising demand for diary products (cheese and butter), meat and wool in the urban areas. Likewise, Alpine forests were exploited more and more intensively as the mountain regions became more integrated with the market economy of the valleys. Also the race for the water resources of Alpine rivers and lakes became more intense as the energy demand of industrialised economies started to

increase and modern hydropower generation technologies were developed. However, these trends were not unproblematic. In the areas where trees were harvested most intensely and pastures were extended to the detriment of forests, several hydrological hazards caused natural disasters of varying magnitude, including floods, landslides, avalanches and the like. In fact, similar problems occurred also when grazing in the Alps and Pre-Alps had started to decline. The abandonment of several Alpine summer pastures and the inadequate upkeeping of the landscape gave also rise to problems. The progressive decline in forest management activities (due to the lack of competitiveness of Alpine forestry) also resulted in new hydrological disasters triggered by climate changes. Likewise, less maintenance work on streams caused significant damage to the landscape. Paradoxically, environmental sustainability issues may arise in connection with both highly intensive exploitation practices and low-intensity ones, adding to the social and economic sustainability problems of local communities.

It should be noted that the pressure exerted on the Alpine assets in the past depended on accessibility of external resources through a market economy. While the market economy often put too much pressure on natural resources, sometimes it also gave the opportunity to relieve such pressure because it made it possible to diversify subsistence strategies and to access external or intangible resources, e.g. professional qualifications achieved through migration.

Resources, sustainability and integrated utilisation

In recent years, several historical studies highlighted the complexity of Alpine economic systems and subsistence strategies of domestic groups, mostly based on multiple activities that gained leverage from different resources, both tangible and intangible. The complex nature of Alpine economies and the development of "integrated" economic models throws a different light on the issue of the sustainable use of resources. Complexity is also inherent in the intertwined use of a variety of natural resources. By means of example, the combination of mining and forestry should be mentioned: the extraction of mineral ores relied on the utilisation of forests that provided the timber used to prop up the mining tunnels and to feed the furnaces in which the extracted ores were processed. Likewise, the utilisation of pastures depended on the availability of water either from wells, rivers or pipelines. What emerges clearly

is that ancient Alpine communities made a sustainable use of resources that were closely intertwined within the local or regional economic system. For this reason, an approach based on the selective analysis of individual resources seems no longer suitable. A more holistic analysis should be promoted in order to highlight the integrated utilisation of the different resources. More specifically, some understanding should be obtained on the extent to which these dependencies have conditioned the types of utilisation and the resulting degree of environmental, as well as economic and political sustainability.

Looking at resources from the opposite point of view, it should be underlined that they were often used for multiple purposes in the Alps. For example, forests were used for grazing, harvesting of timber for constructions and heating, as well as for their wildlife, fruits and natural products. Equally, also water courses were used for multiple purposes: irrigation, hydropower generation, fishing, etc. As a whole, sustainability may be seen as the result of several coexisting utilisation strategies for one same resource; these strategies usually originated from political decisions and power relations that historical research has started to explore only recently.

The diachronic perspective shows that the technological development in the industrial age determined a level of resource exploitation that is barely compatible with the principles of environmental sustainability. An example is provided by hydropower plants that have dried up several water courses and altered the hydrological balance in several Alpine valleys. However, modern technology also drastically reduced the pressure on forests, which were previously the primary energy source for several urban settlements in the flat areas. Technology thus plays an important role in the future balance between resources and sustainability.

Resources, sustainability and ownership/utilisation

Recent historical research has focussed more closely on the forms of ownership of resources and the establishment of property and utilisation rights. More than any other area in Europe, the Alpine space has maintained some meaningful forms of collective or common ownership and this poses the question of who should access and use resources. The issue has been covered comprehensively by the international scientific community, especially thanks to E. Ostrom, economics Nobel prize winner in 2009. In contradiction to the assumptions made by G. Hardin, privatization processes of collective resources demonstrably do not result every time in overexploitation. Conversely, historical studies have warned against the "community myth" that tends to promote collective ownership as the form of property that best matches the sustainability concept. The workshop proved that the management of resources by local communities was not always tantamount to their sustainable utilisation, since other factors may be an excessive pressure on resources or the inadequate maintenance of the systems regulating their use that has resulted in environmental problems. On the other hand, utilisations promoted by external sources did not necessarily result in low sustainibility. A proper assessment of the connections between type of ownership and utilisation on the one hand, and sustainability on the other hand must try to identify the players that most benefited from these resources and to focus on the interplay between local interests and external forces.

Workshop 2-3

Social diversity and resilience in Alpine regions

Ingrid Machold
Federal Institute for Less-Favoured and Mountainous Areas (BABF), Austria

This workshop was organized within the theme of Session 2, "The use of Alpine resources: From past to present". The workshop was based on the assumption that the importance of social diversity as a resource is often underestimated in the discussion about the valorisation of Alpine resources. The main aim of the workshop was to discuss the implications of social diversity, particularly with regard to gender and ethnicity, as a means for achieving resilience in a world rife with both economic and environmental challenges.

The workshop was organized around the following three contributions from research and practice:

- *Enhancing regional resilience through diversity in Alpine regions*
  Theresia Oedl-Wieser, Federal Institute for Less-Favoured and Mountainous Areas, Austria
- *Ensuring and strengthening participation processes – the case of the biosphere reserve "Großes Walsertal"*
  Ruth Moser, Biosphere Reserve "Großes Walsertal", Austria
- *Alpine rural life in a diverse society: Tyrolean emigrants in the Peruvian jungle*
  Karin Zbinden Gysin, School of Agricultural, Forest and Food Sciences HAFL, Switzerland

To give an impression of the increasing social diversity in the Alpine region, a graph drawn from the research project "International migration in Austrian rural areas", led by the Federal Institute of Less-Favoured and Mountainous Areas, was presented by the moderator (Machold et al. 2013). The differentiation between internal and international migration at the regional level shows a twofold picture of the demographic development of Alpine regions (figure 1). Due to internal movements from rural to urban regions and the extension of agglomerated regions, most rural areas are characterized by a decline of population. For most peripheral rural regions, this represents a significant negative development.

However, the graph in figure 1 shows the other side of demographic development in Alpine regions. Although there is much talk about „rural exodus" within a given nation, the movement of foreign passport holders to rural areas paints quite a different picture. In contrast to the negative internal migration balance for most rural areas, the international migration balance is positive for all regions, including rural regions. People of foreign citizenships contribute significantly to a positive demographic development in Austrian Alpine regions, revealing that international migration compensates for, or at least mitigates, internal population losses in rural areas.

These demographic changes indicate an increase in social diversity in rural communities, which leads to a number of questions regarding the acknowledgment and appreciation of social diversity within Alpine communities. It also raises the question of how and if social diversity can be leveraged in regional development strategies and governance structures.

The first input, by Theresia Oedl-Wieser (Federal Institute of Less-Favoured and Mountainous Areas), provided some insight into the concept of resilience and its implication for regional development. She started with a list of the manifold risks of marginalization in Alpine regions, including climate change and demographic changes through migration processes and the overall weakening of regional economic structures. These marginalization threats led to a discussion about the preconditions for resilience pathways at different regional levels. Two "resilience" approaches were identified. "Equilibrium resilience" is mainly associated with "the capacity to absorb shocks and still maintain function" (Folke 2006, 253f). In contrast, "evolutionary resilience" highlights on-going change processes and emphasizes adaptive behaviour and adaptability.

Evolutionary resilience places significance on transformation, whereby social-ecological systems (through individual or collective agency) can adapt and develop alternative development trajectories (Scott 2013). For this approach, it is important to sustain diversity in order to maintain options for coping with, adapting to or shaping change over time. There is an evident interrelation between ecological and social systems in rural regions: only when ecological diversity is ensured can quality of life be secured for the rural population. If the social system is weakened by the outmigration of young people or the dissolution of community networks, for example, complex ecological systems may suffer from abandonment or degradation. Furthermore, social diversity (i.e., age, gender, education, experience, ethnicity, religion and sexual orientation) is an important indicator of the "openness" and vitality of rural regions. Future governance systems need to be better able to take into account the dynamics of social diversity in order to achieve adaptive forms of governance. Social diversity must be esteemed as an important dimension of adaptive future-oriented regional governance structures before it can be fully leveraged.

The next input, by Ruth Moser (Biosphere Reserve "Großes Walsertal"), outlined some background features and main characteristics of the UNESCO Biosphere Reserve (BR) "Großes Walsertal". The focus of this presentation was on participation processes within the last few years. Although participation processes in the Großes Walsertal were initially very successful, new challenges have arisen due to high expectations and projects that demand complex collaboration and decision-making. The main question was how to motivate people with different backgrounds to participate in regional cooperation efforts. Multi-stakeholder participation strengthens

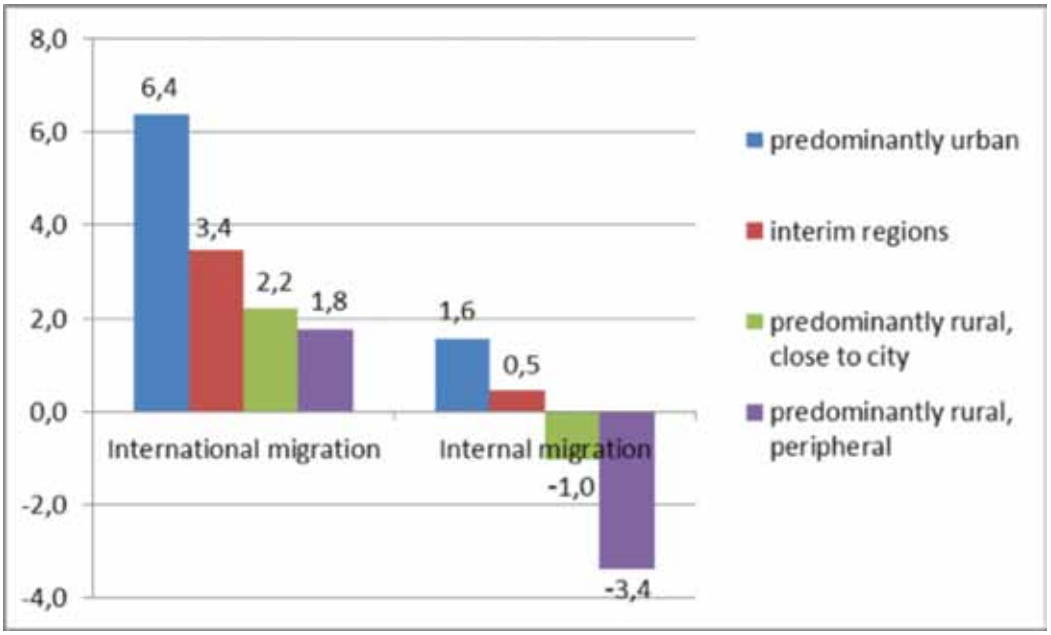


Figure 1: Migration balances in 1,000 persons, 2002-2012, (p.a.) . Source: Machold et al. (2013), p. 148; updated

cooperation and helps ensure stable and sustainable decision-making in the BR region.

A list of various activities focusing on a multi-stakeholder approach and the involvement of local people was presented. The Biosphere Reserve Festivals in particular were highlighted. Started in 2011, each annual Biosphere Reserve Festival has a different core theme. The focus of the BR Festival in 2011 was the future; under the slogan "We are the future", the Festival helped launch an extensive participation process. The BR Festival 2012, in contrast, focused on the present and asked "What is valuable in the valley of Großes Walsertal?" The BR Festival 2013 then challenged participants to consider the question "what do we have to change in order to preserve [Großes Walsertal]?" Through innovative forms of invitation and participation, many people who would otherwise not be involved were activated to take part in this action-oriented process to refine and refresh the already existing regional strategy of the Biosphere Reserve Großes Walsertal. Other activities addressed issues related to young people (youth council) and women (women's forum). The main conclusions of these on-going processes can be summarized as follows: i) people want to participate and care about the future of "their" valley, ii) opening the organization of the BR through broader participation processes facilitates the sharing of important insights regarding future development, iii) strengthening participation processes leads to a culture of cooperation, iv) BR Forums should play a more important strategic role.

The last input, by Karin Zbinden Gysin (School of Agricultural, Forest and Food Sciences HAFL), examined social diversity from a different perspective. In her presentation, Zbinden Gysin put the views of immigrants at the centre of her analyses by examining the dynamics and diversity management of a group of Alpine emigrants living in the Peruvian jungle. At the turn to the 20th century, about 300 Tyrolean emigrants moved to the village of Pozuzu in the Peruvian jungle because of unfavourable living conditions in Tyrol. The emigrants brought with them an Alpine rural system with regard to housing, farming, values and social customs. Although there were mixed marriages from the beginning, many Alpine values and customs were maintained, while agricultural production and meals were adapted to the local environment. The Pozuzu emigrants still maintain contact with their Tyrolean origins, which ensures an on-going cultural exchange. In 2007, about 30 Pozucions visited Tyrol for three weeks, and each winter three to ten Pozucions work in the hospitality sector in Tyrol. These experiences indicate that cultural diversity can produce two different outcomes when such "Glocalisation" occurs, either competition or interaction. There is always the opportunity for transcultural learning, and while "Alpine" values are shifting, new Alpine identities can be adapted and adopted (bricolage) to suit local contexts.

The three input discussions concentrated on the social dimension of Alpine resources and resource development from different perspectives. This included the awareness and acknowledgement of immigration, social diversity within different contexts, and social-ecological interdependencies in regional development activities. The ensuing discussion demonstrated how difficult it is to involve people from different backgrounds, both locals and newcomers, in regional participation processes. Much more research is needed, especially in the field of local and regional power relationships and institutional and non-institutional actor networks. What are the benefits of the existing social diversity in Alpine regions? How should governance structures be arranged to enable the participation of oft-marginalized groups like women and young people, as well as newcomers, in regional development processes? Social diversity should not be framed in a defensive attitude but, as demographic change is ongoing, should be seen as a potential for sustainable and resilient societal development in Alpine regions.

References

- Folke, C. (2006), Resilience: The emergence of a perspective for social-ecological systems analyses. In: Global Environmental Change 16: 253-267.
- Machold, I., Dax, T. and Strahl, W. (2013): Potenziale entfalten. Migration und Integration in ländlichen Regionen Österreichs. Forschungsbericht 68. Bundesanstalt für Bergbauernfragen: Wien. http://www.berggebiete.at/cm3/de/download/finish/16-forschungsberichte/510-fb68.html
- Scott, M. (2013), Resilience: A Conceptual Lens for Rural Studies? In: Geography Compass 7/9 (2013): 597-610.

Workshop 2-4

The recorded state and fate of Alpine glaciers in the archives of the Alpine Clubs

Andrea Fischer
Institute of Interdisciplinary Mountain Research of the Austrian Academy of Sciences, Innsbruck, Austria

Contributions

- *Documentation of glacier states in the archives of the Alpine Clubs*
  Gebhard Bendler, OeAW, IGF, Austria
- *Glacier length changes in the European Alps: Available data and future challenges*
  Isabelle Gärtner-Roer, Samuel U. Nussbaumer, Michael Zemp, World Glacier Monitoring Service, Swizterland

Alpine glaciers are not only valuable and sensitive indicators of climate change, they also influence the relationship between humans and the environment in high mountain regions (Zemp et al., 2010). A source of both natural disasters and water for irrigation in dry inner-Alpine valleys, glaciers have long affected predominantly agricultural societies.

The emerging interest of Europe's urban population in the pristine and wild Alpine region and culture triggered efforts to study the Alps starting in the mid-1800s. With the construction of railways, more and more people were able to visit the Alps, and a tourist infrastructure evolved. Around, and shortly

Figure 1: Photographs of the Ochsentaler Glacier (Silvretta Group, Austria) in the archives of the Austrian Alpine Club showing the retreat of the glacier and the increase of debris cover between 1927 and 2013 (photographers: H. Kinzl and G. Gross).

I n

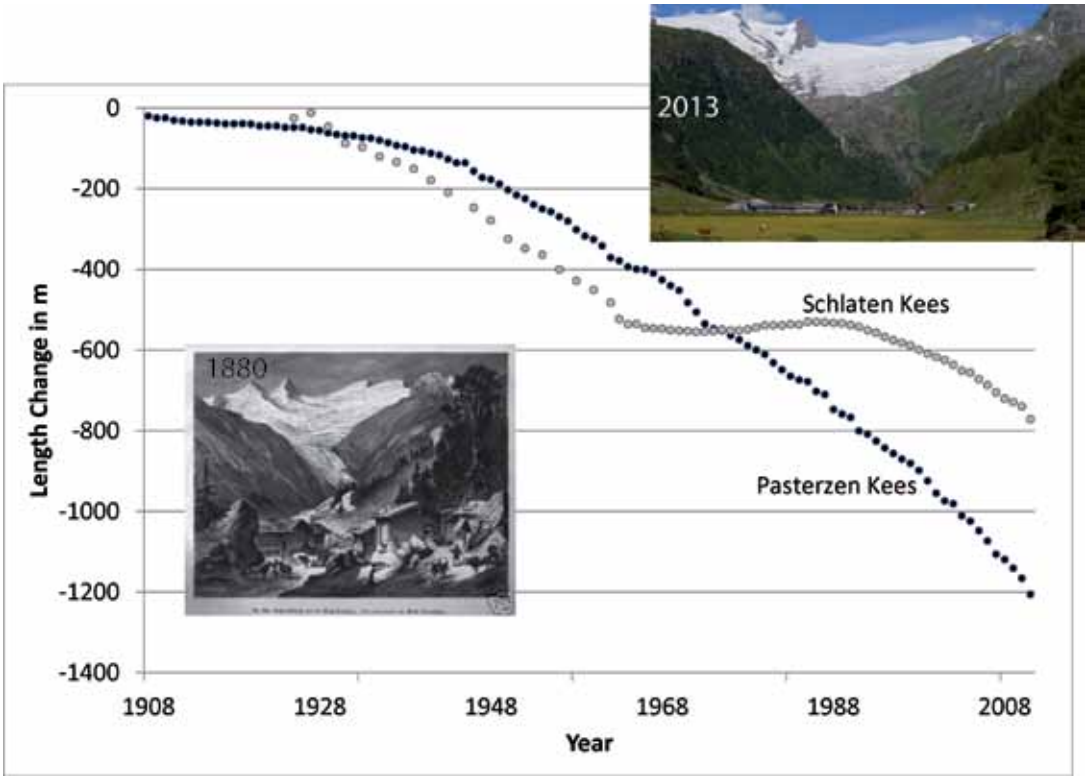


Figure 2: Example of length change data for the Pasterzenkees and Schlatenkees glaciers in the archives of the Austrian Alpine Club as stored at the WGMS. The images are of Schlatenkees in 1880 and 2013 (Fischer et al, 2013).

after, the glacial maximum of the Little Ice Age, the Alpine clubs of Austria, Germany and Italy were founded and built not only mountain huts, but also pursued scientific investigations in the Alps. In addition to cartographic maps, expeditions and research projects were initiated, sponsored and published. In the Austrian Alps, for example, the first drillings through a glacier and a number of further glaciological investigations were part of the scientific programme of the Austrian Alpine Club. The glacier survey of the Austrian Alpine Club was founded in 1891, shortly after the Swiss glacier survey. To this day, both measure and compile length change data for Alpine glaciers.

The state and fate of glaciers is not only documented in the science archives of the Alpine clubs, but also in numerous paintings, sketches and photographs, as well as in the reports of early visitors and mountaineers. Glaciological parameters, such as the extent of firn or crevassed areas, are only recorded in such historical documents. Today, these data are an indispensable source of information in the context of global change because they help researchers understand past changes and predict future scenarios. The database on Alpine glaciers goes back further than almost any other comparable record in the world.

the workshop, Gebhard Bendler from the Austrian Alpine Club and the Institute of Interdisciplinary Mountain Research at the Austrian Academy of Sciences presented an overview and examples of documents in the archives of the German and the Austrian Mountain Clubs from the perspective of the historical sciences. Much effort is currently being put into inventorying and evaluating the archives in specific scientific contexts, e.g. as the history of Alpine Clubs, regional geography or glaciology. Isabelle Gärtner-Roer from the World Glacier Monitoring Service (WGMS) in Zurich presented the work of the WGMS in collecting long-term glaciological data. The WGMS is one of the most important providers of glaciological data worldwide and provides new options for including proxy data and glacier reconstructions derived from historical archives (Zemp et al, 2011). She presented examples of data collection for specific glaciers and data access options.

Some of the participants of the workshop provide data to the archives; others use the data, and many do both. Scientists who primarily generate data expressed a keen interest in discussing data acquisition and distribution strategies. In particular, length change measurements as a means of documenting glacier changes present a specific set of challenges.

As a major finding, the importance of annual photographic documentation was stressed.

Some of the users of glaciological data came from academia, others from regional or local services or businesses. Participants were informed about the available data and data access via the online services of WGMS. They were also able to articulate any demand for new data or data formats, such as firn cover or glacier area shape files. In particular, participants with a background in regional services expressed a strong interest in accessing glacier data from their regions that can be used in brochures, museums, schools and tourism. They also mentioned the value of glacier data and documents in the context of building awareness about climate change and sustainable development. Currently, WGMS data services do not include a ready-to-use compilation for these users. Thus, further work is needed to i) develop a service for this type of user and ii) better identify potential and existing user groups and their needs. To date, the main target community for existing data services has been the international scientific community, and glaciologists in particular. Effort should be taken to make WGMS data available and appropriate for a wider audience. The workshop demonstrated that there is a great demand for glaciological data. We will continue to develop a strategy for creating a service to answer this demand. In particular, the creation of a digital database will increase the usage and impact of data that was heretofore not widely accessible and hence improve our understanding of historical changes in the relationship between humans and the environment in sensitive high mountain areas.

References

- Fischer, A., Patzelt, G., Kinzl, H. (2013): Length changes of Austrian glaciers 1969-2013. Institut für Interdisziplinäre Gebirgsforschung der Österreichischen Akademie der Wissenschaften, Innsbruck, doi:10.1594/PANGAEA.821823
- Zemp, M., Andreassen, L.M., Braun, L., Chueca, J., Fischer, A., Hagen, J.O., Hoelzle, M., Jansson, P., Kohler, J., Meneghel, M., Stastny, P. and Vincent, C. (2010): Glacier and Ice Caps. In: Voigt, T., Füssel, H.M., Gärter-Roer, I., Huggel, C., Marty, C. and Zemp, M. (eds.): Impacts of climate change on snow, ice, and permafrost in Europe: Observed trends, future projections, and socioeconomic relevance. European Topic Centre on Air and Climate Change, Technical Paper 2010/13: p. 46-65
- Zemp, M., Zumbühl, H.J., Nussbaumer, S.U., Masiokas, M.H., Espizua, L.E. and Pitte, P. (2011): Extending glacier monitoring into the Little Ice Age and beyond. PAGES news, 19 (2): p. 67-69.
- Useful Links
- Homepage of the WGMS with downloadable data: www.wgms.ch/
- Homepage of Austrian glaciologists with links to glacier data published at the Pangaea data base of the Alfred Wegener Centre for Polar and Marine Research: www.glaziologie.at
- Homepage of the glacier survey of the Austrian Alpine Club with access to some of the historical documents and publications: www.alpenverein.at/portal/museum-kultur/gletschermessdienst/index.php
- Historical archive (online research tool) of the Alpine Clubs of Germany, Austria and South Tyrol: /www.alpenarchiv.at/
- Achrainer, Martin: Das historische Archiv der Alpenvereine (The historical archive of the Alpine Clubs) www.alpenverein.at/portal_wAssets/docs/museum-kultur/Archiv-Dokumente/Archiv-Dokumente-Texte/Achrainer-Historisches-Alpenarchiv-Arbido_geschwaerzt.pdf
- Achrainer, Martin: Die Liebe zu den Alpen: Zur Gründung des Alpenvereins vor 150 Jahren (Teil 1) www.alpenverein.at/portal_wAssets/docs/museum-kultur/Archiv-Dokumente/Archiv-Dokumente-Texte/Achrainer-Geschichte-Bergauf-2-2012.pdf
- Achrainer, Martin: Die Liebe zu den Alpen: Zur Gründung des Alpenvereins vor 150 Jahren (Teil 2) www.alpenverein.at/portal_wAssets/docs/museum-kultur/Archiv-Dokumente/Archiv-Dokumente-Texte/Achrainer-Geschichte-Bergauf-3-2012.pdf

Workshop 2-5

Water in Valle Camonica: The Oglio River from the Middle Ages to the present

Simone Signaroli
Servizio Archivistico Comprensoriale
Valle Camonica, Italy

The historical context and some documents

Since the late Middle Ages the community of Valcamonica has identified itself as a territorial commune, repeatedly asserting its separation from nearby cities and political entities such as Brescia and Bergamo. Sometimes described as a federation of rural and mountain communes, the Community has had a republican government for many centuries, ruling itself by means of a series of elected magistrates and councils of representatives. It was therefore not unusual that it became part of the Venetian Republic in 1428, when a letter by the doge Francesco Foscari ratified a diplomatic negotiation between the Senate and representatives of Valcamonica. By joining the Venetian Republic, the Community was able to maintain its own political organization and to access the outstanding trade network of Venice. The Community of Camonica remained a border region in the Venetian Republic up to 1797, when the French Revolution and its European-wide consequences determined the end of that State. For the next ~150 years, Valcamonica had no unitary government body until the Italian Republic decreed the birth of the Mountain Community of Valle Camonica during the second half of the 20th Century.

In Breno, the traditional capital of Valle Camonica, the Putelli Collection (Raccolta Putelli) now maintains an extensive archive of historical documents and ancient books. Named after the local historian and collector of antiquities Romolo Putelli (1880-1939), the Raccolta Putelli preserves, among other documents, several relics of the archive of the community that ruled Valle Camonica in the late Middle Ages and early modern times. Scholars can find a wide variety of historical documents, including books of records, fiscal surveys, charters of privilege, single sheets by public notaries, letters, drafts of political speeches, etc. Together, these documents help describe centuries of life in the Alpine Community.

The Community of Valle Camonica and Oglio River

If we look at the course of the River Oglio from its source south of Mount Gavia, to where it meets the River Po, we can distinguish two main tracts that are both geographically and historically distinct. The southern part of the Oglio Basin marked a borderline: first between the territories of Brescia and Bergamo, then between the Republic of Venice and the Duchy of Milan (pl. 1). Extensive research has been conducted in this region, which played a significant role in European history as a trade center and political frontier. The historical significance of the northern part of the river, which includes the territory of Valle Camonica, is less obvious; nevertheless, a plethora of historical documents provide insight into the history of Valle Camonica.

Figure 1. Valle Camonica, the Republic of Venice and the Duchy of Milan in the 17th century, northern Italy; River Oglio is emphasized in light blue (map drawn on a NASA image: <http://visibleearth.nasa.gov>).

If we focus on the Community of Valle Camonica, some prominent documents make it apparent that the river has been largely managed as a common good for many centuries. In fact, some chapters of the Statute of Laws (approved in 1433 and first printed in 1498, then deeply reformed in the early 17th century) explicitly concern public waters, roads and bridges. For instance, the Community was accountable for three bridges over the Oglio (from north to south: Cedegolo, Cemmo and Breno) and local rulers had to protect the water from pollution. They were also responsible for regulating some fishing and timber rafting businesses.

So, the historian has to ask the extant documents some questions. From where, or whom, did the Community receive such rights? How much were the magistrates of the Community involved in discussing matters, and did they manage public waters? How much did their work change over more than four centuries?

Water in Valle Camonica: A publicly funded research project

Early in 2014, a grant by the Fondazione della Comunità Bresciana was awarded to a research project led by il leggio s.c.s., a social and cultural enterprise set in Valle Camonica. The project, hosted by the Archives Service of Valle Camonica, was also funded by the local mountain community (Comunità Montana di Valle Camonica), by the Adamello Regional Park, and by the private enterprise Forge Monchieri.

The project team studied the history of the Community of Valle Camonica, its management of water resources, and its relationships with external communities (Brescia, Bergamo, Venice) and with rural communes and private landowners composing the territorial community. In particular, Michele Pellegrini (researcher: il leggio s.c.s. – Società Storica Lombarda) focused on the early jurisdictional overlap of Brescia (both bishopry and commune) and the Community of Valle Camonica on River Oglio. He also investigated the subsequent practice of managing water resources by local community rulers. Meanwhile, Ivan Faiferri (archivist: il leggio s.c.s.) composed an inventory of documentary sources spanning the 15th-18th centuries, focusing on the official records of the community (a series of sixteen registers covering a period of three centuries, from 1492 to 1796: pl. 2).

A book was produced based on the results of this investigation (also published as an open-access ebook): Acque di Valle Camonica. Il fiume Oglio tra Medio Evo ed età moderna, ed. by Simone Signaroli, Breno 2014 (Pubblicazioni del Servizio Archivistico Comprensoriale di Valle Camonica, 7). A subsequent grant from Regione Lombardia allowed us to expand the project by producing a documentary exposition and a short documentary film.

The research team was supported by a scientific board of three students of early modern history: Prof. Simona Negruzzo (Università Cattolica del Sacro Cuore), Prof. Sergio Onger (Università degli

Studi di Brescia) and Prof. Alessandro Pastore (Università degli Studi di Verona).

To access the results of the project, please visit: www.cmvallecamonica.bs.it/pagine/archivi/acque-divallecamonica.

References

On River Oglio

- - O. Franzoni, G.C. Sgabussi, Segni di confine, Breno 1996.
- - Rive e rivali. Il fiume Oglio e il suo territorio, ed. by C. Boroni, S. Onger, M. Pegrari, Roccaffranca 1999.
- - Civiltà d'acqua in Valle Camonica, Breno 2001.

On the Community of Valle Camonica

- - R. Putelli, Intorno al castello di Breno. Storia di Valle Camonica, Lago d'Iseo e vicinanze da Federico Barbarossa a s. Carlo Borromeo, Breno 1915.
- - Le comunità di valle in epoca signorile. L'evoluzione della Comunità di Valcamonica durante la dominazione viscontea, secc. XIV-XV, Milan 1976.
- - Repertorio di fonti medioevali per la storia della Val Camonica, ed. by R. Celli, I. Bonini Valetti, A. Masetti Zannini, M. Pegrari, Milano 1984.
- - M. Della Misericordia, 'I nodi della rete. Paesaggio, società e istituzioni a Dalegno e in Valcamonica nel tardo Medioevo', in La Magnifica Comunità di Malegno. Dalle origini al XVIII secolo, ed. by E. Bressan, Ponte di Legno-Temù 2009, pp. 113-348.

On the Community archive

- - M. Della Misericordia, 'Mappe di carte. Le scritture e gli archivi delle comunità rurali della montagna lombarda nel basso medioevo', in Archivi e comunità tra medioevo ed età moderna, ed. by A. Bartoli Langeli, A. Giorgi, S. Moscadelli, Trento 2009, pp. 155-278.
- - L. Giarelli, 'I sigilli della Comunità di Valle Camonica contenuti nella Raccolta Putelli di Breno', Archivi, VII/2 (2012), pp. 57-68.
- - S. Signaroli, 'Per una storia archivistica della cancelleria della Comunità di Valle Camonica in epoca veneta', Archivi, VII/2 (2012), pp. 69-80.

Principal editions of the Community Statute of Laws

- - Communitatis Valliscamonicae Statuta, Brescia 1498.
- - Statuta Vallis Camonicae, nuper ex deliberatione Consilii Generalis ipsius Vallis multis de novo additis reformata et a Serenissimo Principe Venetiarum confirmata, Brescia 1624.

Pl. 2: Breno, Museo Camuno, Raccolta Putelli, reg. 4, l. 59 (a council record from 27 August 1574).

Workshop 2-7

Unique tradition, possible modernity

Luciano Bolzoni & Cristina Busin
ALPES società cooperativa
Trento, Italy

"Tradition is a continuous and living flow of new forms subject to the unique mutations of a causal connection, is a harmonious river, different in every hook, neither stagnant water, nor returning" (Carlo Mollino)

"Modern architecture does not wait for time, but challenges it; who shall win?" (Gio Ponti)

The intent of the work submitted to the Forum Alpinum in Boario and, more broadly speaking, the commitment of Alpes is basically a definite philosophy concerning the Alps as they are, not as we would like them to be. This preliminary remark is necessary and shows very clearly the road that we have taken when we founded the Alpes co-operative in 2012, immediately indicating the pay-off, which coincided with a well-defined underlying concept: identity, promotion and development, three terms that indicate our will to refashion the themes and values of Alpine communities with which we collaborate, starting by the very acceptance of the characteristics of the places where they live, emphasizing the main features while consolidating identity matrices. Revaluation and not rediscovery, this is road to follow to underline the cultural value of Alpine populations and of their landscape.

While walking along any mountain path and stumbling upon an old abandoned house, in a solitary electrical junction box apparently out of order, in a stone tub that was once a fountain or stopping by to look at the landscape sitting on a trunk carved on purpose to give a hiker a place to sit, we tend to fuse and confuse in a single synthesis the two entities present in that moment: man, understood as a passing subject, and the nature surrounding him or, better defined, the landscape in which he is immersed.

In fact the Alpine landscape, and not only that, is the place where we live our lives as inhabitants, experiencing and seeing it is already changing it: taking care of it has to do with treating our life space carefully. That is why landscape is neither a "nice view", nor a simple "diorama" acting as a background to our days on the mountains but, rather, it is the sum of our experiences as inhabitants and as beneficiaries of that experience. Different landscapes correspond to different men: the inhabitants of mountain valleys experience them differently than the way the inhabitants of the plains may observe, study and understand them. A peasant or a ski teacher perceives a landscape in different ways than those of an architect working in valleys: but all recognize it as a replication of their past experiences. This observation aims at making clear the importance of the landscape and of all the characteristics it contains: identity-related, social, historical and, above all, natural.

The past experiences of the inhabitants of a place, and as a result of a landscape, are the essence of tradition, which is a matter constantly evolving, a river flowing and not a body of stagnant water, as observed by the architect Molino. The way of experiencing and perceiving the mountain by the inhabitants of plains is the opposite of the way those living up there every day experience and perceive it. The perception of the Alps by those who do not live there weighs upon the image that is currently produced, which is still linked to a simplistic beauty of mountains and valleys, as opposed to the dreariness of outskirts and of factory chimneys (now disappeared!). All this proves eloquently that tradition, taken as cultural outburst and not as a vision that can be projected onto daily life, weighs on our understanding of the mountain. But beware: tradition is not a language.

We usually believe that it is hard, if not impossible, to find affinities between the mountain and the future: for many the mountain still represents the past, the memory, a refuge intended as a slice of heaven where time has stopped and space has remained unchanged. The mountain is experienced more as an image than as a place. A mental frame that is still replicated as a single entity that can be memorized, unchanged, unchangeable and unalterable. The mountain that we know, remember and frequent is no longer that of yore and, as a result, can no longer be described as a banal snow globe that (re)presents an outdated mental reproduction of the Alps.

Despite several real estate attempts to "chaletize" the Alpine valleys, by reiterating toy houses and cots immersed in scenarios (not landscapes...) increasingly fake, snow-covered and heavenly, where in the middle of nowhere miniature wooden dwellings stand out just like those found inside snow globes,

the essence of the mountain has met the future and the "network" has reached the Alps faster than other places. This cannot be ignored. That is why in order to build the future we should work on the past and on consolidating tradition, all traditions that, nonetheless, need to be transcended with new cues for improvement.

"Unique Tradition, Possible Modernity" because, as the introduction to our speech states, by re-reading the past and proposing collective actions and initiatives at a local level, a different approach can be concretely applied to local resources, new cultural proposals can be activated and forgotten riches can be rediscovered for the benefit of both visitors and inhabitants. We wished in particular to concretely demonstrate that events can be organized that may lead to a virtuous, not a vicious circle related to the way we see and interpret, and revaluate Alpine territorial resources. A virtuous circle that sees Alpine tradition and identity escaping from the enclave that, more or less willingly, it has created for itself over time, drawing oxygen and a new lease of life from the creative exchange with the plains and the city, whose histories and vicissitudes have been at any rate inevitably linked since the emergence of Alpine holidays.

The beneficiary of the Alpine culture, or better the inhabitant of the Alps, will be such not by birth but by calling, awareness, knowledge and comparison with other cultures that he may reinterpret on his own territory (where he lives or which he visits) to attain an increasing mastery of himself and of his places. Between past and present, between plains and the Alps, without being afraid to emphasize all differences, even the least apparent and most difficult beauties, because they are however considered integral parts of that place and of its history, witnesses of the flowing of time and of events that have

generated the landscape and the contemporary moment. As in Carlo Mollino's quote, repeatedly referred to: a causal connection, a river that flows harmoniously and not stagnant water. This is the overall philosophy that underlies our local work and all related initiatives.

Let us now talk about our cultural projects and initiatives, which have been planned and implemented together with the communities we work with, some of them being discussed in our workshop. The very legal status chosen for Alpes, the co-operative form, demonstrates that we all believe in the multi-disciplinary nature of our proposals. We have set up a network of partners, collaborators and professionals that provide us with diversified interpretations of the same landscape, which allows us to move in different directions, experiencing the above-described creative exchange.

Obviously, the reinterpretations are widely shared, implementing proposals of a high cultural quality, but beyond the usual patterns, privileging a simple and immediate language, hence extremely accessible and recognizable. Underpinning all this, there is always a great job, almost a fierce passion in the search for places, people, history and resources. Hence the importance of the location, and its many natural and social meanings: territory, inhabited soil, landscape, space regarded as a place of life, natural or built-up area, all terms referring to the importance of the habitat that constructs its history every day, in an alternation of daily events, of social behaviours and actions that form a cultural landscape in all respects. This is the location of our work.

Based on these fundamentals of local communities, Alpes has developed some cultural initiatives in various places of the Alps, bringing to the Forum the most significant experiences, its own "difficult beauties", to prove that, beyond every line of thought and ideology, it is concretely possible to launch and maintain that virtuous circle in the territory, with its consequences, introducing the definition of "memory profitability" i.e. the ability to treasure one's own past heritage, considering culture as an ability to create value, including economic value. Alpes, therefore, designs the initiatives extrapolating and underlining the cultural facts of a place. Out of the projects submitted, those that aroused the greatest interest are, without any doubt, those run in Cervinia and in Val Martello.

Last August in Cervinia we organized the second edition of the "Extraordinary landscapes" format upon the sixtieth anniversary of its most famous modern architecture, the Casa del Sole, a work of the architect Carlo Mollino, from Turin. The initiative was included in the recovery of the identity of the modern architecture built in the Alpine region and in Cervinia in particular, hence the name given to the whole initiative, "Mollino, Architecture & more" chosen with the local municipal administration and tourist board. The importance of architecture in society, often underestimated, although "art of living in places" has brought us to the opposite end of the Alpine region, the Val Martello, the location where the Sporthotel lies forlorn and abandoned: it was designed by the great architect Gio Ponti and was the object of an initiative linked to the potential recovery, for cultural purposes, of this important tourist structure, which was carried out in 2013. In both cases we found ourselves immersed in a territory where the undisputed beauty of natural landscapes – the Cervino in the first, the Cevedale in the second case – coexisted, apparently without any dialogue, with the seemingly much-discussed (or questionable) modern architecture of Breuil and the ruins of the Sporthotel, built by the great architect from Milan.

At the end of our speech, we wished to demonstrate that it is possible to concretely implement a "new

action" in the approach and in the circulation of the Alpine culture and identity that may combine, with moderation and full knowledge and for the benefit of both inhabitants and visitors, both drives: the "modernist" one that often considers the Alps an immense playground, and the "traditionalist" drive, often aimed at being exclusively enjoyed by tourists, which regards the Alpine environment only as the repeated proposal of past rites and customs, not without any apparent stretching to promote local tourist offices. The future, we are convinced of this, will be instead made of openings and exchanges between different forms of culture and visions, a harmonious and different river.

Session 3

Governance of Alpine resources

Moderator: Mimi Urbanc, Slovenian Academy of Sciences and Arts, Ljubljana, Slovenia

Session 3 focuses on the governance of Alpine resources and addresses the basic yet unresolved challenge of developing a governance model that encourages the sustainable use of Alpine resources. Three keynote speeches explore different aspects of the issue. The first talk, by Stéphane Nahrath, discusses the institutional regimes that define resource access. This is followed by input from Mojca Golobič about the importance of the participation process for achieving long-term, sustainable and widely accepted decisions. Finally, Stefan Marzelli examines regional governance from various perspectives and provides insight into how the capitalisation of sustainable spatial development projects could contribute to the sustainable governance of Alpine resources.

Keynote

Institutional Resource Regimes: A new approach for a more sustainable management of Alpine resources

Stéphane Nahrath
University Institute Kurt Bösch &
University of Lausanne, Switzerland

The concept of sustainable development has been gaining political recognition for over 20 years now (WCED, 1987). However, environmental degradation resulting from the over-exploitation of resources such as soil, water, landscape, air, etc. remains an important matter of concern for most countries (McNeill, 2001). For geographically sensitive areas like mountains, resource degradation and overexploitation is especially concerning. Although many policies have been designed to address resource concerns (environmental, land use planning, landscape protection policies, etc.), they often fall short of achieving a sustainable, long-lasting impact. My presentation addresses this situation by adopting the following four objectives.

First, I will point out the main limitations of current environmental policies from the perspective of sustainable development. More particularly, I will show the extent to which current environmental policies, based on the paradigm of the "limitation of emissions", fall short of sustainable development goals (Knoepfel, Nahrath, Varone 2007).

Second, I will argue for the necessity of a paradigm shift that adopts a resource-based approach to sustainability. In fact, sustainable development strategies likely to guarantee or re-establish the reproductive capacity of the resource in question ("stock") should govern all of its units ("harvest") considered extractable in a given time and space (fig.1). The implementation of such a strategy requires three successive operations, each entailing important political choices:

1. Regulators define a maximum global quota for the extraction/withdrawal of resource units. This quota should incorporate both quantitative and qualitative criteria that are compatible with the ecological requirements for the renewal of the resource system (layer 2). We suspect that the definition of such a quota constitutes a central political issue to the extent that it expresses the conception of sustainability (i.e. strong, weak, etc.) adopted by a given society.
2. This global quota will be shared between the different rival users (goods and services), ideally as a function of the principles of social and economic sustainability.
3. The quota of resource units attributed to a specific good or service will again be distributed between the different user groups through individual quotas (layer 1). All together, such regulations constitute what we refer to as an institutional regime for natural resources (IRR).

Building on the idea of an Institutional Resource Regime (IRR) framework, I will then present an

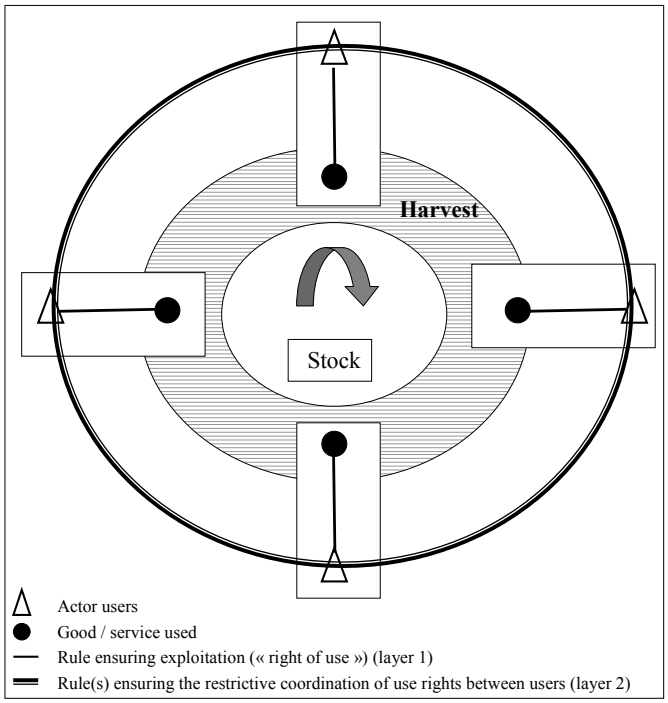


Figure 1: The two regulatory layers of a sustainable resource regime: global and individual quotas.

analytical framework for better understanding the conditions of a more sustainable regulation of resources. The IRR concept, which refers to ownership, resource rights, and the policies regulating the use and protection of the resource, enables the integration of policy analysis and institutional economics. The central postulate of the IRR approach assumes that these two steering dimensions (property rights and public policies) are complementary and that both must be considered simultaneously to facilitate the understanding of the actual uses made of the goods and services provided by the resource. Thus, the exploration of the IRR primarily serves to provide an analytical framework for understanding actual resource management practices, as well as their impact on (un)sustainable resource uses.

Fig. 2 provides a graphical representation of the different elements that make up an IRR and, by highlighting the relationships that link them together, demonstrates the possible ways in which uses can be regulated. Four main ways of regulating the uses of a resource can be identified:

- Regulation through policies with no impact on the content of property rights. This involves the implementation of incentive-based instruments that do not have any impact on the content of the property or on the use rights of resource owners and/or users (e.g., information campaigns, subsidies or tax relief to prompt desired behaviour).
- Regulation through policies that affect the value and content of property rights. This involves the implementation of policy instruments with impacts on the disposal and/or use rights of actors exploiting the resource. Examples include restrictions on development, on the emission of atmospheric pollutants or water pollutants, on harvesting (wood, rare plants and game) and on rights of access (to lakeshores, forests and fragile biotopes).
- Regulation through the re-definition of the institution of property rights (mostly civil code). This involves different types of modifications to the substantial content of property rights. Such modifications will have an impact on the scope and content of the disposal and use rights of actors exploiting the resource. In Switzerland, the most significant example of this type of regulation arose with the introduction of the Swiss Civil Code, which created a unified definition of property rights at the federal level and abolished the old use and disposal rights (e.g., common property regimes) in one fell swoop. A more recent example includes the introduction of the law of condominium ownership into the Civil Code (1965).
- Regulation through the re-definition of the structure of property rights distribution. This may consist of an intervention as radical as privatization or nationalization (of land, water, forest etc.), or of a more limited intervention consisting of formal expropriation (e.g., for the implementation of infrastructure projects).

Finally, I will present a possible normative application of this analytical framework. Thus, the four stages of an ideal decision-making process that allows for the creation of an integrated IRR will be briefly presented.

References

- Bromley, D. (1991). Environment and Economy. Property Rights and Public Policy. Oxford: Blackwell.
- Gerber, J.-D., Knoepfel, P., Nahrath, S., Varone F. (2009). Institutional Resource Regimes: Towards sustainability through the combination of property-rights theory and policy analysis. Ecological Economics, 68(3), 798-809.
- Knoepfel, P., Nahrath, S., Varone, F. (2007). Institutional Regimes for Natiral Re-

sources: An Innovative Theoretical Framework for Sustainability. In P. Knoepfel (Ed.), Environmental Policy Analyses. Learning from the Past for the Future - 25 Years of Research (pp. 455-506). Berlin, Heidelberg: Springer Verlag.

- McNeill, J. R. (2001). Something New Under the Sun: An Environmental History of the Twentieth-Century World. New York: Norton.
- WCED. (1987). Our Common Future. Washington D.C.: World Bank.
- Young, M. D. (1992). Sustainable Investment and Resource Use: Equity, Environmental Integrity and Economic Efficiency. Paris: Parthenon Press.

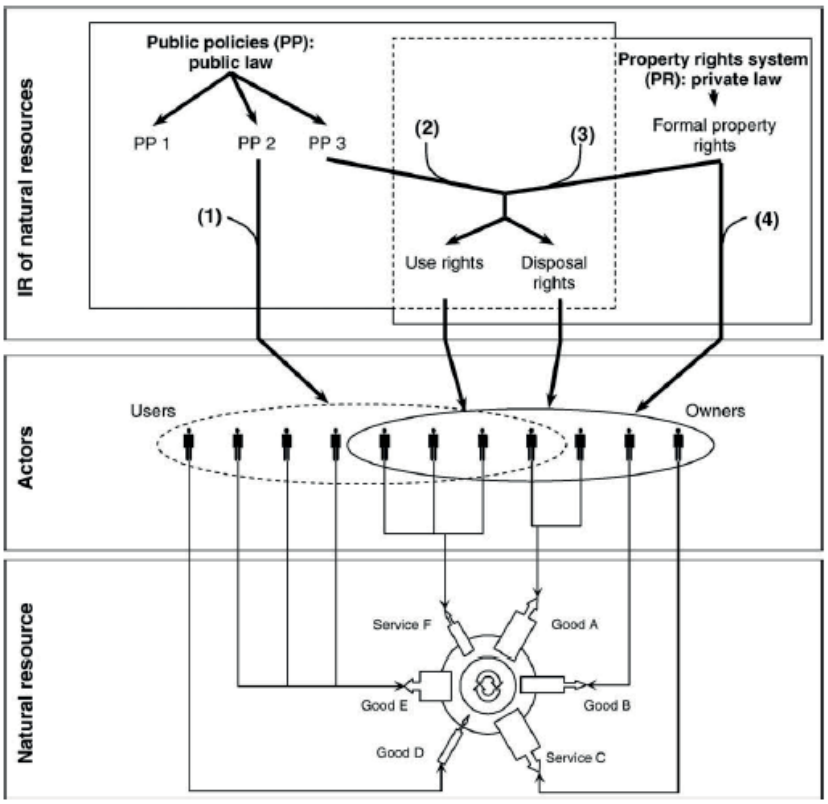


Fig. 1 – Regulation model highlighting the relationships between the Institutional Resource Regime (IRR), composed of a property-rights system (PR) and public policies (PP) (*upper box*), the actors who use the resource (*middle box*) and the condition of the resource (*bottom box*) as suggested by the IRR analytical framework. The thickness of the arrows representing the goods and services provided by the resource is proportional to the intensity of their use (or restoration in the case of the arrow pointing toward the good D). In a sustainable use situation, the capital (stock) of the resource (central circle) is not affected by the overall use. Actors are influenced in their action vis-à-vis the resource by the rules in force, irrespective of whether they originate from PP or the PR.

Figure 2: The institutional resource regime.

Keynote

Participation: Do we still have to talk about it – and why?

Mojca Golobic
University of Ljubljana, Slovenia

45 years ago, Sherry Arnstein introduced her "ladder of citizen participation" (Arnstein, 1969). Today, participation is an almost inevitable part of scientific literature, conferences and meetings, policy documents and projects. One of the key aims of ForumAlpinum is to foster the "dialog between science and society (policy and practice)"; as such, participation has been addressed multiple times and with increasing frequency over ForumAlpinum's 20-year history. At the first ForumAlpinum event in Swiss Disentis in 1994, one presentation observed citizens' reactions to change. Ten years later, in 2004 in Kranjska Gora, a workshop was devoted to cooperation as a key element of sustainable development. In 2007, a plenary session and the following workshops discussed cooperation and decision-making in landscape management. From that point forward, it has been difficult to even separate participatory topics from other discussions, as participation is now solidly integrated into almost all sessions. This evolution follows the development of the participatory paradigm.

Are theoretical discussions about participation at meetings such as ForumAlpinum therefore redundant? The answer could be yes: we know all about it, we just have to go out and do it. However, although we have gained a rich practical experience and are adept at declaring our dedication to participatory approaches, examples of »true« participation are still difficult to find. Reasons for this have been identified and discussed (e.g., Chess and Purcell 1999, Buchecker et al., 2003, Černič-Mali and Golobič 2005, Golobič et al., 2007). Have we reached the limits of our societies' participation capacity? Or is more participation needed to widen these limits? Without attempting to answer this question, I focus here on a few issues that I think are most relevant for a critical reflection on participation.

The first challenge to a productive participatory process is the attitude of those in charge (policy-makers, scientists, planners, etc.). Although there is generally support for a participatory process at the declarative level, those in charge often harbor reservations about the actual value of stakeholder involvement. These reservations are rooted in an "I know, they don't" attitude that questions the validity of the knowledge possessed by "less informed" participants. These attitudes can be roughly divided into 4 different groups (figure 1). The underlying assumption of the members in the first two groups is that the general public does not possess the relevant knowledge to make a meaningful contribution. This leads to two different attitudes: "artistic" and "educational". The "artists" do not need to explain their decisions and derive their validity from personal (or institutional) authority. The "educators", on the other hand, look for public consent but expect to obtain it after the public has been well educated

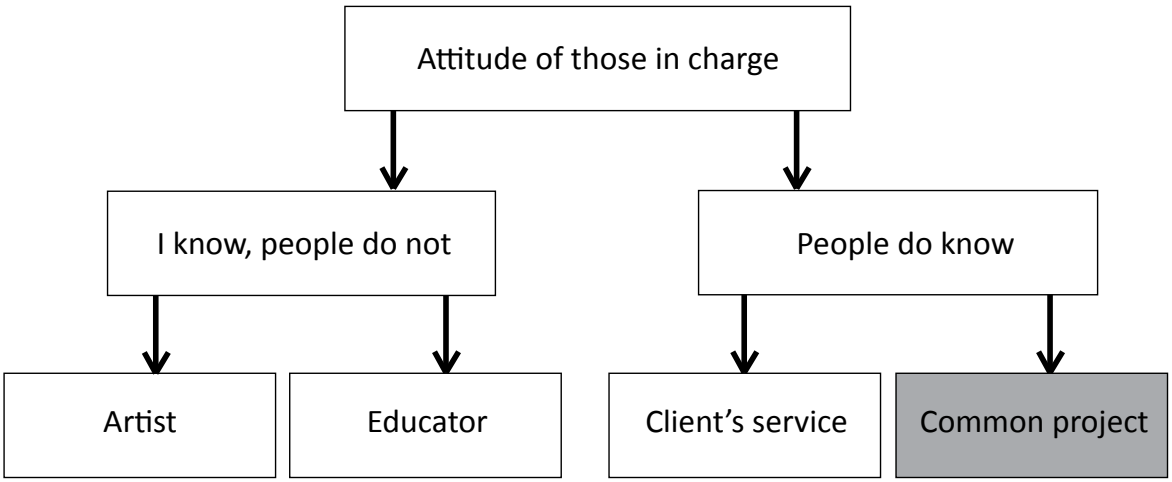


Figure 1: Different attitudes of those in charge with regard to the validity of general public knowledge.

about the "right thing". Educators believe in the so-called "cognitive fix".

The other two decision making "personalities" accept that the knowledge of the public is relevant, but react differently. The "client's service" behavior assumes that there is one Client, whose needs have to be fulfilled at the expense of others. Only the fourth type of attitude, which looks at the decision/planning process as a common project, enables the participatory approach. This is in practice a rare position, since it is often seen by decision makers as a dangerous one and a threat to one's professional identity. Many "participatory" processes fall short of their full potential because one or more of the key participants adopt one of the first three attitudes.

With regard to the public, one of the most serious concerns is the legitimacy of those claiming to represent the public. It is usually (but sometimes incorrectly) assumed that civil groups and NGOs adequately represent ´public interest´ or local inhabitants; as such, these groups enjoy a high level of legitimacy (Valaskakis, 2001). Compared to political representation, however, the functioning of the non-governmental sector is considerably less regulated. Consequently, transparency is not guaranteed and hidden agendas (political, financial or other) are difficult to detect (Voogd in Woltjer, 1999).

Another increasingly common phenomenon is participation overload, or fatigue. Different types of workshops have become a popular approach by the leaders of policy development, programming and project implementation processes, as they increase the legitimacy of the result. In their professional or personal roles, people are frequently involved in such events. However, they tend to invest their time and energy very carefully; if they are not directly affected by an issue, or feel that their participation fails to yield results, people will quickly disengage from the participation process. Proper feedback and transparent implementation practices are essential for ensuring long-term, engaged participation.

Finally, we may ask whether there are certain situations in which participation is counterproductive. Are there topics that people should not be asked about? Are there decision situations in which a participatory approach yields results too late, or even "wrong" results? For decisions that concern safety (wars, natural disasters) or minority rights (underrepresentation), a participatory approach may indeed be counterproductive, or even harmful. There are also times when strategic or visionary thinking is needed. In such situations, the slow give-and-take of collective problem solving may handicap our ability to reach a creative and bold solution. When the reason for the disagreement is due to diverging interests or values (which is most often the case), then yes, we need participation. But we also need decision makers to take their share of the responsibility for decisions in common interest.

References:

- Arnstein S. R. 1969. A ladder of citizen participation, Journal of the American Institute of Planners 35/4 pp. 216-224
- Buchecker M., Hunziker M., Kienast F., 2003. Participatory landscape development: overcoming social barriers to public involvement. Landscape and Urban Planning 64 pp. 29–46
- Chess C., Purcell K., 1999. Public Participation and the Environment: Do We Know What Works? Environmental Science & Technology 33/16, pp. 2685 – 2692
- Golobič, M., Pfefferkorn, W., Praper, S. 2007. New forms of decision making for sustainability. Urbani izziv 18, 1/2, pp. 131-136
- Golobič, M., Černič Mali, B. 2005. The Alps in 2020 : the view of the locals. V: Pfefferkorn, W., Egli, H.R., Massarutto, A. (eds.). Regional development and cultural landscape change in the Alps : from analysis and scenarios to policy recommendations, (Geographica Bernesia, Series G, Basic research, 74). Bern: University of Berne, Institute of Geography, pp. 95-112.
- Valaskakis T. 2001. Long-term trends in Global Governance: from »Westphalia« to »Seattle«, In: Governance in the 21st century, OECD, Paris.
- Voogd H., Woltjer J., 1999, The communicative ideology in spatial planning: some critical reflections based on the Dutch experience, Environment and planning B, 26, pp. 835-854

Keynote

Regional governance of Alpine environmental resources – perspectives and a capitalisation approach for sustainable spatial development projects

Stefan Marzelli
Institute for Environmental Planning and Spatial Development
Munich, Germany

Introduction

The question of how regional governance can best support the maintenance of environmental resources is at the heart of environmental governance issues. This paper focuses on environmental resources in the Alps, discusses what governance at a regional level might mean for the Alpine region, and asks how governance and environmental sustainability might be most effectively linked.

Alpine environmental resources

What are environmental resources in the Alps? Generally speaking, environmental resources comprise all components of the environment that are used as resources or services by humans. Environmental or natural resources can also be considered as ecosystem services in a broader sense (cf MEA 2005).
Due to their topographic and orographic situation, the Alps provide environmental resources far beyond the Alpine territory. As the following examples highlight, Alpine resources are important even in distant lowland regions:

- Freshwater provision: The Alps play a fundamental role in the provision of freshwater discharge due to their topographic and climatic situation and their capacity for storing precipitation in lakes, aquifers and glaciers. The water supply from the Alps feeds the main river systems of the Rhine, Danube, Rhone and Po at a disproportionally high rate compared to the area. Approximately 160 million citizens along these catchment areas take advantage of this resource (EEA 2009).
- Recreation: The Alps are some of the most visited areas in Europe on account of their landscape beauty, nature experiences and recreational offerings such as hiking and skiing. Millions of people visit the Alps every year, creating a demand of about 1.5 million hotel beds in the Alps and about 5 million beds for other categories of overnight stays (Bätzing 2002).
- Biodiversity: Characterized by a wide range of elevations and climatic zones, the Alps are one of Europe's biodiversity hot spots. A rich and as-yet underestimated diversity of plants and animals have evolved in the Alps and spread along the river valleys into the lowlands. The Alps also provide large, un-fragmented habitats and serve as an important migration corridor in Europe.

The value of these resources is often underappreciated or not recognized outside the Alps, leaving the Alpine areas neglected with regard to resource management efforts. This leads to an imbalance between the areas that provide and manage Alpine resources and those that benefits from these resources.

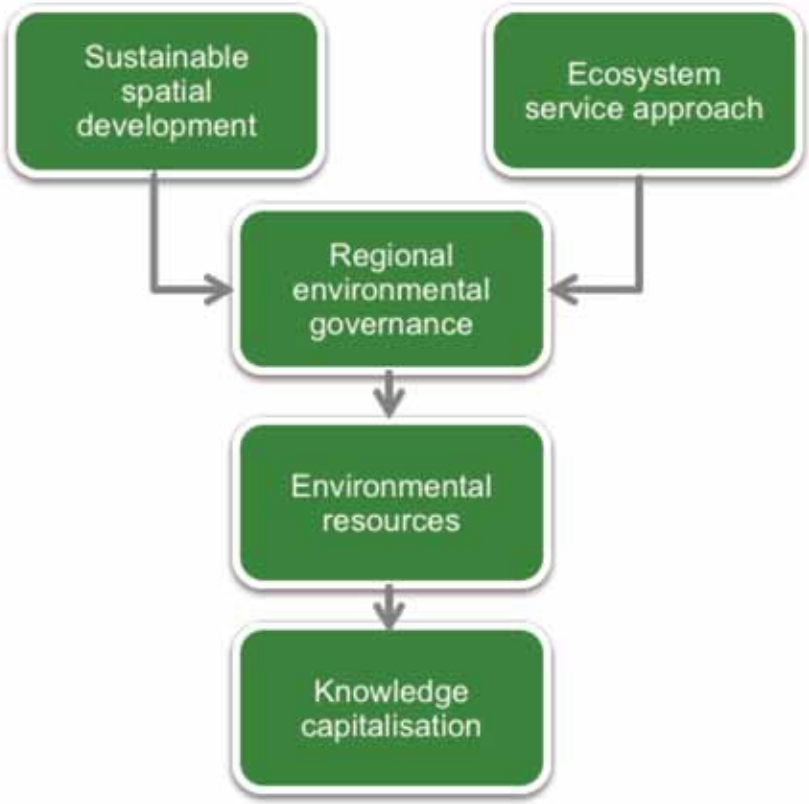


Fig. 1 Interrelation scheme of Alpine regional environmental governance

Governance of environmental resources

The manner in which environmental governance is managed in the Alpine region deserves serious attention. The dependency of environmental resources on physical factors such as water catchment areas, biodiversity corridors or environmental effects of land uses needs to be reflected in administrative responsibilities and collaboration. Such regional environmental governance would need to be adjusted to a scale appropriate to the relevant resources. However, regional environmental governance depends on the self-concept of a region. Regional identities are often influenced by the roles of stakeholders, which differ across the Alpine area. Sometimes this can impede the evolution of environmental governance.

The ecosystem service approach

How can different ecological requirements be embedded in a regional governance framework? By addressing the dependencies of human well-being and ecological integrity, the ecosystem service approach may be a useful guide for the development of an environmental governance framework. Importantly, the ecosystem services approach has the potential to simultaneously address the various needs of stakeholders by providing and managing environmental resources across time and space.
The identification and assessment of ecosystem services in the Alpine region will first require a common understanding of what constitutes an ecosystem service. A physical quantitative assessment of an ecosystem service can then be carried out based on indicators that have already been identified on a conceptual basis at the EU level (cf. Maes et al. 2013), and in some cases at a national level. Once the ecosystem service provision has been identified and quantified, it is possible to negotiate compensation schemes for the use of the resource.

Role of sustainable spatial development in regional governance

The ecosystem approach offers a conceptual basis but it does not provide an approach for implementing the insights into a spatial and development concept. Spatial development is needed to coordinate the different land uses and development activities in a certain territory. A sustainable spatial development (SSD) considers ecological, economic and

social issues in a balanced way. Additionally, a SSD may help to adapt the use of the resources to global megatrends such as demographic change and climate change.

Approach of WIKIAlps

The Alpine Space programme supports, inter alia, a SSD. The Interreg IV-B capitalisation project "WIKIAlps" has observed that many projects carried out in the Alpine Space programme are not well known, their results are not easy accessible, and implementation outside the project area is often rare. To address these shortcomings, WIKIAlps collects project results in the thematic fields of "inclusive growth" and "resource efficiency and ecosystem management" to make them better accessible to the interested public. Furthermore, the project analyses selected projects in order to understand how to make better use of synergies and how to capitalize on achievements. WIKIAlps helps to improve sustainable spatial development by identifying remaining gaps and emerging contradictions between recommendations of different projects. We consider the combination of the ecosystem approach and its spatial implementation via SSD using tools like WIKIAlps to be a promising approach.

References

- Bätzing, W. (2002): Der Stellenwert des Tourismus in den Alpen und seine Bedeutung für eine nachhaltige Entwicklung des Alpenraums, in: Luger, K./Rest, F. (Hrsg.) (2002): Der Alpentourismus, Innsbruck.
- EEA (2009): Regional climate change and adaptation. The Alps facing the challenge of changing water resources. EEA Report 8/2009. EEA. Copenhagen. DOI 10.2800/12552.
- ETC (2006): Operational programme Alpine Space. European Territorial Cooperation 2007 - 2013.
- Maes J., Teller A., Erhard M. et al. (2013): Mapping and Assessment of Ecosystems and their Services. An analytical framework for ecosystem assessments under action 5 of the EU biodiversity strategy to 2020. Publications office of the European Union, Luxembourg.
- MEA - Millennium Ecosystem Assessment (2005): Ecosystems and human well-being. Synthesis. Washington DC: Island Press.

Workshop 3-1

Drawing on mountain policy experiences in the Alps: How to shape common strategies?

Thomas Dax
Federal Institute for Less-Favoured and Mountainous Areas (BABF), Austria

Contributions:

- *Local and regional mountain authorities building an adapted strategy in the context of multilevel governance*
  Nicolas Evrard, Promonte – AEM, France
- *A dedicated mountain policy – more important than ever!*
  Thomas Egger, Schweizer Arbeitsgemeinschaft für die Berggebiete SAB, Switzerland

Policies in the Alps

No mountain range is better suited than the Alps to engage in the challenging and promising task of comparatively assessing the wide range of policy activities and local and regional actions (Price et al. 2011). Regional development initiatives in the Alpine regions have intensified over the last decades and mountain-specific policies have become increasingly prominent in Alpine countries. The increased policy commitment has incentivized an outstanding level of stakeholder involvement, as well as programme elaboration that addresses the wide scope of policy challenges (Figure 1). The range of respective programmes at local and regional levels is highlighted in review studies of Alpine activities (Bausch et al. 2005, Price et al. 2011, Gloersen et al. 2012) as a clear indication of the rich set of instruments and innovative initiatives that already exist. Although few countries in the Alpine space have an explicit national mountain policy, national "approaches" for dealing with available policy instruments have to be taken into account.

The Alps are also the mountain region in which supra-national activities, programmes and agreements have been elaborated to the greatest extent. These fall into two groups: first, the regional cooperation agreements of selected Alpine regions in different sub-sets of the Alps (in particular, ARGEALP, the Alps-Adriatic Alliance and the Alps-Mediterranean Euroregion) and second, networks, programmes and agreements that cover the entire "Alpine area". The International Commission for the Protection of the Alps (CIPRA) is a network operating across the Alps and is the main example of the second group. Since its inception in 1952, CIPRA has worked as an important umbrella institution, identifying Alpine development challenges and raising awareness for coordinated Alpine policies. As the main policy outcome, the Alpine Convention was approved in 1991 by all the Alpine countries and the European Union and is the first and most influential international agreement about a mountain range in the world (Balsiger 2008).

To enhance trans-national action in support of sustainable development of the Alps, the EU offered a

trans-regional structural funds programme for the area in 2000, called the Alpine Space Programme. Building on the conviction that regional inter-relations are of crucial relevance for the development of any space, the spatial framework of this programme is much larger than that of the Alpine Convention and other policies focused on the "core Alpine area". The Alpine Space Programme includes adjacent and linked lowland areas, which constitute a reference area that is distinct from the core mountain zone. The significantly enlarged spatial concept recognizes upland-lowland connections, an important relationship in the debate about mountain development. The recent preparation work for the Macro-regional Strategy of the Alpine Region (EUSALP) has also grappled with the issue of different definitions of the Alpine area. The EU's communication for the consultation phase (EU 2014) with regard to the proposed EUSALP recognizes the Alpine Region as an area that "constitutes the largest European economic and productive hub, with a high potential for development" (EU 2014, 3). From this cursory overview, it is clear that there are many divergent views with regard to the appropriate scope and definition of activities to be favoured within "Alpine policies".

The Workshop

The goal of the workshop, organized within the session "Governance of Alpine Resources", was to deepen discussions about mountain policy experiences in the Alps. The workshop sought to intensify assessment considerations about the appropriate scope and definition of activities to be favoured within "Alpine policies" by drawing on already existing reviews (see introduction). In particular, the workshop sought to introduce considerations about policy coherence, cross-sector collaboration, cooperation issues and impact assessments in Alpine regions.

The analysis of programme implementation and policy impact includes a wide range of different facets. Above all, the required assessment process necessitates the close cooperation of researchers, policy-makers and practitioners in order to achieve sensible policy outcomes. Moreover, even if the Alpine area encompasses some of the most densely researched regions in the world (Körner 2009), there is still a strong need for spatial differentiation within the Alps due to low-scale divergence in socio-economic, cultural and ecological conditions. As the workshop moderator emphasized, local development should be considered the leading concept in assessing the focus, priorities, "knowledge deficits" and conceptual strengths of mountain policies in the Alps.
The debate about relevant policies is particularly present in the current preparation of the Macro-regional Strategy for the Alpine Regions (Joint Drafting Committee 2013). To inform the policy context adequately, a series of influencing aspects have to be taken into account. The following three points are especially important:

- The need to address different dimensions of policies for mountain areas, and the need to achieve balanced assessment and activities across various policy strands.
- The need for spatially differentiated perspectives to adequately reflect the potentials for mountain regions.
- The need to focus on spatial relationships that go beyond the core Alpine area (e.g., the link between lowland and upland communities, watershed areas, activities that determine the attractiveness of mountain areas for users from non-mountain regions etc.).

The two input presentations provided considerable evidence for the need for policies at different levels. The first input presentation, by Nicolas Evrard (Promonte-AEM, France), underscored the crucial role of local and regional authorities. Specific local contexts vary considerably over relatively small spatial extents due to the complexity of mountain topography. The Alps therefore represent a region in which multi-level governance has to be taken seriously to cope with the complexity of inter-related challenges and opportunities. Evrard proposed four main recommendations for policy assessment:

- A fundamental shift in the focus of mountain policy, including a change from predominantly subsidy-based concepts to a set of measures that seek to improve local action by focusing on the valorization of mountain-specific assets.
- Choosing the right level for general policies, with mountain ranges (in France, "massifs") providing a useful conceptual level to enhance territorial dynamics.
- A "place-based" policy approach, which is particularly relevant at the local level (e.g., as epitomized by the Italian "Communità Montane").
- The characterization of the border situation of mountains in general. For large mountain

areas, borders imply additional challenges for economic and social development and result in increased levels of marginalization. Territorial cooperation and cross-border programmes are therefore especially important for mountain regions. As the primarily challenge for the Alps, territorial cooperation and cross-border programmes call for continued effort by multi-level actors.

In the second input, Thomas Egger (SAB, Switzerland) supported the shift in perspective recommended by the first speaker. In particular, he emphasized the need for establishing a more integrated policy view that reflects the challenges of preserving living conditions and achieving sustainable development pathways in mountains. It is especially important to change the general trend in policy implementation that leads to a situation where "most policies are territorially blind". Policies will more effectively contribute to sustainable mountain development when the development discourse addresses the spatial specificities, challenges and assets of mountain regions.

Reviewing the history of Swiss mountain policy, Egger noted that Switzerland's formerly integrated mountain policy approach has been somewhat lost. He argued, however, that such an integrated approach is extremely important in today's increasingly globalized, complex world. In particular, he perceived a need for mountain-specific action due to economic challenges and social changes in these areas. For the overall assessment of mountain policies in the Alps, he identified three aspects that are important from the national point of view:

- There are important institutional differences among the countries of the Alpine area. Some countries have adopted "mountain laws" that seem to apply a strategic approach. Others, despite not having formalized their national aims, apply highly elaborated mountain policies by making use of instruments in different sector policies. Although these different national approaches might have important implications for the implementation of policies with regard to mountain areas, neither necessarily produces better results, i.e. the realization of sustainable development goals.
- In addition to intensive research (as embodied by the Forum Alpinum conferences), we need an enhanced dialogue between researchers and policy-makers. This builds on the concept of increasing transformation knowledge. An intensified exchange in some sort of re-

	local	regional	national	Alpine space/EU
Policies at local/regional level				
LEADER programmes	x	x		
Interreg	x	x		
Biosphere Reserves	x	x		
Local Agenda 21	x	(x)		
Climate Alliance	x	(x)		
Learning Regions		x		
Thematic regional initiatives		x		
National "mountain" policies (e.g. NRP - New Swiss Regional Policy)		x	x	
Alpine area				
Alpine Convention	x	(x)	(x)	x
Alpine Space Programme (ASP)		x	(x)	x
CIPRA and NGO networks	x	x	x	x
Regional cooperation (ARGEALP etc.)		x		(x)
Macro-regional Strategy (EUSALP)		x	x	x

Figure 1: Main policy initiatives in the Alpine regions. Source: Dax 2014

search-policy dialogue is proposed as an important activity for EUSALP.

– We also need to be able to differentiate and assess the spatial impacts of all policies. This can be seen as an element of ex-ante evaluation in EU (and national) programmes, and as a potential activity in EUSALP for fostering urban-rural cooperation.

These input presentations helped identify a number of key issues and provoked an intense discussion in the workshop. In particular, participants noted the gap between policy rhetoric and the ability of policy to actually support local development and innovative action. The research-policy relationship was interpreted as a very complex system with significant obstacles (knowledge transfer hurdles, different pace of activities, different technical "languages", different dynamics etc.). This aspect of differentiation between spaces makes it difficult to provide an overall assessment for the whole Alpine space. Moreover, the great number of stakeholders with different views also exacerbates assessment at lower levels. A particularly sensitive issue is the analysis of lowland-mountain relationships, as aspects of geographical differentiation and socio-economic development have to be incorporated in respective studies and assessment approaches. Moreover, the financial means for supporting innovative development actions are largely missing in certain regions and/or innovative development is not viewed as a priority. (In the discussion, a lack of resources was identified as a particular challenge for Italy). Achieving a balanced assessment that sufficiently takes into account the local requirements of mountain areas seems to be a major challenge for regional development (and other policy) programmes. However, our examination of policy effects is built largely on specific (local/regional/national) experiences, which leaves a highly diverse picture for the whole Alpine space.

Taking this last observation of the workshop as a mandate for policy analysis, current discourse lacks not only a comprehensive integrative approach but also an enhanced dialogue between researchers, local people and stakeholders, and politicians. Future research on mountain policies in the Alps should therefore focus on intensifying "knowledge transfer" in all its different forms.

References:

- Balsiger, J. (2008), Regional Sustainable Development in the European Alps, European University Institute, Working Papers, MWP 2008/23, San Domenico di Fiesole, Italy, 24 pp.
- Bausch, T., Dax, T., Janin Rivolin, U., Parvex, F., Praper, S. and Vanier, M. (2005), Sustainable Territorial Development in the Alpine Space: Towards Long term Transnational Cooperation, Alpine Space Prospective Study, Full Report, Alpine Space Interreg IIIB Programme, Salzburg
- EU – European Commission DG Regio (2014), An EU Strategy for the Alpine Region (EUSALP) Core Document, 3-7-2014, Brussels. http://ec.europa.eu/eusurvey/files/72652d1d-3745-4e47-9a63-2f621059e138 (accessed 11/10/2014)
- Gloersen, E., Bausch, T., Hurel, H., Pfefferkorn, W., del Fiore, F., Ratti, C. and Zavodnik-Lamovšek, A. (2012), Strategy-development for the Alpine Space, Second Draft Report, Alpine Space programme, Salzburg.
- Joint drafting committee (2013), Intervention Document for the Implementation of a European Union Strategy for the Alpine Region. [Grenoble document] http://www.mzz.gov.si/fileadmin/pageuploads/foto/1311/Alpska-Intervention_document_ENG.pdf (accessed 15/09/2014)
- Körner, C. (2009), Global Statistics of „Mountain" and „Alpine" Research, in: Mountain Research and Development, 29(1): 97-102.
- Price, M.F., Borowski, D., Macleod, C., Rudaz, G. and Debarbieux, B. (2011), The Alps, From Rio 1992 to 2012 and beyond: 20 years of Sustainable Mountain development. What have we learnt and where should we go? Perth, UK and Geneva, Switzerland: Centre for Mountain Studies, University of the Highlands and Islands, Perth College, University of Geneva.

Workshop 3-2

Learning lessons the easy way – improving access to and transferring project results in the Alpine Space: Experiences from the WIKIAlps project

Caroline Pecher, Stefan Marzelli, Axel Borsdorf
Institute for Interdisciplinary Mountain Research of the Austrian Academy of Sciences, Innsbruck

Contributions:

- *Towards re-organised and more accessible Alpine Space project results*
  Stefan Marzelli, ifuplan, Munich
- *WIKIAlps: A new platform for sustainable spatial development in the Alps*
  Axel Borsdorf, Institute for Interdisciplinary Mountain Research (IGF), Austrian Academy of Sciences, Innsbruck

The WIKIAlps project partners organised workshop 3.2 with the title "Learning lessons the easy way – improving access to and transferring project results in the Alpine Space: Experiences from the WIKIAlps project". Caroline Pecher, WIKIAlps lead partner from EURAC research in Bozen/Bolzano (IT), moderated the workshop. Stefan Marzelli from ifuplan in Munich (DE) and Axel Borsdorf from the Institute for Interdisciplinary Mountain Research (IGF) of the Austrian Academy of Sciences (ÖAW) in Innsbruck (AT) prepared the ground for a fruitful discussion by providing informative input speeches. A total of 15 practitioners, researchers, public employees and other interested persons participated in the workshop. Of these, five were WIKIAlps project partners. After shortly introducing the input speakers and herself, Caroline Pecher presented the WIKIAlps project to the workshop participants. "WIKIAlps - A wiki for capitalising on spatial-development projects" is a project co-funded by the European Regional Development Fund in the frame of the Alpine Space Programme. It started in October 2013 and will end in December 2014. WIKIAlps contributes to a balanced and shared sustainable spatial development in the Alpine Space by providing operative, ready-to-use information for spatial policy design. The wiki, available at www.wikialps.eu, provides direct access to the information collected and analysed within the project. Addressing sustainable spatial development from three different perspectives – project, policy and stakeholder (cf. Fig. 1) – www.wikialps.eu makes relevant information available to decision makers, civil servants, researchers and entrepreneurs, as well as to the interested public. This information is derived from the results of selected projects from the Alpine Space 2007-2013 Programming Period, from the analysis of collected policy documents, and from an analysis of stakeholder institutions. The wiki is accompanied by four mini guides on how to use the WIKIAlps project results and two practical recommendations that round up the set of available WIKIAlps tools.

Following this introduction, Stefan Marzelli gave an input presentation entitled "WIKIAlps - Towards re-organised and more accessible Alpine Space project results" in which he provided deeper insight into the WIKIAlps approach for project analyses (cf. Fig. 2).

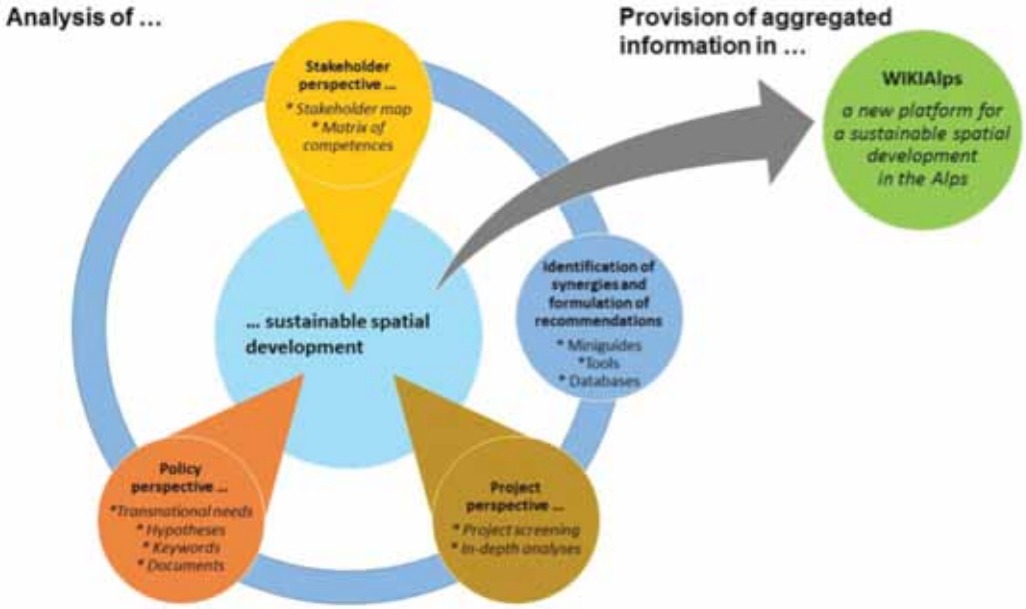


Fig. 1. The three perspectives on a sustainable spatial development: project, policy and stakeholder.

One of the main problems that projects carried out in the Alpine Space Programme face is that they are not well known, results are not accessible, information is lost and synergies and gaps are not identified. In order to counteract this situation, ifuplan has developed a methodological approach for the analysis and reorganisation of project results. This approach consists, in a first step, of a project screening of the 29 projects from the "Inclusive Growth" and "Resource Efficiency and Ecosystem Management" thematic fields. During this phase, important basic information about projects, such as the accessibility of project results or information about project partners, are gathered. Keywords describing the projects are identified, and every project is associated with sustainable spatial development topics and hypotheses. In a second step, an in-depth analysis of selected projects is carried out. This consists of descriptive and interpretative analyses of projects and their results. The aim of the interpretative analysis is to identify synergies within and between projects, achievements that could be implemented further, and remaining gaps and emerging contradictions. In addition to the project analysis, policy documents are analysed in order to provide insights into common transnational challenges and needs in Alpine spatial development. Furthermore, an analysis of stakeholder institutions is carried out to provide a better overview of stakeholders that are active in promoting sustainable spatial development in the Alpine space.

Immediately after this first input, Axel Borsdorf from the ÖAW/IGF followed with his input presentation "WIKIAlps – a new platform for sustainable spatial development in the Alps". The wiki (www.wikialps.eu) is one of the main tools produced in the WIKIAlps project. It is a platform that provides direct access to the information collected and analysed within the project. It approaches sustainable spatial development from three perspectives:

1. The project perspective, which provides access to selected Alpine Space projects, their results and other important information;
2. The policy perspective, which offers information about transnational needs in spatial development that have been identified on the basis of selected official documents;
3. The stakeholder perspective, which provides a competences matrix of stakeholders involved in spatial development in the Alpine Space.

WIKIAlps is a real wiki that provides functionalities such as uncomplicated navigation and the option for registered users to edit, complement, modify or create contents. Users can navigate the wiki by using the navigation menu, the WIKIAlps word cloud or the sitemap. The wiki does more than provide static information to users, however: it is a continuously evolving tool based on the contributions of different authors. Therefore, everyone interested in sustainable spatial development in the Alpine space is invited to contribute to the wiki. An account can

easily be created and the "help" articles provide simple instructions for creating or modifying contents in the wiki. Of course, authors need to respect several rules when contributing to the wiki, such as only editing articles if they can be improved and remembering that all information entered in the wiki is traceable and that authors are responsible for the contents they insert. All of this information can be found directly in the wiki.

Following the introduction to the project and the two input presentations, the floor was opened for discussion. Participants were invited to express opinions or questions about WIKIAlps, its underlying methodology or the wiki. Caroline Pecher, Stefan Marzelli and Axel Borsdorf answered the participants' questions and led a very fruitful discussion that touched on several topics of interest. Although the workshop participants only had a limited amount of time to explore the wiki, they agreed that it is a good tool. They also agreed with Stefan Marzelli's proposal to oblige future Alpine-Space projects to contribute to the wiki. Because the wiki is currently only available in English, participants feared that some stakeholders might be discouraged from using it. However, due to the short duration of the WIKIAlps project, it is not currently possible to provide translations and keep them up-to-date.

The participants found it interesting that contradictions were detected while analysing projects and official documents and they wanted to know more about that. According to Stefan Marzelli, these contradictions have mainly appeared between projects or project results and the needs that have been identified on the basis of the analysed official documents or the required implementation of solutions. For example, it turned out that inflexible local policies can hinder the implementation of innovative approaches that have been developed in Alpine Space projects. Another topic that was brought up during the discussion was the functionality and layout of the wiki: According to one participant, text mining could enhance the functionality of the wiki, and the layout could be improved in order to increase the attractiveness of the wiki. User statistics, which were identified as useful information, will soon be integrated in the wiki. Since the wiki is still a work in progress, ÖAW/IGF and the WIKIAlps partners will continue to enhance the wiki and to implement the various suggestions made during the workshop.

At the end of the discussion, Caroline Pecher announced that the WIKIAlps Final Conference will be held on Thursday, 4 December 2014 in Bozen/Bolzano, Italy. The conference will include presentations about the project and its results, as well as a panel discussion on "How to overcome national borders for sustainable Alpine spatial development".

Fig. 2. The WIKIAlps workshop at the Forum Alpinum – input presentation by Stefan Marzelli.

Workshop 3-3

Alpine added value in resource management and environmental governance

Erik Gloersen, University of Geneva, Switzerland
Antonella Pietta, University of Brescia, Italy

Introduction

Part of the debate regarding the development of an Alpine Macro-Regional Strategy (MRS) has centred on the identification of issues that can be effectively addressed at the transnational level within the fields of sustainable development, economic prosperity and social cohesion. A number of stakeholders argue that the management of Alpine resources (e.g., water and biodiversity) are prime examples of issues that are better answered at the Alpine level. However, the mechanisms that allow for the coordination of Alpine strategies and measures with policies at other levels of governance remain to be defined.

The role of the alpine level in a multi-level governance setup depends on how the Alps are perceived by involved stakeholders. As observed in policy debates, the Alps can be understood as:

1. a "functional territory" for the exploitation, reproduction or management of a given resource;
2. a territory with specific environmental vulnerabilities that affect observed or potential externalities of economic activities;
3. a shared identity that can be used to mobilise actors across regional and national boundaries; or
4. a transnational grouping of stakeholders seeking to defend shared interests in relation to national and European authorities.

Given these varied understandings of the Alps, the purpose of the workshop was to:

- identify the most important pan-Alpine environmental and resource management issues;
- discuss the added value of addressing these issues at the Alpine level, i.e., based on one or more of the understandings of "the Alps" listed above;
- explore institutional and cultural obstacles to the reinforcement of Alpine-level governance in the fields where this is considered most needed.

Alpine added values for adjacent regions

The workshop discussion focused on the integration of Alpine added values into governance. With regard to Alpine added values for adjacent regions (as discussed here), some fundamental preconditions have to be taken into consideration:

- Alpine added values are provided mainly (but not only) by rural areas and consumed by

urban areas. As urban sprawl is widespread in the Alps, some of the consumers are located within the perimeter of the Alpine Convention.

- Solidarity between rural and urban areas is necessary for "fairness" in negotiations between providers and consumers.
- Added values are created by and linked to sustainable development.
- There is a lack of data and knowledge regarding the interrelations (in terms of functional spaces) between the Alps and the surrounding lowlands.
- The regions are crucial for the governance of resources.

The following added values and related issues in the context of a macro-regional strategy were highlighted:

Added values	Related issues
Energy production, renewable energy	energy efficiency
Biodiversity	fragmentation, food security
Ecosystem services	awareness of sustainability
Water	water management, risk management, climate change adaptation
Cultural resources	cultural diversity, sustainable tourism

Other issues relevant to added value in the Alps include enhanced education (e.g., exchange between schools) and the promotion of local, community-based development (e.g., by common production).

Implementation

The European Union Macro-regional Strategy for the Alpine Region (EUSALP) is an opportunity to introduce issues related to Alpine added values and environmental and resource management at a political level (as EUSALP aims to contribute to future EU policies). Nevertheless, a clear vision and corresponding objectives are needed. The following elements were discussed during the workshop:

- build up a green economy (pillar 1 and 2 of EUSALP)
- develop rules between (Alpine) producers and (urban) users, especially for common goods such as landscapes and biodiversity
- invest in diversity (recognize the potentials of a diverse economy, society and nature).

With regard to the implementation of EUSALP, elements of particular importance include broad participation (based on good public information), the continuous monitoring of objectives (e.g., issues concerning diversity), and the development of instruments for trans-national and trans-sectoral cooperation and negotiation. Following the experiences of other macro-regional strategies, a common main topic could act as an integration element (e.g., water quality in the Baltic macro-region). To date, no such integrating topic has been proposed.

Workshop 3-4

Good governance and the role of public participation in the Alpine region

Wolfgang Pfefferkorn, Rosinak&Partner, Vienna, Austria
Federica Maino, EURAC - European Academy of Bolzano, Italy

Background and workshop aims

The participation of local communities in resource management is rapidly becoming a central component of social and environmental sustainability. There are national and international policies that support stakeholder involvement, and local communities that demand it. In practice, however, the tools and experience to ensure effective participatory processes are often missing (lack of time, money, transparency, professional conflict management etc.).

Presently, the elaboration of a Macro-Regional Strategy for the Alpine Region (EUSALP) is at stake. In order to create ownership among stakeholders and the Alpine population, it is crucial to involve these groups in the strategy development process now and in its implementation later on.

The workshop offered a reflection on the requirements for "good governance" in the Alpine region and the role of public participation. What is "good governance" all about? How can public participation support sustainable resource management and the development and implementation of an accepted European strategy for the Alps? How can stakeholder involvement be organized most successfully?

Two case studies were examined during the workshop. The first focused on the Seren del Grappa Valley, a rapidly depopulating subalpine region in northeastern Italy. The plan for the second half of the workshop was to then focus on the more strategic, meta-level issue of the EUSALP strategy (with input from Anita Konrad, CIPRA International), but the workshop plan was changed due to the high number of young participants from local high schools. Instead, participants examined the participation procedure of the Kornmarkt square in Bregenz, Austria.

Case study of Seren del Grappa Valley
Federica Maino, Andrea Omizzolo, Miriam L. Weiß
EURAC - European Academy of Bolzano, Institute for Regional Development and Location Management

The Seren del Grappa Valley, a subalpine, borderline and marginal area located in Belluno province in northeastern Italy, is currently challenged by an advanced state of depopulation and an impoverishment of basic economic resources. As such, it is an interesting case study for our research about mountain regions, depopulation risk, counter trend analysis, regional development and interregional cooperation. The aim of the project was to guide the local community, the economic operators and the local administrators in a participatory process toward the definition of strategic, shared and sustainable choices for the medium- and long-term future of the valley. The key questions of the research were:

- How can the depopulation of the valley be avoided?
- How can we contribute to an innovative and sustainable development?
- What are the endogenous potentials?
- What are the most innovative approaches for improving the socio-economic opportunities of the valley?

The participatory process was structured in four phases:

1. Preliminary phase: collect information and carry out a SWOT analysis.
2. Learning phase: discuss key topics and develop priorities. We illustrated and discussed best practices, involved experts and organized trainings. This phase was particularly important because it accompanied almost the entire process and boosted an ongoing mutual learning process.
3. Planning phase: define a common vision for the future of the valley up to the year 2030. This vision was defined in ten strategic guidelines that provide a framework for the development of actions and projects.
4. Self-sustainability phase: transfer the responsibility to the community through an innovative interaction technique known as OST (Open Space Technology). During this event, we asked participants to assume leadership of the projects they most wanted to realize and then supported them throughout the transition. This new step was possible thanks to the above-mentioned learning and growing process we had shared.

We supervised the first concrete projects, e.g. the renovation of the Col de Bof House, the implementation of an experimental vineyard of resistant hybrids, a web marketing course, and the organization of a festival on the topic "The mountains of the future".

During the whole process, we strengthened the network among stakeholders and with local and external experts, as well as with universities and research centers at the European level. We supervised and monitored the development of actions and projects, boosted interregional co-operation and managed potential conflicts. Although we worked primarily as a scientific and objective partner, our role in supervision, coordination and the facilitation of effective communication was very important.

Some of the key strengths of the territory that contributed to the success of the project were the strong rooting of the inhabitants in their territory, the consistent and strong social community and the environmental resources that were preserved over time. Additional factors that favored the process were the support of a research institute, the financial resources available for the participatory process, the innovative approaches and interaction techniques used, and the ongoing shared learning process. The principal weaknesses were the limited size of the area, the small number of inhabitants, and the initial cultural mindset, which has been the source of some resistance to cooperation and external input at the beginning of the process.

In conclusion, we underline the importance of the empowerment of local communities and the importance of a supporting process to meet the request for change. Furthermore, we highlight the need to

strengthen the implementation of long-term strategies and concrete projects and to foster cooperation among stakeholders. In particular, the direct involvement of the community is important for:

- enhancing endogenous potentials, particularly local and traditional knowledge,
- promoting the exchange of resources (information, experiences, knowledge, etc.) and fostering a better understanding of the problems to be solved,
- promoting solution-oriented and need-based decisions,
- strengthening the climate of trust and encouraging direct interactions between citizens, administrators and experts, and
- fostering the ownership of projects and plans within the local community.

Case study of Kornmarkt Bregenz
Wolfgang Pfefferkorn, Rosinak&Partner, Vienna

The Kornmarkt square is located in Bregenz, the capital of the Austrian Province of Vorarlberg. The square is the cultural center of Bregenz, hosting the Province Theater, the "Kunsthaus Bregenz" (built by the Swiss architect Zumthor) and the Province Museum. This museum was rebuilt between 2010 and 2013. In direct connection with the construction of the new museum, the public square of Kornmarkt and the surrounding public spaces and streets were re-designed and rebuilt. This re-design process was carried out within an externally moderated public participation process, to which all inhabitants of Bregenz were invited.

The participation process was divided into two phases. In the first phase, ca. 200 people participated in each of three big public workshops. The citizens presented their ideas and expectations regarding the future quality, usage and infrastructure of the public spaces around Kornmarkt. These expectations were "translated" by a team of architects and landscape planners into design proposals, which were then commented on again by the citizens. Following this feedback loop, a master plan was finalized and approved by the City Council.

In the second phase, a working group of about 30 participants representing all relevant stakeholders (planning departments, private enterprises, cultural institutions, citizens, planning team and policy makers) carried out 3 planning workshops in which the new design for the Kornmarkt square and the surrounding public areas was developed. The design was presented to the general public at a final information event and was widely accepted. The City Council adopted the plan in July 2011. A detailed planning process took place over the next 12 months, and in winter 2012/2013 the new public square was built. In May 2013, the new Kormarkt was inaugurated, and today it has become the new heart of Bregenz. It is also a commercial success for the owners of restaurants, cafes and shops in this area.

The most important success factors were:

- The open approach of the city planning department of Bregenz and its decision to involve the citizens.
- The time restrictions: the financial support from the Province was dependent on the completion of the new public spaces before the opening of the new Province museum.
- The great organizational support from the staff of the city planning department.
- The approach of the architects and landscape planners: they worked to translate the ideas and proposals of the citizens into intelligent planning proposals.
- The precise planning and supervision of the whole process and of every individual event, as well as the professional moderation of the big public workshops.

For more information: www.partizipation.at

Conclusions regarding the requirements for good governance

In the 1990's, the World Bank introduced the concept of governance into policy making and administrative procedures. Governance is based on the idea that the prosperity of a nation requires a minimum of legislative and democratic structures. In 2001, the EU published the White Paper on European Governance and presented the following five criteria for good governance:

- Transparency: access to information, clear decisions and rules, etc.
- Participation: inclusive approach that involves all concerned parties.
- Accountability: clear roles and responsibilities in both planning and implementation.
- Effectiveness: clear, effective and timely objectives implemented in a proportionate manner and at the most appropriate level.
- Coherence: through political leadership and a strong responsibility to ensure a consistent approach.

Today, governance is a key topic for planning procedures at all levels. The increasing complexity of environmental, social and economic challenges and tasks requires co-operation now more than ever. Successful co-operation is based on the following criteria:

- Co-operation as a new social system
- The technical expertise of the partners
- The creation of a two-fold benefit: for each individual partner and for the new system
- Partners that are able to co-operate
- Joint steering
- A well-functioning service unit
- Team work
- Individuals and their relations
- Confidence among the involved actors
- Involvement of policy makers
- External moderation

These success criteria are relevant for small participatory procedures such as those described above, as well as for large planning processes like the European Strategy for the Alps (EUSALP). The evaluation of existing Macro-regional Strategies in Europe has shown that there is potential for improvement, especially with regard to a clearer description and a better distribution of tasks. There is also considerable potential with regard to increasing the involvement of stakeholders and civil society organisations. The EUSALP strategy has a valuable opportunity to learn from the other Macro-regional Strategies in Europe and to avoid some fundamental weaknesses and mistakes – and to become a model for good governance in Europe.

Workshop 3-5

Energy efficiency in Alpine communities

Francesco Vaninetti
Ecoinstitute South Tyrol
Bolzano, Italy

Contributions:

- *Bolzano fonte d'energia: strategia energetica del Comune di Bolzano*
  Emanuele Sascor, Energia e Geologia del Comune di Bolzano
- *Comune di Malles: la via verso l'autarchia energetica*
  Ulrich Veith, Sindaco di Malles

Content

Municipalities play a key role in the management of natural and human resources at a local level, since a considerable part of the carbon footprint is generated by the daily activities of a community. In order to improve the utilisation of the available resources by Alpine residents, actions must be taken locally in close collaboration with the municipal powers. Ökoinstitut is supporting several municipal administrations in their energy efficiency and energy sustainability efforts with excellent and internationally valued results.

The Chair introduced the topic to the audience on the basis of his experience with the local powers in South Tyrol. Global challenges such as climate change and the secure supply of fossil fuels have to be addressed locally and the most suitable response actions must be identified for medium and small communities like the Alpine ones. The following main fields of intervention at a municipal level were identified:

- Action Plan for Renewable Resources;
- Urban planning;
- Traffic management;
- Water and water supply system management;
- Publicly owned real estate;
- Public street lighting;
- Waste collection and disposal.

Following this brief introduction, participants were invited to discuss the possible actions available to Alpine communities in the sectors of mobility, energy generation from renewable sources and energy efficiency. In order to allow the 35 workshop participants to get more actively involved in the discussion, they were divided into three groups, each covering a different topic. The groups had the task to identify the existing problems; to set realistic objectives that could be achieved by an Alpine community in order to improve energy efficiency and reduce reliance on fossil fuels; to identify implementing solutions and any stumbling blocks on the way to their achievement. Each group posted the results of their discussion on a board and chose a

spokesman that briefly illustrated them to the other participants. Hereinafter are some pictures of the posters produced by the three groups, containing a summary of the main points.

Mobility

Clearly, mobility in the mountain areas is restrained by orographic conditions and the presence of steep slopes, which in combination with the lack of the necessary critical mass in medium to small-sized settlements means that public transport systems are not cost-effective. Cycling does not seem to be a popular mode of transport either, because of the steep slopes that are present throughout the area. Moreover, the culture of private motorised traffic has become deeply engrained over the last 50 years and is difficult to eradicate. The group then discussed the possible solutions to these problems. A crucial aspect was soft mobility based on the promotion of safer walking itineraries that leverage the long-standing walking tradition of Alpine populations. Another focus was "slow tourism" and the attempt to reduce the tourist flows based on daily excursions. However, mobility cannot be addressed alone; it requires a comprehensive re-organization of economic and social relations, since Alpine residents should be enabled to work near their homes or to opt for teleworking if their workplace is very distant.

Energy supply

Since the group that discussed about the energy supply chain included a number of architects, the discussion was extended to energy efficiency in buildings because both aspects are closely related. The main issue identified with respect to the energy supply is the capacity to cater for the energy needs of the mountain communities using locally available and renewable energy sources. On the side of energy consumption, some inappropriate energy consumption patterns have become widespread; the available energy is used inefficiently and consumption is high as a result, making it difficult to cover energy needs with local and renewable energy sources. With regards to energy efficiency, the most effective solution identified by participants would be a new educational model that emphasises the importance of energy saving and energy efficiency already in nursery and primary schools. In a technological perspective, the best energy efficiency results can be obtained through improved planning of constructions, their orientation and solar gains, by relying on traditional construction techniques combined with the most recent architectural and energy-efficiency innovations. The regulatory framework plays a role here as well, because it should be adapted to the specific characteristics of the different geographical and climatic regions, as well as to the needs of local populations.

The different types of energy generation methods were also discussed, including the most common ones such as geothermal, photovoltaic, wind, solar, biomass and hydropower generation. Preference should be given to locally available resources in order to reduce the amount of "grey energy" required in the process. The implementation of the identified measures could be hampered by local communities opposing the construction of power plants fuelled with energy from renewable sources due to their environmental and landscape impact. A widespread reluctance to change and an exceedingly complex legislation often discourage attempts to install sustainable energy generation plants. Last but not least, there is no local governance in many cases, i.e. individual projects are implemented but there is no comprehensive planning and coordination for optimisation of the final outcome. Municipal administrations could play an important role; they should be motivated into coordinating the different actions that are being implemented locally with a medium to long-term perspective.

Energy efficiency

The group working on energy efficiency was composed of students from a high school that had good technical knowledge and competences. The issues identified were the following: high energy demand for heating in the cold Alpine climate; a proportionally high consumption and high costs for heating; air pollution caused by combustion processes and the lack of adequate financial incentives for the introduction of energy-efficiency measures. Solutions were suggested for different aspects: modern LED lighting systems were proposed for efficient street lighting; they should be provided with light sensors and a photovoltaic panel that makes the lighting system grid-independent through the use of a battery. In the construction sector, energy-efficiency opportunities are provided by domotics, improved insulation, ground source heat pumps in place of remote heating power stations in order to improve the efficiency of the energy supply and reduce its polluting effects. Another way of abating pollution generated by transport is to buy local products that do not require to be transported for long distances and to

introduce “alternative” vehicles (e.g. electric cars) on a large scale, as well as to promote bike transport by building more cycle paths and launching awareness campaigns. The impact of these policies is limited, however, by the intrinsic features of the mountain areas, i.e. significant differences in elevation that make it difficult to move and carry goods, on the one hand, and the reluctance to change well-established transport habits on the part of individuals and communities.

Some cross-cutting issues emerged during the discussions in the three groups. First, the model role of the local powers: when municipal authorities implement highly visible high-efficiency projects, citizens are encouraged to reflect on their consumption patterns and to take action. Second, the utilisation of local resources should be improved, both in the case of tangible assets (biomass, water...) and intangible ones (local traditions and knowledge). The involvement of residents is another important aspect: the municipal authority may as well improve the energy efficiency of its buildings and plants, but they make up only a minor fraction of all the buildings present in the municipality. The direct involvement of residents is needed to achieve significant results and a change in consumption patterns that were also examined by the three groups.

By means of conclusion, the Mayor of the Municipality of Malles (Bozen) illustrated the mobility, energy efficiency, energy generation policies implemented by his municipality that prove to be very innovative as compared to both domestic and European standards. For example, in 2014 the Municipality of Malles will have generated more electricity from renewable resources than it needs to cover its local energy requirements.

Workshop 3-6

New approaches and perspectives for managing hydrogeological risks and soil erosion in mountain areas

Gian Battista Bischetti, University of Milan, Italy
Michele Freppaz, University of Turin, Italy

Floods, landslides, soil erosion, avalanches and debris flows are natural processes that often turn into dangers and into degradation factors when they involve human settlements and activities. Considering that around 14 million people live in the European Alps, human activities have often settled in areas exposed to those natural risks, determining changes in the original use of soil and increasing its vulnerability. To tackle these problems, also in terms of adaptation to climate change and of economic and environmental sustainability, new knowledge and management strategies are required. Based on this, the workshop has developed along two lines: new approaches and prospects on soil erosion and good practices and experiences in the field of hydro-geo-morphological risk reduction.

With regard to erosion, Dr. Ratto has observed that the improvement in the knowledge of soil characteristics affects several aspects related to the management of hydrogeological and water risks. The activity of the Functional Centre follows basically two parallel reference lines, which are distinct but closely interrelated, i.e. real time, in which the Functional Centre has to forecast, monitor and issue bulletins, and delayed time, in which it prepares preliminary studies for defining dangerousness and risks. In the delayed time, indeed, maps, studies and modelling with a double value are produced: they are used both for territorial planning and as tools for defining expected scenarios following heavy weather/hydrologic events.

In hydrologic modelling for estimating flood flow rates, soil plays an essential role because it controls the surface, sub-surface and deep outflow. An improved representation of its characteristics – particularly those of hydraulic conductivity and of effective porosity – could generate finer modelling and, as a result, a significant increase in the performance of models.

In the maps of hydrogeological dangers homogeneous zones with different degrees of danger according to the magnitude of landslides and their likelihood, based on past events. The spatialized knowledge of the geo-technical characteristics of soils might allow introducing the notion of proneness to land disruption, including for those situations in which, for various reasons, no events have been observed.

These and other considerations prompted the Functional Centre to activate three research strands.

– The first strand has led to drawing up a map of soils at a scale of 1:10,000 of some basins in the Region (e.g. Valpelline) and a map of soil vulnerabilities at a scale of 1:100,000 for the whole region.

– The second strand has generated two thematic maps regarding gravitational instability factors, i.e. the lithotechnical map and the lithofacies map.
– The third strand equipped 5 automatic weather stations with sensors measuring soil moisture with a view to better determining this fundamental variable for several applications. At these sensors' locations, soil characterization was carried out to determine local characteristics, infiltration tests were conducted to calibrate the conductivity of outlets with measured and literature values as well as to determine hydraulic functions.

At the moment the Functional Centre is busy trying to optimize the enormous amounts of data that have been collected in the activities described above in order to identify the operational tools to be used in the management of alerts. In particular, it is trying to use those data to improve hydrological modelling, to define soil saturation indicators to be used in forecasting hydrogeological disruption. In the future, land disruption proneness maps, along with saturation data and soil characteristics, might allow us to outline dynamic scenarios to be associated with different alert levels.

As regards the reduction of hydro-morphological risks, Dr. Coali presented the experiences of the Mountain Basin Services of the Autonomous Province of Trento, which is an excellent unit in the field of mountain engineering works, both in Italy and internationally.

The long experience and, particularly, the historical evolution of the Service have ensured, first of all, a continuous care of the territory around Trento with reference to land disruption phenomena and are one of the keys of today's success. The Austrian-Hungarian organizational model, shared by the whole Alpine region since the late 19th century, within which the Service was set up in 1882, was able to preserve the founding principles, developing and adjusting to the changing needs of the social, economic and political context.

This model divides the territory into watersheds where the Service is responsible for planning, scheduling, designing and for supervising hydraulic and forest engineering works. Furthermore, it is responsible for administering the public waterways domain, the catalogue of works and events, for drawing up maps of hydrogeological dangers and for preventive and emergency activities in the event of catastrophes, as well as for information activities regarding hydrogeological dangers and strategies for managing flood and torrent risks. It is, basically, the single entity responsible for the various aspects of the hydrogeological protection, at various levels, of mountain territories.

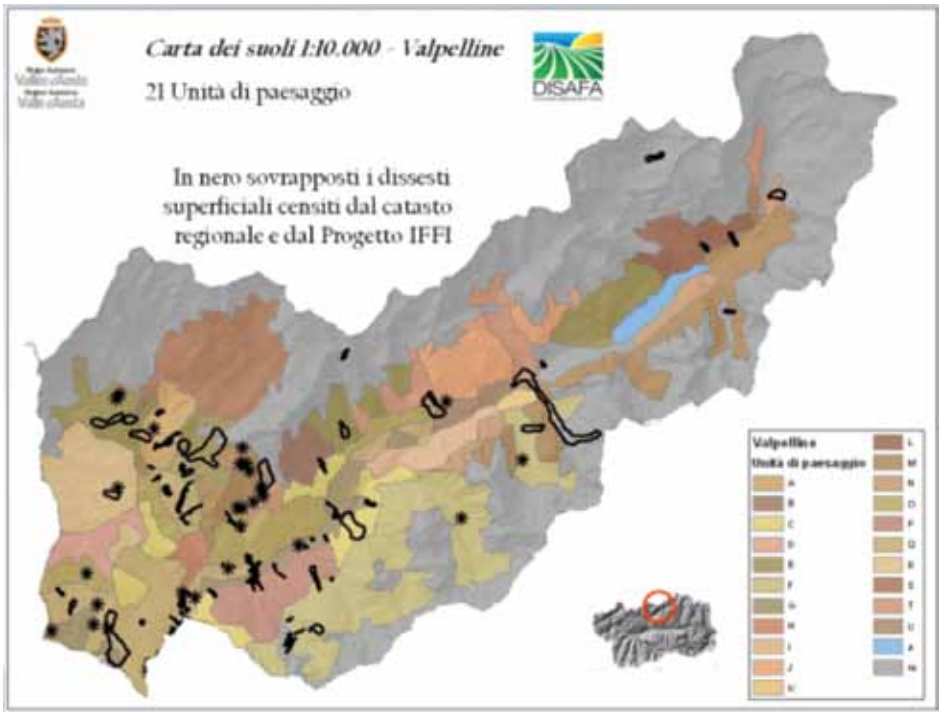


Figure 1. Example of a study looking for a correlation between soil types and superficial disruptions.

Figure 2. Result of mountain engineering works (photos by the Mountain Basin Service of the Autonomous Province of Trento)

A second peculiar aspect is direct administration as the prevalent form of execution of works, which ensures significant flexibility and multi-year planning, not only of works, but also and especially of maintenance which, as occurs extremely rarely in Italy, draws on almost half of the resources earmarked for the Service. The direct performance of these measures allows designers and workers to strongly specialize, which is one of the keys to the success of these kinds of measures. The local occupational benefits are not to be neglected either (today 212 workers, while in the late '80s they were around 400).

Another strength is the availability of a detailed and continuously updated catalogue of works (since the Service was set up in 1882) that allows scheduling accurately maintenance and new requirements. The latest function for the preparation of risk assessments (to be used in town planning) and for outlining civil defence plans, is combined with the function of building and maintaining engineering works, thus optimizing resources to reduce the residual risk, which cannot be completely eliminated, and which should be considered according to the Floods Directive - 2007/60/EC. The Service devotes part of its energies to raise the population's awareness to these issues in order to contribute to the real safety of citizens.

The paradigm of mountain defence upon which the action of the Mountain Basin Service rests can be summarized in three points:

- ensuring the stability and functional efficiency of watersheds and forests in terms of "bed-slope systems", guaranteeing the continuity of maintenance measures in the territory, of woods, of hydraulic and forest engineering works and of watercourse management;
- ensuring the safety of man and of his activities, by correctly identifying hydro-geological dangers and the compatibility of new town planning measures and by improving protection levels (with concrete measures);
- pursuing a dialogue on dangers, raising the awareness about the limits of the notion of stability of natural systems and of functionality of engineering works ("residual risk").

All this by reconciling technical functionality with environmental quality, which is only feasible through a continuous professional updating of both technicians and workers, in its turn a consequence of the choice of direct administration as the main operational form.

Conclusions

The workshop, which was attended by a large number of people, beyond the limits of the hall devoted to it, allowed good practices for the management of natural dangers on the Alps to be disseminated, with particular reference to soil erosion and hydrogeological hazards. Thanks to the speakers' ability and competency, the public, including numerous young people, had the opportunity to know two outstanding landmarks and to discuss in the detail, although with a not overly technical language, aspects that are often reported superficially and misleadingly in the news.

Session 4

The use of Alpine resources: From present to future

Moderator: Philippe Bourdeau, University of Grenoble, France

Session 4 focuses on the challenges and opportunities for sustainably managing Alpine resources in the future. Today, the future of some Alpine resources, such as traditional landscapes and human capital, depends strongly on finding a balance between economy, culture and nature. Other resources, such as Alpine tourism and energy production, are well developed but need to be adapted to future needs.

Four presentations will highlight selected key resources. Stefan Lauber will explore the future of Alpine farming and what changes in farming practices mean for other Alpine resources. Arne Arnberger will examine the changing face of tourism in the Alps, and Anna Giorgi will shift the generational spotlight to young people and their role in creating a sustainable future. Finally, Anthony Patt will discuss the potential for developing sustainable energy resources in the Alps. Discussions will draw attention to the coordination of actors, thanks to networks, collective intelligence and cooperation skills both, at local and alpine scale.

Keynote

AlpFUTUR – Prospects for Alpine summer farming

Stefan Lauber, Irmi Seidl & Rosa Böni, Swiss Federal Institute for Forest, Snow and Landscape Research WSL
Felix Herzog, Agroscope, Switzerland

Short Abstract

Alpine summer pastures are an important natural fodder source for livestock, as well as a distinctive feature of the mountain landscape in Switzerland and in many other European countries. However, in Switzerland, approximately 2400 ha of Alpine summer pastures turn into forest or are overgrown by bushes every year due to extensification and abandonment. The research programme AlpFUTUR (www.alpfutur.ch) has shown that the future of Alpine summer farming strongly depends on whether farmers can decrease their dependence on summer pasturing by increasing the forage area available on the home farms. Another major factor is the availability of dependable personnel willing to work in often remote summer pastures. Overall, the future of Alpine summer farming is a question of public payments, tradition, and public appreciation. By developing Alpine goods and services for which consumers are willing to pay higher prices, such as naturally, locally and traditionally manufactured products like Alpine cheese, Alpine summer farmers can build a viable future.

Full abstract

Every year from June to September, some 17'000 herders and cheese makers spend their summers on 7'100 summer farms in the Swiss Alps, together with almost 800'000 cows, sheep, goats and other livestock. They contribute to a varied cultural landscape, to the upkeep of species-rich grasslands and, in doing so, to the protection of settlements from natural hazards. A key source of natural fodder in the mountain regions, summer pasturing shapes one-eighth of Switzerland's surface (about 500'000 hectares) and is an important part of the Swiss identity. Unfortunately, however, summer pasturing can no longer be taken for granted, as climate and agricultural structural change are both affecting Alpine summer farming. Until 2007, very little consolidated knowledge existed about the Alpine summer farming system in Switzerland and its probable future (Baur et al. 2007) in spite of initiatives like the European TRANSHOUMANT project (Bunce et al. 2004) and the Swiss National Research Programme "Landscapes and Habitats of the Alps" (NRP 48). This is, however, an issue that demands the attention of politicians and practitioners now. To help fill the gap, the Swiss research programme "AlpFUTUR – The future of summer pastures in Switzerland" (www.alpfutur.ch) was initiated in 2007. AlpFUTUR brought together 80 researchers, consultants and transfer experts from 15 institutions to analyse Alpine summer farming in depth and disseminate advice and knowledge (Lauber et al. 2013).

Agricultural structural changes on home farms sooner or later affect the summer farms and their

Photo 1: The share of suckler cows on Swiss Alpine summer pastures is increasing (Photo: Gabriela Brändle, Agroscope).

pastures. As more and more farmers take on part-time, off-farm jobs, they replace their dairy cows with suckler cows (photo 1). Suckler cows need less fodder and lower fodder quality than dairy cows; as a result, the livestock structure and fodder demand on the summer farms change. At the same time, fewer dairy cows are even suitable for Alpine summer pasturing as advances in breeding create dairy cows with high fodder demands. Indeed, the available forage area on the home farm is a key determinant of the demand for summer pastures. The seasonal increase in forage area was traditionally – and still is – the most important reason for summer pasturing. In a representative survey, however, half of the farmers indicated a desire to increase their home farm forage area (Fischer et al. 2012). Although not all of them will achieve this goal, those who do may abandon summer farming. The high number of farmers wanting to opt-out of summer farming must be seriously considered in agricultural policy.

However, over the last ten years, the decrease in livestock sent to Alpine summer farms has been compensated for on the national level by longer summering periods enhanced by climate change. The consumed fodder amount, calculated as the product of the number of pastured animals and the duration of pasturing, has remained relatively constant. Even if there is no systematic decrease in the amount of fodder consumed, about 2'400 hectares of Alpine summer pastures are overgrown with bushes or turn into forest every year. According to the Swiss National Forest Inventory, this trend will not change in the next years (Brändli 2012). With parts of Alpine summer pastures being extensified or even abandoned, the constant amount of fodder consumed can only be explained by an intensified use of the remaining pastures. Neither intensification nor extensification/abandonment, is desirable, as both lead to a decrease in biodiversity. Only in the case of encroachment by dwarf shrubs has biodiversity been shown to increase, as these habitats often provide the right grass-shrub balance to support exclusive plant species that need the crossover conditions of the two habitats to survive (Koch et al. 2013). However, it is not yet known for which shrub-grass ratios the effects for biodiversity remain positive.

Good management practices are essential for the future of Alpine summer pastures. With proper care, the quality of pastures may even be improved. Livestock keeping, herding in a harsh natural environment, milk transformation, etc. require qualified personnel with – ideally – long experience (photo 2). The future of Alpine summer farming is therefore strongly dependent on reliable, experienced staff. It will be important to offer good working and living conditions to motivate herders and cheese makers to continue working on summer farms in the years to come, and to encourage younger generations to continue this practice.

As surveys show (e.g., Böni and Seidl 2012), consumers are willing to pay higher prices for naturally, locally and traditionally manufactured products like Alpine cheese. The profitability of Alpine summer farming can be increased by ensuring that the number of pastured animals matches the fodder potential of the summer farms, by producing milk and transforming it to cheese on the summer farm,

and by directly marketing the resulting products. It is important to note that a decrease in milk, cheese, butter or meat production has a stronger impact on profitability than a decrease in working hours and salary; it is therefore in farmers' best interests to produce such products.

The future of Alpine summer farming is as much a question of public payments as of tradition. An important fraction of farmers today continue to use summer pastures for traditional, rather than economic, reasons. As long as summer farming is coupled with a home farm, a deficit from summer farming can be compensated for. Since 2014, public payments for Alpine summer farms have increased. Together with newly introduced compensation instruments that encourage the protection of pastures and landscapes with high natural value, the increase in public payments will help the fraction of economically driven farmers to maintain summer farming.

References

- Baur P., Müller Wahl P. and Herzog F. (2007): Alpweiden im Wandel. Agrarforschung 14 (06): 254–259. With English summary.
- Böni R., Seidl I. (2012): Alpprodukte und Alpdienstleistungen – Ergebnisse einer Nachfrageerhebung bei Konsumenten und einer Befragung von Käsehändlern. Eidg. Forschungsanstalt WSL, Birmensdorf. 72 pp.
- Brändli U. B. (2012): National Forest Inventory, special analysis of LFI2, LFI3 and LFI4a. Swiss Federal Institute for Forest, Snow and Landscape Research WSL. Personal communication from 8.6.2012.
- Bunce R.G.H., Pérez-Soba M., Jongman R.H.G., Gómez Sal A., Herzog F. and Austad I. (eds.) 2004: Transhumance and Biodiversity in European Mountains. IALE Publication Series 1. IALE, Wageningen.
- Calabrese C., Mann S., Dumondel M. (2013): Alpine Farming in Switzerland: Discerning a Lifestyle-Driven Labor Supply. Review of Social Economy 2013: 1–20
- Fischer M., von Felten S. and Lauber S. (2012): Heimfutterfläche – Schlüsselparameter der Sömmerungsnachfrage. Agrarforschung Schweiz 3 (4): 194–201. With English summary.
- Koch B., Hofer G., Walter T., Edwards P. J. and Blanckenhorn W. U. (2013): Artenvielfalt auf verbuschten Alpweiden. ART-Bericht 769. Agroscope Reckenholz-Tänikon ART, Ettenhausen: 16 pp.
- Lauber S., Herzog F., Seidl I., Böni R., Bürgi M., Gmür P., Hofer G., Mann S., Raaflaub M., Schick M., Schneider M. K., and Wunderli R. (2013): Zukunft der Schweizer Alpwirtschaft. WSL, Birmensdorf, and Agroscope, Zurich: 200 pp. [Available in French with the title "Avenir de l'économie alpestre suisse" (2014) and in Italian with the title "Futuro dell'economia alpestre svizzera" (2014)]

Photo 2: In the AlpFUTUR film series "Farmer to farmer – Successful grazing management and pasture maintenance in the Swiss Alps", experienced summer farmers share their knowledge with newcomers (Video still: Renata Grünenfelder; film series see www.alpfutur.ch/transfer).

Keynote

Alpine landscapes as resources for human health and well-being: Research results and potentials for sustainable development

Arne Arnberger
University of Natural Resources and Life Sciences Vienna, Austria

Many urban societies are faced with a growing incidence of poor health because of mental stress and sedentary lifestyles. Natural and cultural landscapes are increasingly seen as a counter to hectic city living; as restorative settings and places for physical activity, they compensate for the negative psycho-physiological effects humans suffer in urban settings (Cervinka et al., 2014; Hartig & Staats, 2006; Velarde et al., 2007). Exposure to nature has been shown to lower heart rates, improve moods and reduce stress (Kaplan & Kaplan, 1989; Ulrich et al., 1991). Empirical studies suggest that natural settings are more effective at reducing stress than are built environments (Hartig et al., 2003; Van den Berg et al., 2003), and that natural environments may be particularly effective in restoring one's attention capacity (Hartig et al., 1997; Kaplan & Kaplan, 1989). If the health benefits of natural settings are so valuable, then they could play a key role in future sustainable rural development strategies.

Unfortunately, previous research assessing the psycho-physiological effects of green environments on human health has mostly contrasted built urban environments with natural environments (Hartig & Staats, 2006). Although there is substantial evidence for the restorative potential of green environments, little is known about the specific landscape components that drive this effect in humans (Van den Berg et al., 2003; Velarde et al., 2007). Thus, little information exists about which landscape qualities contribute most to the objectively or subjectively reported health effects (Hartig & Staats, 2006; Velarde et al., 2007). There is also little known about the relationship between cultural ecosystem services, such as human health and well-being, aesthetics or place identity (Daniel et al., 2012), and biodiversity and regulating, supporting and provisioning ecosystem services (Fuller et al., 2007).

Furthermore, despite the clear aesthetic appeal of mountains, research has rather neglected the role of mountainous/alpine landscapes in human health. Humans seem to develop an emotional linkage to a place through the aesthetic appeal of the landscape. This connection strengthens their relationship with the landscape, resulting in a perception of increased well-being (Parsons & Daniel, 2002). Thus, the health benefits of landscapes, especially mountainous landscapes, should be studied further.

Alpine landscapes seem to be valuable resources for human health and well-being. They provide many qualities that potentially make them to restorative environments (Wöran & Arnberger, 2012). Unfortunately, the potential health benefits of alpine landscapes are poorly documented and their potential therefore is underutilized.

If alpine landscapes are specifically effective in providing restorative effects, then such benefits can be used for sustainable regional development. New health-related services and tourism offers can strengthen the economic situation in remote alpine areas. Because the health of such a market depends on the health of the environment, such a development strategy is almost intrinsically sustainable, and an excellent means for encouraging the preservation of such valuable landscapes. If we preserve these environments, we also preserve ourselves. The restorative value of alpine landscapes should therefore play a central role in future sustainable development strategies.

This presentation provides an overview of the health effects of landscapes on humans, the relationships between biodiversity and human health and existing research gaps. It explores possibilities for using the potential restorative value of alpine landscapes for sustainable development.

References:

- Cervinka, R., Höltge, J., Pirgie, L., Schwab, M., Sudkamp, J., Haluza, D., Arnberger, A., Eder, R., & Ebenberger, M. (2014). Zur Gesundheitswirkung von Waldlandschaften. BFW-Berichte 147/2014. ISBN 978-3-7001-6098-4.
- Daniel, T. C., Muhar, A., Arnberger, A., Aznar, O., Boyd, J. W., Chan, K. M. A., Costanza, R., Elmqvist, T., Flint, C. G., Gobster, P. H., Gret-Regamey, A., Lave, R., Muhar, S., Penker, M. Ribe, R. G., Schauppenlehner, T., Sikor, T.; Soloviy, I., Spierenburg, M., Taczanowska, K., Tam, J., & von der Dunk, A. (2012). Contributions of cultural services to the ecosystem services agenda. Proceedings of the National Academy of Sciences USA, 109(23), 8812-8819.
- Hartig, T. & Staats, H. (2006). The need for psychological restoration as a determinant of environmental preferences. Journal of Environmental Psychology, 26, 215-226
- Hartig, T., Korpela, K., Evans, G. & Gährling, T. (1997). A measure of restorative quality in environments. Scandinavian Housing & Planning Research, 14, 175-194.
- Hartig, T., Evans, G. W., Lamner, L. D., Davis, D. S. & Gärling, T. (2003). Tracking restoration in natural and urban field settings. Journal of Environmental Psychology, 23, 109-123.
- Fuller, R. A., Irvine, K. N., Devine-Wright, P., Warren, P. H., & Gaston, K. J. (2007). Psychological benefits of greenspace increase with biodiversity. Biological Letters, 3, 390-394.
- Kaplan, R. & Kaplan, S. (1989). The experience of nature. A psychological perspective. New York: Cambridge University Press.
- Parsons, R. & Daniel T. C. (2002). Good looking: In defense of scenic landscape aesthetics. Landscape and Urban Planning, 60, 43–56.
- Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. Journal of Environmental Psychology, 1, 201-230.
- Van den Berg, A. E., Koole, S. L., & Van der Wulp, N. Y. (2003). Environmental preference and restoration: (How) are they related? Journal of Environmental Psychology, 23, 135-146.
- Velarde, M. D., Fry, G., & Tveit, M. (2007). Health effects of viewing landscapes - Landscape types in environmental psychology. Urban Forestry & Urban Greening, 6, 199-212.
- Wöran, B. & Arnberger, A. (2012). Exploring relationships between recreation specialization, restorative environments and mountain hikers' flow experience. Leisure Sciences, 34(2), 95-114.

Keynote

Sustainable energy production

Anthony Patt
ETH Zurich, Switzerland

Mountainous areas have traditionally been a major locus of hydroelectric power generation. For years, there have been debates about their sustainability. On the one hand, advocates of hydropower have argued that it is a clean and secure source of electricity that does not require the burning of imported fossil fuels. On the other hand, opponents of hydroelectric power have argued that it causes a great deal of local environmental harm, both in the flooded valleys upstream, and in the downstream environments that suffer from fluctuating water levels. Even pump-storage facilities, which may not have such downstream consequences, may nevertheless be controversial.

The role of hydropower in the energy system, however, is already changing. European countries are transitioning from an energy system based on fossil fuels to one based on renewable power. This is almost certainly a requirement for halting climate change; addressing climate change needs will require a 100% decarbonization of the electricity supply system, even as electricity contributes a greater share of the total energy system. Energy system planners and modelers do not expect hydropower to offer substantially more generation capacity than it does presently, simply because in most industrialized countries the best hydropower resources have already been exploited. Energy system modelers do, however, see a need for hydropower to provide flexible balancing capacity to an energy system in which two other renewable sources—wind and solar—are expected to play a major role, a likely occurrence given their high economic potential. Figure 1 shows a potential scenario for the transition of the power system, from one today where most power generators either supply base (i.e. constant) or peak load (i.e. fluctuating to meet changing demand), and only a small proportion of generation is intermittent (i.e. fluctuating on account of environmental conditions). A future scenario relying on renewable sources, with wind and solar accounting for the largest share, could easily be dominated by intermittent generation. Maintaining a reliable supply of power to consumers is thus one of the hardest challenges to overcome.

Both large capacity dams and pump storage facilities can balance the intermittency of wind and solar by providing power when either or both are inoperable on account of dark skies and calm winds. Energy system planners assume that the former can be operated more flexibly, and see a role for constructing even more of the latter. Indeed, only with both conditions met would it be possible to maintain a reliable power system relying on decentralized wind and solar power production for the majority of electricity needs. The result is that greater attention to one environmental problem (climate change) may exacerbate another (local dam impacts) in the near

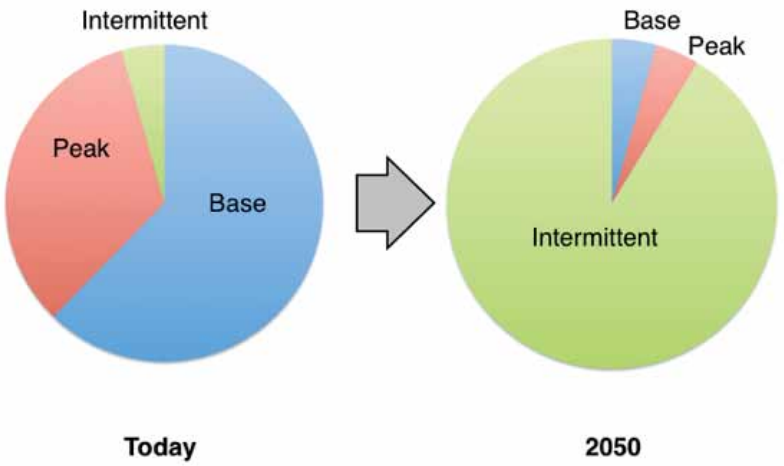


Figure 1: A plausible scenario for the transformation of the power generation system. The 2050 scenario implies a great need for energy storage in order to balance intermittent supply.

term. In workshops held over the past 18 months, the potential for such conflicts arising has become evident. An important question, then, is whether this need for flexible hydropower and pump storage is absolute, or whether there are substitutes that can still allow the achievement of climate policy goals.

Two sets of possibilities exist, and I present recent analyses for each of them. The first possibility is to construct a network of wind or solar power plants that makes use of geographic heterogeneity. If such a network is spread over a wide area with negatively correlated meteorological conditions, it may be able to provide reliable electricity without the need for other energy sources. Recent high-resolution modeling work for both wind and solar has shown this to be an option, with the most promising results in the area of concentrating solar power (CSP) utilizing short-term thermal storage. A recent analysis of four world regions suitable for CSP has revealed that in all four, CSP could satisfy a large share of the power demand in a reliable fashion. For two of those regions—the Mediterranean basin and South Africa—CSP could constitute an essentially unlimited supply of reliable power.

The second possibility lies in new battery technologies, which offer the promise of long-term grid-scale storage at an affordable price. A review of existing technologies, combined with modeling to project their cost developments over the coming years, suggests that these may in fact become feasible within the next decade. Relying on batteries for storage, however, would likely require a more distributed and decentralized storage system than currently exists.

Both of these alternatives would require deliberate choices about the future structure of the electric power system. In other words, the sustainability of mountain areas, and the conflicts between sustainability and hydropower production, may well depend on decisions in which the fate of mountain areas seems of marginal concern. An option including large quantities of CSP, for example, would require European countries to import a large share of their electricity, and imply a power system with much greater regional integration. Likewise, an option including grid-scale battery storage would likely require a different power-grid architecture, with a potential need for additional transmission and distribution lines. It is important to understand the connection between these decisions and the fate of mountain areas, given the inconvenient truth that tradeoffs will have to be made.

Keynote

Mountain resources and young people: The challenge for a sustainable future

Anna Giorgi & Guiseppe Carlo Lozzia
University of Milan, Mountain University Edolo, Italy

Mountains cover about a quarter of the Earth's surface, are found on all continents, and provide — directly or indirectly — goods and services to more than half of the world's population. The depopulation that has characterized mountain areas in recent decades is due to an array of economic, social and cultural factors including unfavourable climatic conditions, geographic isolation, difficulty accessing markets and structural changes in the economy. The inevitable repercussions of this abandonment and the resulting lack of land management affect the whole of society and range from environmental instability and degradation to the gradual disappearance of an important socio-cultural heritage.

The same conditions that today penalize the mountains from an economic and social point of view have, over time, generated the prerequisites for them to become, and in some cases remain, areas rich in biodiversity and endemic life forms; this variety is also evident in many traditional and socio-cultural aspects. Hence, mountains offer a wealth of landscapes, strategic assets such as water, soil and forests, traditional products, and recreational opportunities that, if well-managed and well-marketed, can provide promising development opportunities. Additionally, mountain regions include some of the most precious and fragile ecosystems of the world, characterized by extremely variable climatic conditions, heterogeneous habitats and unique life forms. These assets make them invaluable natural laboratories, the study of which will enable mankind to acquire knowledge useful for progress.

The recognition of the distinguishing qualities of mountain areas is essential in order to adopt measures and prepare interventions that encourage residents to remain. The protection of natural and cultural resources, the conservation of biological and socio-cultural diversity, the production of high quality traditional products and the preservation of appealing landscapes are fundamental for a sustainable management of mountain areas. If mountain areas are to become competitive they must provide "high added value" in every sector. Since such a situation is achievable only through human intervention, it is of utmost importance to invest in train-

ing and technology. The need for trained experts is, however, often at odds with a context in which an ongoing reduction of services and opportunities discourages people, especially young people, from remaining in the mountains, leading them to seek more favourable conditions elsewhere.

Encouragingly, there has been a surge of interest in mountain areas in recent years. An increasing number of young people make educational and career choices that indicate a strong inclination to remain in - or even move to - mountain communities. Initiatives that encourage this trend definitely include the Edolo University Centre project. Started in the academic year '96-'97 in cooperation with the University of Milan, Edolo University Centre is a university campus dedicated to the mountains. The Centre offers a degree course in "Conservation and Sustainable Development of Mountain Areas", a positive example of university training decentralization that is unique in Italy. The "Mountain University" has become a well-established and well-attended institution (there are currently 215 students enrolled) that combines theoretical training with practical work experience, study days and seminars in an approach specifically aimed at the development and management of mountain territories. In 2006, the Edolo University Centre expanded with the establishment of the "Centre of Applied Studies for the Sustainable Management and Protection of Mountain Areas GeSDiMont", which aims to promote, coordinate and develop scientific and applied research of agro-forestry and environmental interest.

The image that emerges from the analysis of data on the geographical origin of students confirms the opportuneness of the experience, which now attracts young people from a wide catchment area. During A.Y. 2007/2008, 59% of students were from the province of Brescia, the province in which the municipality of Edolo is situated. In the current academic year, only a third of students are from Brescia; 53% of those enrolled come from other provinces in Lombardy, and the remaining 13% are from outside the region altogether. These data demonstrate that a significant number of young people see mountains as a context in which to develop a career. In the debate about sustainable mountain development, this trend should be both recognized and welcomed.

Careful monitoring of the situation in Edolo has included a fundamental aspect, namely the career and employment opportunities of our graduates.

Research on such topics has led to an improved organization of courses, with an emphasis on making them more appropriate to the requirements of mountain areas. Out of a total of about 247 graduates to date, 76%, are currently employed (of which 64% work in mountain areas), 13% are working on a Master's degree, and the remaining 11% include those who are unemployed (4%) and or did not respond. Work sectors reflect the employment profile of mountain areas, with many opportunities in the primary sector. There is especially room for entrepreneurial agricultural activities that feature multifunctional, high quality production. Other professions combine tradition with innovation and include the management of refuges, consultancy, and environmental education, as well as technical work connected with land management.

Unfortunately, the desire of young people to work in the mountains is currently hampered by structural, bureaucratic and tax constraints that hinder the creation of new enterprises. It is therefore fundamental that institutions implement serious agricultural and rural development policies that address various issues related to the creation of new enterprises: aid for young farmers; measures for training and technical assistance; investment support; actions in favour of the promotion and marketing of products; measures to support access to land; actions to facilitate the matching of supply and demand of land and land assets. The activation of such measures could fill a void in agricultural policy and encourage the creation of new enterprises, facilitating current generational change and leading to an increase in qualified young people who see the agro-environmental mountain context as a place in which to express themselves professionally. Only with accessible land assets over the medium- to long-term can the investments and the challenging and risky activities typical of mountain agriculture be planned.

Workshop 4-1

The 30 most important questions regarding the future of Alpine resources

Alessandro Gretter, Leopold-Franzes University of Innsbruck, Austria & Fondazione Edmund Mach, Italy
Beatrice Marelli, University of Turin, Italy
Rocco Scolozzi, University of Trento, Italy

Abstract

The issue of the future(s) is considered in research and governance discussions about Alpine resources, but rarely do such discussions focus on explicit time windows or scenarios, and even more rarely on being prepared for desirable (or unwanted but possible) futures. We proposed to collaboratively identify priorities and emerging issues concerning the future of Alpine resources through a workshop (Exercise of Anticipation) involving participants in a structured open discussion inspired by the World Cafè methodology. The expected result was a shared definition of 30 questions that, if answered, would have the greatest impact on the future resilience of social-ecological systems in the Alps. Questions were defined by imagining the possible consequences of two plausible but contrasting demographic and climate scenarios. Participants were introduced to a general theoretical framework of anticipation considered useful for such exercises. The purpose of these scenarios was not to test their likelihood, but to help participants imagine multiple possible futures, not just the most mainstream or business-as-usual scenarios.

Two short talks regarding two different UNESCO initiatives provided additional food for thought and discussion. The workshop operated under the patronage of "The UNESCO Chair in Anticipatory Systems" and "Dolomites UNESCO World Heritage".

Introduction

During his speech, Alessandro Gretter drew attention to the two dimensions that are relevant for the Alps and their resources: space and time. The Alps are faced with challenges ranging in scale from the local community to the global market. Similarly, challenges span temporal boundaries, from legacies of the past to needs of the present and visions of the future. The governance of natural resources and processes is strongly influenced by past actions as well as by future expectations. These issues should be identified and studied, as they are important for stimulating possible (re)actions.

Beatrice Marelli briefly introduced the evolution of social theory over the last several decades as it pertains to the empowerment of local communities in the Alps. From Hardin's "Tragedy of the Commons" (1968) and Olson's call for collective action (1971) to Ostrom's concept of the Commons (1990) and North's revival of institutional design (1990), researchers of the last half century have developed a new framework for interpreting the complexity surrounding local communities. Indeed, Ostrom's definitions of social capital (2014) and Folke's concept of social-ecological systems (Folke et al, 2005) are particularly relevant.

Cesare Micheletti (Fondazione Dolomiti UNESCO) presented the novel approach to managing the Dolomites UNESCO World Heritage. The preservation of the site's special features must be linked with the presence of active local actors such as farmers, citizens and administrators. Various actors are already focusing on possible future scenarios and on opportunities for optimally leveraging the resources in the Dolomites.

Rocco Scolozzi discussed some issues related to the theory of anticipation. Scholars from a variety of disciplines claim to reverse the traditional approach of "using the past to understand the present" (historia magistra vitae) by instead "using the future to understand the present". Anticipation capacity is essential to individuals, organizations and communities for making better decisions in the present. If we are blind to the future, we fail to understand the present and we fail to see that the present is already bounded by the future. In reality, no action can be performed without a future component, even the simplest of choices. Nonetheless, our understanding and ability to imagine possible futures is usually very limited, and biased by past experiences or incomplete information.

For these reasons, we should try to visualize a range of possible futures. Since the future is "where we will spend the rest of our life", the quality of the future (e.g., whether we like or dislike it) becomes fundamental. The ensuing "exercise of anticipation" therefore aimed at expanding participants' perspectives about possible futures for Alpine resources. The exercise also demonstrated one approach for dealing with futures. Specifically, the exercise was designed to support the identification of directions for research and policy making based on desired futures for Alpine social-ecological systems.

Workshop: Exercise of Anticipation

The objective of this exercise was to enlarge participants' perception of the future and to encourage them to consider multiple future scenarios, including less mainstream possibilities. The exercise encouraged participants to consider the probable consequences of these scenarios on Alpine resources. The expected result was a shared definition of the most relevant questions about the management of Alpine resources. The workshop consisted of three phases:

- Presentation of two divergent scenarios (increasing vs. decreasing Alpine population, warmer vs. cooler climate);
- Anticipation of consequences for Alpine resources within the two proposed scenarios in smaller working groups;
- Collection of insights from the imagination exercise and definition of the most relevant questions.

The five working groups included participants (7-9 each) from all over the Alps, ranging from high school students to seniors scientists. Each group had the option of focusing on Natural Resources (ecosystem services) or on Cultural Resources (institutions, landscapes).

Two rounds of discussion entailed a different scenario each. In the first round, population growth was considered under opposite climate scenarios (warmer vs. cooler). In the second round, population decline was considered. The third and final round allowed participants to compare and contrast the results of the first two rounds, and to compose a list of key questions.

Results

In the working groups, participants first identified the issues and variables most directly impacted by the given scenario. Among the relevant issues affected by scenarios were:

- Durability of glaciers
- Accessibility and demand for transportation
- Water scarcity and water distribution (potential conflicts)
- Population concentration on the valley floors

- Local identity and traditional governance of natural resources
- Integration of immigrants and foreigners
- Changes in hydroelectricity production
- Changes of crops (or productivity)

After considering the scenarios and their related issues and consequences, a number of meaningful questions emerged:

- How can traditions be maintained?
- How should an educational system that can meet demand be developed?
- How will agricultural activities change due to climate change?
- How should overpopulation in villages be managed?
- How to preserve glaciers?
- How to conserve and enhance cultural goods?
- How to attract new inhabitants to the Alps?
- How to attract and integrate foreign immigrants in the Alps?
- How to preserve local traditions and identity?
- How to develop innovative actions in cultural, societal and economic sectors?
- Is it possible to return to the ancient and traditional management of Alpine economies?
- How should innovation and tradition be balanced?
- How is it possible for many people to live together without harming the environment and historical city centres?
- How can institutions retain their constituents' trust?
- How should institutions be adapted to gain know-how for adaptation in crisis?
- Where and how will (50%) more people be accommodated, transported, entertained, fed, etc.?
- How can we provide water and energy supplies and new sewage systems with a minimum of emissions?
- What is the best way to protect Alpine landscapes (forests, pastures, agricultural land) from urbanization?
- Are "underground" cities, inspired by cavemen, a solution for an uncertain future in the Alps?
- What is needed to achieve a zero emission society, and to motivate people to shape it?

During the concluding plenary session, questions and comments about the methodology and anticipation applications were shared.

Conclusion

Participants confirmed that they are not used to thinking about multiple possible futures. Typically, such exercises are restricted to decision-making processes in which the participants are seldom involved, and even then multiple futures are rarely considered.

We found that we had over-simplified the proposed scenarios; in the future, the scenarios should be enriched and more grounded in data and expert opinion. There was also not enough time to explore the two different targets (cultural resources and natural resources) in sufficient detail. Given such time limitations, it may be more effective to provide less input during future exercises. Nevertheless, the exercise clearly inspired a change in perspective and was useful for define deeper questions about the future of Alpine resources.

The questions that emerged from this workshop highlight interconnected topics like water management, population, innovation and tradition, most of which entail trade-offs sensitive to community identity and initiative. Overlapping insights by participants facilitated common visions of desired futures. These visions may guide the next actions in research and policy-making towards more resilient social-ecological system in the Alps.

Workshop 4-2

Biodiversity and sustainable management of Alpine agro-ecosystems

Stefano Bocchi
University of Milan, Italy

Contributions

- *Innovative monitoring and analysis techniques for the sustainable management of Alpine agroecosystems*
  Fausto Gusmeroli, Fondazione Fojanini
- *Remote sensing applications for Alpine semi-natural system management and conservation*
  Francesco Fava, University of Milano-Bicocca
- *Educational path through Alpine biodiversity*
  Mario Pierik, University of Milan

The workshop dealt with certain aspects concerning the knowledge, preservation and appreciation of biodiversity in the Alpine environment. Alpine agro-ecosystems mainly comprise permanent grasslands (meadows and pastures): these are semi-natural or sub-natural areas that retain some parts and functions of natural ecosystems. Although biodiversity cannot be considered their attractor, it is still essential to them at all levels of their structure: genetics, organisms, ecology and landscape.

In these agro-ecosystems, biodiversity can be investigated using naturalistic or agronomic methods. The former method places more emphasis on ecological factors and is based on phyto-sociological surveys. Such surveys provide an accurate assessment of biodiversity in terms of richness (number of components), but only approximate an approximate assessment of the biodiversity structure (quantitative distribution of the components). The agronomic method puts more emphasis on the productive aspects, and is based on phyto-pastoral surveys that are more precise in evaluating the structure of the biodiversity rather than its richness. And then there are more rapid methods proposed when applying agro-environmental support measures and when estimating the values of ecosystem services. These procedures refer to the presence of indicator species, which leads to partial but quick biodiversity estimates that are easily understood by non-expert observers.

Biodiversity should be maintained at all levels and by engaging all relevant stakeholders, from the farmers who manage the agro-ecosystems to the decision-makers who determine the policies for governing the territories. It is also important to increase awareness and to educate the public to recognise and respect biodiversity. Educational courses are an effective tool, particularly in mountain areas where, in just a small space, many different ecosystems and habitats can be found in quick succession.

Also described during the meeting were the main techniques for regional scale monitoring using remote sensing principles and tools. These non-destructive techniques are very effective for analysing, by means of the traditional and new-generation indices of vegetation, the behaviour of forest, pasture and grassland systems.

Workshop 4-3

The wood-based bio-refinery: A new value-added opportunity for mountain areas

Daniele Colombo
Lombardy Green Chemistry Cluster
Milan, Italy

Introduction

The goal of this workshop was to open the debate about the most innovative strategies for extending the wood value chain beyond traditional uses and energy production. The goal is to implement a cascading use approach, where added value components are extracted all the way down to energy production. Rainer Bush and Thomas Timmel introduced two fairly advanced wood-based biomass efforts in Germany and Austria, respectively. In addition, Giovanna Speranza introduced the Velica project in Lombardy; although this particular project is not focused on wood, it nevertheless represents a perfect example of a modern approach to the use of biomass.

BioEconomy Cluster
Rainer Bush, BioEconomy, Halle, Germany

In his presentation, Rainer Bush focused on an integrated approach to the material and energetic use of non-food biomass (the Leuna Project), especially beech wood, which is particularly abundant in the area. The project benefits from the long-established chemical tradition of the local industry and the high concentration of local research institutions: the two can cooperate to implement advanced value chains based on beech wood. The BioEconomy cluster was founded in 2012 with the support of the Ministry of Sciences and Economic Affairs of the Federal State Saxony-Anhalt. In 2013, ThyssenKrupp opened a multi-fermentation plant, and Global Bioenergies inaugurated an iso-butene pilot plant. The cluster currently has an 80 M€ R&D-Budget, 25 joint R&D projects and 63 members (41 enterprises, 22 research/education).

Flippr°- Future Lignin and Pulp Processing Research
Thomas Timmel, Flippr Project, Gratwein, Austria

Flippr° (Future Lignin and Pulp Processing Research) is an Austrian-based research project focusing on the advanced uses of lignin (coatings, decolourisation, adhesives, soil conditioner) and fibre fines (fractionation, non-paper applications, physical and chemical modifications). The project will run for 4 years with a total budget of 6M€, and is supported by four pulp and paper companies and by governments and research institutions. Flippr° examines the economic potential of new lignin and pulp processing technologies based on scientific analysis, technological application and economic proof-of-concept.

The Velica project: Materials and products for the future derived from crops of the past
Giovanna Speranza, University of Milan, Italy

The VeLiCa project reviews the history of flax and

hemp cultivation in Regione Lombardia and explores options for new products derived from these historical crops. This 5 million euro project has been 50% financed by Regione Lombardia and has a special emphasis on the training of young people. Although it does not focus on wood materials, VeLiCa is a good example of a modern approach to efficiently exploiting biomass for new purposes.

High value added products from lignocellulosic raw materials
Graziano Elegir, Innovhub, Milan, Italy

The paper and board industries compete heavily with the energy sector for wood as a raw resource. This has prompted the launch of a number of different projects exploring the potential for locally based lignocellulosic waste residues to complement wood-based fibres. Residues from coffee bean skins, tea leaves, tomatoes and rice husks may be valuable supplements for downstream manufacturing industries (e.g., food, feed, chemicals, pharma, cosmetics, materials). For example, rice husks account for about 20% of the weight of rice and are the principal side products in the rice milling process. Because of the elevated ash and lignin content, these residues are not appropriate for animal feed and have historically been burned or dumped in landfills. At present, rice husks still have little commercial value; in Italy, a ton of rice husk costs 30€. However, new advances have shown that rice husk residues can be used to produce biogas, bio-plastic films, renewable bio-based composites, bioethanol, paper products and nano-cellulose.

Workshop 4-4

Biosphere reserve landscapes as resources for human health and well-being

Renate Eder & Arne Arnberger, University of Natural Resources and Life Sciences Vienna, Austria
Günter Köck, Austrian Man and Biosphere Committee, Austrian Academy of Sciences

Topic and programme of the workshop

Historic and natural landscapes such as Alpine pastures and natural forests harbour not only a high biodiversity, but can also attract tourists and positively influence human health. Today's Western societies are faced with a growing incidence of poor health due to mental stress and sedentary lifestyles. Cultural and natural landscapes are increasingly seen as restorative settings for humans, compensating for the negative psychophysiological effects experienced in more urban settings. The extent of these positive effects, however, may depend on the quality of the landscape. This workshop discussed the potential benefits of mountainous (biosphere reserves) landscapes for human health and well-being.

The workshop started with two input presentations, "Biosphere reserves as model regions for sustainable development" and "Are biosphere reserve landscapes resources for human health and well-being?" The presentations were followed by a moderated group discussion on the potential of biosphere reserve landscapes for human health and well-being based on the following questions:

- Which mountainous landscapes might be particularly restorative for humans?
- Do you know of any existing human health offers that focus on mountainous landscapes?
- What do you think about the potential of mountainous landscapes for health-related offers?

The audience of the workshop was quite heterogeneous. A class of Italian pupils joined the workshop, so we adjusted the programme to motivate the adolescents to join the discussion and to guarantee that their opinions could be fully considered. Rather than focusing specifically on biosphere reserve landscapes, we opened the discussion to include all types of landscapes typical to Italy and the Alps.

Biosphere reserves as model regions for sustainable development

Following the aims of The Man and the Biosphere Programme (MAB) of the UNESCO, biosphere reserves should promote and demonstrate a balanced relationship between humans and the biosphere model regions for sustainable development. Biosphere reserves are learning sites for sustainable development for policy professionals, decision-makers, research and scientific communities, management practitioners and stakeholder communities. Biosphere reserves are thus globally considered as sites of excellence, where new and optimal practices for managing nature and human activities are tested and demonstrated. According to the 1995 UNESCO Sevilla Strategy, biosphere reserves should serve three main, interconnected functions:

- Conservation: Protection of natural areas and historic cultural landscapes, cultural and biological diversity, ecosystem services, and genetic resources.
- Development: Demonstrate sound and innovative sustainable development practices and policies and foster the use of traditional knowledge in ecosystem management. Sustainable development is fostered by local inhabitants and enterprises with often highly innovative and participative governance systems.
- Logistic support/knowledge generation: Support for demonstration projects through policy, research and monitoring; support for (environmental) education and training; knowledge support through the global network of biosphere reserves.

In 2014, the World Network of Biosphere Reserves consisted of 631 biosphere reserves in 119 countries. Of these, 48 biosphere reserves are located in the Alpine countries (e.g., "Großes Walsertal" in Austria, "Entlebuch" in Switzerland and "Area della Biosfera del Monviso" in Italy).

Are biosphere reserve landscapes resources for human health and well-being?

The presentation focused on three case studies that investigate the potential of different landscape types for human health and well-being. The outcomes of the studies provide a better understanding of the relationship between landscapes and human health and well-being. The studies were carried out in the Wienerwald Biosphere Reserve (WWBR), located in Vienna and Lower Austria. About 750,000 inhabitants live in the region. The reserve encompasses a hilly region that is characterized by many forest (beech, oak, pine) and meadow types, vineyards and riverscapes. More than 2000 plant species are found within the reserve. The main challenges of the WWBR are urbanisation, the maintenance of extensive dry meadows, and intensive visitation. Table 1 provides an overview of the different approaches and target groups of the presented studies. Initial results indicate that a stay in specific landscapes (meadows, forests, vineyards) positively affect human well-being. Results also showed that different age and professional groups prefer different landscape settings.

Results of the moderated group discussion

Question 1: Which mountainous landscapes might be particularly restorative for humans?

The group worked on a list of areas that might be relevant for human health and well-being. In a second step, a ranking system was developed to identify which of the named landscape types might be most effective for restoring human health (see table 2). Mountainous and marine landscapes were perceived as most restorative; vineyards, riverscapes and glaciers were considered less effective. The pupils favoured the sea as a restorative setting, while older participants listed a wider variety of natural and cultural landscapes.

Studies	**Biosphere People** Local residents' views on the Wienerwald Biosphere Reserve	**A break please!** Adolescents document and investigate places for their cognitive restoration	**HealthSpaces** Biosphere Reserve Landscapes and Human Health Benefits
Sample	Local residents of WWBR	Pupils of Vienna	Probands of different ages and professions in Vienna & WWBR
Landscapes investigated	Whole WWBR	Different green spaces in Vienna and the WWBR	Different landscape types of the WWBR
Exposition	Population survey	Field experiment	Field experiment
Methods & measures	Written questionnaire about acceptance of WWBR, landscape perception & health	Human well-being (mood scale); cognitive & physical health (e.g. pulse, peak flow)	Human well-being (mood scale); cognitive & physical health (e.g. pulse, blood pressure)
Funding	Man and the Biosphere Programme	Sparkling Science Programme	Man and the Biosphere Programme

Table 1: Overview of the presented studies
For more information see: www.boku.ac.at and https://forschung.boku.ac.at/fis/suchen.person_projekte?sprache_in=en&ansicht_in=&menue_id_in=103&id_in=4547&laufzeit_in=laufend

Question 2: Do you know of any existing human health offers that focus on mountainous landscapes?

The participants listed traditional health-related offers like SPA, the use of etheric oils for therapies, and kneippism. They also mentioned activities like hiking, cycling and climbing. However, few people were aware of any offers that specifically address the relationship between human health and well-being and the Alpine landscape.

Question 3: What do you think about the potential of mountainous landscapes for health-related offers?

The participants agreed that Alpine landscapes have a great potential for health-related offers. The discussion focussed on individual restorative needs and landscape preferences. Humans instinctively seek places where they can relax, such as the sea, forests or mountains. However, the reported health effects are psychological in nature and therefore difficult to quantify. Measuring the physical effects of restorative environments on human health (e.g., blood pressure, heart rate variability, cortisol levels etc.) is a useful way to document the effectiveness of a particular setting.

We also discussed the issue of conflicts between user groups, which can diminish the health effects of natural settings (e.g., conflicts between mountain bikers and hikers). A separation of conflicting user groups might be useful on recreational trails. Good visitor management is essential for regions that focus on the health-related effects of their landscapes.

Named landscape types	Votes	Rank
mountains	9	1
seas	7	2
mixed forest	6	3
lakes	5	4
mountain meadows	4	5
historic landscapes	4	5
historic cities	4	5
mix of natural and cultural landscapes	3	6
vineyards	2	7
glaciers	2	7
rocks	2	7
riverscapes	2	7
gorges	1	8

Table 2: List of "healthy" landscape types

The adult participants also emphasised the importance of communicating the positive effects of natural landscapes on well-being to children. One important communication channel could be schools. For example, researchers could visit schools to demonstrate scientific results about the importance of visits to nature or they could work together with pupils on small scientific projects on this topic. Offers like forest school days or excursions to biosphere reserve landscapes could be another possibility.

Conclusions

The workshop demonstrated that the possible positive effects of landscapes on human health and well-being are currently underexploited. Offers specifically addressing the relationship between human health and well-being and mountain landscapes are hardly known. Nevertheless, the participants were convinced that these landscapes are valuable resources and that they should be used to aid economic regional development in Alpine regions. It is therefore essential to communicate the value of these areas to policy makers, land owners, and regional and protected area managers. More research is needed to help stakeholders determine how to best leverage the health effects of mountain landscapes, and to provide empirical evidence about their health effects.

References

- Cervinka, R., Höltge, J., Pirgie, L., Schwab, M., Sudkamp, J., Haluza, D., Arnberger, A., Eder, R., & Ebenberger, M. (2014). Zur Gesundheitswirkung von Waldlandschaften. BFW-Berichte 147/2014. ISBN 978-3-7001-6098-4.
- Eder Renate, Allex Brigitte, Ebenberger Martin, Griesbach Andrea, Stummer Romana, Arnberger Arne (2014). Should it be grey, green or blue? Adolescents' preferences for restorative settings. In: Federal Office for the Environment, Crossing Boundaries, Urban Forests - Green Cities, EFUF 2014., p. 49.
- Eder, R., Allex, B., Arnberger, A., Hutter, H.-P., Kundi, M., Damm, L., Piegler, B., Wallner, P., Tappler, P. (2013): Where to reload my batteries? Viennese adolescents document and investigate places for their cognitive restoration. In: ERSAF, The Walking Forest - A Dynamic Infrastructure For Our Cities – EFUF 2013, p. 104.
- Hartig, T., Evans, G. W., Lamner, L. D., Davis, D. S. & Gärling, T. (2003). Tracking restoration in natural and urban field settings. Journal of Environmental Psychology, 23, 109-123.
- Kaplan, R. & Kaplan, S. (1989). The experience of nature. A psychological perspective. New York: Cambridge University Press.
- Wöran, B. & Arnberger, A. (2012). Exploring relationships between recreation specialization, restorative environments and mountain hikers' flow experience. Leisure Sciences, 34(2), 95-114.

Workshop 4-5

Innovative and sustainable business in the Alpine area

Giovanni Ferrazzi, Stefano Corsi & Guido Agnelli
University of Milan, Italy

The development of the Alpine area increasingly depends on the expansion of innovative and sustainable businesses. Multifunctional agriculture and sustainable tourism and services represent the key factors for preserving natural resources and, simultaneously, for increasing quality of life and employment in the Alpine area.

Agriculture still constitutes one of the main economic activities in mountain regions, but it faces multiple difficulties due to the intrinsic marginality of mountain areas in European countries. A lack of infrastructure and services and poor demographic stratification due to emigration has affected the region's ability to renovate and to invest in agriculture. Challenging climatic conditions and poor soils contribute to a lower agricultural productivity compared to farmlands in the more fertile lowland areas. These factors drive a positive feedback cycle in which the absence of infrastructure and economic initiative results in a demographic decline that leads to a further decrease in investments in innovation and infrastructure that in turn causes yet more young people to leave the region. Nevertheless, mountain agriculture is still an important economic factor in Europe, representing 15% of European utilized agricultural area (UAA) and 18% of farms that employ 18% of the labour force. Agriculture also plays an important role in the economic, environmental and cultural identity of these less favoured mountainous areas. The conservation and revitalization of mountain agriculture is therefore an important goal for both local governments and the European Union.
The analysis of statistical data from Europe's Alpine regions shows a greater decrease in the number of Alpine farms than in UAA. Between 2000 and 2010, this trend is seen in France (-30,9% farms and -7,1% UAA), Italy (-34,1% farms, -8,4% UAA), Slovenia (-9,5% farms, -5,1% UAA) and Switzerland (-16,7% farms, -1,4% UAA). Austria shows a different trend in which a decrease in UAA seems to drive a decline in the number of farms (-15,6% farms, -29,3% UAA). With the exception of Austria, these data suggest an increase in medium-sized farms. Although this may lead to a more efficient and competitive agricultural system, it also means that there will be fewer employment opportunities in the agricultural sector.

We have also considered two particular types of agriculture in the period between 2000-2010: permanent grasslands and pastures, which are representative of an agricultural model particularly widespread in mountains, and viticulture, an intensive and profitable form of agriculture. Italy and France show similar trends with respect to both pastures and viticulture, with a stronger decrease in farm numbers than in UAA. In contrast, Slovenia and Switzerland show a decrease in the number of farms (-12% and -18%, respectively) and an increase in UAA (+0,7 Slovenia and +8,4 Switzerland). With

the exception of France, viticulture in all countries is associated with an increase in UAA and a decrease in the number of holdings. In Italy, where viticulture has a strong tradition and diffusion, UAA has increased 8.4%, while the number of holdings has declined -34% over the same period. In Slovenia, holdings decreased by 17% and UAA increased 18%. Austria has seen a strong increase in both farms and UAA (more than 200% for both).

Multifunctionality in mountain farms in Lombardia

A strong process of depopulation has affected the mountains of Lombardy over the last 50 years. As shown by an agricultural census covering 1982 to 2010, the number of farms has decreased by 74% and UAA by 40%. Thus, we find on one hand an increase in medium-sized farms, yet an overall abandonment of agricultural activities. This is particularly true with regard to permanent grasslands and pastures, which declined by 38% between 1982 and 2010. Small farms (<5 hectares) have been most affected by this process. Between 2000 and 2010 alone, there was a 41% decline in the number of small farms in Lombardy, or a loss of 6700 productive units. Although the endogenous low profitability of agricultural activity in mountain regions was a fundamental cause, sociological processes also undoubtedly played a major role. Employment opportunities and service availability in urbanized lowland areas in particular draw people from the mountains

Multi-functionality is an intrinsic characteristic of agriculture activity. Not only does agriculture produce primary goods, like food and fibres, it also shapes landscapes, builds community and positively or negatively affects the environment. Furthermore, some activities attributable to multi-functionality, such as tourism and education, can constitute an additional source of income for the farmer. Of all the multifunctional farms in Lombardy, 34% are located in mountain municipalities; the Common Agricultural Policy (CAP) and the Rural Development Programme (RDP) of Lombardia are decisively incentivizing this evolution. What are the drivers that influence or determine the extent to which an agricultural system is multifunctional is therefore a question of considerable interest that may have a strong influence on policy design.

To answer it, we used a regressive approach to identify the key drivers of agricultural multi-functionality in the Lombard mountain region. We used agricultural and population census data at the municipality scale for 2000 and 2010. As the dependent variable, we took the sum of all farms in a municipality with at least one multifunctional activity. As independent variables, we used UAA, ESU (European Size Unit), average farmer age, regional Rural Development Programme payments, municipality population density, municipality average age, percentage of municipal territory in protected areas, degree of urbanization, and the difference in the number of farms between 2000 and 2010.

The variables UAA, ESU, public payments and decrease in farm numbers have a significant relationship with multi-functionality. UAA has a negative effect on multi-functionality, which could mean that in agriculture-oriented municipalities where an intensive production model prevails, multifunctional activities are not developed because pure agricultural activity still constitutes the main source of income for farmers. On the other hand, in municipalities where UAA is low, multi-functionality and differentiation are more important. ESU positively affects multi-functionality, which may be due to the positive effect of multi-functionality on farm incomes or to the greater capacity of strong farms to invest and innovate. At municipal level, the decrease in the number of farms positively affects multifunctional activities, which can be a good strategy for enhancing competitiveness. Finally, public payments have a positive effect on multi-functionality, probably because many public payments are specifically created to support and encourage multifunctional activities.

Saffron in the Alps: An opportunity for "new" income

Vallecamonica is naturally suited to cultivation thanks to its temperate climate and rich soil. The presence of sunny, terraced slopes and loose, rich, well-drained soil create ideal conditions for the cultivation of saffron (Crocus sativus L.). A valuable spice, saffron is derived from the dried stigmas of a bulbous perennial hermaphrodite belonging to the family Iridaceae. The cultivation of saffron is a multifunctional activity that can generate a good return even if the saffron plots are small or marginal. In addition, C. sativus can be sustainably and profitably grown alongside other local crops. In light of these considerations, this portion of the workshop was devoted to presenting and discussing the results of some multi-year field experiments that tested the economic viability of saffron production in the Vallecamonica.

The monitoring of field trials has shown that the climatic characteristics of Vallecamonica are suitable for the cultivation of this precious spice, and that agronomic and qualitative factors are optimal. All analysed samples were classified in the highest quality class, in accordance with the ISO standard 3632/2003. An economic evaluation of saffron cultivation in Vallecamonica shows that the first year of cultivation is cost-intensive due to the need to purchase corms and to prepare the soil for planting. Costs decrease in subsequent years; the greatest recurring cost is due to the manual labour required for harvesting saffron. However, if the farmer family can harvest the saffron themselves, production costs are minimized. Over time, the production potential of a field of saffron increases, thereby increasing the economic gain of the farmer. This study has shown that quality saffron production in Vallecamonica has considerable economic potential and is therefore a good candidate as a new source of income for multifunctional farms in the mountains.

Workshop 4-6

Impact of climate change on a fundamental Alpine resource: Water
A contribution from the SHARE-Alps network

Guglielmina Diolaiuti, University of Milan, Italy
Elisa Vuillermoz, EvK2CNR, Bergamo, Italy

The Alpine water resource is crucial not just for mountain areas but also for all the systems in the hills and plains that depend on it to different extents. Climate Change is having an impact on this resource in various ways, with effects also on the human and economic systems. For this reason it is essential to have meteorological, atmospheric and hydrological data acquired in key sites of our mountains so that processes underway can be described and to model their evolution and effects on water.

The workshop was an occasion to present the results of the most recent research in the climate, hydrology, glaciology and applied geology fields to administrators, experts and those affected, and a presentation was made of the SHARE Alps network, with the results achieved to date and the databank produced. This was followed by a debate with the representatives of the network, offering the possibility to request to view the available data collected (historical and real time).

Five reports were requested and presented at the Workshop which addressed the issue from various points of view. The first two reports set out the Analysis of need i.e. to learn about water and its variability in our mountains and the expected effects of its variations according to different scenarios of climate change. Another two reports came from representatives of the pilot projects and/or observation stations, and these illustrated some strategies for a better present and future understanding of the blue gold of the Alps and the results already achieved. The works were concluded with a report describing the SHARE and SHARE-Alps network, which stressed the importance of knowledge for better management: databases and their accessibility, to make all citizens (not just those resident in the mountains) aware and attentive in managing a valuable resource.

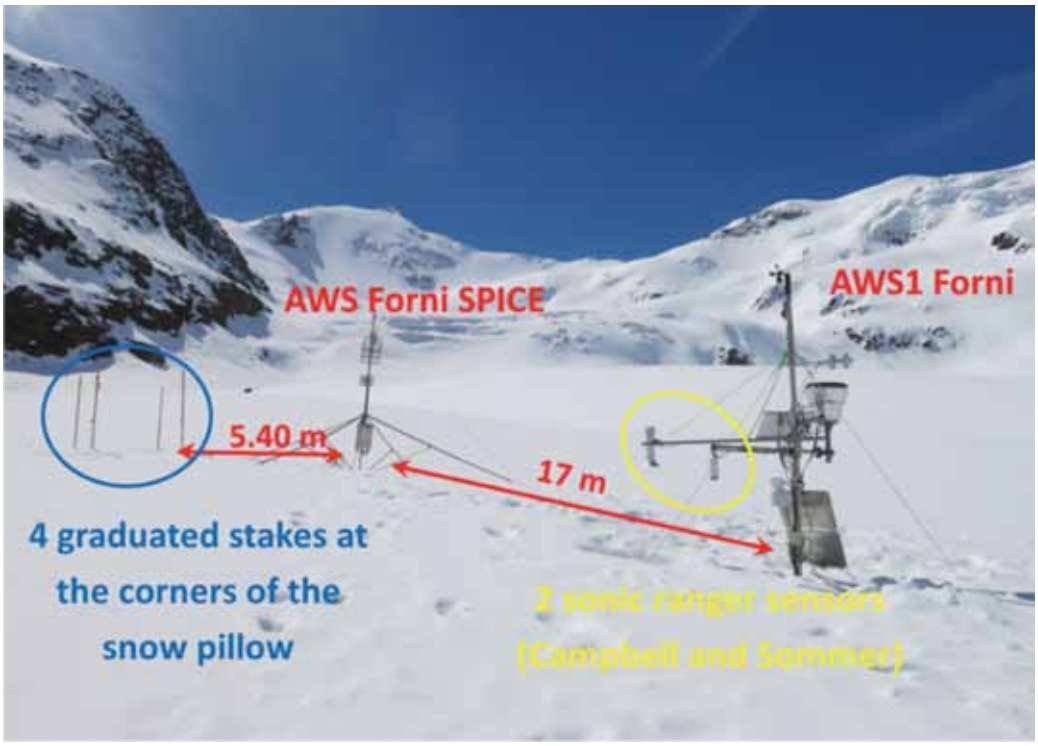
The first report came from Carlo D'Agata of the University of Milan who described the recent changes (1981-2007) in the glaciers of Lombardy. D'Agata said that the volume of water locked up in the glaciers of Lombardy is moderate compared to the other reserves, and there is estimated to be approximately 4 billion m^3 of water distributed over a currently glaciated area of roughly 85 km^2. However, this small quantity partly becomes available in the summer period when the high temperatures and the dry periods could otherwise make the rivers, streams and canals dangerously low, with consequent effects on the various users. But how much water do glaciers release every summer? How can the blue gold that flows from the cold heart of the Lombardy Alps be quantified?

There are various methods which include analysis of spatial data such as aerial photos and the Digital Ele-

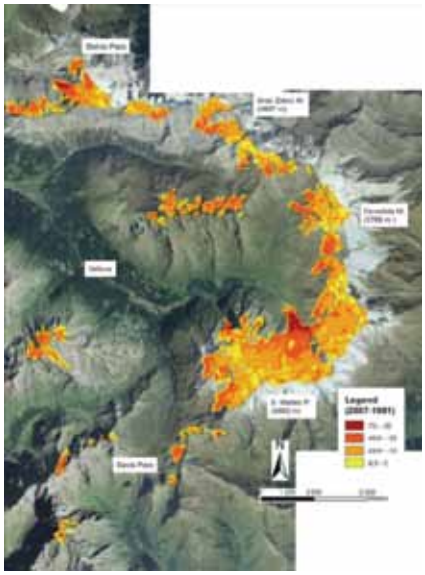
vation Models (DEM, 3D representations of the territory for analysis of changes in the elevation plane extended to large areas), and also field surveys in specific sites selected for their representativeness and accessibility to precisely check the validity of the data obtained from the remote analysis. A profitable collaboration between researchers of the University of Milan (Department of Earth Sciences "A. Desio") and the ITT Service of the Lombardy Region has enabled such analysis to be in progress for quite a long time in Lombardy. The results obtained are extremely interesting and have revealed how much water has been released from the Lombardy glaciers in recent decades. The ITT of the Lombardy Region made available the high resolution Digital Elevation Models for the years 1981 to 2007. By comparing the DEMs, it has been possible to quantify the volume shrinkage of Lombardy glaciers over this period of time.

Apart from the Orobie mountain range where there are only few glaciers of very small size with a negligible quantity of locked-in and released water (notwithstanding its very high importance in terms of landscape and nature), the analysis of all the mountain ranges in the region showed that the glaciers in Lombardy have lost 1663 million m^3 of ice in the period 1981-2007 (about 1.5 km^3 of water released, i.e. 1496 billion litres of water in 26 years!). The total volume lost compared to the surface covered by glaciers in 1981 leads to estimating an average loss of thickness of Lombardy glaciers amounting to 18 m of ice, equivalent to an annual thinning of 0.7 m of ice. This average thinning accords with the data for glacier thickness loss recorded every year by ground measures on selected glaciers in Lombardy, including the Sforzellina Glacier at the Gavia Pass, monitored for variations in thickness and mass since 1986 and the Dosdè Orientale in Val Viola, bordering on Switzerland, monitored since 1995. If the average annual loss evaluated in all the Lombardy glaciers (-0.7 m of ice) is extended to the entire present day Lombardy glacial area (85km^2), it can be estimated that the average release from glaciers in the summer is over 54 million m^3 of water. Every summer, this quantity leaves the cold heart of the Alps and flows into streams, rivers and lakes precisely in the period when there is most need.

In his report, Dr D'Agata also spoke of the serious decline in the Lombard glacier resource shown by the intense fragmentation suffered by the glaciers



The automatic meteorological station installed on the Forni Glacier. To the right, the structure installed in September 2005 (AWS1 Forni) on which there are all the main weather sensors including ultrasonic ones for measuring snow accumulation (yellow circle). To the left, the structure installed for the SPICE-WMO (AWS Forni SPICE) project to which is attached the snow pillow (blue circle). Four graduated stakes periodically photographed by a webcam located on a pole of the station complete the instrumentation.



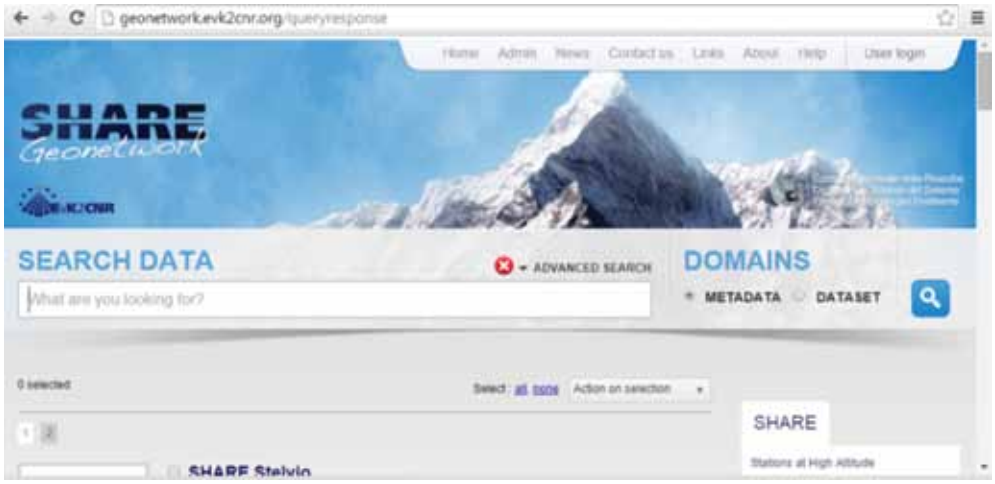
Thickness variation of glaciers in the Ortles Cevedale Lombardo Group quantified for the period 1981-2007 by comparing DEMs provided by the ITT of the Lombardy Region. The analysis was conducted as part of the SHARE Stelvio project, relating to SHARE, and funded by the Lombardy Region. The data can be viewed at the Share GEONetwork portal. The results obtained indicate that, in the 26 years of analysis, the ice in the glaciers in the Ortles Cevedale group, Lombard sector, decreased by 766 million m³ (corresponding to a release of water of about 702 million m³). The average annual rate of thinning has been 0.7 m, in accord with the land measures carried out on some sample glaciers.

(which have increased in number in the last thirty years, going from 140 in 1981 to 308 in 2007) and by the considerable reduction in area (on average, 30% smaller area compared to the amount in 1981). The reduction in the Alpine glaciers owing to climate change will lead, over time, also to a reduction in the volume of water released by the ice in Lombardy. Suffice it to say that, in the early 1990s, the seasonal water release resulting from the melting ice has been estimated at 10% greater than the current amount because of the greater surface area of glaciers at that time.

The report of Maurizio Maugeri, climatologist at the University of Milan, concentrated on the impacts of climate change on water availability in the Alps and particularly on the water usable in the future for generating hydroelectric power. Maugeri reported the results of a recent project (ECLISE: Enabling CLimate Information Services for Europe) where CNR ISAC and UNIMI estimated the past, present and future productivity of a sample reservoir based on temperature and precipitation reconstructed for each point of a high resolution grid that describes the territory analysed. The results of the project show that the virtual series (reconstructed based on climatology and then spatialized) of temperature and precipitation are very useful instruments for evaluating the potential productivity of a reservoir where a hydroelectric plant is located. Specifically, it emerged how a key role in the future could be held by the projected temperatures that could significantly impact the SWE (snow water equivalent) and thus the water available for the electricity generating plants.

The second part of the workshop, which focused on strategies and observational and monitoring networks, began with a report from PhD Ing Daniele Bocchiola, hydrologist at the Politecnico di Milano (POLIMI), who presented the hydrological monitoring network IDROSTELVIO that POLIMI developed jointly with the University of Milan (UNIMI) for Stelvio National Park (Lombard sector) in 2010. The network is owned by the Park but its management has been entrusted to the researchers and technicians of POLIMI and UNIMI who designed it. There are 11 active hydrometric stations located in key points of the Park i.e. high altitude streams and water courses mainly fed by the snow and glacier melt waters and by the melting of permafrost. The data collected so far have been entered in a database very useful to the administrators of the Park who have been able, for the first time, to correctly quantify the water resources of this large protected area. The data collected also means it is possible to calibrate and validate the outflow models developed by researchers of POLIMI and which will be applied to various scenarios of climate change to project the water availability expected in the future in the largest protected area of Lombardy.

Antonella Senese of the University of Milan described the meteo-glacier monitoring network of UNIMI managed in collaboration with the Associazione Riconosciuta EvK2CNR. The network, consisting of three permanent supra-glacial stations located in key areas of the Italian Alps, acquires the main meteorological parameters and the energy flows responsible for melting directly from the surface of the glaciers. The data acquired are both recorded by the stations and sent via radio-modem and GSM to the UNIMI and EvK2CNR laboratories where they are processed, validated and stored in databases accessible to the scientific community and also to citizens. These stations, initially included in the



Opening page of Share GEONetwork from which users can access interactive maps (via Web GIS), metadata and data relating to the SHARE project and to the observation stations belonging to the EvK2CNR network.

high-altitude monitoring network SHARE (Stations at High Altitude for Research on the Environment), promoted and managed by EvK2CNR, also belong to other prestigious networks such as GEWEC and, recently, SPICE-WMO. This last is an experiment of the World Meteorological Organisation for collecting and comparing snow data in key areas of the planet using different tools and sensors to set out the most correct and effective measuring and monitoring protocols in the various climatic areas.

In Italy, only one site has been admitted to the experiment: it is the Forni Glacier and specifically relates to the supra-glacial station UNIMI-SHARE that has been active here since September 2005. For SPICE, the Forni site was provided with two ultrasonic sensors to measure the snow accumulation, with a snow pillow to evaluate in real-time the SWE and with a camera focused on 4 graduated stakes taking a picture every hour to assess the thickness of the snow cover on the ground. Additionally, every two weeks, SWE readings are taken with an Enel Valtecne snow-weighing tube and a snow trench is dug in accordance with the AINEVA standards. In her report, Senese also highlighted the important results achieved up to now thanks to the presence of supra-glacial stations that not only correctly describe the glacial micro-meteorology but also quantify the energy absorbed which is responsible for the melting processes. They also validate the climate and weather models of the main parameters starting with the data measured in valley areas, away from the glaciers. Once validated, the models are applied to distribute the meteorological and energy data to quantify the melting and the consequent water flows.

The Workshop was concluded by Elisa Vuillermoz of EvK2CNR who reported not just on the SHARE network promoted and run by EvK2CNR but also on the platforms for viewing and accessing the data collected. Vuillermoz described Share GEONetwork, the website recently launched by EvK2CNR for sharing and transmitting environmental data collected in the main high-altitude areas of the planet. The website provides the correct geolocation of data by means of a simple and user-friendly web GIS where users can view the geographic area monitored and the spatial attributes of the stations or the parameters analysed, and also access the metadata and the actual databank. This tool for information collection and sharing is particularly important for learning about and correctly managing Alpine water resources. It's value is certain to grow in the near future as the amount of data collected increases and is made accessible not just to researchers and administrators but also to all citizens of Alpine countries.

Workshop 4-7

Sustainable use of water, energy and landscape in the Alps

Viviana Ferrario
University of Venice, Italy

Contributions:

- *Is it possible to develop renewable energies in the Alps while preserving landscapes, biodiversity and ecosystem services?*
  Erica Zangrando, Francesca Miotello, Veneto Region and Recharge.green project
- *Masking vs. integrating: Some elements for a critical reading of hydropower development "through landscape"*
  Benedetta Castiglioni, University of Padova

The aim of this workshop was to explore the relationship between hydropower development and landscape transformation in the Alps. Over the last ten years, renewable energy (RE) development has become a driving force of landscape change in Europe. Despite their acknowledged contribution to sustainable development, "renewables" are not ipso facto "sustainable"; on the contrary, renewable energies can have negative impacts and create both environmental and social conflicts. Landscape is often at the heart of these conflicts, both as an asset to protect and as a resource to use. This paradox is particularly strong in the Alps, where considerable energy resources and outstanding landscapes with high tourism value exist side by side.

This workshop aims to present and compare the results of two recent studies about energy and landscape in the Eastern Alps. The Piave River Basin is one of the key study areas in both studies.

The Piave River Basin

The Piave River Basin extends from the Dolomites to the Adriatic Sea, traversing the Alpine and Prealpine mountain areas where the hydroelectric potential of the main river and its largest tributaries has been exploited since the end of the 19th century. Today, the Piave is one of the most exploited rivers in Europe: over 80% of its water flows outside its natural river bed. The river basin hosts one of the largest hydropower systems in Italy, with 12 large artificial lakes with a total water capacity of 156 million cubic metres. Together, 25 hydroelectric plants produce an average of 2200 GWh of energy annually. Electricity is collected and transported through a high voltage power transmission line (220 KV) that connects the Veneto Plain with Austria.

In the 2000s, new European policies in favour of renewable energy (in particular, Directive 2001/77/EC) pushed for the rapid and intense development of small-scale hydropower plants on minor rivers. As municipalities try to become energetically and financially self-sufficient, both private companies and public administrations have become promoters of new plants. Unfortunately, the small scale of the plants and their scattered distribution does not

correspond with a negligible environmental impact. Small hydropower projects can have a serious impact on natural habitats and landscapes because they take water away from long sections of rivers and streams. Because of this, local environmental associations are contesting small hydropower plants, calling into question their social, cultural, ecological and even economic sustainability.

As in many other parts of the Alps, RE does not yet offer a solution for developing sustainable landscapes in the Piave River Basin. Is it possible to sustainably develop small hydropower projects? How can landscapes be used to manage this trade-off?

The "Recharge.green" project: Reconciling renewable energy production and nature in the Alps

The European project "Recharge.green: Reconciling renewable energy production and nature in the Alps", developed in the frame of the Alpine Space program, became operational in October 2012 and will run until mid-2015. The goal of the project is to analyse impacts of renewable energy production on biodiversity in the Alpine region and to find solutions for minimizing them.

The growing demand for renewable energy (RE) is increasing the pressure on Alpine environments. It strongly impacts land use patterns, ecological connectivity and biodiversity. The project's core objective is to develop tools and an integrated strategy for renewable energy production, sustainable land use, and the conservation of biodiversity and soil across the Alpine region. It will valorise Alpine biodiversity, land use patterns and related ecosystem services, and model the carrying capacity of Alpine ecosystems with respect to all aspects of RE production and consumption. This information will support the implementation of relevant EU Directives.

In this context, the Veneto Region is developing a dialogue with stakeholders in two pilot areas of the Piave River Basin to collect feedback regarding evaluations produced by other partners. Interviews with local experts have already revealed the ambiguity of hydropower development at the community level, which has both positive and negative socio-economic impacts. This project will develop a shared scenario that will be presented to policy makers and local communities. Local guidelines will be developed as a framework for a valley-scale energy plan.

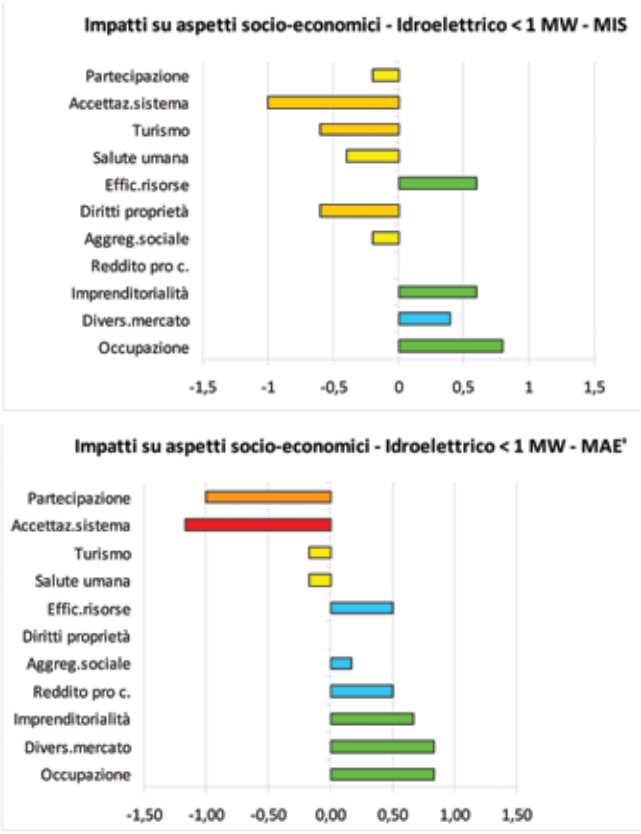


Figure 1. Positive and negative socio-economic impacts of two small hydropower pilot projects in the Piave River Basin, as reported by experts (from the project "Recharge.green", 2014)

Using landscape to make the invisible visible

The international research project "Ressources paysagères et ressources énergétiques dans les montagnes sud-européennes: Histoire, comparaison, expérimentation" was financed in 2012 by the French Ministry of Culture. The project involves scientists from different disciplines and countries and focuses on hydropower in southern European mountains in France, Italy, Spain and Switzerland. Now the centre of the renewable energy debate, hydropower played a fundamental role in shaping the economies of these countries during the 20th century.

The objective of the project is to propose an integrated approach to hydropower development that considers multiple perspectives and needs, from economic development and tourism to environmental protection. Ideally, this "integrated" approach should help us consider energy transition in a more constructive way and develop energy projects that are less sectorially driven. To this end, is it possible to better understand the relationship between the territory and energy production/consumption?
A multiscalar reading of the spatiotemporal pat-

	Sustainability questions		
	Environmental sustainability	**Economic sustainability**	**Social sustainability**
Hydropower exploitation of the Piave river basin	Renewable energies as an answer to global change *vs* Ecological and geomorphologic stability of the rivers due to the changes in the local water stream	Income of companies: local companies or larger outsider companies? Public or private companies? Public funds? Advantages and/or disadvantages due to the change in the land use and in the development/ deterioration of other economic activities (agriculture, forestry, tourism, ...)	Insiders vs outsiders Power (democracy? power of money? participation?) Cultural models in looking at the mountains and at the exploitation of its resources (value of naturalness, myth of "development", myth of sustainability, ...)

	Conflicts		
	Environmental conflicts	**Economic conflicts**	**Social Conflicts**
Hydropower exploitation of the Piave river basin	Renewable energies as an answer to **global** change *vs* Ecological and geomorphologic stability of the rivers due to the changes in the **local** water stream	Income of companies: local companies or larger outsider companies? Public or private companies? Public funds? Advantages and/or disadvantages due to the change in the land use and in the development/ deterioration of other economic activities (agriculture, forestry, tourism, ...)	Insiders vs outsiders Power (democracy? power of money? participation?) Cultural models in looking at the mountains and at the exploitation of its resources (value of naturalness, myth of "development", myth of sustainability, ...)

Figure 2. Inconsistencies and conflicts of large/small hydropower development during the 20th century (from the project "Ressources energetiques, ressources paysageres", 2014)

terns of hydropower "through the landscape" highlights the relationships and conflicts in the different uses of Alpine resources, both within the Alps and between Alpine and peri-Alpine metropolitan regions. This helps the user address the three components of sustainable hydropower development (***economic*** development, ***social*** development and ***environmental*** protection) and to identify inconsistencies and conflicts between these elements.

Inconsistencies and conflicts are often masked by/ in/through the landscape. Masking is used as a "conflict avoidance" strategy because it prevents the public from becoming directly aware of the consequences of the exploitation. However, conflicts can be overcome using the logic of integration. Integrating is the opposite of masking: it needs to clarify all the questions and take into consideration all the values, risks and opportunities that concern the different stakeholders and the general public. Integration is a strategy for finding ways to avoid new territorial conflicts and for hopefully solving – at least partially – old ones. To do that, it is first necessary to remove the mask: this becomes possible if we use landscape as a tool to make visible what is invisible.

Figure 3. A highly contested hydropower plant in the Piave River Basin, being masked by a natural stone clap.

In other words, it is important to explicitly recognize the different values at stake and the diverse meanings expressed by the different stakeholders.

People have a role and landscapes are a tool

The following points emerged from the discussion:

- It is necessary to redefine indicators to better understand hydropower impacts. These should take into account social acceptance of the project, as well as environmental and economic indicators. People have an important role in defining the acceptability of different renewable energy options.
- Renewable energy projects need to be integrated in the territory. Energy development must be part of a territorial project, not of a sectorial plan. Energy production should be designed in cooperation with tourism development, agro-pastoral activities, settlement design, etc.
- Landscape is not something to be protected by masking impacts and conflicts, but a tool for revealing inconsistencies inherent in hydropower development. Landscapes can help people visualize the relationships between energy and the territory, and oblige stakeholders to explicitly identify values and meanings they attribute to the territory itself.

Landscapes provide useful insights for a more aware, broader-based, landscape-sensitive development of sustainable renewable energies.

Workshop 4-9

Digital Divide in Alpine areas: ideas and solutions

Marcello Petitta
National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)
Rome, Italy

Contributions

- *Broadband at high altitudes*
  Luca Grimaldi and Massimo Bardea, ERSAF, Milan, Italy
- *Alpine Digital Agenda: What's new?*
  Carlo Maria Medaglia, University of Rome Sapienza, Italy

Work commitments prevented Prof. Medaglia from taking part in the Workshop, so Marcello Petitta, the workshop moderator, read his report. The meeting was attended by a significant number of young people interested in the development and spread of new technologies in the Alpine area.

The first part involved the two speakers from ERSAF who provided the results of the INTERREG Italy-Switzerland VETTA project. This was followed by a brief summary of the project's objectives.

Between 2010 and 2013, the European project Italy-Switzerland (Interreg IV A) V.E.T.T.A. (Valorisation of experiences in medium and high altitude cross-border tourism products) ensured broadband connectivity in 56 Alpine Rifugi in Lombardy, located in the border regions of the provinces of Como, Lecco and Sondrio. This action was put in motion by ERSAF (Regional Agency for Services to Agriculture and Forestry) and by the Directorate General of Sports and Youth Policy of the Lombard Regional Council, in cooperation with CAI Lombardia. The aim of V.E.T.T.A was to improve, promote and stimulate tourism offerings at medium and high altitudes.

The question of broadband in the mountains means dealing with the problems of the digital divide and the areas of market failure. If we exclude the ski areas, the possibility of using mobile or fixed broadband is very low once outside the urbanised sections of mountain communities. The intention of the VETTA project was not merely to provide the Rifugi with broadband connections: the internet was viewed as an instrument and not an end in itself.

For those who run businesses, such as a mountain rifugio for tourism or managing pastureland, having connectivity is no longer just an opportunity but is becoming a necessity. It is required for managing bookings, for instance, or for the use of home banking and online procedures, promoting tourism, the possibility of connecting a webcam or a remote control system for the electrical and heating systems.

In recent years, the proportion of foreign tourists compared to Italian visitors in the Italian Alps has increased. For many service providers in the mountains, such as refuges, being able to offer services for accessing email and maps, paying with credit card and getting real-time information about weather,

avalanche conditions and transportation is a competitive advantage.

The speakers then presented a new regional project that will start in the next few months to enable the mountain rifugi in the Bergamo and Brescia provinces to use a service similar to that provided by the VETTA project.

The focus of the second report was the presentation of the Alpine digital agenda developed by the Italian Presidency of the Alpine Convention. The speaker explained how the difficulties caused by the structure and specific features of the Alpine region require developing digital themes that differ from those ordinarily present in the internal policies of countries. It is appropriate to emphasise that some of these require prompt and effective action in political and economic terms.

The intention of the Alpine Digital Agenda proposal is to continue the objectives of the European Digital Agenda, with an approach that encourages the harmonious development of the Alpine macro-region. In particular, the Alpine Digital Agenda aims to increase the region's competitiveness, social inclusion, diversity and excellence.

The actions that the working group of the Italian Presidency wants to bring to the attention of the other member countries are:

- The elimination of the digital divide in Alpine areas by working to stimulate digital competitiveness and social inclusion
- Implementation of broadband in remote areas to support the development of innovative businesses
- The restructuring of networks so that they are able to support the development of innovative start-ups and slow down the emigration of young people to towns
- Facilitation of remote training for schools and secondary education
- Promotion of actions that encourage higher education and technical literacy for adults/the elderly
- Support for policies that develop telehealth services that meet the needs of an aging population and that help monitor chronic diseases
- Standardisation of the digital services offered by the public administration to provide innovative and useful services to people living in remote areas.

The workshop ended with a lively round table discussion in which the participants described their personal experiences with technological services in remote Alpine areas.

Workshop 4-10

The PTRA Alpine Valleys: Opportunities for economic and sustainable development

Maurizio Federici, Lombardy Regional Council, Milan, Italy
Fulvio Adobati, University of Bergamo, Italy

Contribution

– *Governing the Lombardy Territory, Regional Territorial Plan and Territorial Plans by Area* **Maurizio Forchini,** National tourism association "Italia Holiday", **Filippo Carlo Pavesi,** University of Bergamo, **Carola Rizzi & Andrea Macchiavelli**, University of Bergamo

In Article 20, paragraph 6 of the framework agreement on the regional planning law LR 12/2005, reference is made to the "space of action" of the regional territorial plans for the area whose purpose is to investigate, "on a more detailed scale", the objectives already stated in the Regional Territorial Plan (PTR): "if areas of significant size are affected by works, actions or functional uses that are of regional or supra-regional importance, the Regional Territorial Plan (PTR) may, also at the request of the provinces concerned, approve a regional territorial plan by area, which regulates how these areas are governed".

The current Regional Territorial Plan identifies in the Regional Territorial Plans by Area – the PTRA – the programming tools for developing certain territorial areas as an opportunity to promote the competitiveness of the region and to rebalance the territory. The Lombard Region Territorial Plan provides for:

- a system of objectives to sum up the needs and aspirations of the territory
- guidelines for territorial changes to promote sustainable development and maximise opportunities
- countryside regulations to protect and maximise the territorial resources

Operating Tools to implement the courses of action Regional Territorial Plans by Area (PTRA) to govern the transformations

The PTRA investigates in more detail the socio-economic and infrastructural objectives to pursue, can dictate the criteria necessary for procuring and allocating resources and provide precise and coordinated instructions for governing the territory, also with reference to the estimates of settlements, the forms of environmental compensation and recovery and the regulations for the actions in that territory. The PTRA is therefore the instrument for territorial governance to ensure implementing an effective synergy between the strategies of economic and social development and to safeguard environmental sustainability for a portion of territory, taking a proactive approach in the protection and enhancement of the environmental components and the landscape.

The PTRA territorial area "Alpine Valleys"

The study area consists of 45 municipalities in the Alpine and pre-Alpine band across Bergamo (41 municipalities) and Lecco (4 municipalities), covering an area of 908 km^2 and counting a total population of 47,463 inhabitants (at 01/01/2011). Most of the municipalities have fewer than 1000 inhabitants (30 of the municipalities, of which 8 have a population below 200). The area includes a Regional Park (Parco Regionale delle Orobie Bergamasche) and part of 3 Mountain Communities (Valle Brembana, Valle Seriana, Valsassina-Valvarrone-Val D'Esino and Riviera).

The framework is based on intersecting two main themes common to the municipalities involved: belonging to areas classified as being less favoured and having a significant stock of homes (in both relative and absolute terms) – for tourists – that are rarely occupied, going to extremes in certain places (particularly in Castione della Presolana and Selvino).

Another aspect characterising the context of the PTRA is the presence of broad areas of excellent landscape-environmental values ("sanctuaries of naturalness") of continental importance as enshrined in the recognition of large portions of the territory in the Natura 2000 network of the EU. This territory is of great interest owing to its relative proximity to the regional metropolitan system with its concentration of infrastructures and accessibility from extensive networks (for instance, the airport at Orio al Serio and the Lombard airport system in general), together with the availability of identifying and recognisable features of local products (such as the excellent local cheeses). These aspects can form a basis for developing policies (not just spatial) for territorial positioning and promotion able to exploit the potential flows of production of value.

Construction process and plan contents

The process of forming the plan developed from three key assumptions:

- The need to identify some strong "objects" and "themes" characterising the PTRA, able to inspire interest and involvement from the local communities
- The opportunities in a process of "shared construction" of the plan, in which to foster local responsibility about the general actions
- A method for narrating the plan which, by excluding any rhetorical argumentation, provides a concise and easily communicated explanation of the project

A renewed approach to co-planning led to a constructive relationship between the Region and local authorities in the period of managing the PTRA: the most interesting and challenging part of the process began with the need to find the right balance, in the Region's planning responsibilities, between "command and control" methods and using encouragement and guidelines (accompanying, facilitating, rewarding).

The potential functions of the PTRA can include:

- Building a "territorial schedule" i.e. identify a framework of specific spatial and relational situations in the differences between local territories, divided internally by diversity and repetitions, by consolidation and changes, and try to find some rules in them
- Identifying a possible "project storyline" that provides a descriptive and prospective "story" on which to base a cohesive view of the territory and of its inhabitants, its elements of suffering and fragility, and its assets and potential.

In recent years, action by the region has been developed to maximise Lombard mountains as a resource, identifying policies aimed to combat depopulation, safeguard environmental features, enhance mountain agriculture and the typical local products, reduce the infrastructural gap with the lower valley and to develop tourism and culture aspects. How-

ever, the territorial scenario has changed radically in recent decades, as a result of:

- The major process of relocating businesses and residence, which has concentrated the population in the valley floor and in some mountain resorts, leading to a dangerous fragility in the hillsides abandoned by the population;
- The evolution that has characterised the real estate market in recent decades (extensive purchasing of holiday homes) which, in some cases, has produced consequences in urban planning that require careful monitoring because it is taking place in an extremely delicate territory with high environmental value;
- The tourism sector which, more than any other, represents the contradictions and imbalances in the mountain territory. Although tourism is certainly a significant economic resource, it largely fails to embrace the areas beyond the leading and best known centres that cover a demand for winter sports or provide holiday homes.

Specifically, the elements to think about to ensure an overall governing of the territory and which become of regional importance are:

- The identity of the territories to promote by preserving an economic fabric with a "typical", local vein, relating both to craftsmanship and to agriculture
- Tourism development to be planned and consolidated.

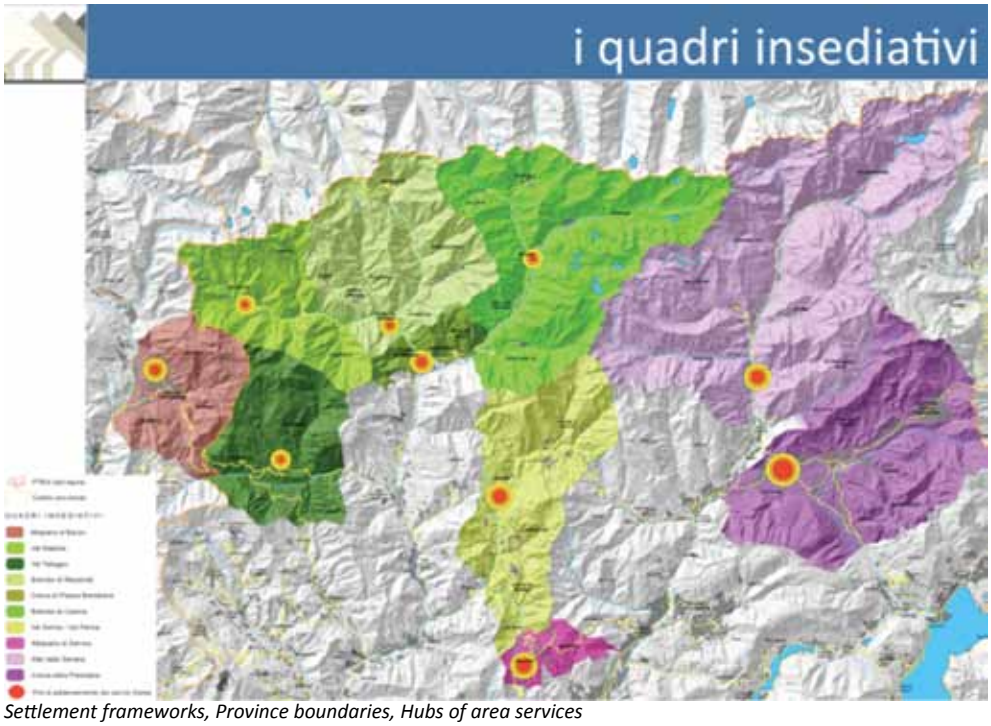
The mountains in Lombardy acquire a strategic role in the regional spatial configuration; the PTRA should focus on and interpret certain fundamental objectives for the individual and specific local situations:

- Promoting a model of endogenous development of the areas that allows makes to maximise their resources to their own advantage
- Making sure that stable and continuous growth is pursued, especially in mountain areas
- Ensuring an appropriate level of services so that both those who want to stay (e.g., the elderly) can and those who would like to move to the region (e.g., the young) are encouraged to do so.
- Identifying the complementary situations and integrations between mountain areas, valley floor areas and lowland areas (where the complementary condition also applies to the hinge function – inter-regional or international – that mountains provide).

Interpreting the hallmarks of the territorial structure and helping to define an appropriate project both in

GENERAL OBJECTIVE *Opportunities for sustainable economic development compatible with mountain territories*		
SPECIFIC OBJECTIVE 1 Valorise local identity	**SPECIFIC OBJECTIVE 2** Promote a new development model based on high quality tourism	**SPECIFIC OBJECTIVE 3** Promote new settlement models to economise use of the land
1.1 Renovation, reuse and recovery of historical centres and existing rural buildings with a view to simplification	2.1 Defining a territorial marketing strategy to attract flows of tourists also coming from abroad	3.1 Support to the local agencies for an economic model of the real estate activities to optimise the resource of holiday homes
1.2 Enhancement of a priority regional network of trails and soft mobility	2.2 Strengthening of the existing accommodation structures to ensure sustainable and non-invasive tourism	3.2 Promoting of energy efficiency in public and private buildings
1.3 Promoting of the landscape features exemplifying an integrated ecosystem, consisting of natural and cultural aspects that represent the identity of the territory of the PTRA	2.3 Enhancing of the traditional local production supply chains	3.3 Promoting of means for a rational use of the land resource
1.4 Valorisation of the human capital and improvement of the training offer	2.4 Promoting of technologies to reduce the digital-divide	3.4 Recognition of areas of strategic importance for improving the defence of the land in order to promote widespread maintaining of the territory

Table 1. Regional territorial plans by area (PTRA) Alpine valleys.



Settlement frameworks, Province boundaries, Hubs of area services

scale of work and specificity has led to the identification of 10 "settlement frameworks" (validated in the meetings with the local stakeholders).

This structure recognises territorial specificities in a context where, despite having similar needs to reposition and redefine a model of economic and social development, there are even significant differences internally (for instance, between the strong tourist spots and the weak areas).

The strategic guidelines of the plan are based on the general objective in the direction of sustainable development (in the social, environmental and economic components) for the mountain territories, divided into specific objectives and actions as shown in Table 1.

To conclude, the key elements of the PTRA "Alpine Valleys" about to be approved, whose effectiveness as a project and for governance will be verified in the coming years, are:

- defining a territorial project that forms a reference scheme as a platform for active projects, not imposed but proposed
- the implementation of the plan's guidelines has the nature of legitimising choices and of potential effectiveness stemming from the fact of being the outcome of a process of co-planning (hard work and not without difficult moments, as in all true exchanges)
- the objectives and the actions are fairly simple and clear, and the implementation does not rely on conforming but on performing
- the construction of projects and the active monitoring of the plan are a necessary precondition for the effective implementation of decisions; in this context of significant thematic complexity between players, it is important to note that appropriate political and technical leadership will be essential
- the recognition from the DGRegio of the European Union for the 'good practices' of the PTRA "Alpine Valleys" in terms of multilevel governance is a fertile environment for an active discussion with other European contexts, also in a complementary manner with the more specific projects that can be activated, starting with the Alpine Space programme.

Workshop 4-11

Improving the environmental sustainability of livestock farming in the Alps: Problems, strategies and opportunities

Marco Marchetti, Aldo Castellazzi & Oreste Zecca
ASL Sondrio, Italy

An exceptionally specific dairy production can be found in the Alpes and particularly in the Sondrio Province, since it exclusively produces a cheese that can be matured up to ten years and where, not infrequently, the milk is processed on-site still warm from the udder. This province also has the highest number of active production sites for raw milk (cow and goat), located in Alpine pastures of the Lombardy Region, amounting to more than 150 processing plants. And yet, just twenty years ago they were six times more numerous.

During the workshop, the authors dealt with the most important scientific, cultural, economic, social, business and tourism aspects, which the authors believe are able to raise awareness in politics and stakeholders in order to halt this seemingly inexorable decline. Also presented were the results of the work carried out for Official Control and veterinary supervision in the years 2012-2014 to promote a strong interaction and dialogue between all operators in the sector. Strong emphasis was placed on the absolute necessity to preserve the age-old, traditional production techniques of typical Alpine cheeses, while still complying with EU and national regulations regarding food safety.

The intention was to show that it is not only possible but a duty to continue to use the Alpine pastures to produce dairy products of high organoleptic quality, applying techniques passed down over the centuries from generation to generation, at the same time guaranteeing health and food safety to consumers.

The workshop participants also agreed that if we really want to guard and protect "the mountains" of Valtellina and Valchiavenna, it is necessary to assure the local people livelihoods and living conditions appropriate to the modern day standards. It is possible and necessary to live and produce in an Alpine pasture in the comfort that modern cultural, technological and social knowledge allows and guarantees to all the rest of the country's population.

Lastly, as both countries and mountain communities are faced with shrinking financial resources, it is important to ensure that resources are used wisely and targeted at truly effective areas.

Logos relating to the restoration of sheep breeds in the Piedmont.

"Credible" environmental sustainability for livestock farming in the Alps
Alberto Tamburini, University of Milan

In the current economic situation of livestock farming, particularly in the mountains, the strengths still to be found in this activity are of even more value and interest. The typical local features, character and quality of animal husbandry in the mountains are aspects of historical importance, but also not to be forgotten is the ability of such farms to preserve the territory and the plant and animal biodiversity of mountain areas. Other highly important functions relate to forest management as an antidote to territorial decline and for maintaining the culture and food heritage characterising the mountain environment. The public – consumers – generally attribute a very positive meaning to livestock farming in mountain areas, but this awareness is often not backed up by such farming being more profitable than for the farms in the lowlands.

The most critical points in livestock farming in the Alps, on the other hand, relate to the higher production costs and the low or insufficient revenues from the sale of milk compared to lowland farms. Furthermore, the insufficient size of farming areas for producing forage and concentrates and the resulting lack of food self-sufficiency lead many farms to try and improve their situation by increasing the number of animals and copying the production systems typical to the lowlands. This tends to increase the environmental impact of mountain farms and to not take the welfare of the animals into account. The remedies being taken by livestock farmers in the mountains are to abandon the traditional breeds and give preference to specialised or high production breeds, replacing permanent pasture with other more productive fodder (including, where possible in the Alpine valley floors, shredded maize), sharply increasing the amount of fodder purchased from outside the mountain areas and resulting in a strong tendency to abandon Alpine pastures, at least as regards the high production animals.

In terms of environmental impact, in addition to the known problems of nitrates (i.e. the presence of excess amounts of nitrogen in certain zones compared to others – with the paradox that, in the Alpine pastures, the insufficient number of animals means that the cycle of nutrients does not come full circle and does not prevent the growth of shrubs, which results in diminishing the amount of pasture grass), other emerging critical issues relate to the consumption of non-renewable resources (petroleum derivatives), the consumption of raw materials coming from very distant, high impact cultivation systems that worsen the production of total greenhouse gases, and the lower efficiency of transformation of animals bred extensively which produce greater quantities of pollutants (especially greenhouse and acidifying gases) than more productive and efficient animals.

The situation of mountain livestock farms differs in the three areas of the Alps taken into account. In Piedmont and the Aosta Valley, for instance, there has been a very low reduction in cattle bred, although they are concentrated in farms housing many animals. Considering that there are more than 50% of farms that take their cattle to higher pastures in the summer, there has been an increase in cattle in the last 20 years. Therefore, in these areas, allowing cattle to graze continues to be considered very important as a fundamental tool for the management of fodder at farms, but placed in a context of pastoral planning that is also particularly attentive to the aspects of typical Alpine habitat conservation and to the production of local cheeses (not just Fontina DOP), and also to preserving many breeds

of local cattle, goats and sheep (among the many examples, the Frabosana- Roaschina and the Sambucana) which, in turn, are linked to historical dairy products of very high quality.

To the west of the Alps, there are certain types of farmers that differ and each speak of very different routes. There are the traditional farmers with small businesses of just a few animals who very strongly identify with the territory, who are subject to a medium-low social acceptability and sustainability, but who pursue high environmental sustainability levels and make choices for "proud" production (such as the Macagn, Plaisentif and Nostrale cheeses) or other cheeses connected to the breed owned (such as Fontina). There are many returning farmers who are re-territorialising abandoned areas, who very much choose indigenous breeds, often with a twofold attitude (old stock such as "Alpine" Bruna and Piedmont dairy cows). Lastly there are the "new rural" breeders, whose social sustainability is medium-high (and rising) and a high level of environmental sustainability, even though their economic sustainability is still poor and could be supported. In these cases there is a frequent return to the native breeds (often sheep and goats) that have low productivity but are long living and generally stay healthy.

The situation of the eastern Alps saw a considerable concentration of animals in farms between 1990 and 2010 – whether cattle, sheep or goats – with a sharp drop in the small farms (-50% for cattle farms, -23% for those of sheep, and -30% for goats). This production loss has very much affected the pasture areas that, on average, have dropped by 20%, with peaks of loss in Fruili-Venezia-Giulia of 60%, not converted into other agricultural production sectors, simply abandoned.

Unlike in the western Alps, here the DOP production (Asiago and Montasio above all) have not focused on a strong characterisation of the territory or production, such as in the choice to not place particular limits on the type of fodder, on the breed raised or on farming systems. Therefore, it is interesting to note the first attempts to develop productions of Montasio using milk from just the Pezzate Rosse breed of dairy cows which, not coincidentally, were once called "friulane".

In terms of cattle farms for meat in the eastern Alps, the project for promoting organic veal of the Rendena breed appears very promising. This experiment begins with a simple product protocol that compels the Rendena dairy cattle farmer to even further valorise this breed, but goes in the direction of trying to increase economic sustainability since it involves the considerable commercial interest in this production, with particular emphasis on catering, the diversification of the production in organic farms, and in direct sales that shorten the supply chain (farm shop, 'agri-tourism' and buying groups).

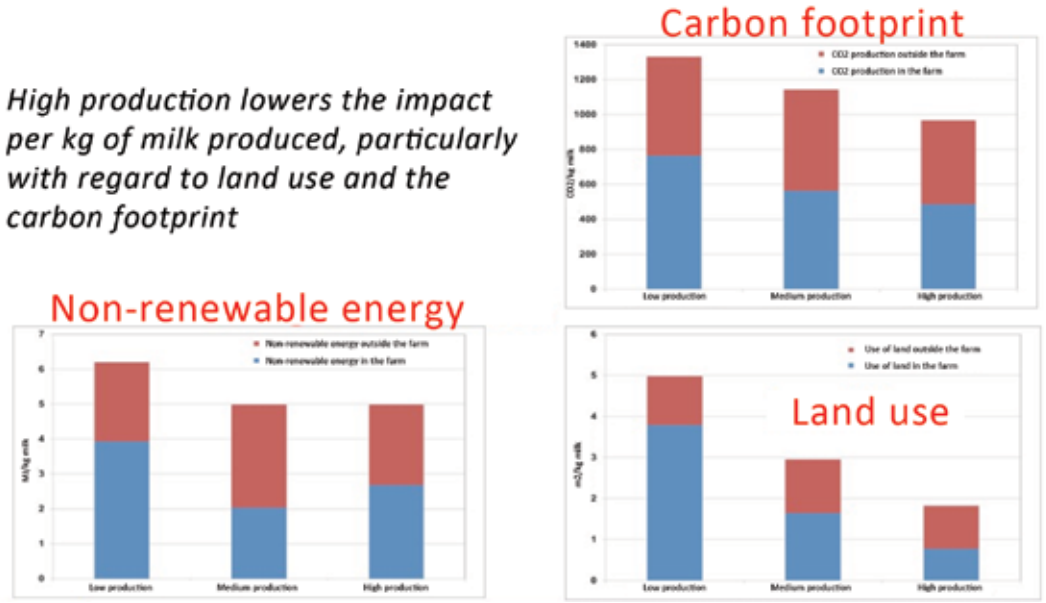


Figure 1. Relationship between production capacity of dairy cows and environmental impact

Workshop 4-12

Project *Saussurea costus, Saussurea alpina*

Margit Strobl
Agroscope, Institute for Plant Production Sciences IPS, Switzerland

Medicinal plants are an important ecological and economic resource in the Alps. Using the genus Sausserea as a model, the Uttarakhand Organic Board in the Indian Himalaya has started an initiative for the humanitarian and ethical cultivation of Saussurea costus, which is recognized for its medical properties. Another species of Sausserea, ***Saussurea alpina***, is native to the Alps and may have similar economic and medicinal potential. We propose to develop guidelines for the exploration and sustainable utilization of this species, using the cultivation procedure in Uttarakhand as an example for cultivating ***S. alpina*** in the Alps. We want to test the feasibility of using Saussurea costus to develop health products, which will later help guide the development of health-enhancing products containing ***S. alpina.***

Medicinal plants provide many ecological services that are at the heart of human well-being. In addition to their healing properties, medicinal plants help to purify water and to stabilize the composition of the atmosphere. As with other plants, the solutions that medicinal plants have evolved to cope with environmental challenges vary enormously from species to species and often involve associations with other organisms, such as microbes and insects. Our lack of success in understanding the traits that are important for a medicinal plant's environmental performance is in part a failure to heal the unhappy divorce that split plant biology departments along cellular-molecular and ecological-evolutionary lines.

The solution to this problem is to form a research model that reconnects these two types of scientific investigation and apply it to an important and rare plant genus: Sausserea, particularly ***Saussurea costus*** and ***Saussurea alpina***. Saussurea alpina is a plant that lives in the Alps and has never been studied in a scientific manner. However, it shares many similarities with ***S. costus*** in India, the medicinal properties of which are well documented in traditional Chinese medicine, Tibetan medicine and ayurvedic medicine. This research investigates the medical and economic potential of Saussurea by establishing

Saussurea alpina (Photo: Janet Macpherson)

research cultivation areas in the Alps and conducting cellular-molecular research.

If research can scientifically and unambiguously demonstrate the therapeutic effects of ***Saussurea alpina***, this native plant may be a valuable source of new income for Alpine farmers. The cultivation of ***S. alpina*** and the development of new medical products would benefit both the environment and human health by providing a profitable, completely organic and carbon neutral crop that thrives on abandoned pastures and provides medicinal products that benefit to human health.

Saussurea costus. (Photo: Jitendra Butola)

Workshop 4-13

Landscape as a resource for the Alps

Cristina Mattiucci & Stefania Staniscia, University of Trento, Italy
Stefano Duglio, University of Turin, Italy

In Workshop 4.13, participants discussed two approaches for utilizing the Alpine landscape as a resource in its own right. During two separate sessions, the potential of the landscape as a social and cultural resource was explored. At the same time, participants considered the economic potential of tourism and the need for careful governance.

Exploring landscapes

The first session was seen as a possibility to explore the landscape as a conceptual and physical field able to record – in the changes in cultural interpretations and in the policies and projects as well as in space, etc. – the multiple transformations that, in a special context such as the Alpine region, take them on simultaneously as a catalyst and an objective.

Here, in fact, where the social and economic transformations in the last thirty years have been influencing the traditional production sectors (agriculture, manufacturing, tourism...) and the settlements (whether or not temporary), the landscape emerges as a central element in the territorial capital of a residential situation extending from the valley floor to the peaks. It is also a tangible and intangible resource, as well as a physical indicator.

From this interpretation perspective and in order to explore the potential of the landscape as an intangible resource to understand and guide these transformations in the best way, the session was structured as an occasion for comparing the various activities of the Landscape Observatories (OdP) of three Alpine regions – Trentino, Piedmont and Veneto.

The OdPs were selected because they are operational instruments of the European Landscape Convention. They were set up to achieve the activities of raising awareness, training, educating, identifying, evaluating and monitoring the landscapes. The OdPs were therefore asked to present a selection of experiences of an operative nature which would be able to express the subject of the landscape according to the resources – physical, social, political and economic – on which such experiences are based, in order to strengthen, enhance, restore and revitalise their attributes.

Benedetta Castiglioni reported on the numerous activities of the Observatory of the Brenta Canal, describing the "OP!" project and what emerged from the focus groups whose slogan was "The Observatory looks, discusses, proposes", with proposals that stimulated the intangible dimension of the landscape as an activator and mediator of processes of care and re-appropriation of the territory by citizens.

For Trentino, **Emanuela Schir**, architect, presented the eight projects financed by the "Fund for the Landscape" which, although very different in size and in project issues, had the objective of implementing real policies of action on the landscape, dealing with the most urgent questions for the dynamics of the Trentino landscape and emphasising certain aspects.

Diego Corradin, architect, described the activity of establishing the young Piedmont OdP for the Moraine Amphitheatre of Ivrea and, particularly, the construction of networks and relationships among the many players operating in the territory, by means of focus groups and round tables with the agricultural operators of the area and, more generally, with all the different stakeholders, in an attempt to bring to the surface the possibilities and difficulties of creating a business in the landscape.

Among the various key matters that emerged in the debate followed by the speeches, there was the open issue of the ambiguity of interpreting the meaning of the landscape as an intangible resource. This ambiguity is partly due to the lack of a common language for the various levels of institutional and/or local reflection and action and in those contexts where work is done to make the landscape recognised as such and where action should and can be taken to emphasise it. At the same time, such ambiguity also lends itself to more fertile interpretations, such as in the case of mountain landscapes where a specific imagery and a special tradition of care and development has grown.

A second matter emerging during the debate was the mediator role of the OdPs between the institutions and the local communities; the importance was stressed of the intellectual and operational independence of these institutions and also the value of working "within the system" in close contact with the public decision-makers and thus the possibility to influence decisions, tabling the requests of the local communities. This role can be of great value for the Alpine region: networking among the OdPs to coordinate the general priorities for the landscape could lead to coordinated strategies of valorisation and management as a specific contribution to, for instance, the new European Strategy for the Alpine Space.

Landscape as a resource for developing mountain tourism

Alpine tourism has undergone major changes in recent years: as **Umberto Martini**, University of Trento, explained, new aspects and motivations in tourism demand are emerging, focused on the "4L" (Leisure, Landscape, Learning & Limit). In addition, an increasingly sharp division is appearing between two categories of guests in mountains: those who aim for wellbeing and relaxation, others wanting

sports who see mountains as a place dedicated to the outdoors. For both types, the Alpine landscape continues to be an aspect of fundamental importance, a container that makes mountain holidays special and irreplaceable. Thereafter the natural elements (rocks, water, slopes, trails...) become the basic element for tourism in the territory, particularly for the second type of visitors. This requires great attention to environmental issues, making sustainability of the offer a priority for Alpine regions.

The landscape is, therefore, a resource for tourism whose use must be managed – as **Riccardo Beltramo**, University of Torino, emphasised. A method for managing and evaluating the landscape aspects when managing the actions of the government agencies for the territory, particularly at municipal level, is the system of Environmental-Landscape Management (SGAP). SGAP is a methodological framework through which it is possible to integrate the landscape component, as stated in the European Landscape Convention, with the environmental management system referred to by the EU Regulation EMAS – Eco-Management and Audit Scheme (Reg. 1221/2009).

In this way, the landscape forms a full part of the systemic process by which the government agency of the mountain territory manages its resources (water, soil, etc.) and by whose management the agency can achieve the intended development goals.

Therefore, for mountain communities that make natural resources (and their use) the basis to provide an image as a high quality tourism destination, the landscape is not only of undoubted appeal but has, in the tool described, a model through which it is evaluated and governed, at predetermined intervals, by means of appropriate study techniques such as the application of ecological indicators of the territory (fragmentation, habitat patches) and the evaluation of its visual quality (by revising the methodology of the Bureau of Land Management) in order to preserve and improve its quality.

Conclusions

The disciplinary approaches developed in the workshop have revealed interesting points of contact. The socio-cultural value, together with the economic-environmental value, act as the backbone of the concept of sustainability of development. From this point of view, the landscape must be considered in all respects as a resource for the Alpine space and, as such, it must be preserved, enhanced and governed. To be able to guarantee a goal of this magnitude requires action that involves the various players that interact with the landscape, useful for integrating several faces in a common vision: the Administrations that govern the territory, the Landscape Observatories that present the requests of society, and the academic world able to provide the tools for defining the policies for the area.

Session 5

Resource use in the Alpine region: Future action and cooperation

Moderator: Thomas Scheurer, ISCAR, Berne, Switzerland

How can the findings from ForumAlpinum be implemented in future policies and initiatives? In the concluding session of the Forum, three instruments and drivers for developing future action and cooperation will be presented: The Alpine Space Programme (with its 2014-2020 programme), the EU Strategy for the Alpine Region EUSALP (with its ongoing public consultation) and the Alpine Convention (with the results of its activities during the Italian presidency 2013-2014). All participants will have the opportunity to propose and discuss possibilities for future actions and collaborations in different fields of resource use during three interactive workshops.

Keynote

The Alpine Space Programme 2014-2020: Its contribution to the sustainable use of Alpine resources

Eva Stare & Christian Salletmaier
Alpine Space Programme
Munich, Germany

The Alpine Space Programme 2014-2020 is an EU transnational cooperation programme to support sustainable regional development in the Alpine region and thus contribute to the EU 2020 strategy for smart, sustainable and inclusive growth. The rationale of the programme and its content can best be understood within the policy context.

Context and Challenges

The third generation of the ASP has been elaborated on the basis of the experience made during the last two funding periods. Since the year 2000, more than 100 transnational cooperation projects have been developed with the support of the programme, delivering results that will, ideally, influence local, regional and even national policies. The programme itself has conducted an on-going strategy revision process from 2009 onward that has culminated in a strategy development project that paves the way for the 2014 - 2020 programme.

Although solid ground was laid in terms of strategy, the preparation of the programme has encountered the following key challenges:

1. The legislative framework of the European Commission asks for focus, coordination and result orientation. Focusing on a limited number of objectives and investment priorities requires a good understanding of what kind of challenges can best be tackled by transnational cooperation. Strong coordination with other funding instruments is essential. These national level arrangements, as established in the partnership agreements of the states with the Commission, had to be coordinated in the programming process. Much effort was also put into the development of an intervention logic that links the expected results to the challenges. It goes without saying that such an approach cannot satisfy all stakeholder expectations.
2. The Council decision of December 2013 paved the way for the development of a "new" instrument for policy coordination. Under the acronym EUSALP, a macro-regional strategy for the Alpine Space is currently being prepared. EUSALP is another layer of transnational cooperation that partially overlaps with the Alpine Space programme (and for which the ASP's "Strategy Development Report" provided considerable input). The integration of EUSALP and ASP had to be considered in the programming process of the ASP. It has to be clear that whilst the EUSALP is a strategy for aligning policies, the Alpine Space Programme is an instrument for achieving this alignment in a limited number of fields.
3. The Commission's legislative package clearly demands a reduction of administrative bur-

dens for beneficiaries. The legislative package, however, has increased the complexity of the programme administration considerably. Thanks to a very stable, experienced and flexible programme administration, future beneficiaries should nevertheless be able to direct their efforts to content rather than to administration.

The Programme has an ERDF envelope of 117 Mio Euro. Support for projects is offered in four priority areas.

Content of the coming programme

Innovative Alpine Space – Aiming at business, social and governance innovation

The specific objectives of this priority ask for projects that contribute to

- the improvement of the framework conditions for innovation in the Alpine Space, in order to increase knowledge transfer between businesses, users, academia and administration actors (quadruple helix approach) and/or
- an increased capacity for the delivery of services of general interest in a changing society. Projects shall achieve more efficient, adaptable and adequate services of general interest by developing, testing and adopting new social innovation solutions.

Low Carbon Alpine Space – Aiming at a low emissions, efficient and sustainable societies, and mobility and transport solutions

The specific objectives of this priority ask for projects that contribute to

- the establishment of low carbon policy instruments that provide practical responses to specific Alpine Space needs and challenges and/or
- an integrated organisation of spatial interaction, economic activity and mobility and transport patterns in order to provide the prerequisites for a low carbon economy and society.

Liveable Alpine Space – Aiming at the sustainable utilisation of the natural and cultural heritage and the protection of Alpine Space ecosystems

The specific objectives of this priority ask for projects that contribute to

- an increase in the consistent, balanced and sustainable use of the Alpine Space's cultural and natural heritage by raising awareness about present opportunities and future challenges, and by developing new solutions and/or
- the harmonisation of management approaches, the facilitation of knowledge transfer and the sharing of responsibilities with the goal of integrating Alpine Space ecosystem functions and needs into policies.

Well-Governed Alpine Space – Aiming at enhancing multilevel and transnational governance in the Alpine Space

The specific objective of this priority asks for projects that contribute to an increase in the application of multilevel and transnational governance in the Alpine Space.

It is clear that the results of all four priorities must be policy-relevant. The programme has developed a policy cycle model to guide beneficiaries with regard to how a project contributes to policy development. Although it is fairly clear that the first three priorities have sector-specific orientations, the fourth priority aims to strengthen governance on a more general level. It should be an instrument for exploring new ground, enhancing institutional capacity and triggering and guiding governance innovation.

Having said this, it should be obvious that the programme is more than a mere funding instrument. In its role as a driver of development and change, the programme combines three functions:

- It triggers and funds results-oriented projects that contribute to the programme objectives.
- It nourishes debates about cohesion policy and the future of the Alpine Space.
- It acts as a catalyst for cooperation and common solutions in the programme area.

Keynote

The European Union Strategy for the Alpine Region (EUSALP) in dialogue: Objectives of the public consultation

Peter Eggensberger and Florian Ballnus
Bavarian State Ministry of the Environment and Consumer Protection, Munich, Germany

Background

On 19-20 December 2013, the European Council invited the Commission, in cooperation with Member States, to elaborate an EU Strategy for the Alpine Region (EUSALP) by June 2015. On the basis of this resolution, an international Steering Group outlined the first cornerstones of the Strategy during the first half of 2014. Working groups dedicated to each pillar of the strategy supported the Steering Group. These pillars were defined at a conference in Grenoble in October 2013 and are (in short): Developing Alps, Connecting Alps, Protecting Alps.

Members of the Steering Group and Working Groups are representatives from the authorities of the participating states and regions and the European Commission as members with voting rights. Observers from the Alpine Convention, the INTERREG Alpine Space Programme and from NGOs (only in the working groups) complement the discussion and negotiation rounds on the way to an EUSALP.

On the basis of the key topics identified and following the example of the now closed consultation of the EU Strategy for the Adriatic and Ionian Region, the European Commission developed a consultation document for the EUSALP in cooperation with the Alpine states and regions.

Objectives of the Consultation

The consultation is open to all European citizens and institutions and provides the opportunity to take an active role in shaping the future EU Strategy for the Alpine Region. It allows interested parties to be involved in the discussion process and to help identify key topics and actions for implementation. The public consultation is open from 16.07.2014 – 15.10.2014 and has two main objectives:

- To obtain feedback from stakeholders and the public regarding the preparatory work that has been achieved thus far
- To gather proposals for the future action plan of the EUSALP

Target groups of the consultation are all interested persons, as well as groups that can offer specific expertise and knowledge that will help sharpen the Strategy and ensure its successful implementation. It is especially hoped that the scientific community will participate, as it can build on a long tradition of cross-sectoral and cross-border cooperation in the Alpine Space and thus has a profound expertise.

Structure of the Consultation

The online questionnaire is structured in four main sections. Section 1 requests background informa-

tion from participants; Section 2 addresses the general framework of challenges, opportunities and expectations of the Strategy. Section 3 is the core element of the questionnaire and provides respondents with an opportunity to identify key strategic topics, as well as to propose concrete activities and measures within the EUSALP scope and objectives. Finally, Section 4 is dedicated to questions concerning the governance of the EUSALP.

Next steps

The consultation will identify the key topics that find an Alpine-wide agreement and should therefore constitute starting places for the further elaboration of the Strategy. These topics will be presented at a stakeholder conference on 1-2 December 2014 in Milan, Italy. The conference will also mark the start of the elaboration of the Action Plan.

Role of the Forum Alpinum and expectations from the scientific community

As a key platform for scientific exchange in the Alpine research community, the Forum Alpinum provides a unique opportunity to bring in scientific viewpoints regarding the EUSALP in a concerted way. The Workshop should therefore be used to elaborate a contribution to the EUSALP from the scientific community. The workshop should focus on the questions raised in Section 3 of the EUSALP consultation paper, and on Pillar 3 in particular ("Promoting sustainable management of energy and natural and cultural resources and protecting the environment and preserving biodiversity and natural areas"). The proposal for the future governance of the Alpine Space, found in Section 4, should be considered as well.

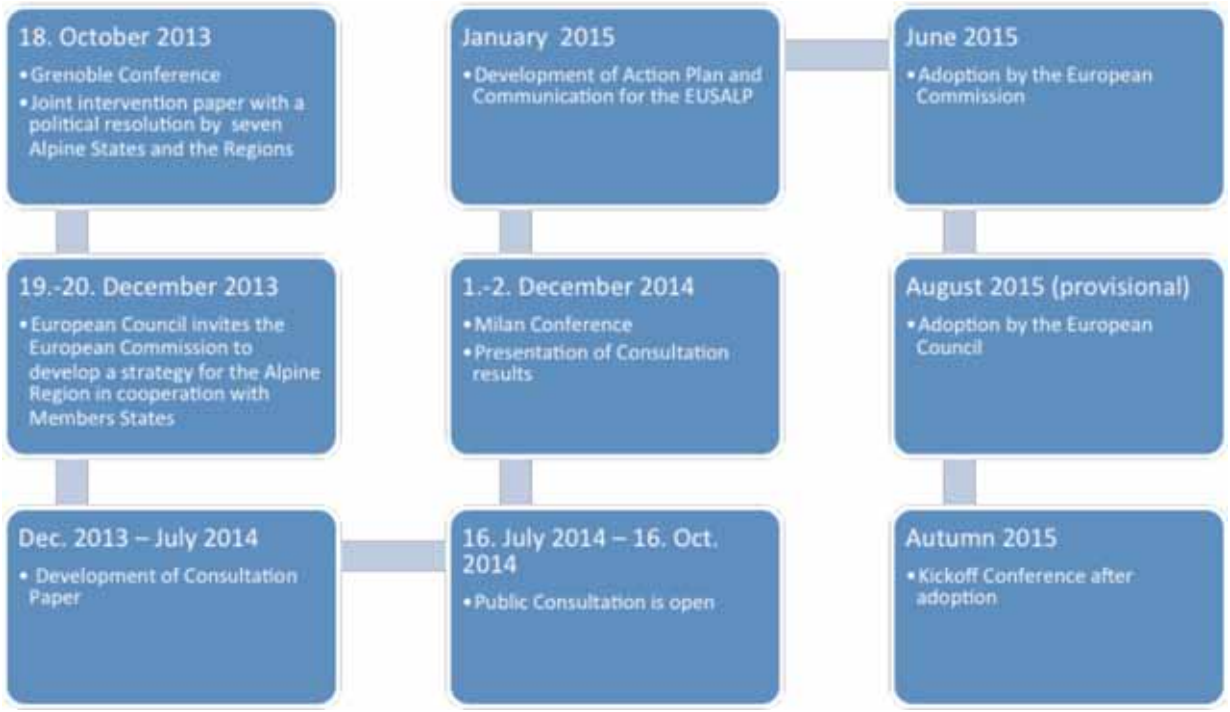
The results of the workshop could be submitted by ISCAR as a joint contribution from a larger group of Alpine researchers and scientists. This implies an agreement on a few key messages, which should be achieved during the workshop. To stimulate and ease the discussion, the specific objectives of each question in the survey will be explained in more detail in the following.

What kinds of contributions are expected?

Sections 1 and 2 are self-explanatory and do not need to be further described here.

Section 3

Question 1 asks respondents to identify the three key objectives that the EUSALP should address. The following criteria should be taken into consideration during the selection of these objectives.
The objectives of the EUSALP should:



Roadmap towards an EU Strategy for the Alpine Region. Reference: www.alpinestrategy.eu/about-eusalp.html

- have potential for a cross-sectoral approach, as a higher acceptance and a more substantial and sustainable implementation can be expected
- consider the functional relations between the core area and the surrounding metropolitan areas of the Alpine Space
- have potential for strong trigger and leverage effects
- have a high urgency for implementation

Question 2 provides the possibility to mention other objectives than proposed in the list. Question 3 attempts to identify those objectives that can only be tackled successfully using a macro-regional approach. Only those issues for which implementation is currently delayed, blocked or stopped, and to which the EUSALP could contribute to untying the knots, should be discussed.

Question 4 raises the most important question in this section as the results will directly contribute to shape the Action Plan of the EUSALP, which will be the decisive document for the successful implementation of the Strategy. Question 4 asks for the indication of concrete (EU, national, regional or local) actions or projects, which could contribute to achieve the objectives of the EUSALP in the short or medium term. Ideally, two actions should be elaborated and agreed upon with regard to Pillar 3 during the Forum Alpinum 2014. These two actions should consequently reflect the key topics chosen in question 1.

Section 4

Section 4 of the questionnaire is dedicated to the governance of the EUSALP and shall contribute to the development of a sound culture of participation and implementation.

Question 1 asks respondents to indicate the problems and impediments related to existing cross-border and transnational cooperation structures as well as overall systematic and systemic obstacles which hamper cooperation and which need to be solved within the framework of the EUSALP. Individual problems however should not be mentioned here. Scientific research results and personal experiences with problems concerning the distribution of science and knowledge or the capitalization and transfer of research results are of specific interest here.

Consequently, question 2 leads to proposals for unraveling these barriers. Focus should be laid on the potential individual contribution or position of the scientific community and its potential contribution to solve the identified problems.

Finally, question 3 asks respondents to identify the (other) main actors who would be needed for better co-operation and coordination in the Alpine Region. Although macro-regional strategies are based on the principle of multilevel governance, there might be actors who should play a leading role in the implementation of specific key topics. For example, a specific local or regional authority or non-governmental organization may be particularly suitable to enhance co-operation in the Alpine Space. The specific role of the scientific community should be addressed here as well.

References and Links

- Direct link to the Public Consultation: http://ec.europa.eu/regional_policy/consultation/eusalp/index_en.cfm
- EU Strategy for the Alpine Region (EUSALP): http://ec.europa.eu/regional_policy/cooperate/alpine/index_en.cfm
- EUSALP Homepage: www.alpinestrategy.eu
- Alpine Space Programme: www.alpine-space.eu
- Alpine Convention: www.alpconv.org

Keynote

State of activities before the XIII Alpine Conference in Torino

Paolo Angelini
Ministry for the Environment, Land and Sea
Rome, Italy

The Alpine Convention is an international treaty that promotes sustainable development in the Alpine area and protects the interests of the people living there. The Ministry of Environment, Land and Sea holds the Italian Presidency of the Alpine Convention for 2013 and 2014. Many institutions from the Italian Alpine region have contributed to the Presidency's program. In November 2012, the Ministry of Environment signed a Memorandum of Understanding with local Italian bodies to work toward identifying priorities and actions to be undertaken during the Italian Presidency. The main goal of the 2013-2014 Program was to investigate and promote adequate instruments for ensuring better living and working conditions in the Alpine region. The program explicitly noted the important role local communities play in safeguarding the Alpine territory and in ensuring a continuous provision of the services provided by mountain ecosystems.

The Presidency actions were developed as a contribution to the Multiannual Work Programme 2011-2016 of the Convention and to the Declaration on "Population and Culture". In particular, the Presidency sought to develop integrated policies and measures for identifying "common benefits" between the mountains, the peri-Alpine areas and the urbanized plains of the Alpine region.

The outcomes of this biennium will be discussed by the Ministers of the eight Alpine countries at the XIII Alpine Conference, which will be held in Turin on 21 November 2014. Among the topics scheduled for the Conference agenda, the following are worth noting:

- The Alpine Convention endorses the implementation of the **EU macro-regional strategy for the Alpine Region (EUSALP)**. During the first stage of the process, the Convention developed an input paper containing observations and recommendations for the definition of the Strategy. Moreover, the Italian Presidency and France committed to planning a Joint Conference for identifying the main issues to be included in the new strategy. Following the conference, which was held in Brussels in December 2013, the European Council formally invited the European Commission to develop an EU Strategy for the Alpine region by June 2015. Through an "ad hoc" expert group, the Convention participates as an observer to the Steering Committee charged with defining the pillars of the EUSALP Strategy. This expert group recently contributed to the preparation of the final stakeholder consultation phase (July 16th - October 15th, 2014).
- **Employment and demographic change** in the Alps will constitute the subject of the Fifth

Report on the State of the Alps, to be formally presented in Turin at the XIII Alpine Conference. The report, coordinated by the Italian National Statistical Institute (ISTAT), collects figures and identifies current demographic trends in the Alps and how they influence socio-economic conditions and the regional job market. The analysis also includes a focus on **Sustainable Tourism**, which often provides income and jobs to people living in the mountains. The Presidency set up a Task Force on the topic with the goal of identifying indicators of sustainable tourism in the Alps and outlining a list of challenges and possible responses. These have been collected in a report stemming from the outcomes of the 4th Report on the State of the Alps (RSA 4). The work developed by the Task Force will feed the discussion among the Alpine Ministers at the XIII Alpine Conference, who will consider the proposal to set up an "ad hoc" working group dedicated to sustainable tourism in the Alps.

– The development of **guidelines for local adaptation to climate change** has involved many different working groups and platforms within the Alpine Convention, including the Water and Natural Hazards Platforms. The final version of the guidelines is currently being revised and will be presented to the Ministers in Turin. The guidelines will also be presented at the UNFCCC COP in Lima (Peru) within a side event on planning for local adaptation organised by the Italian Ministry for Environment. In Lima, a Joint Statement of the Alpine and Carpathian Conventions will be announced to draw global attention to the value of taking local measures to adapt to climate change in mountain regions. This Joint Statement is the result of a fruitful cooperation between UNEP as the interim secretariat of the Carpathian Convention and the Permanent Secretariat of the Alpine Convention.

– The multi-functional role of **Alpine mountain forests** was analysed by the Working Group Mountain Forests. Experts collected data on forests and the ecosystem services they supply, most of which were derived from national inventories. A report that describes the outcomes of this effort is currently being prepared. The report will discuss the ecological, economic and social roles of forests, the status of Alpine forests, the value of their ecosystem services, and current threats and opportunities. This technical document will serve as the basis for a statement on the importance of mountain forests that will be presented at the XIII Conference of the Alps.

– The Convention is seizing the opportunities offered by **EXPO 2015 in Milan** for the promotion of initiatives on food production and farming in the Alps. Partnerships with local entities that are willing to promote their territories in the context of EXPO have been established and are expected to grow further. For example, the Italian Presidency has been working with Valtellina and Val Poschiavo for the past two years to promote the "Valtellina, Poschiavo EXPO" project.

– The Alpine Convention is scheduling a joint thematic itinerary through the pavilions of the Alpine countries. The itinerary, which EXPO visitors can follow both inside and outside the exposition site, will be dedicated to mountain/alpine areas and their related agricultural products. The EXPO 2015 "**Mountain Week**" (4-11 June 2015) will bring together events dedicated to the mountains. The Mountain Week is organized by national delegations and other public or private entities with excellence in mountain food. The Convention is expected to provide coordination services to the organisers and promoters of coherent events for enhancing cooperation, partnerships and visibility.

– The **Alpine Digital Agenda** is an initiative that aims to break down the digital divide that currently hinders relationships within mountain territories. The agenda aims to increase the quality of life for people living in mountain regions. The Italian Presidency has set up a Task Force to address the problem of the digital divide. The Task Force is preparing a paper, "A Digital Agenda for the Alps", that presents tools (indicators, assessments) for building a digital network in mountain areas that is dedicated to improving social services (e.g., telemedicine) and enhancing the local economy (e.g., development of e-commerce).

– Much has been done during the Italian Presidency to enhance the commitment of the Alpine Convention to cross-border cooperation in mountain regions. Cooperation amongst mountain regions and communities was strongly promoted at the International Workshop on **Mountain Cooperation** (Budoia, 6-7 June 2013); subsequent meetings assured the cooperation of "minor" mountain areas

such as the Apennines (Sarnano, 23-24 March 2014) and the Ardennes (Sedan, September 15-16 2014). The Alpine Convention has also strengthened its ties with UNEP, as well as with universities and research centres working on mountain topics. The conference held in Sarnano issued a charter ("La Carta di Sarnano") that sets objectives and outlines future actions for launching a cooperation project in the Apennines.

– The project **New Generation** aims at recognising young talent in mountain regions and creating more educational and career opportunities. The Italian Presidency has set up a special Task Force chaired by Prof. Anna Giorgi (University of Milan - University of the Mountain in Edolo) to establish cooperations between research and education institutions. The Task Force has produced a number of initiatives, such as the promotion of a training course on "Project Management for the Mountain" for young talents and post-graduates. Furthermore, the Task Force has created opportunities for young people to participate in national delegations attending the XIII Conference of the Alps, and in the organisation of a session at the ForumAlpinum (Boario Terme, Italy) dedicated to the "New Generation".

Workshop 5-1

Liveable Alpine Space 2014-2020: Finding action ideas

Eva Stare
Alpine Space Programme
Munich, Germany

The Alpine Space Programme 2014–2020 is an EU transnational cooperation programme to support sustainable regional development in the Alpine region. Contributing to the EU 2020 strategy for smart, sustainable and inclusive growth, it provides stakeholders with a framework to develop, test, implement and coordinate new ideas. In its role as a driver of development and change, the Programme combines three functions:

- trigger and fund result-oriented projects contributing to the Programme objectives;
- nourish debates on cohesion policy and the future of the Alpine Space;
- act as a catalyst for cooperation and common solutions in the Programme area.

Following these three functions, the workshop had a threefold aim:

- to present the new Alpine Space Programme 2014-20 and especially the specific objectives and indicative actions of Priority ''Liveable Alpine Space'';
- to present the achievements of past and current Alpine Space projects focusing on the topic of natural resources;
- to discuss action ideas for tackling the objectives of the Priority ''Liveable Alpine Space''.

Specific objectives and indicative actions of the Priority ''Liveable Alpine Space''

From 2014 to 2020, projects will be approved in the context of four programme priorities. The priority ''Liveable Alpine Space'' is dedicated to the use, valorisation and management of Alpine resources. In this priority, the Programme follows two objectives to which future projects should contribute:

1. With the specific objective ''Sustainably valorise Alpine Space cultural and natural heritage'', the Programme aims to increase the consistent, balanced and sustainable use of cultural and natural heritage by raising awareness about present opportunities and future challenges in the Alpine Space. The Programme supports the development of new solutions for managing cultural and natural heritage (e.g., the adoption of governance tools and the development of new production chains, conflict management tools etc.).
2. Within the specific objective ''Enhance the protection, the conservation and the ecological connectivity of Alpine Space ecosystems'', the Programme aims to harmonise management approaches, facilitate knowledge transfer and share responsibilities for integrating Alpine Space ecosystem functions and needs into policies.

Achievements of past and current Alpine Space projects focusing on the topic of natural resources

In 2013, the Programme organised a special call for proposals for projects that would gather the outputs and results of other Alpine Space projects, evaluate them and present them to the relevant stakeholders. The aim was to capitalise on these outputs and results by encouraging experts, administrations and policy makers to use them in their efforts to facilitate sustainable territorial development. Three such projects were approved in the thematic fields of resource efficiency and ecosystem management: balancing riverine ecosystems and hydropower production, ecosystem services and connectivity, and natural risks and hazards.

Project AIM (Alpine space In Movement, targeted at water & energy capitalization) focuses on **balancing aquatic ecosystems and hydropower production**. In the frame of the AIM project, a series of user-friendly software was developed, enabling the key beneficiaries, such as public administrations, policy makers, dam owners and private investors, to easily access the results of the Alpine Space projects. During the workshop, Andrea Danelli (RSE SpA - Ricerca sul Sistema Energetico) presented the main tools and methodologies that were developed in the frame of the projects SHARE, Alp-Water-Scarce, SedAlp, SEAP_Alps, ECONNECT and recharge.green. Tools like SESAMO, VAPIDRO-ASTE, SMART Mini-Idro, Water Scarcity Index, SEAP_Alps Action Tool and MORIMOR-GIS improve water management, reservoir operation, hydropower potential assessment and small hydro development. They are available through the project website www.aim2014.eu, with a detailed description and examples of application in pilot case studies.

Ecosystem services and connectivity are the key topics within the **greenAlps project** ("Valorizing connectivity and sustainable use of resources for successful ecosystem management policies in the Alps"). The goal of GreenAlps is to strengthen the conservation of Alpine biodiversity by identifying and integrating the most significant results from projects like ECONNECT, recharge.green and others, all of which focus on ecological connectivity, ecosystem services and ecosystem management. As a continuation of the work done in the aforementioned projects, the greenAlps partnership identifies relevant ecosystem services and evaluates them for their significance and their valorisation in the pilot regions through a stakeholder consultation processes. The project is also exploring why available knowledge is not better transferred to the policy level. An online survey was conducted to collect feedback from knowledgeable stakeholders and experts about subjects related to EU and national/regional biodiversity policies. The results showed that it is much easier to involve stakeholders with knowledge (academics, researchers, experts etc.) in project activities than stakeholders with power and political interests (politicians, ministries, decision makers etc.). Also, stakeholders tend to cooperate and communicate within their own groups (i.e., academics versus politicians); contact between the two groups is almost non-existent. Dr Chris Walzer from the University of Veterinary Medicine, Vienna presented the greenAlps project and described efforts to integrate these results into current and future regional, national and Europe2020 policies. For more information, go to www.greenalps-project.eu.

Susanne Mehlhorn from the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management presented the **project START_it_up** (State-of-the-Art in Risk Management Technology: Implementation and Trial for Usability in Engineering Practice and Policy), which addresses issues related to **natural risks and hazards**. The project collects, evaluates and disseminates good practice examples that already exist at different levels in the Alpine Space. A database of existing standards and best practices is being created and a transnational standardisation process in the field of natural hazard engineering is underway. START_it_up focuses on the following thematic fields of hazards and risks related to floods, debris flows, avalanches, rock falls and landslides: Hazard Mapping and Implementation in Regional Development, Technologies in Natural Hazard Engineering, Expert Decision Making, and Good Governance in Risk Management. For more information, visit www.startit-up.eu.

Action ideas tackling the objectives of the Priority "Liveable Alpine Space"

The participants of the workshop were asked to identify remaining transnational issues and potentials in the Alpine region, as well as possible solutions and action ideas that could be addressed by future Alpine Space projects. The participants agreed that many good solutions, tools, methodologies and practices already exist, but that decision makers and policy makers are not using them. Although the abovementioned valorisation projects have made some progress in this regard, it is always difficult to

transfer scientific results to the policy realm. A few ideas were gathered about how to overcome this issue within the framework of transnational cooperation projects:

- Involve policy and decision makers in projects from the beginning so that project outputs are better tailored to meet policy and management needs.
- Cross-sectoral dialogue and the involvement of both experts and decision makers in projects can lead to mutual understanding and improved solutions and decisions.
- In times of economic austerity, when many development projects stall due to a lack of human and financial resources, transnational cooperation projects should be seen as an opportunity for developing innovative solutions and tools that support more sustainability-oriented decision-making.
- If administrations cannot become project partners due to a lack of human resources, they can nevertheless be involved as active observers and final beneficiaries.
- The Alpine Space Programme should continue its efforts to promote better cooperation and exchange between different types of institutions, different sectors and different levels of governance.
- EUSALP (European Strategy for the Alpine Region) should also be considered as an opportunity for a stronger exchange between policy- and decision-makers and researchers.

Workshop 5-2

European Strategy for the Alpine macro-region (EUSALP): Responding to the consultation phase

Thomas Scheurer
ISCAR
Berne, Switzerland

This workshop focused on questions relevant to the EUSALP consultation of 2014 (presented by Florian Ballnus). In particular, the workshop addressed three key questions within EUSALP Pillar 3, "Ensuring sustainability in the Alpine Region: preserving the Alpine heritage and promoting a sustainable use of natural and cultural resources".

1) What are the main challenges for ensuring sustainability in the Alpine Region?

The main challenges for ensuring sustainability in the Alpine Region are primarily social challenges. Sustainability in Alpine areas depends on the self-responsibility of locals, stakeholders and (especially) tourists with regard to the use of resources. Self-responsibility means that locals create ownership for their region by developing commonly recognised achievements. For example, the Baltic Forum brought together 1200 people with the aim to commonly improve the water quality in the Baltic Sea. EUSALP has to create a similar sense of ownership and identity amongst Alpine residents and stakeholders. Such a communal sense of ownership can be built up over the course of a project, but should endure well past the completion of the project. Thus, it is important that EUSALP facilitates the long-term evolution of its projects. Actively involving local partners and existing institutions in the development of a macro-regional strategy will be a key component in the creation of a long-term sense of ownership and identity.

From a macro-regional point of view, sustainability is synonymous with resiliency. The ability of a region to adapt to ever-changing social, environmental and economic conditions is essential to its long-term success. The disparate challenges of individual regions will, however, require a regional approach. It will be a task of EUSALP to create various regional development models (e.g., energy regions, wood chains) and to develop a spatial concept for balancing supply and demand between regions. A lack of know-how currently hampers this effort, but tools such as macro-regional compensation models will be important for solving or mediating resource use conflicts. Further, solidarity (rather top-down) will be a topic within the coming Alpine Space Programme.

2) These challenges are likely to include the objectives listed below. Please indicate, in order of priority, a maximum of 3 objectives on which the EUSALP should concentrate in Pillar 3:

- Promoting ecosystem services
- Developing transnational management schemes for protected areas (instruments and criteria)
- Ensuring ecological connectivity within the Alpine Region, as well as between the Alps and

surrounding territories

- Developing regional landscape development agreements and planning instruments
- Establishing integrated watershed management systems
- Developing products and services based on local natural and cultural resources
- Fostering instruments and procedures that balance the interests of multiple resource uses, including energy production, habitat conservation, tourism, etc.
- Increasing the sustainable use of biomass for renewable energy production
- Fostering energy efficiency, particularly in the housing and mobility sectors
- Mainstreaming the adaptation of risk management strategies
- Developing regional responses to climate and demographic changes

During the workshop, the following three strategic objectives were identified as priority issues:

– **Priority 1: Watershed management systems**
Here, effort should be made to build on rather than duplicate the EU water framework directive. For example, the topic should be broadened to include risk management and climate change. By working at a macro-regional scale, there is an opportunity to integrate downstream lowland areas in water management solutions.

– **Priority 2: Promoting ecosystem services**
The promotion of ecosystem services has to be understood as a concept for managing natural resources. In particular, this priority should focus on developing products and jobs in core mountain areas, especially for young people. This priority is related to pillar 1.

– **Priority 3: Fostering instruments and procedures that balance the interests of multiple resource uses.**
This topic, which includes energy systems, primarily concerns different types of protected areas.

Comments to other topics:

– Biodiversity and ecological connectivity are also cross-sectoral topics; successfully incorporating them into EUSALP will depend on whether concrete targets can be developed.

– It should be noted that most of the objectives are directly linked to future demographic changes, an important issue that needs to be considered in conjunction with Pillar 1, which focuses on improving competitiveness, prosperity and cohesion in mountain regions.

– The focus on landscape development is too narrow in that landscapes should be treated as a resource with private and public dimensions.

– The use of biomass is linked not only to energy production, but also to the regional economic system (value chains).

3) Concrete actions or projects

For each pillar, a single topic should be selected during a test phase and treated as a laboratory for testing the strategy. For pillar 3, the workshop participants proposed the topic water management. Such an action should not only consist of several individual projects, but also of a wider approach that includes the implementation of concepts over the long term. The Water Platform of the Alpine Convention could develop such projects. Possible actions are: climate change related issues in water use, as far as transnational aspects are concerned (based on results of the Alpine Space programme), and transnational water use compensation models.

Workshop 5-3

Themes for a new Alpine research and education network built on youths' views

Luca Cetara
EURAC Research
Bolzano, Italy

The workshop "Themes for a new Alpine research and education network built on youths' views" was promoted by the Italian Presidency of the Alpine Convention 2013-2014 in co-operation with the University of Milan and the UNIMONT "Mountain University" in Edolo. The workshop was part of an initiative of the Task Force "New Generations", which was set up by the Presidency to promote actions that enhance the capabilities of Alpine youth and increase their participation and voice in the institutional framework of the Alpine Convention.

One of the objectives of the Italian Presidency of the Alpine Convention in 2013-2014 was to involve young people in the institutional process of the Alpine Convention and to create regional educational and job opportunities for them. The Task Force focused on supporting young talent interested in or qualified to deal with the promotion, development and sustainability of the Alpine region. The main initiatives undertaken in this regard include the participation of young people in high-level institutional meetings of the Alpine Convention (meetings of the Permanent Committee and the Alpine Conference) and the organisation of a project management course for young people specializing in the development of Alpine areas.

The session organised in the framework of the Forum Alpinum 2014 highlighted existing education and training initiatives in the field of sustainable mountain development. It is quite likely that regional or local demand (often backed by institutional, policy-oriented and/or financial measures) drives the supply of mountain-specific courses, degree programmes and other ad hoc initiatives. Sometimes, strict co-operations between governments and research institutions are found. In other instances, the reach of a few originally local or regional initiatives extends beyond regional borders to include applicants from elsewhere within the same country (e.g. many of the education initiatives of UNIMONT in Italy), or from bordering countries (e.g. the Joint MSc Programme offered in Bern and Freising, in Switzerland and Germany), The availability, cost-effectiveness and efficacy of innovative information and communication technologies also provide opportunities for distance-learning without sacrificing the possibility for interaction and exchange between lecturers and students.

The participants in the Round Table shared a range of experiences developed across and within the Alps (e.g., UNIMONT, University of Innsbruck, University of Bern and the higher education system of Slovenia; the University of Reims-Champagne Ardennes). These experiences illustrated some of the challenges of incorporating sustainable development principles in education initiatives, as well as the potential for cross-border partnerships and exchange.

Only some regions of the Alps have launched specific education initiatives focused on mountain areas, as described below. Universities often offer a variety of educational programmes linked to sustainability; although these programmes provide students with the ability to address a range of sustainability issues, they seldom focus on mountains in particular. More commonly, research programmes, rather than education or training programs, focus on mountain areas, especially in cooperation with local governments and organizations. One positive effect of such programs is the significant involvement of students in the development of local research projects, as is the case at the University of Innsbruck in Austria, for example.

In the cases in which mountain-specific courses have been launched, such as the joint MSc programme in Bern and Freising and the various offerings of UNIMONT in Edolo, the results have been quite positive. Such programs have generated significant interest both locally and more regionally. The Edolo courses, for example, are mainly delivered in Italian and have attracted a growing number of students from other Italian regions, no doubt due to their uniqueness in the national landscape.

Experiences and case studies in mountain-oriented education across the Alps, and beyond

Austria
The University of Innsbruck shows a remarkable expertise in involving students at different levels in research initiatives developed in the Alpine area, often in strict connection with regional and local governments. The experience in Innsbruck focused on empirical insights about youths' perceptions, knowledge and attitudes towards different topics related to mountain sustainability (e.g., risk, natural hazards, renewable energy, tourism). These topics are addressed in a holistic manner and on-site outdoor activities are encouraged. Involving students of all ages, from kindergarten through university, in education initiatives focusing on the Alpine environment is an excellent means of ensuring that youth are engaged in the care and management of the environment they live in.

Italy
The University Centre of Excellence "Mountain University", located in Edolo, Italy, specializes in the analysis of sustainable development actions for mountain areas and qualifies as a national reference point for research in mountain areas. The first academic partnership in Italy dedicated to sustainable mountain development, the Mountain University was established on the basis of a framework agreement between the Italian Ministry of Education, University and Research (MIUR) and the University of Milan. Today, it benefits from partnerships with higher education and research institutions like the Universities of Milano, Florence, Padua and Turin. The Centre offers courses that provide specific competences in mountain management, as well as considerable research opportunities. Students may, for example, specialize in issues such as the prevention of hydro-geological instability, the safeguarding of water resources, the conservation of socio-cultural and biological diversity, or the development of high-quality local products and sustainable tourism offerings.

In the framework of the 2013-2014 Presidency of the Alpine Convention, the University of Milano opened a course on "Project management for the mountains: Methods and tools". The programme offers an opportunity for the analysis, systematization and consolidation of project management methodologies that facilitate the design and management of development policies in mountain areas. The learning objectives of the course include planning and implementing projects that support business opportunities and sustainable development actions in mountain regions. The course emphasizes public-private partnerships and the specific legal, institutional and financial background needed for the preparation of successful project proposals. Particular attention is dedicated to existing frameworks, programmes and agreements in mountain areas, including the Alpine Convention, the Carpathian Convention, the European Strategy for the Alpine Region EUSALP, and EU financial programmes such as the Alpine Space Programme.

France
The region of Ardennes is a vulnerable and ecologically sensitive territory undergoing a delicate economic and social transition. To tackle these challenges, the Rheims University – the only educational institution with facilities located in the Ardennes region – has started a research project dedicated to the Ardennes as a social-ecological system. This ecological region has thus been recognised as a natural space of international interest where data need to be collected and analysed in line with the Ostrom framework. This work is being conducted by the Institute of Regional Development, Environment and Urban Planning (IATEUR) and the Inter-

national Research Centre on Sustainability (IRCS). Moreover, the university is currently defining an educational program (MSc) in sustainability science in co-operation with other international universities. Both of these initiatives have been promoted in strict cooperation with local partners, including the Champagne-Ardennes Region and the Ardennes Regional Nature Park.

Switzerland and Germany
The double "Master Degree in Regional Management in Mountain Areas" is the result of a transnational partnership between the Bern University of Applied Sciences (MSc in Life Sciences) and the Weihenstephan-Triesdorf University of Applied Sciences (MSc in Regional Management in Mountain Areas). The resulting programme combines training in ecological and socio-economic issues with training in the management of regional development in mountain areas. The programme focuses on the interactions between nature, land use, society and politics, and incorporates on-going research and policy developments in the curriculum. The programme offers competences in topics like regional development policies and measures, nature reserves, protected areas and natural hazards management. Programme graduates are qualified for careers in fields ranging from environmental advocacy and consulting to tourism and public administration.

Other countries
Other Alpine countries represented at the Round Table, such as Slovenia, have not yet set up education and training initiatives that directly address challenges in the Alps. However, a large number of research programs and other initiatives address mountain development issues in these regions. Many of the sustainability programmes started elsewhere in Europe are directly applicable in countries like Slovenia. Thus, much potential exists for cross-border sharing and exchange.

Concluding remarks

The evidence collected represents a partial consideration of existing mountain-specific educational courses and initiatives, and is indicative of the growing interest in sustainable mountain development. All the initiatives presented address sustainable development and the need for educational initiatives in this field. Considerable opportunity exists to develop an extensive network of institutions that can exchange ideas and experiences in sustainable mountain development at different levels and across different countries. Participatory approaches that emphasize knowledge sharing and encourage young people to "co-shape" activities and policies are particularly important for the future of mountain development. Some promising cases of cooperation already exist, such as the Swiss-German Masters program, UNIMONT, and the International Research Centre on Sustainability (IRCS) in Rheims. Finally, initiatives like those undertaken by the Italian Presidency in 2013-2014 in the framework of the Alpine Convention demonstrate the important role that international institutions can play in supporting education for sustainable development in the mountains.

Policy Session

Towards a macro-regional resource policy

Moderator: Anna Giorgi, ISCAR president, Milan, Italy

The sustainable use of resources will be one of the pillars of the 2015 European Strategy for the Alpine region (EUSALP) and of the consecutive action plan. In the policy session, the ways in which resource use should / could be integrated into the strategy and the action plan – and the likely challenges – will be discussed. The discussion will start with a scientific overview of future resource use, include the political views from regional, national and Alpine perspectives and end in a dialogue between these positions.

Policy Keynote

Global challenges for sustainable resource use in mountains

Hans Hurni
University of Berne, Switzerland

The Earth system in general, and humankind in particular, is negatively impacted by processes of global change, including climate change, biodiversity loss, and the degradation of land resources such as water and soil, fauna and flora. Such processes are induced by increasing human populations and changing consumption patterns, a general overuse of natural resources, and accelerating economic activities with negative externalities. Mountains are important components of the Earth system, as they contain particular ecosystems and have sensitive bio-physical dispositions and distinctive socio-economic characteristics (cf. Messerli and Ives, 1997; Price et al, 2013).

Global challenges for sustainable development are particularly pronounced in mountain areas (Huber et al, 2005). What major trends will influence mountain systems the most? And how can past and current processes of mountain degradation be minimized? Of the numerous processes observed in the various mountain systems of the world, the most important are:

- land degradation, which is mostly induced by intensified agricultural use, particularly in mountain areas where population densities are higher than in the surrounding lowlands, such as in Ethiopia (cf. Hurni et al, 2011), Latin America and Australia;
- problems induced by transport networks crossing mountain systems, or problems of hydropower and irrigation uses of mountain rivers;
- increasing natural hazards (cf. Allan, 1995), accelerated by global warming and land use changes;
- overstretching the touristic potential of mountain areas (Wiesmann et al, 2008);
- emergence of conflicts between people favouring nature protection and others pushing for economic development (cf. Hurni and Ludi, 2000);
- ex-migration of people from mountain areas, which is currently experienced in many mountains of the world, including the Himalayas (cf. Thieme and Ghimire, 2014), the Andes and the Central Asian mountains. Ex-migration is often an indication of relative economic weakness in remote mountain areas;
- problems of biodiversity shifts and changes in mountains due to changes in climate and land uses (Koerner and Spehn, 2002).

The Alps are uniquely positioned at the centre of Europe. Surrounded by prosperous lowland regions, the Alps benefit by trading in specialized Alpine products (Fig. 1) and by taking advantage of

Fig. 1. Moving cattle to alpine meadows constitutes a centuries-old practice of mountain agriculture in the Swiss Alps, which has become less and less a transhumance process due to motorized mobility. H. Hurni, 1 June 2009.

nearby markets in the neighbouring lowland areas. Alpine recreational tourism opportunities also bring millions of tourists to the mountains every year, which can benefit local economies but strain local resources. However, the pressure of transport networks and traffic density heavily impacts on mountain peoples and resources because the economic areas all around the Alps require easy linkages with one another. In addition, global change and the intensified use of mountain resources are increasing the number and diversity of mountain hazards, with consequences for both upland and lowland communities.

Mountain systems elsewhere in the world share many similarities with the Alps, particularly those in temperate zone regions such as Northern Europe (cf. Thompson et al, 2005), South-eastern Europe (Zhelezov, 2011), the USA, and western Russia. In these regions, mountains are typically embedded in economically affluent lowlands and can benefit from a balanced exchange of goods and services between upland and lowland communities. In tropical zones, however, there are marked differences. In much of Africa, Asia, Australia and Latin America, the lowlands are climatically less favourable for human uses than the mountains. As a result, mountains in these regions experience high concentrations of human land uses. Forced to meet the needs of many people in a much smaller area, the economic prosperity of these countries is often much lower, and poverty prevails (Fig. 2). These differences call for differentiated strategies for mountain development (cf. Ives, 2006).

The sustainable use of resources in mountain areas relates to people, landscapes, renewable natural resources, and non-renewable resources like minerals, oil and even rare plants and animals. What will be the main conflicts concerning resource use in the coming years? Human activities of all kinds are expected to intensify in most mountain areas, as will the associated hazards. Depending on local circumstances, mountain uses may become both more sustainable and more destructive in the future. What information do we need to help push mountain development in a sustainable direction? There is a general need for more mountain research (Price, 2007) and mountain-specific development approaches. Although knowledge regarding mountain systems has been enhanced through science and local experience, there is a general lack of target and transformation knowledge, which will require new research approaches such as inter- and transdisciplinarity (Wiesmann, Hurni et al, 2011).

References

- Allan NJR. 1995. Mountains at Risk: Current Issues in Environmental Studies. Manohar Publishers & Distributors, 296 pp
- Huber UM, Bugmann HKM, and MA Reasoner (edts). 2005. Global Change and Mountain Regions: An Overview of Current Knowledge. Advances in Global Change Research. Springer, 662 pp
- Hurni H, Berhanu Debele, and Gete Zeleke. 2011. Sustainable land management in the Ethiopian Highlands. Adaptive Management in Agriculture, Box 9. Highlands and Drylands – mountains, a source of resilience in arid regions. Published by FAO, UNCCD, Mountain Partnership, Swiss Agency for Development and Cooperation (SDC), and CDE, with the support of an international group of experts. Rome, p 76
- Hurni H, and E Ludi. 2000. Reconciling conservation with sustainable development. A participatory study inside and around the Simen Mountains National Park, Ethiopia. Produced with the assistance of an interdisciplinary group of contributors. Bern: Centre for Development and Environment, 476 pp
- Ives JD. 2006. Himalayan Perceptions: Environmental Change and the Well-being of Mountain Peoples. Himalayan Journal of Science, 284 pp
- Koerner C, Spehn EM (edts). 2002 Mountain Biodiversity: A Global Assessment. CRC Press, 350 pp
- Messerli B, and JD Ives (edts). 1997. Mountains of the World. Taylor & Francis, 510 pp
- Price MF, Byers A, Friend D, Kohler T, and LW Price (edts). 2013. Mountain Geography: Physical and Human Dimensions. University of California Press, 378 pp
- Price MF (edt). 2007. Mountain Area Research and Management: Integrated Approaches.
- Thieme S, and A Ghimire. 2014: Making Migrants Visible in Post-MDG Debates. Sustainability 6, p 399-415
- Thompson DBA, Price MF, and CA Galbraith (edts). 2005. Mountains of Northern Europe: Conservation, Management, People and Nature. The Stationary Office, Edinburgh, 396 pp
- Wiesmann U, and H Hurni (edts). 2011. Research for Sustainable Development: Foundations, Experiences, and Perspectives. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 6. Bern, Switzerland: Geographica Bernensia, 640 pp
- Wiesmann U, Wallner A, and B Ruppen. 2008. Tourismus als Schlüssel zur nachhaltigen Entwicklung in der Welterbe-Region Jungfrau-Aletsch-Bietschhorn (Schweiz). Welterbe und Tourismus, Reihe Tourismus, Studien Verlag, p 197-216
- Zhelezov G (edt). 2011. Sustainable Development in Mountain Regions: Southeastern Europe. Springer, 306 pp

Fig. 2. Poverty-induced overuse of mountain resources in Ethiopia, where forests have been removed and soils exhausted due to centuries of agricultural use and soil erosion. H. Hurni, 27.1.2011.

Policy Keynote

The Alps: A civilization model

Stefano Bruno Galli
University of Milan, Italy

The idea of organizing the territorial volunteer communities in the Alpine region, from Nice to Vienna, federally - that is, to federate on a macro-regional basis, beyond the boundaries of nation-states - is by no means a novelty of the present time. Its theoretical and practical formalization - which cannot exclude the centrality of Switzerland - is a model of "Alpine federalism" which was present in the formulation of thought well before its recent delineation at a European institutional level in the wake of the Baltic and Danube macro-regions. As is often the case, the elaboration of thought - in the historical cycle of political modernity – is neither produced by nor represents an outcome of development; rather it is an essential factor - a sort of "engine" – of institutional, and political, economic and social development.

The Charter of Chivasso in December 1943, and the ideas of Émile Chanoux, Denis de Rougemont and Guy Heraud are merely at the forefront of a common political sentiment closely linked to the civilization of the Alpine area. A political sentiment that, although polyphonic - that is varied, complex and composite - can be analyzed as a unit due to its basic compactness and homogeneity. Common elements are, in fact, discernible, such as a sort of Alpine "mysticism", which is an inclination for contemplating the magical and tremendously fascinating mountain world, also made up of impenetrable mysteries, with all that this entails from a cultural and social viewpoint in terms of civic virtue and collective mentality. An essential component of this Alpine "mysticism" is detectable in the widespread and strong religious feeling – whether Catholic or Protestant is almost irrelevant, since Alpine Catholicism takes on content related to Protestantism – of the political writers who animate this current of thought. Indeed, there is a kind of Alpine syncretism which moves from a religious to a cultural and political level and forms the ideological frontispiece for the emergence of a federation of territorial volunteer communities of the Alps, within a federal Europe.

Another element that unites the Alpine federalists is a strong and conscious feeling of resistance to oppression, whether towards an authoritarian or totalitarian State, or to a democratic but centralist and bureaucratic State. An identity-forming attachment to their origins is in fact at the base of the radical autonomism of these writers who see in federalism - framed in the context of an indisputable pro-European feeling - an entirely reasonable and practicable political and institutional perspective.

Alpine Federalism finds its doctrinal elaboration as part of a personalist and integral federalism. An elaboration that sees the Alps as a connection with Central Europe, viewing the border as a resource and defining a veritable model of civilization. The Alps are to be regarded, not as a geomorphologi-

cal element of fracture but as a territorial space that has generated an actual model of civilization. The idea of an Alpine region that has overcome the boundaries of time and space, also mentally; that of a mountain range on which to plant the flags of the border sacred to the nation since a natural bulwark against the old enemies, the Austro-Germanic peoples, has long since been set aside. And with it the "hereditary enmity" as defined by a member of the South Tyrolean ethical and civil tradition, Claus Gatterer, which weighs heavy on Italian political culture and public sentiment from time immemorial, has also been overcome.

The split is deep, as even British analysts have observed. Four years ago, the Economist published - on 5th May 2010 - a geopolitical map of Europe in which the Italian Peninsula appeared to split in two. In the South, from Rome down, the Kingdom of the Two Sicilies around the Mediterranean area, defined by the British, not very elegantly, by using the Italian word "bordello." Instead, the North was part of a confederation composed of more economically advanced, stronger and richer countries. On 14th June 2012 the Financial Times produced a geopolitical map showing the North of Italy separated from the rest of the Peninsula and included in a sort of revival of Lotharingian Europe, the heart of which is represented by a strip of land that stretches from Amsterdam and Antwerp to Florence. Here, in this area, the merchant civilization, cradle of modern capitalism, which is the basis of the production of wealth, was born.

In both cases, British analysts lead Northern Italy back to its natural Central European gravitation, - as in fact has been the case since the second half of the nineteenth century (see for example, Carlo Cattaneo and Camillo Cavour) feasible only if the Alps are seen as a sort of "link" from a geopolitical viewpoint. A link that holds together territorial volunteer communities on both sides of the Alps and sees the border as a resource. It is the Alpine 'space', much more than just a place, but rather an area privileged by a vocation for autonomy which is never dormant, due to the history, culture, traditions, identity and collective mentality which are similar because forged by the Alps, by the mountains. It is a land that, over the centuries, has been the privileged laboratory of particular forms of autonomy, self-government and tax freedom, for example of the Carte di regola and ancient statutes. It is the territory of the resolution of conflicts, especially those with the plain.

Round Table Discussion

Challenges for policy

Maurizio Busatta
Journalist, Belluno, Italy

As a valuable complement to the scientific discussions, the ForumAlpinum Round Table, "Challenges for Policy", explored new prospects for the Alpine space and its resident populations from a policy perspective. Round Table participants included representatives from the Lombardy Region and the Swiss Canton of Grisons, namely **Gianni Fava** (Regional Councillor of Lombardy), **Ugo Parolo** (Undersecretary of the Lombardy Region), **Cassiano Luminati** (President of the Valposchiavo Region in the Canton of Grisons) and **Massimo Sertori** (former President of the Province of Sondrio).

The Round Table discussion focused on different ways of managing mountain areas on both sides of the Alps, particularly in relation to the forthcoming macro-regional EUSALP Strategy for the Alpine Region and EU-sponsored programmes that promote self-governance in the Alpine regions. Veneto Law No. 25, for example, gives the Province of Belluno the status of "mountain area with administrative autonomy". The macro-regional strategy for the Alps (EUSALP) is an instrument to that transcends borders and focuses on mountains as integrated systems. The benefits and drawbacks of such programs and reforms were discussed, and special attention was devoted to initiatives designed to increase the political weight of the Alpine communities.

As panellists represented different countries, I first explained in my capacity as chairman how power is shared in Italy between the State and the Regions – including both Autonomous Provinces and "standard", non-autonomous Regions – and the main institutional issues that are currently being debated in Italy. Panellists were asked to specify the priority agenda that, in their opinion, should create the conditions needed to foster both environmental protection and social cohesion. During the discussion, measures for creating such conditions were proposed, primarily within the framework of regional policies (as national policy-makers were not in attendance).

Following an input by **Davide Caparini** and a written message by **Marina Berlingheri**, several case studies focusing on hydropower were discussed that illustrate both positive and negative examples of resource management in mountain areas. The President of the Valposchiavo Region described the Lago Bianco project, an excellent example of a successful regional initiative. Located at the Bernina Pass between Italy and Switzerland, this project concerns the construction of a 1000 Mw pumped-storage hydropower facility at Camp Martin at Lake Poschiavo. The required investment amounts to CHF 1.5 billion (about EUR 1.1 billion). Following long negotiations with local residents, the mandatory referendum received 65% of votes in favour of the

project, allowing the Canton of Grisons to approve the wording of the concessions in collaboration with the municipalities of Poschiavo and Brusio in March 2014. The package approved by Valposchiavo is a good example of sustainable regional development because it benefits both local residents and downstream users. The package includes water rates to be paid yearly to the municipalities and, to a lesser extent, to the Canton, a wide range of environmental compensation measures, and measures supporting farming and the provision of a set amount of free power to the municipal utility.

In contrast to the hydropower settlement in Poschiavo, which both benefitted and involved local stakeholders, similar projects in Italy are handled at a high administrative level that excludes the views of local residents and municipalities. Legislative Decree 79/1999 declares that concessions granted to the Italian company ENEL shall expire in 2029 in the non-autonomous regions. An exception is represented by Lombardy, where several concessions have been extended. Facts and figures were reported by undersecretary **Ugo Parolo**, who is also responsible for relations with the Alpine macro-region under Governor Maroni. In Lombardy, 82 concessions were issued for large hydropower facilities; about 15 of them have already expired. However, the granting of concessions for a 20- to 30-year period requires a tendering procedure for which no criteria and parameters have been set yet. On this issue, the Lombardy Region wants to negotiate some legislative amendments with the government: dams should not be owned by the concessionaires but should remain public property; mixed companies (of private managers and local powers) should be admitted to the tender; fees due to individual municipalities and groups thereof should be increased following the Swiss model; compulsory environmental compensation measures should be expanded in compliance with water management plans.

The policy-makers participating in the roundtable discussion expressed strong agreement that strengthening support for the development of mountain areas is needed. Councillor Fava emphasized that the Region of Lombardy is ready to support mountain areas, both with regard to their claims on hydropower plants and through financial support for rural development. In Lombardy, mountain areas make up 14% of the agricultural area and 20% of the regional gross marketable production. They also receive 35 to 45% of Lombardy`s programme resources, which are primarily used to target young farmers and multi-functional farming.

Massimo Sertori called for more self-government, since the current policy trends for non-autonomous mountain provinces may result in further marginalisation of these areas and reduce their territorial representativeness. The Province of Sondrio signed a programme agreement with the Lombardy Region and used the “water balance” as a tool to obtain more decision-making powers that could bring many benefits once the issue of concessions is solved.

Although the majority of the discussion focused on the economic and social aspects of hydropower development in mountain regions, it is important to also consider the relevant environmental issues, as sustainable regional development depends on a balance between social, economic and environmental factors. In fact, the Energy Protocol of the Alpine Convention declares that contracting States may “examine how they can make end-consumers of Alpine resources pay market-related prices, and the extent to which the local population can be fairly compensated for services supplied in the general interest”. This aspect should be further researched and included in the political discussion in order to create specific national regulations and programmes that take into account the specificities of mountain areas.

The ForumAlpinum

Young Scientist Award

The ForumAlpinum 2014 dedicated a poster session to young scientists active in the field of alpine research. The goal of the poster session was to give young scientists the opportunity to present their work to an international scientific community, and to give more attention to their results. A total of 33 young scientists presented their posters in the poster session. The posters dealt with the valorisation, use or governance of both socio-economic and agri-natural alpine resources.

All presented posters were assessed by a jury composed of three members appointed by the Presidency of the Council of Ministry and ISCAR. The judges considered the originality and innovation of the research, its relevance to sustainable development, and the clarity of the poster. The 4 best posters received a prize of €1,000 each, sponsored by the Presidency of the Council of Ministry - Department of Regional Affairs, Sports and Autonomy. The next 6 best posters received a prize of €500 each. Abstracts of the awarded posters are published on the following pages.

ForumAlpinum
Young Scientist Award

The effects of debris on glacier-derived water resources: A novel method for the quantification of supraglacial dust and its influence on ice albedo

Roberto S. Azzoni
University of Milan, Italy

Approximately 4 billion m^3 of water are stored in the Lombardy glaciers. This store of freshwater has declined significantly over the past several decades: between 1981 and 2007, about 1.67 billion m^3 of glacier-derived water was discharged due to ice melt. This decline is expected to continue, not only because of ongoing climate change but also because of the increasing presence of sparse and fine debris and dust over the glacier surfaces. These light absorbing particles reduce the ice albedo, thus enhancing glacier ablation. This surface phenomenon is common over the retreating glacier tongues. Indeed, the surface darkening is in part due to the fact that glacier shrinkage increases the exposure of nesting rockwalls and thus triggers the enhancement of surface processes and debris formation. Unconsolidated rock materials are easily mobilized by debris flows, particularly during the summer. These materials are then abraded, transported by wind gusts and deposited tens to hundreds of meters away, typically on glacial surfaces.

In this work, we investigated the characteristics of sparse and fine debris coverage at the glacier melting surface and its relation to ice albedo. We developed a protocol to: i) sample fine and sparse supraglacial debris, ii) quantify its surface coverage and covering rate using high resolution digital images, iii) describe debris composition and sedimentological properties and their temporal and spatial evolution, iv) measure ice albedo, and v) identify the relationship between ice albedo and fine debris coverage. The procedure was tested on the Forni Glacier (northern Italy) during the summers of 2011, 2012, and 2013. The results confirm that the percentage of glacier surface covered by debris is affected by albedo in an exponential relationship. Debris and dust analyses indicated that the mineral fraction was of local origin. However, some cenospheres were also found, which suggests an anthropogenic contribution to the superficial dust. Finally, the surface coverage of fine debris varied considerably, increasing from the beginning to the end of each summer and thus influencing ice albedo and increasing ice melt rates.

ForumAlpinum Young Scientist Award

Grassland irrigation and fertilisation decrease soil and within-vegetation temperatures and negatively affect orthopteran populations

Sarah Delley
University of Berne, Switzerland

Traditional mountain meadows have hosted an exceptionally rich biodiversity for centuries. They are now threatened not only by land abandonment, especially in remote areas, but also by massive agricultural intensification, notably via aerial irrigation and slurry application. The consequences of this intensification on arthropods are not well documented; this study helps fill this knowledge gap by examining how various levels of fertilization and irrigation affect invertebrate (Orthoptera) communities.

Six experimental management treatments combining a full factorial design and gradual levels of fertilization and irrigation were implemented in 2010 in twelve different subalpine Swiss meadows. The meadows were then sampled three years later (2013) to determine how the different management practices affected orthopteran populations. Changes in vegetation height and microclimate (both within the soil and just above the ground) were recorded in order to better appraise underlying mechanisms.

Intensification had a negative impact on both orthopteran density and species richness. Caelifera (grasshoppers) were generally more affected, with a density decrease of up to 70% and a decline in species richness of up to 50% in the most intensively managed plots. Intensification also induced a cooling of up to 4.5°C of above-ground, within-vegetation (air) temperature, and of 2.0°C in soil temperature, again within the most intensively managed plots, which could in part be related to an increase in vegetation height. This marked temperature drop is likely to have affected the development of orthopterans, leading to local extinction of thermophilous species. In contrast, the use of a single input (irrigation or fertilization) had moderate effects on orthopterans and microclimate.

This study contributes to a better understanding of how aerial irrigation and slurry fertilization affect mountain grassland invertebrate communities. This knowledge is needed to help guide the conservation and sustainable development of mountain agricultural systems.

ForumAlpinum
Young Scientist Award

The agrobiodiversity of the Camonica Valley: A first survey of traditional vegetable and cereal typologies in the Camonica Valley

Adarosa Di Pietro
University of Bologna, Italy

I investigated the traditional cultivation of vegetables and cereals in the Camonica Valley, to promote the knowledge and the valorisation of the agrobiodiversity resources of this territory.

To investigate the traditional genetic resources of the Camonica Valley, I interviewed 16 holders of traditional typologies using the interview format proposed by GIBA in PNBA (2012). The interviewees have lived and worked in the valley for almost 50 years and have developed strong cultural bonds with the people and the landscape.

I've found 20 traditional types of vegetables and cereals belonging to 12 species.

- Cereals: 4 typologies of Zea mays, 2 of Hordeum vulgare, 1 of Secale cereale and 1 of Fagopyrum esculentum.
- Pulses: 6 typologies of Phaseolus vulgaris, 1 of P. coccineus, 1 of Vicia faba var. minor and 1 of Glycine max.
- Vegetables: one typology each of Solanum tuberosum, Brassica rapa var. rapa and Allium ascalonicum.

Cultivation occurs primarily in home gardens (about 500 m^2). The most commonly cited reasons for cultivating traditional typologies are to aid with the conservation of local plants, to use locally adapted crops and to take advantage of the most savoury agricultural products. Most of the farmers use these crops primarily at home, and sell only their production surpluses at the market.

This first investigation of the traditional typologies of vegetables and cereals grown in the Camonica Valley indicates the importance of home gardens in maintaining the local patrimony of agrobiodiversity, handed down within the family. Of the 20 recovered typologies, 5 should be better investigated and genetically characterized: red spiny corn, Copafam bean, Paisco's bean, mountain broad bean and San Carlo's potato. These types in particular run the risk of extinction; the others are also at risk, but are currently more widely cultivated.

ForumAlpinum Young Scientist Award

Knowledge transfer in regional agriculture: Handling innovation and traditional knowledge on the farm

Heidi Humer-Gruber
Institute for Interdisciplinary Mountain Research
Innsbruck, Austria

Remote areas in mountain regions have been left largely untouched by the enormous structural changes in agriculture in recent decades; as a result, many small-scale agricultural systems have been preserved. These specific cultural landscapes, with their mosaic of various uses, remain in relatively good ecological condition. Their rich biodiversity gives these areas special importance, both because of their conservation value and because they represent important sources of traditional cultural and ecological knowledge. As such, they are of great interest for sustainable rural development. In this assignment, I investigate how knowledge transfer takes place on farms in rural areas. The farmers' attitudes towards knowledge transfer, innovation and traditional knowledge are explored.

Social-empirical methods are well established in the field of perception research and highly appropriate to this study. This research is based on a comprehensive literature review and four qualitative interviews. Semi-structured interviews ensure that the main topics are discussed in all interviews while leaving enough freedom for the interviewed farmers to express their own positions.

My empirical research so far suggests that farmers are very inquisitive characters, with a talent for inventive solutions. Their often difficult situation encourages them to experiment and try new methods and products. New ideas are implemented primarily to facilitate work and to save time and money. Occasionally, subsidy agreements and strong legislation discourage farmers from trying new methods.

Highly diverse agricultural and ecological knowledge can still be found in mountain regions. This knowledge is at risk of being lost if the livelihoods of Alpine farmers cannot be assured. As managers of the land and keepers of traditional ecological and cultural knowledge, Alpine famers play an important role in the maintenance of the Alpine landscape. It is important to find out how this innovative talent can be publicly supported and preserved.

ForumAlpinum
Young Scientist Award

Alpine inhabited infrastructures: Sustainable densification and mobility strategies in large Alpine urban centers

Fiona Pia
Swiss Federal Institute of Technology EPFL
Lausanne, Switzerland

The design and implementation of large, built-up areas, which is a topic of increasing concern in the Alps, is a complex process. Supported by the Swiss National Science Foundation, ComplexDesign is a doctoral program that studies complex urbanisation projects at a scale between the city fragment and the building (≥100,000 m^2) from an interdisciplinary perspective. Within this program that explores project complexity in different contexts, Fiona Pia focuses on the study of complex alpine projects.

Urban sprawl, particularly in the Swiss Alps, is an issue of increasing public concern, as its frequent occurrence in public media suggests. Spurred by the development of ski resorts at elevations above 1,400 m, uncontrolled urbanization is gaining momentum. Alpine urban sprawl is the result of the multiplication of individual chalet-style houses, and the source of considerable controversy. Efforts such as the Franz Weber initiative of 2012 (Switzerland) curb urban sprawl by limiting the construction of second homes. But could there be a better solution than to simply "freeze" the current situation to protect nature? The urbanization of the Alps requires new urban, legal and economic solutions.

This study focuses on a variety of large alpine urbanities, including Verbier (CH), Zermatt (CH), Andermatt (CH), Avoriaz (FR) and Whistler-Blackcomb (Canada). This research offers contemporary densification strategies in Verbier by grouping multifunctionality and transportation interfaces in order to create a renewed Alpine context.

Verbier is currently at its size limit and suffers from significant mobility problems. This PhD project proposes a new transportation system for the Alpine public that helps solve problems of traffic congestion. Specifically, a new urban gondola would work in a circular form that bypasses urbanization so as not to block the view, but provides convenient and regular access to the town center, ski slopes and the surrounding environment. All related infrastructure, including five new residential structures located in the last available building zones, would be built following valley contours. Outside the constructible areas, the cables from the cable car would be suspended well above avalanche areas, allowing nature to take its course while reducing the risk of infrastructure damage.

In order to take advantage of the last available square meters in Verbier, the project envisages inhabited infrastructure. This Alpine hybrid building contains several programs (the cable car, housing, offices, shops, specific public facilities for alpine and urban activities) served by a central public strip. Empty voids through the volume create a rapport and a set of visual relationships between the different programs. The foot of the mountain enters the

building; it connects to the forest behind and to the view of the mountains ahead.

This study demonstrates that it is possible to construct large, dense and durable buildings, and to "build large" while still protecting the landscape. The project indicates that it is possible and even desirable to increase the densification in Verbier further before investing in "virgin" territories. Urban density in the mountains can therefore be considered a valuable asset for sustainable mountain development.

Image 1. The route of the cable car and the footprint of the inhabited stations. © Fiona Pia, EPFL-LAMU

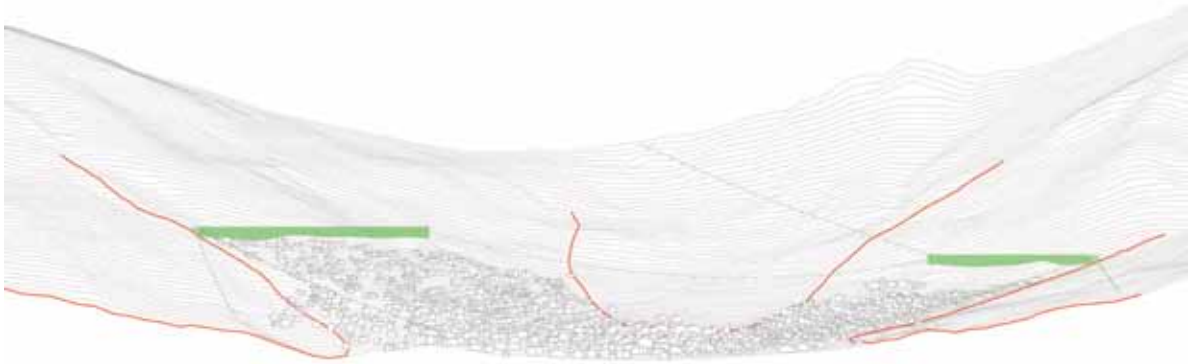


Image 2. Partial elevation of the new densification «limits». © Fiona Pia, EPFL-LAMU

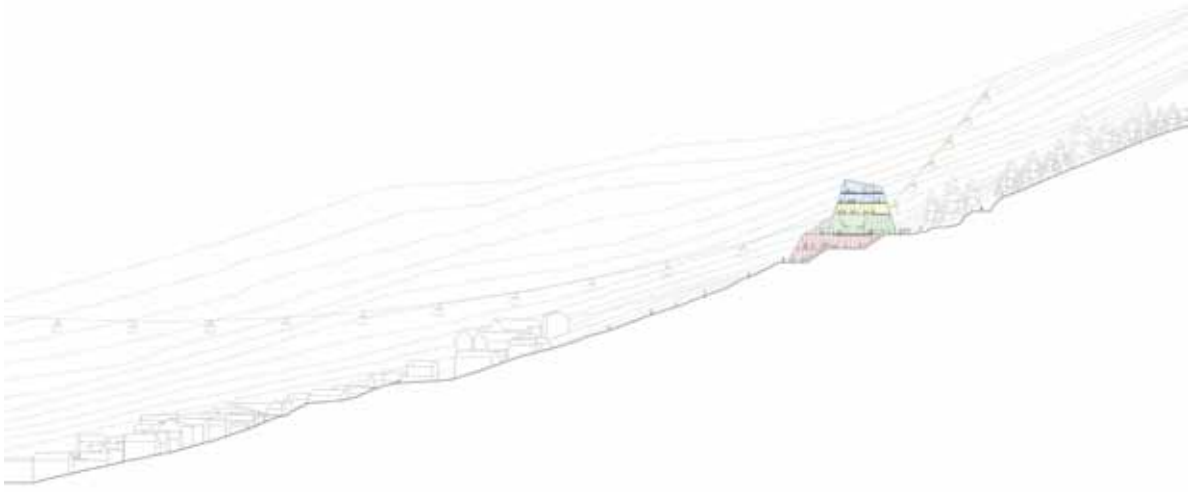


Image 3. Inhabited infrastructure containing various programs. © Fiona Pia, EPFL-LAMU

ForumAlpinum
Young Scientist Award

Experiences with Scottish Highland cattle on Alpine pastures: Ethology and food intake

Pierik Mario Enrico
University of Milan, Italy

Abandonment of Alpine grazing and farming is a common problem throughout the Alps and has negative impacts on the biodiversity of pastures and meadows. This new agricultural situation is leading to radical changes in marginal livestock farming. The introduction of non-native breeds should be explored as an environmentally sustainable alternative for managing marginal areas. This study investigates the impact of Scottish Highland cattle on degraded Alpine plant communities (phytocoenoses).

Thirteen Highland cattle were introduced to pastures located in Val Malenco (SO, Italy) in 2012. Eight experimental parcels with different vegetation compositions were defined and the cattle were allowed to graze on each parcel for as long as sufficient forage was available (7 -12 days). As the cattle grazed, we carried out phytosociological relevés and species consumption estimates. Ethology was studied in terms of ingestion, rumination, movement, rest and other activities, during daylight hours for several consecutive days.

Most of the phytocoenoses surveyed clearly showed the effects of the abandonment of agro-pastoral practices. An abundance of shrub species led to low average pastoral values, indicating low forage quality. However, Highland cattle showed a certain preference for grazing invasive species and lignified essences, making it an excellent candidate for maintaining and improving Alpine pastures. Highland cattle primarily ingest the vegetative apex, which positively decreases shrub growth and allows herbaceous species to colonize the pasture, thus improving pasture structure.

Highland cattle showed a tendency to remain stationary while grazing in pastures so as to avoid energy loss. Ingestion was significantly greater in the morning hours ($p<0.01$) than in the afternoon, while the measurements of cattle standing still showed less significant differences ($p<0.05$) between morning and afternoon. Cattle tended to move less frequently in meadows ($p<0.05$) compared to open woodlands. These behaviors were unique compared to other Alpine breeds (e.g., Brown Swiss) and indicated a greater efficiency in terms of energy saving (in open pastures) and foraging capability (in woodlands). For this reason, the Highland breed seems better suited to the Alpine environment than prevailing breeds. The breed seemed to be gregarious and showed excellent maternal instincts. Ectoparasites were found to only affect newborn calves, and veterinary expenses were minimal.

The feeding habits, hardiness and low operating costs of Highland cattle make them an attractive and environmentally sustainable alternative for maintaining Alpine pastures.

ForumAlpinum
Young Scientist Award

SCI IT3230017: "Monte Pelmo-Mondeval-Formin" An ecological survey using DPSIR indicators

Nicola Rossi
University of Ferrara, Italy

Alpine environments are unique natural ecosystems that are currently threatened by ever-increasing human activities and by territorial policies that often see natural resources as obstacles rather than assets. To standardize the means of assessing and protecting biodiversity across borders, the Fanalp project established an innovative platform of shared expertise and policies between Alpine regions of the eastern Italian Alps and Austria.

Exploiting the existing Natura 2000 network and the drive-pressure-state-impact-response (DPSIR) model of the European Environmental Agency (EEA), 188 indicators were developed together with detailed monitoring protocols for key Alpine species. The indicators and monitoring methods were tested in the Site of Community Importance (SCI) "Monte Pelmo-Mondeval-Formin", an important natural area that lies in the heart of the Dolomites. Anthropic presence is constant year round in this part of Veneto's Alpine region. A subset of 86 candidate indicators was calculated for the SCI under study, and 6 umbrella species in the Phasianidae and Picidae families (pheasants and woodpeckers) were picked for monitoring during spring 2011 using standardized protocols.

Results confirmed the presence of all the study species, although local abundances were highly variable. By combining socioeconomic indicators, particularly regarding tourism, and the spatial distribution of the monitored species, it was possible to identify areas of high ecological interest and the menaces to their conservation.

DPSIR indicators can be a great tool for quantifying biodiversity and threats to biodiversity. Their advantage lies in the capacity to blend data from different fields, which gives decision-makers a broad understanding of all the issues involved in the management of the area. Furthermore, standardized methods enable comparisons at an inter-regional level. It would be desirable to extend the DPSIR framework to the whole Alpine region in order to identify the sectors of the Alps most in need of attention and funds.

ForumAlpinum
Young Scientist Award

Family farms in the mountain region: What principles contribute to resilience?

Agnes Strauss
University of Natural Resources and Life Sciences
Vienna, Austria

The multifunctional activities of Alpine farmers and the active management of Alpine farmland are the key for maintaining an attractive, lively rural area. However, farming under difficult Alpine conditions is not compatible with the currently propagated paradigm of modernization and farm growth. Farmers face the dual challenge of finding alternative strategies to secure their livelihoods and adapting to changing political, environmental and social conditions. How do small and medium sized farms master these challenges? What allows them to be resilient? The Austrian case study within the RETHINK project addresses these questions.

Interviews with 30 farmers were held in the province of Salzburg (AT) to identify principles that strengthen the resilience of family farms, i.e. their ability to face shocks and stresses through persistence, adaptability and transformability. The farms were selected using a snow-balling method to ensure that a high diversity of full- and part-time farmers, as well as specialized and diversified farms, were included. The interviews were recorded, transcribed in full and coded. Although the interviewed farmers pursued different strategies based on their individual values and goals, we identified common principles that allowed farms to be resilient. These include solidarity within the family, a diversity of income sources (on- and off-farm, several marketing channels), the willingness to learn and experiment, a high degree of autonomy through low external inputs (characteristic of organic farming), and a low level of debt. Cooperation between farms enables mutual support and the pursuit of common goals in agricultural initiatives, further strengthening resilience at both the farm and regional levels. The results of this study are helpful for understanding the persistence of family farms. Policies that strengthen the implementation of these principles would contribute to maintaining a sustainable, successful agriculture in the Alpine area.

ForumAlpinum
Young Scientist Award

Key role of the mycorrhizal symbiosis on belowground ecology for apple orchards in southern Tyrol

Elisabetta Tomè
University of Bolzano, Italy

Understanding the carbon (C) cycle in terms of C sequestration and release is important for assessing the ecological sustainability of agro-ecosystems. Mycorrhizal fungi (VAM), a vital component of the soil microbial community, represent the primary interface between photosynthates and soil through their intimate associations with plant roots. The aims of this research were to quantify the presence of VAM in the root systems of apple orchards and to study the role of these fungi in the belowground C cycle.

To achieve these aims, we set up two different experiments. The first was performed in apple orchards planted in 2008, 2010 and 2012, which were treated at planting with chemical fumigation (F), mycorrhizal inoculation (M) and no treatment (control, C). Soil cores were collected and roots were analysed for the ratio of root colonization length (RLC%) using a dissecting microscope. In the second experiment, we combined a stable isotope technique with measurements of soil respiration fluxes in an eight-year-old apple orchard. A physical separation of the Rsoil components was applied using 5 – 50 µm mesh and no mesh filled with C4 soil. Rsoil measurements were collected during a series of surveys between March 2013 and April 2014. The collection of CO2 samples for isotopic analysis (using the Keeling approach) was performed monthly from March until November 2013; samples were further analysed using a Gas Bench coupled with an Isotopic Mass Spectrometer (CF-IRMS; Delta V Advantage, Thermo Fisher Scientific, Germany).

One year after planting, the root systems of apple plants were well colonized by mycorrhizae, with RLC between 36 ± 3% and 56% ± 3%. The range of colonization increased with age; the highest value was observed in the 5-year-old orchard (90 ± 6%) and the lowest in the 1-year old orchard (36 ± 7%). Roots from inoculated trees had higher RLC than roots from 1- ($p=0.0028$), and 3-year-old ($p=0.0231$) fumigated trees. However, RLC in inoculated blocks were not significantly higher than those in C blocks ($p=0.5163$). RLC in fumigated blocks was high (36 ± 7%), but significantly lower than in M and C blocks one year after treatment. No fumigation effect was observed three years after treatment. The annual soil respiration (Rsoil) was 600.44 gC m-2y-1 and Rmyc, calculated as the difference between fluxes, accounted for around 21% of Rsoil. The δ13C of the soil CO2 changed seasonally from -21‰ in the early season to -23‰ during the vegetative season. The fraction of root and mycorrhizal respiration counted for 20-30% of the total δ13C respired since July; during the latter part of the year, this declined and the microbial (SOM) contribution increased. This study highlighted the key role of mycorrhizae in apple cultivation and set the basis for further studies on the importance of this symbiosis for sustainable cultivation.

ForumAlpinum Young Scientist Award

Carbon footprint of milk production in the Italian Alps

Maddalena Zucali
University of Milan, Italy

In the Italian mountain areas, particularly in the Alps, dairy production is still an important economic activity, strictly connected with the production of typical cheese varieties. During the last several decades, the Italian Alps have suffered from a high rate of agricultural abandonment that has mainly affected small farms. The remaining farms, especially in the dairy sector, show a trend toward increasing size and intensifying production. The aim of this study was to evaluate the carbon footprints (CF) of dairy mountain systems that employ summer grazing (SG) activity and those with no summer grazing (noSG).

A sample of 32 dairy farms, located in the central area of the Italian Alps, was analyzed using a "cradle to farm gate" Life Cycle Assessment (LCA). All the processes related to the on-farm activities and pertinent emissions were taken into account. Greenhouse gases arising from off-farm activities were calculated with the assistance of Simapro 7.3.3 (PRé Consultants, 2012) software. The functional unit was 1 kg Fat and Protein Corrected Milk (FPCM) leaving the farm gate.

On average, the farms had small herd sizes (54±61 lactating cows) but high stocking rates (3.7±2.0 livestock units ha^{-1}). The average milk production was 6206±1892 kg FPCM cow-1 year-1. The 19.1±17.1% of lowland was used for growing maize for silage, while the remaining was permanent grassland used for harvesting hay. The percentage of pastures in the highland varied from 0 to 96.6% of the total farmland. The Carbon Footprint values obtained were 1.55±0.21 and 1.72±0.37 kg CO2-eq. kg^{-1} FPCM for noSG and SG farms, respectively. There was no significant difference (P=0.22) between these values.

Traditional summer grazing in high-elevation pastures is a low input activity and may be considered environmentally sustainable. However, farms that use summer grazing do not show any reduction in the the carbon footprint of milk, probably as a consequence of low milk yield and low feed efficiency.

ForumAlpinum Young Scientist Award Poster applicants

Name	Institution	Poster title
Andreoli Elena	University of Milano	Monitoring sanitary status and evaluation of body conditions as tools for the alpine wild ungulates management
Arena Libera Paola	University of Insubria	The IGS project: on the steps of scientist-voyagers of the past. New tools and strategy for an Historical Geotourism.
Azzoni Roberto S.	University of Milano	The effects of debris on glacier-derived water resource: a novel method for the quantification of supraglacial dust and the influence on ice albedo
Basso Daniele	University of Trento	Sustainable bioenergy for rural areas through hydrothermal carbonization of forest maintenance residues
Beghi Roberto	University of Milano	Testing and design of a passive precooling system for the postharvest quality preservation of Alps blueberries from Valtellina
Bertolino Maria Anna	University of Torino	How to represent local heritage and their use in repopulated alpine villages? A practical example from the Ostana's Parish map
Bortolotti Carla	University of Bologna	Landscape, sustainability and agritourism. The Lagorai mountian chain (Trentino)
Cattivelli Valentina	University of Parma	The creative capital of Italian and European Alpine regions
Confortola Gabriele	Politecnico of Milano	Future climate change may affect habitat suitability in Alpine streams: Serio River case study
Delley Saraj	University of Bern	Grassland irrigation and fertilisation decrease soil and within vegetation temperatures and negatively affect orhopteran populations
Di Pietro Adarosa	University of Bologna	The agrobiodiversity of the Camonica Valley: first survey on traditionals typologies of vegetables and cereals in the Camonica Valley
Ferrari Jacopo	Politecnico of Milano	The broken thread

Franco Caterina	Politecnico of Milano	Between memory and contamination - The future of rural alpine landscape
Gabrieli Jacopo	CNR	Hydrological, geochemical and isotopic characterization of discharge waters from the Piz Boè active rock glacier, Dolomites, Eastern Italian Alps
Gasparella Lorenza	University of Tuscia	Device for managing the Alpine neighbouring valleys landscape
Gasperotti Mattia	Edmund Mach Foundation	Strawberry: polyphenols composition and their nutritional properties for valorisation of agronomy in Alpine area
Giacomelli Riccardo	University of Trento	Tomorrow Mountain's Architecture
Giacomelli Stefano	Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna	Validation of behavioral and biochemical parameters in wild mammals kept in breeding condition, captivity and free life
Giarelli Luca	I.S.T.A.	Cultural Meetings for the Alps
Giovenzana Valentina	University of Milano	Setting up of simplified handheld optical systems to estimate ripeness of grapes and blueberries from Valtellina (SO, Alps region)
Girometta Carolina	University of Pavia	Laricifomes officinalis: a rare and precious resource in the Alpine forest to be protected and exploited
Humer-Gruber Heidi	Interdisciplinary Mountain Research, Innsbruck	Knowledge Transfer in Regional Agriculture Handling of innovations and traditional knowledge at the farm
Lucchese Martina	University of Architecture, Venice	Vajont 1963-2013
Maccezzoli Niccolò	University of Milano-Bicocca	Elemental characterization of Alpine ice cores using Instrumental Neutron Activation Analysis
Malek Ziga	University of Vienna	Combining participatory modeling and land change simulation for generating spatially explicit scenarios of future tourism development: example in the Italian Alps
Mancon Simona	University of Milano	Ruta Graveolens from Valcamonica Valley: an incredible source of bioactive compounds for the agrifood and pharmaceutical industry

Mania Ilaria	University of Torino	Biodiversity and ecology of microbial communities in Patterned Grounds
Mignatti Andrea	Politecnico of Milano	Interplay between population density and climate on the dynamics of the black grouse (Tetrao tetrix) in the Piedmont region (Italy)
Miličić Vesna	University of Ljubljana	Stakeholders' impact within the spatial planning process on the use of agricultural land in the Koper municipality
Mrad Meriem	University of Padova	The alpine summer pastures in the Veneto Region: management systems
Nardin Francesca	University of Parma	First characterization of the macro-benthonic fauna of the perennial glacial river Rio Saldura (BZ) in the context of climate change in the Alps
Peroni Francesca	University IUAV of Venice	After Schengen Strategies for a smart reuse of disused areas sites in Pontebba
Pia Fiona	EPF Lausanne	Alpine ComplexDesign
Pierik Mario Enrico	University of Milano	Experiences on alpine pastures with Scottish Highland cattle: ethology and food intake.
Pignata Giuseppe	University of Torino	Technical innovations to support cultivation, processing and postharvest handling of Western Alps wormwoods (Artemisia L.) ecotypes: an overview
Pinna Jonathan	University of Bologna	Monitoring experimental grassing at Julierpass (CH) and characterization of hayseed at high altitudes (Prog. INSEM)
Poto Luisa	CNR	Late Glacial to Holocene peat bog succession from the Dolomites (Belluno, Italian Alps)
Pradella Francesco	Politec Valtellina	Alpine-centric Valtellina EcoEnergy (VEE)
Righetto Lorenzo	Politecnico of Milano	Trophic state change and ecosystem response in lake Maggiore: a food-web model
Rossi Nicola	University of Ferrara	"Monte Pelmo-Mondeval-Formin" An ecological survey using DPSIR indicators
Šoos Pia	University of Ljubljana	Climate change adaptation from the perspective of landscape planning
Stain Devid	Research Team for Comunità Montana of Valcamonica	The "re-discovery" of the maggenghi through natural paths

Strauss Agnes	BOKU Vienna	Family farms in the mountain region: What principles contribute to resilience?
Tomè Elisabetta	Free University of Bolzano	Key role of the mycorrhizal symbiosis on belowground ecology for apple orchards in South Tyrol
Torresan Chiara	CRA-MPF	Statistical analyses and techniques for forest volume estimation and stand structural classification using airborne laser scanner data
Trotti Paolo	University of Milano	A top predator species as a bio-indicator of alpine biodiversity in relation to human activities
Vučenović Dragan	Trzic (SI)	Alternative food networks: Three case studies from opper Carniola (Gorenjska) Region
Zecchin Luca	University of Trento	MARGIN[AL] SPACES A methodological approach for the Alpine territory of the low and medium mountain
Zucali Maddalena	University of Milano	Carbon footprint of milk production in Italian Alps

The Alpine Convention

Young Scientist Award

The Young Scientist Award, organised by the Alpine Convention, is a contest dedicated to young people doing research in the Alps and about the Alps. The Award, organised every two years and open to both Master and PhD students, is one of the Alpine Convention's key initiatives regarding young people in the Alps. The new generations are of crucial interest to the Alpine Convention because they represent the future of the Alps; thus, the Convention considers the development of initiatives that encourage young people to engage in Alpine issues a priority.

One specific feature of each edition of the Young Scientist Award is that it is structured around topics that are of interest to the Alpine Convention. This year, the focus was on Energy and Sustainable Tourism, two very relevant topics closely related to the objectives of the Convention. Contributions addressing the theme of Energy focused on the role of the end user in improving efficient energy use and on the development of sustainable energy systems in the Alps. Under sustainable tourism strategies, initiatives and policies designed to improve sustainable tourism development and its implementation in the Alpine reality were sought.

We received more than 40 contributions from almost all Alpine states; these contributions were reviewed by an international jury composed not only of representatives from the academic world, but also of a representative from an Alpine Convention Infopoint. Infopoints are local initiatives designed to promote the implementation of the Alpine Convention. In total, six prizes were awarded: a first and second prize, three ex-aequo prizes and one "Infopoint prize". The Infopoint prize was awarded by the Infopoint Domodossola in recognition of a project of particular relevance to the local community. The topics tackled by the authors of the winning posters range from the use of renewable energy sources and sustainable tourism initiatives to water usage in tourism areas and the architectural restoration of abandoned villages.

In the future, the Alpine Convention will strive to further promote the Young Scientist Award and to enhance the participation of young researchers. We have particularly appreciated this year's cooperation with ISCAR and the organisation of the Award in the context of the Forum Alpinum; this allowed for the exposure of the Young Scientists' outstanding research outcomes within the broader public, as well as within the "Alpine Academia".

Simona Vrevc, Vice Secretary General of the Alpine Convention

FIRST PLACE

Decision support in the implementation of sustainable development in protected areas with regard to environmental education and ecotourism

Mojca Stubelj Ars
University of Nova Gorica

Background

The thesis examines the relationships between sustainable development, environmental education and ecotourism in protected areas. Specifically, it addresses the question of how to provide decision support that can aid decision makers in the implementation of sustainable development in protected areas. In the thesis, we addressed decision problems that occur in mountain and island areas, since these are highly vulnerable ecosystems in need of protection. We developed various decision support models and conducted few socio-environmental case studies. Based on the results, we derived recommendations and guidelines for sustainable management of protected areas in mountain and island regions by implementing sustainable tourism practices and environmental education. The research was structured around four foci: decision problems in protected areas, the relationship between environmental education and sustainable development, decision support for ecotourism, and the relationship between environmental education and ecotourism.

Methods

The methodologies used in this research include content analysis, questionnaires, semi-structured interviews, focus groups and multi-attribute decision modeling. Statistical analyses were conducted using SPSS, R and Excel. We made an overview of decision problems and decision making in protected areas over the last decade, identified decision problems associated with protected areas, and developed a classification system for decision problems in protected areas. Eight case studies were conducted, four in the Republic of Slovenia and four in the State of Hawai'i, USA. The Slovenian case studies can be considered to apply to the broader Alpine space.

Results

We developed two decision support models using the qualitative decision modeling methodology DEX, which facilitates multi-attribute qualitative analysis, is freely available and has a history of successful applications in various research disciplines (Bohanec et. al., 2013). The first model addresses the sustainability of mountain hut infrastructure; the second model enables the assessment of students' information perception at the educational event. The assessment of tourists' pro-environmental behaviour was done in two protected areas: the Triglav National Park in Slovenia and the Mānoa Falls Trail in the Ko'olau Mountain Watershed Conservation District on the island of O'ahu, Hawai'i. We addressed tourists' willingness to pay to hike the Mānoa Falls Trail and their support for nature conservation. Further, we assessed the sustainabil-

ity performance of six ecotour operators in Hawai'i. Based on the assessment of good practice examples from Hawai'i, we derived guidelines for the future development of ecotourism in Slovenia, as well as a list of workable environmental education indicators for Triglav National Park. Finally, we proposed solutions for decision problems and dilemmas regarding ecotourism and environmental education in the Alps, based on the results from our case studies conducted in mountain and island protected areas.

Conclusion

The most important results show that: (a) common decision problems are present in protected areas worldwide; (b) mountain and island protected areas are attractive tourism destinations and require proper management in order to balance conservation and resource use pressures; (c) environmental education influences one's support for nature conservation in both Slovenia and Hawai'i, and one's willingness to pay for experiences like hiking in protected areas in Hawai'i; (d) ecotourists in Hawai'i behave more pro-environmentally than general visitors; (e) ecotourism operators in Hawai'i provide environmental education as an integrated part of their services.

Other contributions of the thesis are: (f) classification of decision problems and decision making processes that occur in protected areas; (g) environmental education indicators for the Triglav National Park; (h) guidelines for the future development of ecotourism in Slovenia; (i) operational decision support models for the assessment of mountain hut infrastructure and for the evaluation of environmental information perception.

The outcomes of this work are multidisciplinary and contribute to a better understanding of decision problems in protected areas and of the relationships between sustainable development, environmental education and ecotourism.

SECOND PLACE

A proposal for reinterpreting the landscape for the reuse of a forgotten settlement in the Ossola Valley

Elena Pidò & Arianna Pirazzi
Polytechnic University of Milan, Italy

The consequences of unsustainable and destructive behavior on the territory, the environment and the landscape have specific impacts at the local level on small communities. Because "living" in a specific place means actively participating in the daily life, contributing to the local "identity" and belonging to a community, it is important to re-evaluate the great potential inherent in small communities. It's time to think about radically different conditions for development, to create regionally-centered economies, and to revalue places such as small mountain settlements that are a priceless source of both goods and knowledge.

The underlying theme of this thesis is of the recovery and revitalization of some characteristic realities of the Alpine space: small villages, hamlets and other forms of rural mountain architecture that have been abandoned in recent decades. The ultimate goal of this research is to better understand a reality that we know, love and exploit by achieving two major objectives. First, our goal was to analyze and understand the changes over time that have led to changes in socio-economic dynamics at the local scale. The second objective was to assess whether and how direct interventions, aimed to the re-appropriation of these spaces, can be implemented by developing a set of specific recovery strategies. In this regard, it is essential to develop a project that is mindful of both the landscape and the people. Issues such as environmental sustainability, land use, energy consumption and the use of local, eco-friendly materials, must be addressed at the same time as issues about social sustainability, the preservation of local traditions and culture, and community collaboration.

This thesis focuses specifically on the recovery and reuse of a small rural village in the municipality of Montecrestese (Verbano-Cusio-Ossola - Piemonte - Italy). Here, a set of 9 traditional stone buildings dating back to the fifteenth century has been completely abandoned for the past 100 years. We assume a future scenario in which the hamlet is re-inhabited, hosting residences and providing useful services to the local community, and in which the land is exploited to its full potential.

Our work shows that it is possible, even necessary, to imagine a different future scenario for Alpine communities. Envisioning a specific future helps communities re-appropriate their sense of identity and maintain their local resources by allowing them to develop a set of specific strategies. The Alpine space must be re-evaluated with regard to its historical roots, which should be viewed as a source of traditional ecological and cultural knowledge about how humans can establish a condition of equilibrium and harmony with the environment.

THIRD PLACE

Transition towards sustainable tourism in protected areas in Trentino (Italy): Recommendations for designing and implementing successful partnerships for sustainable tourism in protected areas

Laura Marinelli
Utrecht University & Trentino School of Management, Italy

The tension and tight dependency between the preservation of natural resources and the potential for social and economic growth that tourism conveys are currently a major problem, especially in vulnerable, marginalized mountain environments. Protected areas have been used for more than a century as an instrument for safeguarding areas with high natural value. Initially, the management of such areas was characterized by top-down decisions that were based on a purely conservative paradigm. Over the last years, this traditional approach has become more open and inclusive, recognizing that the sustainable use of protected areas, such as through tourism, may benefit biodiversity. This change emerged along with the concept of sustainable development and that of governance. The democratization of decisional processes and the complexity of certain policies or problems requires suitable forms of government in which a variety of actors work together to carry out effective solutions to complex issues. Sustainable tourism, as a set of policies explicitly designed to lower the pressure of tourism on the environment and rural communities, represents an important concept that embraces both environmental protection and sustainable social and economic growth.

The Autonomous Province of Trento (an Italian mountain province situated in the central Alps) represents the tight dependency between nature management and tourism development. This region is of specific interest because its incredible natural heritage, which includes the Dolomites UNESCO World Heritage Site, attracts approximately five million tourists every year. The province has committed, via a new, voluntary instrument known as "Reti di Riserve", to manage protected areas in an integrated way. The province is working with stakeholders to design a multi-level, long-term strategy to foster and coordinate sustainable tourism development in its system of protected areas.

Considering the problems presented above and considering the content of the relevant protocols and academic studies, this dissertation aims to propose recommendations to the Province of Trento for the design and implementation of sustainable tourism policies in its system of protected areas. Such recommendations are based upon long-term cooperation between local and provincial stakeholders representing different sectors and interests.

First, this research develops an analytic framework gathered from the existing literature about intersectional cooperation and sustainable development in order to identify the factors that may impede or facilitate the success of such management. Secondly, applying a qualitative case-study method, the framework is based on a specific case, i.e. the Adamello Brenta Natural Park, a protected area in

Trentino that has been exploiting such participatory practices for almost ten years. More than 30 in-depth or semi-structured interviews with different stakeholders have been collected and qualitatively and iteratively analyzed. These interviews are used to depict as clearly as possible the different geographic and social components of the Park's context.

The results of this case study allowed us to redesign the analysis framework for this kind of governance, and to enhance and integrate aspects that are particularly relevant for the context of Trentino. Secondly, it is important that the system of protected areas of Trentino (30% of its territory) is examined in order to understand which aspects of each protected area will allow a more efficient implementation of participatory and sustainable policies.

The research concludes that a participatory management of natural resources with recreational purposes requires first of all a dependable management authority, as well as sufficient human, organizational, technical and financial resources. Furthermore, the research demonstrates how important it is for the Province to reinforce its commitment in favor of sustainable policies, especially in the field of tourism, where shrewd financing is needed to support long-term policies. In particular, policies designed to deal with fluctuating tourism intensities are needed. Such changes would also positively stimulate the attitude of certain local stakeholders (APT, the public utility for tourism promotion, as well as tour operators, municipalities and usi civici associations). Moreover, we hope for an increased participation of provincial APT in developing the touristic product to avoid problems in the consecutive promotion. In conclusion, it is necessary that a majority of stakeholders take part proactively (also in budgetary terms) in the process of formulating and implementing new policies.

Participants

Name	Institution/Affiliation	Location
Adani Fabrizio	Università degli Studi di Milano	20133 Milano (I)
Adobati Fulvio	Università degli Studi di Bergamo	24129 Bergamo (I)
Agnelli Guido	Università degli Studi di Milano	23880 Casatenovo (I)
Allegretti Alberto		24010 Ponteranica (i)
Andersen Prisca	JTS Alpine Space Programme	80797 München (D)
Andreoli Elena	Università degli Studi di Milano	20133 Milano (I)
Angelini Paolo	Ministry for the Environment, Land and Sea	46028 Sermide (MN) (I)
Aouinait Camille	Agroscope	1964 Conthey (CH)
Arena Libera Paola		21026 Gavirate (I)
Aresi Monica		24047 Treviglio (I)
Arnberger Arne	BOKU - University of Natural Resources and Applied Life Sciences	1190 Vienna (A)
Azzoni Giorgio	MUSIL	25122 Brescia (I)
Azzoni Roberto Sergio	Università degli Studi di Milano	20133 Milano (I)
Ballarin-Denti Antonio	Alpine Convention - Italian Focal Point	20124 Milano (I)
Ballnus Florian	Bavarian State Ministry for the Environment and Consumer Protection	81925 München (D)
Balsarini Fabio		25040 Gianico (I)
Barcella Matteo		20093 Cologno Monzese (I)
Barras Charles	Ticino Tourism	6501 Bellinzona (CH)
Basso Daniele	Università di Trento	38123 Trento (I)
Battaglini Luca	Università degli Studi di Torino	10095 Grugliasco (I)
Bava Luciana	Università degli Studi di Milano	20133 Milano (I)
Beghi Roberto	Università degli Studi di Milano	20133 Milano (I)
Begus Ines	Univerza na Primorskem / Università del Litorale	6000 Koper-Capodistria (SI)
Begusch-Pfefferkorn Karolina	Bundesministerium für Wissenschaft und Forschung	1014 Wien (A)
Belladelli Leonardo	Politecnico di Milano	26013 Crema (I)
Bellini Daniele	Edison SpA	Milano (I)
Beltramo Riccardo	Università di Torino	10134 TORINO (I)
Bendler Gebhard	Österreichische Akademie der Wissenschaften	6020 Innsbruck (A)
Bertogliati Mark	EcoEng Sarl	6703 Osogna (CH)
Bertolino Maria Anna	Università di Torino	10064 Pinerolo (I)
Bevione Michela	Politecnico di Milano	12043 Canale (I)
Bialetti Alfonso		28922 Verbania (I)
Binda Roberto	Rivista professione Montagna	22020 Cavallasca Como (I)
Bischetti Gian Battista	Università degli Studi di Milano - GeSDiMont	20133 Milano (I)
Bocchi Stefano	Università degli Studi di Milano	20133 Milano (I)

Bocchiola Daniele	Politecnico di Milano	20133 Milano (I)
Bolzoni Luciano	Alpes società cooperative	38122 Trento (I)
Bordini Nicola		25040 Angolo Terme (I)
Borec Andreja	FALS UM	2311 Hoče (SI)
Borsdorf Axel	Österreichische Akademie der Wissenschaften	6020 Innsbruck (A)
Bortolotti Carla	Università di Bologna	38057 Pergine Valsugana (I)
Bossone Moreno	Geogroup	28885 Piedimulera (I)
Bourdeau Philippe	Université Joseph Fourier	38100 Grenoble (F)
Bovolenta Stefano	Università di Udine	33100 Udine (I)
Bressa Gianclaudio	Presidenza del Consiglio dei Ministri	00187 Roma (I)
Brethaut Christian	Université de Genève	1227 Carouge / Genève (CH)
Briscioli Vincenza		25055 Pisogne (I)
Brun Jean-Jacques	IRSTEA	38402 Saint Martin d'Hères (F)
Brusati Marco	Università Cattaneo - LIUC	28046 Meina (I)
Busatta Maurizio	Journalist	32100 Belluno (I)
Busch Rainer	BioEconomy e.V.	6120 Halle (D)
Busin Cristina	Alpes società cooperative	38122 Trento (I)
Butola Jitendra Singh	Kuth Conservation Group/Uttarakhand University	Pauri, Uttarakhand (IN)
Calvo Enrico	ERSAF	20124 Milano (I)
Cappellini Alessia	Politecnico di Milano	20099 Sesto San Giovanni (I)
Capra Michela	Museo Etnografico "Giacomo Bergomi" di Montichiari (BS)	25070 Pertica Alta (I)
Capraro Franco	Club Arc Alpin	39100 Bolzano (I)
Carzaniga Alessandro	Università degli Studi di Milano	20882 Bellusco (I)
Castellazzi Aldo	ASL Sondrio	23032 Bormio (I)
Castelli Pier Maurizio	CAI - Pro Natura	16156 Genova (I)
Castelli Giacomo		38123 Trento (I)
Castiglioni Benedetta	Università di Padova	35123 Padova (I)
Caterina Franco	Politecnico di Milano	21100 Varese (I)
Cattaneo Maria Chiara		23037 Tirano (I)
Cattivelli Valentina	Regione Lombardia	20122 Milano (I)
Cerutti Stefania	Università degli Studi del Piemonte Orientale - ARS.UNI.VCO	28887 Omegna (I)
Cetara Luca	Eurac Research	00186 Roma (I)
Church Jon Marco	Université de Reims Champagne-Ardenne	51096 Reims Cedex (F)
Civelli Raffaele	Università degli Studi di Milano	20133 Milano (I)
Coali Roberto	Provincia autonoma di Trento	38121 Trento (I)
Colombini Stefania	Università degli Studi di Milano	20133 Milano (I)
Colombo Daniele	Innovhub - SSI	20133 Milano (I)
Colucci Giancarlo		18038 Sanremo (I)
Conedera Marco	WSL	6500 Bellinzona (CH)
Confortola Gabriele	Ingegnere per l'Ambiente e il Territorio	23032 Bormio (I)
Coratza Paola	Universià di Modena e Reggio Emilia	41100 Modena (I)

Corradin Diego	Studio Tecnico Associato S.Ar.In.	10016 Montalto Dora (I)
Corsi Stefano	Università degli Studi di Milano - DEMM	20133 Milano (I)
Cortines Felipe	EURAC	39100 Bolzano (I)
Cossi Paolo	Hazard editore	33090 Castelnovo del Friuli (I)
Cotti Piccinelli Sergio	Distretto culturale di Valle Camonica	25043 Breno (BS) (I)
Cottini Andrea	Associazione ARS.UNI.VCO	28845 Domodossola (I)
Cremaschi Roberto	ERSAF	20124 Milano (I)
Cristini Attilio		25041 Darfo Boario Terme (I)
Crosetto Adriana	IntrAlp	12100 Cuneo (I)
Crovetto Gianni Matteo	Università degli Studi di Milano	20133 Milano (I)
Cugusi Battistina	Université de Genève	1211 Genève 4 (CH)
Daina Patrizio	Museo Scienze Naturali “E. Caffi” Bergamo	24129 Bergamo (I)
Danelli Andrea	RSE SpA	20134 Milano (I)
Dax Thomas	Federal Institute for Less-favoured and Mountainous Areas (BABF)	1030 Wien (A)
Del Barba Oscar	Club Alpino Italiano	20124 Milano (I)
Del Curto Davide	Politecnico di Milano	20133 Milano (I)
Della Mea Laura		33010 Malborghetto-Valbruna(I)
Della Torre Roberto	Rivista professioneMontagna	22020 Cavallasca Como (I)
Dellavedova Paola	Perito tecnico commerciale	11020 Roisan (I)
Delley Sarah	University of Bern	3012 Bern (CH)
Dematteis Giuseppe	Associazione Dislivelli e Politecnico di Torino	10123 Torino (I)
Di Bella Elena	Provincia di Torino	10100 Torino (I)
Di Luca Monica	Università degli Studi di Milano	20133 Milano (I)
Di Mauro Biagio		20141 Milano (I)
Di Pietro Adarosa	Università degli studi di Bologna	25047 Darfo (I)
Diamantini Corrado	DICAM - Università di Trento	38050 Trento (I)
Dietinger Tomaz	Universität Graz	8010 Graz (A)
Dini Roberto	Politecnico di Torino - Ass. Cantieri d’alta quota	11100 Aosta (I)
Diolaiuti Guglielmina Adele	Università di Milano	20133 Milano (I)
Dioli Enrico	CISL	23885 Calco (Lecco) (I)
Dioli Paride	Museo Civico di Storia Naturale Milano	20121 Milano (I)
Dossi Carlo	University of Insubria and ALPsolut	21100 Varese (I)
Drexler Claudia	The Mountain Research Initiative (MRI)	3012 Bern (CH)
Duglio Stefano	Università degli Studi di Torino	10134 Torino (I)
Durbano Jean		18039 Ventimiglia (I)
Dusina Francesco		25062 Concesio (I)
Eder Renate	BOKU Universität für Bodenkultur Wien	1190 Wien (A)
Egger Thomas	SAB	3001 Bern (CH)
Ehringhaus Barbara	ProMONT-BLANC	1299 Crans (VD) (CH)
Elegir Graziano	Innovhub - SSI	20138 Milano (I)
Elmi Marianna	Permanent Secretariate of the Alpine Convention	39100 Bolzano (I)

Emma Marcello	Italian Presidency of the Alpine Convention	00147 Roma (I)
Eocci Manuela	Éupolis Lombardia	20124 Milano (I)
Evrard Nicolas	AEM	73000 Chambéry (F)
Faiferri Ivan	Cooperativa il Leggio	25056 Ponte di Legno (I)
Failla Osvaldo	Università degli Studi di Milano	20123 Milano
Falcone Maria Pia	IntrAlp	12100 Cuneo (I)
Fanchini Veronica	Università degli Studi di Milano	25048 Edolo (I)
Fassin Ivan	CISL	23100 Sondrio (I)
Federici Maurizio	Regione Lombardia	20080 Basiglio (I)
Ferrari Jacopo		20133 Milano (I)
Ferrario Viviana	Iuav University of Venice	30100 Venezia (I)
Ferraris Paolo	NREresearch	261032 Fano (I)
Ferrazzi Giovanni	Università degli Studi di Milano	20133 Milano (I)
Filippi Enrico	Architetto	54027 Pontremoli (I)
Fiorina Silvia	ASL Sondrio - Dipartimento di prevenzione veterinario	23100 Sondrio (I)
Firmo Ilaria		25124 Brescia (I)
Fischer Andrea	Österreichische Akademie der Wissenschaften	6020 Innsbruck (A)
Fontana Lupi Nadia	Ente Turistico Mendrisiotto e Basso Ceresio	6850 Mendrisio (CH)
Forchini Maurizio		24121 Bergamo (I)
Fornaciarini Daniela	Giornalista	6815 Melide (CH)
Fossati Massimo	ITB Valsassina & ANEF Lombardia	20851 Lissone (I)
Fosson Jean Pierre	Fondazione Montagna sicura - Montagne sure	11013 Courmayeur (I)
Franzini Lino	Sindaco di Palanzano (PR)	43025 Palanzano (I)
Franzoni Oliviero	Banca Valle	
Freppaz Michele	Università degli Studi di Torino	10095 Grugliasco (I)
Fumagalli Monica	Azienda Ospedaliera della Valtellina e della Valchiavenna	23100 Sondrio (I)
Gabrieli Jacopo	University of Venice	30123 Venice (I)
Galli Davide		21040 Venegono Superiore (I)
Galli Stefano Bruno	Università degil studi di Milano	20122 Milano (I)
Galluzzo Fabrizio	ISPRA Servizio Geologico d'Italia	00144 Roma (I)
Gärtner-Roer Isabelle	Universität Zürich	8057 Zürich (CH)
Gasparella Lorenza		36034 Malo (I)
Gasparotti Claudio	Studio Aura	25047 Boario Terme (I)
Gasperotti Mattia	Fondazione Edmund Mach	38010 San Michele all'Adige (I)
Gatti Elena	Università della Montagna UNIMONT	25048 Edolo (I)
Ghirardelli Emanuele	Coldiretti Sondrio	23100 Sondrio (I)
Ghiroldi Alice		25050 Piamborno (I)
Giacomelli Riccardo	Università degli Studi di Trento	38052 Caldonazzo (I)
Giacomelli Pietro	FEDERBIM	00185 Roma (I)
Giacomelli Stefano	Istituto Zooprofilattico Sperimentale della Lombardia e dell' Emilia Romagna	25124 Brescia (I)
Giacomoni Giorgio	Deputazione Storia Patria della Lombardia	21047 Saronno (I)

Giarelli Luca	I.S.T.A - LOntànoVerde	25040 Nadro di Ceto (I)
Giorgi Anna	University of Milan	20133 Milano (I)
Giorgi Alessandra	Proxima	25043 Breno (I)
Giovenzana Valentina	Università degli Studi di Milano	20133 Milano (I)
Girometta Carolina	Università di Pavia	27100 Pavia (I)
Giudici Francesca		24060 Pianico (I)
Giupponi Luca	Università degli Studi di Milano	24016 San Pellegrino Terme (I)
Gleeson Erin	The Mountain Research Initiative	3012 Bern (CH)
Gloersen Erik	Université de Genève	1211 Genève 4 (CH)
Golobic Mojca	University of Ljubljana, Biotechnical Faculty	1000 Ljubljana (SI)
Gretter Alessandro	Leopold-Franzes University Innsbruck	38050 Castelnuovo (I)
Grimaldi Luca	ERSAF	20124 Milano (I)
Grosso Silvia	IntrAlp	12100 Cuneo (I)
Guerini Angelo	Edizioni Angelo Guerini e Associati	20135 Milano (I)
Guglielmetti Ilaria	Politecnico di Milano	20156 Milano (I)
Guiducci Franco	Dipartimento per gli affari regionali, le autonomie e lo sport	00187 Roma (I)
Gusmeroli Fausto	Fondazione Fojanini di Studi Superiori	23100 Sondrio (I)
Haller Andreas	University of Innsbruck	6020 Innsbruck (A)
Harte Dominic		39100 Bolzano (I)
Herzog Felix	Agroscope	8046 Zürich (CH)
Hiwot Zelalem	UVDOCW	3600 Addis Abeba (ET)
Humer-Gruber Heidi	Interdisciplinary Mountain Research	6020 Innsbruck (A)
Hurni Hans	Universität Bern	3012 Bern (CH)
Iacone Viviane	Regione Lombardia	20124 Milano (I)
Köck Günter	Österreichische Akademie der Wissenschaften	1010 Wien (A)
Kozina Jani	Research Centre of the Slovenian Academy of Sciences and Arts	1000 Ljubljana (SI)
Krebs Patrik	WSL	6500 Bellinzona (CH)
Kupper Patrick	Universität Innsbruck	6020 Innsbruck (A)
Lago Chiara		20014 Nerviano (I)
Lanzetti Marina	Comune di Ceto	25040 Ceto (I)
Lauber Stefan	WSL	8903 Birmensdorf (CH)
Lorenzetti Luigi	Università della Svizzera italiana	6850 Mendrisio (CH)
Lorenzini Claudio	Università degli Studi di Udine	33100 Udine (I)
Lozzia Giuseppe Carlo	Università di Milano	20133 Milano (I)
Lucchese Martina		33070 Polcenigo (I)
Lugeri Francesca Romana	ISPRA - UNICAM	00144 Roma (I)
Lugon Ralph	Institute of Tourism HES-SO Valais / Wallis	3960 Sierre (CH)
Luminati Cassiano	Regione Valposchiavo	7742 Brusio (CH)
Macchi Gianluca	CERVIM	11100 Aosta (i)
Macchiavelli Andrea	Università di Bergamo	24129 Bergamo (I)
Machold Ingrid	Federal Institute for Less-Favoured and Mountainous Areas	1030 Wien (A)

Maculotti Giancarlo	Incontri Tra/Montani	25040 Cerveno (BS) (I)
Mader Clemens	Leuphana University Lüneburg	21335 Lüneburg (D)
Maffezzoli Niccolò	Universitä degli Studi di Milano-Bicocca	46100 Mantova (I)
Maino Federica	EURAC research	39100 Bolzano (I)
Malek Ziga	International Institute for Applied Systems Analysis (IIASA)	2361 Laxenburg (A)
Mancon Simona	Universitä degli Studi di Milano	20150 Peveranza di Cairate (I)
Mania Ilaria	Università degli Studi di Torino, DISAFA	10095 Grugliasco (I)
Mannoni Federico	Italian Presidency of the Alpine Convention	00147 Roma (I)
Manzo Alessandra		13030 Caresanablot (I)
Marai Simone	Università degli Studi di Milano	20133 Milano (I)
Marchetti Marco	ASL della Provincia di Sondrio	23100 Sondrio (I)
Marelli Beatrice	Università di Torino	25060 Collebeato Brescia (I)
Mari Franco	Università degli Studi di Milano	25048 Edolo (I)
Marinelli Laura	Utrecht University	38026 Ossana (I)
Mariotti Luca		25040 Malonno (I)
Martinazzoli Donatella	Consiglio Regionale della Lombardia	20124 Milano (I)
Martini Umberto	Università di Trento	38122 Trento (I)
Marzelli Stefan	ifuplan	80799 München (D)
Mattiucci Cristina	DICAM / Università degli Studi di Trento	38123 Trento (I)
Maugeri Maurizio	Università di Milano	20121 Milano (I)
Mazzina Nada		23100 Sondrio (I)
Mazzoleni Alberto	Comunità Montana Valle Brembana	24014 Piazza Brembana (I)
Mazzucchelli Patrizio	Raetia Biodiversità Alpine	23035 Teglio (I)
Mazzucco Marianna		32013 Longarone (I)
Meazza Renata	D.G. Culture, Identità e Autonomie - Regione Lombardia	20124 Milano (I)
Medaglia Carlo Maria	Università di Roma Sapienza	00198 Roma (I)
Mehlhorn Susanne	BMLFUW	1060 Wien (A)
Membretti Andrea	Università di Milano-Bicocca	20126 Milano (I)
Micheletti Cesare	Fondazione Dolomiti UNESCO	32043 Cortina d'Ampezzo (I)
Mignatti Andrea	Politecnico di Milano	20025 Legnano (I)
Miličić Vesna	University of Ljubljana	1000 Ljubljana (SI)
Miotello Francesca	Regione del Veneto	30172 Mestre Venezia (I)
Mocarelli Luca	Università di Milano Bicocca	201226 Milano (I)
Mondini Ezio	Città di Darfo Boario Terme	25047 Darfo Boario Terme (I)
Monopoli Marco		25055 Pisogne (I)
Monti Fabiano	ALPsolut S.r.l.	23030 Livigno (I)
Mora Isabela	Fundacion Ecologica Mundo verde	576 Marsella-Risarida (CO)
Morra di Cella Umberto	Agenzia Regionale per la Protezione dell'Ambiente della Valle d'Aosta	11020 Saint-Christophe (I)
Moser Ruth	Biosphärenpark Großes Walsertal	6721 Thüringerberg (A)
Mrad Meriem	University of Padova	35020 Legnaro (I)
Naddeo Antonio	Presidenza del Consiglio dei Ministri	00187 Roma (I)

Nahrath Stéphane	Institut Universitaire Kurt Bösch (IUKB)	1950 Sion 4 (CH)
Nakhutsrishvili George	Ilia State University - Institute of Botany	105 Tbilisi (GE)
Nanchen Eric	Foundation for sustainable development in mountain regions	1950 Sion (CH)
Nardin Francesca	University of Parma	39121 Trento (I)
Nared Janez	ZRC SAZU	1000 Ljubljana (SI)
Negriolli Roberta	Regione Lombardia	20124 Milano (I)
Oedl-Wieser Theresia	Federal Institute for Less Favoured and Mountainous Areas	1030 Wien (A)
Oiry Varacca Marie	Université de Savoie	1200 Châtillon-en-Michaille (F)
Olmedo Marcela	University of Kent	11010 Introd (I)
Omizzolo Andrea	EURAC	39100 Bolzano (I)
Ongaro Vittorio	Cooperativa sociale ProSer	25047 Darfo Boario Terme (I)
Onida Marco	Ständiges Sekretariat der Alpenkonvention	6020 Innsbruck (A)
Oppio Alessandra	Politecnico di Milano	20133 Milano (I)
Panjek Aleksander	University of Primorska	6000 Koper - Capodistria (SI)
Panseri Sara	DIVET	20133 Milano (I)
Papa Danilo	ASL1 Liguria	18038 San Remo (I)
Papa Gianluca	VAOL.IT - Valtellina	23022 Chiavenna (I)
Parolo Ugo	Regione Lombardia	20124 Milano (I)
Parolo Gilberto	Università degil studi di Milano	20133 Milano (I)
Parreno Maria Alejandra	University of Lausanne / Eawag	1005 Lausanne (CH)
Patt Anthony	ETH Zürich	8092 Zürich (CH)
Pe Renato	Sindaco Comune di Pian Camuno	25050 Pian Camuno (I)
Pecci Massimo	Dipartimento per gli affari regionali, le autonomie e lo sport	00187 Roma (I)
Pecher Caroline	EURAC Research	39100 Bozen (I)
Pecqueur Bernard	Université Joseph Fourier	38041 Grenoble cedex 9 (F)
Pedemonti Andrea		24060 Solto Collina (I)
Pedersoli Alessandra	Università IUAV di Venezia	30122 Venezia
Pederzolli Gianfranco	FEDERBIM	00185 Roma (I)
Pedrazzi Stella	Università degli Studi di Milano	25048 Edolo (I)
Pedrazzoli Ambra	Laurea triennale	24023 Bergamo (I)
Pedrocchi Paolo	Architetto	25040 Angolo Terme
Pellegrini Michele	Società storica lombarda	24129 Bergamo (I)
Peluchetti Flora	Architetto	25040 Artogne
Peroni Francesca		35129 Padova (I)
Personeni Carlo	FEDERBIM	00185 Roma (I)
Petitta Marcello	ENEA	00123 Roma (I)
Petrella Andrea	Università degli Studi di Trento	38121 Trento (I)
Petriccioli Enrico	FEDERBIM	00185 Roma (I)
Pettenella Davide	Università di Padova	35020 Legnaro PD (I)
Pfefferkorn Wolfgang	Rosinak & Partner ZT GmbH	1050 Wien (A)
Pia Fiona	EPF Lausanne	1015 Lausanne (CH)

Pianezzola Maria	SEACOOP	10100 Torino (I)
Piantoni Chiara	GAL Valle Camonica Val di Scalve	25050 Paspardo (I)
Pidò Elena	Politecnico di Milano	28854 Malesco (I)
Pierik Mario Enrico	Università degli Studi di Milano	25040 Esine (I)
Pietta Antonella	Università degli Studi di Brescia	25122 Brescia (I)
Pignar Tomanic Andreja	IntrAlp	12100 Cuneo (I)
Pignata Giuseppe	DiSAFA Torino	10153 Torino (I)
Pinna Jonathan		21040 Carnago (I)
Pirazzi Arianna	Politecnico di Milano	28859 Trontano (I)
Plona Stefano	Associazione per i produttori agricoli di Vallecamonica	25040 Esine (I)
Poggio Pier Paolo	Musil - Museo dell'industria e del lavoro di Brescia	25122 Brescia (I)
Poli Massimiliano		25086 Rezzato (I)
Polonioli Gian Bettino	Comune di Cimbergo	25050 Cimbergo (I)
Porcellana Valentina	Università di Torino	10124 Torino (I)
Poto Luisa	CNR-IDPA	30123 Venezia (I)
Pozzi Andrea	Università dell'Insubria DiSAT	22100 Como (I)
Pradella Francesco		20900 Monza (I)
Prišenk Jernej	University of Maribor	2311 Hoče (SI)
Protti Daniela Emilia	Regione Lombardia	20124 Milano (I)
Psenner Roland	Leopold-Franzens-Universität Innsbruck	6020 Innsbruck (A)
Putelli Alessandro	Comunità Montana di Valle Camonica	25043 Breno (I)
Raciti Angela Evelina	CAI	16156 Genova (I)
Raja Raffaele	Regione Lombardia	20124 Milano (I)
Ratto Sara Maria	Regione Autonoma Valle d'Aosta	11100 Aosta (I)
Rauch Jürgen		80637 München (D)
Regli Marion	ISCAR	3007 Bern (CH)
Regolini Géraldine	Bureau d'étude RELIEF	1860 Aigle (CH)
Reynard Emmanuel	Université de Lausanne	1015 Lausanne (CH)
Riede Maximilian	University of Innsbruck	6020 Innsbruck (A)
Righetto Lorenzo	Politecnico di Milano	20032 Milano (I)
Rigling Andreas	WSL	8903 Birmensdorf (CH)
Rizzi Carola	Università di Bergamo	24129 Bergamo (I)
Rizzi Gianmaria	Camera id Commercio	25121 Brescia (I)
Rocca Marco	Mottolino SpA Livigno	23030 Livigno (I)
Rossa Andrea	MeteoSchweiz	8058 Zürich-Flughafen (CH)
Rossi Nicola	Università di Ferrara	32032 Feltre (I)
Ruggieri Rossana	IntrAlp	12100 Cuneo (I)
Ruoss Engelbert	Global Regions Initiative	31027 Lovadina di Spresiano (I)
Sala Alessandro	Consiglio della Regione Lombardia	20124 Milano (I)
Sala Walter	GAL Valle Camonica Val di Scalve	25050 Paspardo (I)
Salsa Annibale	Accademia della montagna del Trentino	38100 Trento (I)
Sandrini Sara Gabriella		25056 Ponte di Legno (I)

Sandrucci Anna	Universita degli Studi di Milano	20133 Milano (I)
Santolini Riccardo	Università d'Urbino	61029 Urbino (I)
Sascor Emanuele	Comune di Bolzano	39100 Bolzano (I)
Savino Elena	University of Pavia	27100 Pavia (I)
Scheurer Thomas	ISCAR	3007 Bern (CH)
Schir Emanuela	Osservatorio del paesaggio Trentino	38122 Trento (I)
Scolozzi Rocco	Università di Trento, Universidade do Minho	38066 Riva del Garda (I)
Scotton Andrea		28865 Crevoladossola (I)
Senese Antonella	Università degli Studi di Milano	20133 Milano (I)
Setton Denise	IntrAlp	12100 Cuneo (I)
Sever Bojan	Municipality of Idrija	5280 Idrija (SI)
Signaroli Simone	Cooperativa il leggio s.c.s.	25052 Piancogno (I)
Silva Jean-Marc	France Montagnes	73800 Francin (F)
Silveri Luana	TSM_STEP Scuola per il governo del territorio	38100 Trento (I)
Smiraglia Claudio	Università Milano	21133 Milano (I)
Šooš Pia	University of Ljubljana	6310 Izola (SI)
Spadaccini Roberto		25047 Darfo Boario Terme (I)
Spagnoli Sonia	Università degli Studi di Milano	25048 Edolo (I)
Spavetti Santo	Freelancer	25040 Berzo Demo (I)
Speciale Nunzio		90011 Bagheria (I)
Speranza Giovanna	Università di Milano	20133 Milano (I)
Stain Devid	Associazione temporanea	25048 Edolo (I)
Stanchi Silvia	Università degli Studi di Torino	10095 Grugliasco (I)
Staniscia Stefania	DICAM / Università degli Studi di Trento	38123 Trento (I)
Stare Eva	Alpine Space Programme JTS	80797 München (D)
Stasi Maria Beatrice	Azienda Ospedaliera della Valtellina e Valchiavenna	23100 Sondrio (I)
Strauss Agnes	BOKU Vienna	1180 Vienna (A)
Strobl Margit	SLP Snow Lotus Project	39044 Neumarkt (I)
Stubelj Ars Mojca	Regional Development Agency Severna Primorska	5000 Nova Gorica (SI)
Svaluto Ferro Pier Luigi	FEDERBIM	00185 Roma (I)
Tamburini Alberto	Università degli Studi di Milano	20133 Milano (I)
Tedeschi Paolo	Università Milano-Bicocca DEMS	25127 Brescia (I)
Tempesta Tiziano	Università di Padova	35123 Padova (I)
Theiler Alex	Theiler Landschaft GmbH	6460 Altdorf (CH)
Timmel Thomas	Flippr - Future Lignin and Pulp Processing Research Projekt GmbH	8112 Gratwein (A)
Tomè Elisabetta	Libera Università di Bolzano/Bozen	39100 Bolzano (I)
Torresan Chiara	CRA-MPF	38057 Pergine Valsugana (I)
Torrione Stefano		11010 Saint Pierre (I)
Tovini Miretta		25040 Cividate Camuno (I)
Tricoire Emmanuelle	Revue de Géographie Alpine	1201 Genève (CH)
Trivellini Guido	WWF Italia	20 144 Milano (I)

Trotti Paolo		25055 Pisogne (I)
Trucco Micole	Fondazione Montagna sicura - Montagne sure	11013 Courmayeur (I)
Tschurtschenthaler Martin	FH Kufstein Tirol	6471 Arzl im Pitztal (A)
Turetti Elena	Comunità Montana di Valle Camonica	25043 Breno (I)
Udovc Andrej	Univerza v Ljubljana	1001 Ljubljana (SI)
Urbanc Mimi	Scientific Research Centre of the Slovenian Academy of Sciences and Arts	1000 Ljubljana (SI)
Valzelli Oliviero	Comune Darfo Boario Terme	25047 Darfo Boario Terme (I)
Vaninetti Franesco	Ökoinstitut Südtirol / Alto Adige	39100 Bolzano (I)
Vanzan Gabriella Suzanne	IntrAlp	12100 Cuneo (I)
Vecchiato Daniel	Università degli Studi di Padova	35020 Legnaro (I)
Veith Ulrich	Gemeinde Mals	39024 Mals (I)
Vignati Arianna	Politecnico di Milano	20158 Milano (I)
Vogl Christian R.	Universität für Bodenkultur	1180 Wien (A)
Vrevc Simona	Permanent Secretariat of the Alpine Convention	39100 Bolzano (I)
Vucenovic Dragan		4290 Trzic (SI)
Vuillermoz Elisa Maria	Institute of Atmospheric Sciences and Climate CNR	24126 Bologna (I)
Walzer Chris	University of Veterinary Medicine	1160 Wien (A)
Weingartner Rolf	Universität Bern	3012 Bern (CH)
Zaccaria Cinzia	Ministero Rapporti con le Regioni - Dipartimento struttura	00187 Roma (I)
Zampiceni Alessia	Università degli Studi di Milano	25048 Edolo (I)
Zangrando Erica	Regione del Veneto	30172 Mestre Venezia (I)
Zanini Ermanno	Università degli Studi di Torino	10095 Grugliasco (I)
Zanotti Mauro	Comune di Marone	25054 Marone (I)
Zanzi Luigi	Storico	21100 Varese (I)
Zbinden Gysin Karin	Berner Fachhochschule	3052 Zollikofen (CH)
Zecca Oreste	ASL Sondrio - Dipartimento di prevenzione veterinario	23100 Sondrio (I)
Zecchin Luca	University of Trento	35020 Arzergrande (I)
Zerbi Maria Chiara	Università degli Studi di Milano	21047 Satronno (I)
Zucali Maddalena	Università di Milano	20133 Milano (I)