Regional Report

Sustainable Mountain Development in the Alps

From Rio 1992 to Rio 2012 and beyond

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From Rio 1992 to 2012 and beyond: 20 years of Sustainable Mountain Development

What have we learnt and where should we go?

The Alps

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1.1. Introduction

Of all the world's mountain ranges, the Alps are unique in one particular regard: their outer perimeter is specifically defined by an international treaty, which is based on key principles of sustainable development. In 1991, most of the Alpine States adopted the Convention on the Protection of the Alps (usually known as the Alpine Convention); by 1995, all the signatories – Austria, the European Community, France, Germany, Italy, Liechtenstein, Monaco, Slovenia and Switzerland – had ratified it. Article 1 of the Convention begins by defining the Alps according to a map which is annexed to the Convention (Figure 1). Notably, this map includes the Principality of Monaco, but not a corridor to its north which includes major transport infrastructure. This shows the importance of political processes in defining mountain regions and, as discussed below and in Part 3, of transport and accessibility through and around the Alps as a key issue for the Alps', and Europe's, sustainable development.

A second way in which the Alps are unique is that they have been investigated for longer, and in more detail – and thus have a greater availability of data, information, and research studies – than any other mountain range. Both Chapter 13.on 'Sustainable Mountain development' of 'Agenda 21' in 1992, and the Alpine Convention (particularly articles 3 and 4) have favoured research and research cooperation in the Alps. Subsequently, interdisciplinary topics as natural risks and hazards, climate change, water scarcity, land use and landscape change, and shifts in transport systems have been addressed in the European Commission's Framework Programmes for Research and Development (5, 6 and 7) and national research programmes (such as the National Research programmes 31, 41, 48 and 61 in Switzerland and research supported by the Austrian Man and the Biosphere

programme). Increasingly, these programmes have incorporated social and economic scientists. Across the Alps, many research institutes specialising in mountain issues have expanded (e.g., in Berne, Davos, Grenoble, Innsbruck, Zurich) and new institutes have emerged (e.g., in Obergurgl, Austria, Garmisch-Partenkirchen, Germany; Bolzano, Eddolo, and Monte Biondone, Italy; Sion and Mendrisio, Switzerland). Thus, a large community of scientific expertise on mountain issues is available in all Alpine countries. To bring together these scientists from a wide range of disciplines and to foster pan-Alpine research cooperation, networks have been established at different scales, including the Rete Montagna (Italy- Austria); the International Scientific Committee on Research in the Alps (ISCAR), the Association of Alpine Historians; and the European element of the global Mountain Research Initiative (global). Scientific knowledge has played, and continues to play a crucial role in many of the initiatives discussed below and will be a key driver for further developing evidence-based management practices towards sustainable mountain development.

In geographical terms, the Alps as defined for the Alpine Convention have an area of 190,568 km², extending more than 1,000 km from east to west and, at the widest, almost 300 km north to south. The highest peak is Mont Blanc (4,810 m), on the French/Italian border. The total population of the Alps is about 14 million people, giving an average population density of 73 inhabitants/km². However, if one takes into account the fact that only 17.3% of the Alpine area is suitable for permanent settlement, the effective population density is 414 inhabitants/km², comparable to densely populated regions in other parts of Europe (e.g., the German region of Hannover, the Italian Region of Campania). Nevertheless, the settled parts of the Alps include both major urban areas – Grenoble, France (415,000), Innsbruck, Austria (250,000), Bolzano and Trento, Italy (200,000), and Klagenfurt, Austria (150,000) – and very rural areas. Thus, as in most mountain ranges, such average values have relatively little practical meaning.

The data presented in the paragraph above are drawn from an Atlas of the Alps (Tappeiner et al., 2008), which compiles data on a very large number of variables, mainly at the scale of municipalities. Overall, there is a greater availability of data, information, and research studies for the Alps than for any other mountain range in the world. At the same time, it should be noted that, though the Parties to the Alpine Convention recognised in the 1990s the key need for a System for the Observation and Information on the Alps, with harmonized data from across the range, this has not yet been fully realized. Most available data have been compiled, particularly, in the Atlas of the Alps[1]; other key sources for this section of the report are various reports of the Alpine Convention, particularly the three reports on the state of the Alps (on transport and mobility, water and water management, and sustainable rural development and innovation: Permanent Secretariat of the Alpine Convention, 2007, 2009, 2011a)[2] and documents from the International Commission for the Protection of the Alps (CIPRA), especially the reports of the cc:Alps project[3]; as well as a recent report published by the European Environment Agency (2010) in which data presented for the Alps are effectively for the area defined under the Alpine Convention.

1.2. Key characteristics

1.2.1. Demography

As noted above, about 14 million people live in the Alps (EEA, 2010). As censuses took place in Alpine countries in 2010 and 2011, more recent data should soon be available; however, most analyses rely on the result of the previous censuses in the early 2000s.

[1] available also at http://diamont-database.eu/
[2] see www.alpconv.org
[3] see www.cipra.org

Overall, population densities tend to be higher at lower altitudes and on more gently-sloping land. Given the topography of the Alps, this means that the municipalities with the lowest densities tend to be to the west, especially in France, but also at high-altitudes in western Italy and south-east Switzerland, while those with the highest densities are to the east in Germany, Slovenia, most of Austria, and the mid/eastern Italian Alps (Figure 2). In the 1990s, the death rate exceeded the birth rate over more than two-thirds of the Alpine area, most markedly in remote valleys and at high altitudes. Overall in the Alps, there is a high old age dependency ratio (population 65+/population 15-64) and an even higher old to young age dependency ratio (population 65+/population 0-15). In their spatial extent, these tendencies are particularly marked for the latter, with 'young' municipalities (over 25% below 15) generally in the North, and 'old' municipalities in the southern and inner Alps. Ageing is particularly evident in small municipalities and large urban centres (Tappeiner et al., 2008).

For the Alps (as for Europe) as a whole, migration is a far more important component of population change than natural population growth (mortality is quite stationary). Economic disparities between urban and rural areas and the improvement of infrastructure services have led to rising internal migration. From 2001 to 2007, there was a high (7.5‰) overall annual rate of population growth, particularly because of immigration, which has been increasing in the last decade (Working Group Demography and Employment, 2011). However, changes in population are very heterogeneous across the Alps (Figure 3). Differences depend, to variable degrees, on accessibility, topography and altitude, socio-economic factors, and the location and role of the Alpine region in each country. At every scale – municipality, region, etc. – areas with growing populations are often adjacent to those where populations are decreasing. In very general terms, the population of the central

and northern Alps is growing, while that of the eastern Alps and parts of the southern Alps is decreasing.

Generally, for both internal and international migration, internal, less-favoured (in terms of economic opportunities and infrastructure) areas have a more negative migratory balance, and the more favoured areas towards the edges of the range have a positive migration rate. This trend has been strongest among young and middle-aged people who are most mobile, thus also affecting age structures and the availability of people with high qualifications. Peri-urbanisation and the development of commuter cities have been restricted to favourable locations close to rural or urban centres (PSAC, 2007). Generally, rural areas located close to the large peri-Alpine towns have the highest positive migration balance, as they are very attractive for working people who commute into these towns (Perlik, 2006). Amenity migration has also been important in some areas, such as regions around lakes, to which older people retire.

1.2.2. Services and quality of life

Most of the urban centres of the Alps are on the Alpine fringe, where they are influenced by the large metropolises bordering the Alps (e.g., Milano, Torino, Lyon, München, Vienna) or in the large intra-Alpine valleys (Aosta, Dora Baltea, Etsch/Adige, Inn, Isère, Rhône). All large intra-Alpine cities with more than 50,000 inhabitants have good rail and/or road access from outside the Alps. The establishment of urban centres within the Alps and the ongoing process of peri-urbanisation have led to changes in living standards. These parts of the Alps no longer constitute a mainly-rural area with a rural population, but can be considered preferred locations of residence for people who are able to reconcile residential choices and professional occupations, combining the advantages of urban infrastructure with the attractiveness of the countryside (PSAC, 2007). Conversely, such patterns of residence can

also act against sustainable development, for instance in terms of increasing both the use of energy for transport and land prices in rural areas, and lower the quality of life for those who, because of high housing costs in cities, have to live far from their workplace and therefore have to spend many hours a week travelling to and from work. One aim of public policies is therefore to mitigate the negative effects of commuting, e.g. by providing public transport options or limiting, through spatial planning, imbalances between the locations of residences, workplaces, and services such as schools (CIPRA, 2010b).

About 45% of the Alpine population lives in municipalities with less than 5,000 inhabitants (Working Group Demography and Employment, 2011). Such settlements often lack accessibility, employment and services. Many of the smallest settlements do not have enough people to keep convenience stores, post offices and local associations open. Public transport is cut to a minimum, since operation costs are too high for local government budgets. As a result, citizens have to rely on private cars and, for those who cannot drive (e.g., the elderly), access to basic services can become rather difficult. The disappearance of basic services triggers a vicious cycle because the declining quality of life encourages residents to move to less peripheral areas, where access to services is better, and at the same time limits immigration. Ageing of the population therefore imposes a reconsideration of the ways in which services are provided.

1.2.3. Economic sectors and employment

Cultural landscapes cover the majority of the area of the Alps, and the primary sector still has a great cultural, political and socio-economic importance. Primary land uses have changed in recent decades, with a clear trend towards agricultural intensification in areas where conditions for production and access to markets are good, such as major intra-Alpine valleys, and extensification or even abandonment in disadvantaged areas, which may have undesirable environmental and social consequences. The rate of full-time jobs in the primary sector is rather low; though many more people have seasonal or part-time jobs in the sector (Tappeiner et al., 2008).

Overall, about 71% of the jobs in the Alps are concentrated in 50 urban centres on the Alpine fringe and in the large intra-alpine valleys (Favry et al., 2004) (Figure 4). The share of employed people in the secondary (industrial and manufacturing) sector is decreasing, while that in the tertiary (service) sector has been rising since the 1980s. In the early 2000s, the secondary sector accounted for about 36% of the jobs, with considerable regional variations. High proportions are mainly found in accessible locations in low-altitude areas and lower valleys, often at the fringes of the Alps, especially in the Italian and northern French Alps. Overall, most jobs are in the tertiary sector, although its importance varies from one region to another, being below 50% in 40% of Alpine municipalities, but rising to 75% in others, particularly in the major cities and tourist resorts (Working Group Demography and Employment, 2011).

Within the tertiary sector, jobs in tourism represent about 10 to 12% of the total in the Alps. Over 60 million tourists and 60 million day visitors come to the Alps each year. However, tourism is seasonal, with more visitors in summer than in winter (though winter expenditures are generally higher) and quite localized (Figure 5). On one hand, the economy of 10% of the municipalities (accounting for 8% of the whole Alpine population) is based on tourism; and 46% of the beds are concentrated in 5% of the municipalities (Working Group Demography and Employment, 2011). Most of the larger tourist areas are concentrated in the higher central Alps, and winter tourism is often particularly important, though many resorts are now offering a wide variety of ‘products’, aiming for a year-round market. Conversely, 37% of Alpine municipalities have no tourist beds (Tappeiner et al., 2008).

Employment rates are high in the northern Alps and some high mountain tourist areas; conversely, employment rates are lower in the southern Alps (e.g. Provence-Alpes-Côte d'Azur, most Italian regions, Slovenia) (Tappeiner et al., 2008). The main factors which explain these differences are difficulties in finding employment, and differentials in employment of different groups of workers. Unemployment rates confirm that the job situation is more critical in the eastern and westernmost Alpine regions, with more favourable conditions in the well-developed and easily accessible central intra-Alpine areas.

In conclusion, as with demographic trends, economic development and employment in the Alps are extremely heterogeneous. This also applies to GDP and economic density, though the highest rates are typically in the northern Alps (Liechtenstein, Germany, Switzerland) and the southern foothills of the Italian Alps (EEA, 2010). The appropriate symbiosis of multiple sectors – tourism and services, industry, electric power generation, agriculture – is the basis of sound economic development. Currently, about 70% of the Alpine population is concentrated in modern poly-structured economic centres (Working Group Demography and Employment, 2011). Some, such as Alto Adige/Südtirol (Italy), benefit from their diversified economic structure and have high regional GDPs. Furthermore, 'soft' factors (e.g. quality of life, leisure, culture and environment, services) tend to become more important than the traditional 'hard' factors (income, infrastructure) when considering the conditions for setting up new enterprises with a high-quality labour force.

1.2.4. Transport and accessibility

In the Alps, 72% of the total traffic volume (vehicle-kilometers) is local and regional inner-Alpine traffic, while tourism and recreational traffic accounts for 20%, and transit traffic for only 8% (Ackermann et al., 2006). The Alps are situated between some of Europe's most productive industrial countries, containing areas with strong economies, high population densities, and high tourism intensities. These are pre-conditions for high levels of passenger and freight transport as well as commuting. Consequently, and as a result of EU market integration, transport volumes have risen continuously in recent decades – and many Alpine citizens feel harmed, particularly by road transport, and perceive further extension of transport as a disadvantage rather than as an increase of accessibility. At the same time, it is worth noting that, across the Alps, 84% of tourists use their cars (90% in Italy, about 83%

in Austria, France and Germany, 67% in Switzerland); and, in Germany and Switzerland, about 40% of all journeys are for leisure purposes; a proportion that is likely to continue rising (CIPRA, 2010c).

Freight transport by road increased significantly more than rail freight transport in recent years, and now accounts for about 75% of the freight crossing the Alps, especially through France and, to a lesser extent, Austria. In contrast, in Switzerland, whose transport policy favours rail, twice as much freight is carried by rail than by road. For road transport, it is not easy to analyse the origin and destination of counted trucks as these data are aggregated for large administrative units which are broader than the Alpine Convention area. However, the available data show that about 19% of road crossing transport movements are definitely trans-Alpine, neither originating nor ending in a region that is at least partly within the Alps. About 33% of transport movements take place between regions that are at least partly within the Alps, and about 47% are between partly Alpine and non-Alpine regions (Marzelli, 2010).

Although the Alps may be perceived as a region of low accessibility in terms of transport, in reality accessibility by road and rail differs significantly, between high accessibility at the fringes of the range (particularly in the catchment areas of large agglomerations) and the main valleys, and lower accessibility in the centre of the Alps. About 58% of all Alpine municipalities are less than 14 km away from the next major road or motorway, while for 28%, the distance is greater than 20 km (Tappeiner et al., 2008) (Figure 6).

One key concern related to transport is the resultant air pollution (PSAC, 2007). Pollutants emitted or formed in valleys are dispersed over large areas by specific meteorological conditions such as valley and slope winds, and temperature inversions during autumn and

winter. They affect sensitive ecosystems and human health. Adverse dispersion conditions particularly affect the valleys and basins of the south-eastern Alps, which are shielded from oceanic north-westerly winds by the central Alpine ridge. Nitrogen dioxide (NO_2) concentrations are constant or increasing, due to continuously increasing traffic loads (which compensate for technical advances to reduce emissions), and probably due to an increasing NO_2/NO_x ratio of diesel car emissions. Long-term limit values for NO_2 are exceeded at many urban and rural locations. For ozone (O_3), which is formed by the reaction of sunlight on air containing hydrocarbons and nitrogen oxides, EU target values for the protection of both human health and vegetation – which should have been met by 2010 – are exceeded over much of the Alps, and long-term levels have increased over the last decade. Levels of particulate matter (PM_{10}) above the short-term daily limit are observed in most major Alpine valleys and basins in many towns, especially along roads. The major sources are road traffic and domestic heating (wood burning).

Finally, it should be noted that road transport contributes 25-27% of greenhouse gas emissions in the Alpine countries; it should be noted that, at the European scale, transport is the only sector in which emissions are increasing. If the EU '20/20/20 by 2020' goal (a 20% increase in energy efficiency, a 20% cut in greenhouse gas emissions, and a 20% share of renewables in total EU energy consumption, by the year 2020) is to be met, transport emissions will have to decrease significantly (CIPRA, 2010c). At the same time, transport will be affected by climate change mainly due to the likely increases in the frequency and intensity of extreme weather conditions, which will both delay traffic and increase damage to infrastructure. This implies the need both to take measures to avoid damage and to be ready for high costs of repair.

1.2.5. Water and energy production

The Alps are often described as the 'water tower' of Europe because of their crucial influence on the continent's water balance, and particularly because of their location in the centre of Europe. The Alps include almost two-thirds of Central Europe's glaciated area, many large lakes, and the headwaters of most of Europe's major rivers (Figure 7). The four main ones (Danube, Rhine, Rhone, Po) contribute a disproportionate amount of water to other parts of Europe: from 2 to 6 times more that might be expected from the area of their catchments (Weingartner et al., 2007). Especially in spring and summer, when meltwater from snow and ice is available, the lowlands benefit from the Alpine runoff: from 35% (Danube) up to 80% at peak times (Po) of the overall discharge in the various catchments. Thus, water which is stored in the Alps and its management are critical in preventing and mitigating the consequences of droughts both in the mountains and downstream. The urbanization of major valleys and areas close to European centres – such as Ljubljana, Marseilles, Milan, Munich, and Zurich – depends partly and directly on the availability of Alpine water. Water from Lake Constance, fed by the Rhine, for example, is piped over 200 km to the north for domestic use (PSAC, 2009).

Water from the Alps is not only essential in the Alps for agriculture, domestic purposes, and industry, but also downstream for these purposes as well as the cooling of power stations (including nuclear). Only a few Alpine rivers have not been significantly modified (Figure 8), given that the Alps are also vital for the production of hydro-electricity, which accounts for over 90% of the energy produced in the Alps (Haberl, 2001). Most sites for large dams have already been developed; they play a key role in the European power grid. Large plants (capacity >1MW) contribute over 95% of the total electricity production from hydropower. However, these account for only a quarter of the total number of facilities (PSAC, 2009). Given recent policy developments within the EU and in Alpine States – such as the '20/20/20 by 2020' policy – and the resulting financial incentives and support schemes to increase the proportion of energy produced from renewable sources, there have been several hundred applications for new small hydropower stations in the Alps (with a considerable difference in numbers between countries), thus potentially adding to the high number of existing facilities. This presents a particular challenge for the authorities in handling the huge number of applications and deciding on authorisations, due to the various aspects to be taken into account (energy generation, CO_2 emission reduction, ecological impacts etc). However, neither master plans, action plans or strategies for the development of hydropower, nor pre-planning mechanisms to identify the remaining potential and assess ecological compatibility, are generally yet in place. Decisions on new facilities are mostly based on the assessment of impacts of the individual facility at the chosen site, though protected areas are often taken into consideration (Platform Water Management in the Alps, 2010).

A further key issue that needs to be considered when planning for all future uses of water resources, both in the Alps and downstream, is climate change (CIPRA, 2009). Over the last century, average temperatures in the Alps rose by more than 1.5°C, more than twice the global average. The years of 1994, 2000, 2002, and especially 2003 were the warmest in the Alps in the past 500 years. In contrast, for precipitation, there have been considerable spatial differences in both seasonal means and short- and long-term variability. Recent trends such as reduced snowfall at lower altitudes and retreating glaciers can be expected to worsen. Projected changes suggest that the Alps will have slightly warmer winters with more precipitation, and much warmer and drier summers (EEA, 2009). Glacier retreat will initially enhance summer flows, though the contribution of ice melting to mean runoff is often overestimated. However, as glaciers shrink, summer flows in catchments which they now strongly directly influence will be reduced by up to 50%. Generally across the Alps, the timing and amount of runoff will change. In summer, there will be significantly decreased discharge, still dominated by snow melt, and more frequent floods and droughts. Winter floods – generally small to medium but not large extreme events – may become more frequent in lower areas. All these impacts will be felt far beyond the Alps; further research is needed to quantify the impacts on the water cycle at regional levels in more detail, and to translate findings of climate models into hydrological parameters so that effective adaptation measures for all sectors depending on Alpine water can be developed and implemented.

1.2.6. Land covers and uses

Over half (52%) of the area of the Alps is covered by forests and woodland, and this proportion is growing: increases in forest cover accounted for over half of the total changes in land cover from 1990 to 2006. The next most frequent land cover classes are pastures and mosaic farmland and natural grassland and heathland (both 14%). Next most frequent

is open space with little or no vegetation (12%), which includes most of the unvegetated high mountains. Arable land and permanent crops cover only 3% of the Alps, slightly more than artificial surfaces, including settlements and transport infrastructure, which are also expanding; for instance, from 1992 to 2004, the area of such land covers grew by 20% in the German Alps (EEA, 2010).

Agriculture

The landscapes of the Alps are cultural landscapes and, although agriculture is no longer a significant element of Alpine economies or employment, it will be considered first here because of its long-standing cultural importance and as a key element of the tourist economy in providing landscape, food, and drink. In recent years, major changes in the perception of rural space and the organization of agricultural production have taken place. For instance, the number of farms decreased by 43% from 1980 to 2000, and the proportion of part-time farmers increased (Streifeneder et al., 2007); the average is 40%, with particularly high rates in Austria where this type of farming is subsidized and is now dominant (Penz, 2005). A key intended output of this policy was to minimize the abandonment of farms, which has been severe across large parts of the French, Italian and Slovene Alps, but less frequent in Austria and Germany (Tappeiner et al., 2008) (Figure 9). Overall, important determinants of such changes include the liberalization of agricultural markets, increasing consideration of environmental concerns, a far-reaching move towards a recognition of the multifunctionality of rural space and towards supporting a diversification of agricultural and, more widely, rural activities (Knickel et al., 2009). With the exception of a few high-quality products, mountain agriculture cannot compete in national and international markets. Therefore, policies supporting agriculture will be crucial for the maintenance of Alpine cultural landscapes.

Grazing is the dominant type of farming, especially at higher altitudes and on the northern side of the Alps, because of the natural conditions of altitude, climate and slope. Also notable are the permanent crops (mainly grapes and apples), grown mainly on small landholdings in protected inner-Alpine valleys (Tappeiner et al., 2008). While pastures are the most typical 'mountain agriculture' land use, and integral to mountain farming, many are being used less and less, their quality is worsening, and their area is decreasing as forests expand. Such changes influence not only the results and practices of pasture use, but also the high biodiversity of mountain pastures, which depends on the selective grazing of livestock, in various combinations of species (Fischer et al., 2008). However, new breeds are often not appropriate for pasture use, as they are selected for the high production of milk and meat and therefore have a high demand for fodder. This trend, as well as technical changes in agriculture, is having significant negative impacts on the sophisticated, traditional system of mountain agriculture that relies on mountain pastures and transhumance. Yet economic reasons, tradition, and the positive impact of pastures on the health of animals and people still motivate some farmers to use pastures, as long as the infrastructure and accessibility are adequate. Challenges to maintaining pasture use – such as strong rules, milk quotas, needs for high investments, sales of pastures for non-traditional use, inappropriate animal species – are being addressed through approaches such as subsidy systems, Interreg projects, and regional or local projects and associations which try to strengthen the multi-functional use of pastures. Cooperation, the production and labeling of alternative products, and the combination of mountain farming with tourism have been identified as key themes that must be addressed to ensure that pasture use continues be a key element of mountain farming (PSAC, 2011a).

Climate change may have a wide range of impacts on agriculture (CIPRA, 2011a). Two sets of key concerns relate to changes in the availability of water, compounded by increases in temperature, especially in the dry southern Alps, where some groundwater levels have dropped by 25% over the past century (EEA, 2009), the productivity of grassland may decrease significantly, and conflicts over water are anticipated. With increases in the amount and intensity of precipitation, soil erosion is likely to increase; open agricultural land is more vulnerable than grassland, and abandoned land than managed meadows. On the other hand, as long as adequate water supplies are available, increasing air temperatures may extend growing seasons for both crops and pastures, and cultivation may be possible at higher altitudes. Overall, agriculture is likely to become more uncertain, both with regard to the types of changes mentioned above and particularly because of increases in both the frequency and intensity of extreme events.

Forests

In addition to the increase in forest cover over recent decades, Alpine forests have become more dense, particularly because less timber has been removed – due particularly to decreased timber prices and high production and harvesting costs – and levels of grazing in the forests have decreased (Stöhr, 2009). These forests are multi-functional, fulfilling a range of social and ecological functions. Given the high density of settlement and transport infrastructure throughout the Alps, a significant proportion of the forests provide the vital function of protection against natural hazards, such as landslides, rockfalls, and avalanches. These protective forests need to be exploited in order to maintain their functions and, as protection against natural hazards is a public good, this requires public subsidies as, in most cases, the costs of management are greater than the income generated.

In terms of wood production, most forests are under-exploited, with a general tendency towards ageing which can endanger the stability of both the forests and their soils. Critical factors limiting exploitation are restricted accessibility, lack of skilled manpower, lack of dynamism in the regional sector, small private forest holdings, and difficulties of concentrating supply in public forests (Morel-a-l'huissier, 2008). Establishing a functioning

timber industry is particularly important in places with difficult access and/or on steep slopes, especially to ensure the protective function. In this context, the potential of wood as a carbon-neutral, renewable energy source presents new opportunities.

Forestry and the utilisation of wood can offer attractive job opportunities, especially in combination with employment in agriculture or other activities, and recognizing the need for better cooperation along the value chain. Finally, forests are also important for recreation, bringing both health and economic benefits. For example, the annual value of Swiss forests for recreation has been estimated as 10.5 billion CHF (c. 13 billion USD: Ott and Baur, 2005).

Climate change may influence Alpine forests in a number of ways (Fuhrer et al., 2006). In simple terms, rising temperatures may allow trees to grow at higher altitudes – but only if the soil and moisture conditions are suitable. Another key concern is that the stability – as well as the productivity – of forests may be decreased by increases in the populations of pests and diseases and, in drier areas, fire. As for agriculture, increases in the frequency and intensity of extreme events mean increasing uncertainty, compounded by the long life-span of trees. Trees that are planted now may, during their lifetimes, experience very different climates from those of the present.

1.2.7. Biodiversity and instruments for conservation

The Alps, like other mountain areas, are 'hotspots' of biodiversity within their continental context. For example, 4,350 plant species are found in the closed grasslands of the mid- and upper-alpine belts: about 40% of the total flora of Europe. Nearly a quarter of these species are endemics, found only in the Alps (Ozenda and Borel, 2003). In terms of habitats, it is notable that a third (79 of 231) of the European habitat types listed in Annex 1 of the European Commission's Habitats Directive are found in the Alps. National reports on the status of these habitat types state that 14% are in favourable status and 72% in unfavourable status (EEA, 2010). It should also be noted these reports do not use consistent criteria, and that one criterion for inclusion in Annex 1 was threat or historical decline, so it would be expected that most of these habitat types would be in unfavourable status; also, in all Alpine countries, the status of habitat types within the Alps is better (by a significant margin except in Slovenia) than those in other parts of these countries.

One of the principal mechanisms for conserving biodiversity is through the creation of protected areas. Given the high biodiversity of the Alps, it is not surprising that a significant part of the range is covered by protected areas designated under national legislation: 25% (Figure 10). An even higher percentage of the Alpine parts of the five EU Member States has been designated as high nature value farmland (HNV): agricultural areas where specific farming activities can be expected to support high levels of biodiversity (EEA, 2010). To some extent, these designations, as well as those of the Natura 2000 network in the five EU Member States, overlap. Through such designations, both the EU and individual States have recognised the importance of the biodiversity of the Alps, and provide resources to manage protected areas and, mainly through the Rural Development Programmes, support HNV farming. In both cases, such funding aims both to minimise activities that lead to the deterioration or loss of key species and habitats and to promote activities intended to maintain or enhance biodiversity.

One major biodiversity issue concerns the return and spread of large carnivores[4]. Over centuries, due to the spread of agriculture and hunting, the distribution of forests and wild ungulates and carnivores was significantly reduced. By the late 19th century, the forests were in an alarming state, natural disasters had become frequent and red and roe deer, chamois, ibex and wild boar had become locally extinct. Due to a lack of wild ungulate prey and to direct persecution, wolf and lynx were completely eradicated from the Alps, and only a few brown bear persisted in the Trento Province of Italy. From the early 20th century, new methods of forest exploitation and the growing interest in the protection of nature helped to renew the forests and restore them for wild ungulates. Their populations have since recovered through spontaneous reimmigration, supported by reintroductions. In consequence, large carnivores, the last species missing for the restoration of complete ecosystems, have begun to return. Wolves are now beginning to recolonise the Alps from the Appenines and Dinaric Mountains; lynx were reintroduced in the 1970s in Switzerland, Slovenia, Austria, and Italy; and brown bear numbers have increased thanks to a restocking project in Trento, reintroduction in the Ötscherregion (Austria), and natural immigration from the Dinaric Mountains. Concurrently, the legal status of large carnivores has changed in all Alpine countries from that of unprotected vermin, whose eradication was often encouraged through bounties, to 'strictly protected'. Their return is also supported by the Habitats Directive, the recommendations of the Bern Convention, and the Alpine Convention and the Convention on Biological Diversity. However, legal protection alone is not enough, as these species come in conflict with different societal interests. The management of both the large

[4] http://www.alpconv.org/theconvention/conv06_WG_f_en

carnivores and the resulting conflicts is required to achieve the aim of restoring and maintaining viable populations of large carnivores in coexistence with people, by minimising conflicts and preventing damage.

Despite the considerable proportion of the Alps that has been designated as protected areas and/or HNV farmland, the example of large carnivores shows the importance of designing and implementing policies for biodiversity management that go beyond delineated areas and are dynamic. This key need is becoming increasingly urgent with the continued fragmentation and loss of habitats and as climate change leads to changes in both terrestrial and aquatic habitats, especially those that are essential for the survival of key species. Consequently, a number of initiatives to create a functioning ecological network within the Alps, and between the Alps and adjacent areas, are underway, as described in Parts 2 and 3. In a broader context, it should be noted that healthy ecosystems can withstand the consequences of climate change better than damaged ones, and that natural and semi-natural forests, wetlands, and extensively cultivated meadows store carbon and therefore can contribute positively to the carbon balance (CIPRA, 2009).

1.3. Key issues for development and driving forces of change

From a sectoral point of view, the key issues for development in the Alps were identified in 1991 in Article 2 of the Alpine Convention. For the majority of these – conservation of nature and countryside, energy, mountain farming, mountain forests, soil conservation, spatial planning, tourism and recreation, transport – protocols have been prepared and ratified, though not by all Parties (see Part 2). For another (population and culture) and also for climate change, which was not recognised as a key issue in 1991, Ministerial declarations have been prepared. There are also three issues which were identified in the Convention for which no formal document has been prepared, though work has been done: air pollution, water management, and waste management. The implementation of the Alpine Convention is further evaluated in parts 2 and 3. It should also be noted that the most recent report of the Alpine Convention (PSAC, 2011a) addresses sustainable rural development and innovation; but not urban areas – although the report recognises the importance of the important relationships between rural and urban areas in the Alps.

Part of the DIAMONT project, funded under the EU Alpine Space Programme, was devoted to the identification of key Alpine issues, using a Delphi survey of 62 individuals with a good knowledge of sustainable development issues from all of the larger Alpine countries (Austria, France, Germany, Italy, Slovenia, Switzerland), including scientists, civil servants, representatives of NGOs, and other stakeholders (Briquel et al., 2007). First, general driving forces that affect the Alps but are not specific to them were identified: globalization; increasing awareness of threats to the natural and cultural heritage; increasing mobility of goods and persons; increasing competition between firms, and sometimes regions; diminishing demographic growth rates; change in the meaning of local identity; standardisation of lifestyles, and the multifunctionality of agriculture. These trends were then reinterpreted and reformulated in the Alpine context as major ongoing issues. The first set of key issues of specific concern in the Alps, with significant differences at various spatial scales, were: marginalisation of peripheral rural areas; maintenance of Alpine forests; urbanisation processes; and the sustainability of tourism. The second set of issues and concern the Alps as a whole, although with regional variations: transport pressures; innovative and competitive economic activities; maintenance and development of the natural and cultural heritage; and the impacts of climate change. These issues are further addressed in Part 3 of this report.

1.4. Contributions of the Alps in providing goods and services at the European scale

An overall balance of the importance of the Alps in providing goods at the European scale has not been prepared. These goods derive from both rural parts of the Alps (i.e., products from farms, pastures, and forests – which may also be regarded as provisioning services – see below – mineral extraction and small enterprises) and urban areas (i.e., products from manufacturing and industry). However, as noted above, the tertiary sector is predominant across much of the Alps; and a key service provided at the European scale (and beyond) is tourism.

Like other mountain ranges, the Alps provide a wide range of ecosystem services that benefit not only Alpine people, but many others across Europe and, in some cases, beyond. Ecosystem services may be divided into three types: provisioning services – products obtained from ecosystems; regulating services – benefits obtained from regulation of ecosystem processes; and cultural services – non-material benefits obtained from ecosystems (Carpenter et al., 2009).

At the European scale, the most important provisioning services from the Alps relate to water, although minerals and products from agriculture and forestry are also exported from the region; many – such as certain cheeses – have a high reputation and cost because of their high quality, and their production is important in supporting local economies. As noted in section 1.2.5, the Alps are the 'water tower' of Europe because they include the headwaters of most of the continent's main rivers, providing very significant proportions of freshwater for agricultural, domestic, and industrial use. The production of energy is another provisioning service, and water is an important source of hydropower. A further service deriving from the rich biodiversity of the Alps is in terms of medicinal plants.

In terms of regulating services, the Alps play a crucial role at the continental scale in terms of climate regulation and, linked to this, air quality regulation. Alpine forests contribute to climate regulation and to the global carbon cycle through the storage of carbon in soils and woody biomass, although the net effects are still unclear (Ciais et al., 2008). More generally, the Alps act as a topographic barrier that separates air masses, significantly influencing European climates, and extracts water from these air masses, feeding back to regulate regional climates and contributing to air quality regulation through the mixing of the air. A second set of regulating services relate to the storage of water in glaciers, snow, soil, underground aquifers, and vegetation, thus modulating runoff regimes. Alpine ecosystems, especially along watercourses, are also important in maintaining water quality and regulating soil erosion and natural hazards. In the European context, this is important particularly in terms of the key transport infrastructure crossing the Alps, as well as settlements and infrastructure within the Alps used for tourism. Intact vegetation plays a key role in providing these services (Körner, 2002), as well as decreasing the likelihood of floods, which can cause severe damage not only in the Alps but also downstream.

The Alps include 21 properties that are inscribed on UNESCO's World Heritage List and thus can be regarded as providing cultural services at the global scale. Most of these are Cultural Heritage and Mixed Heritage sites, as well as Cultural Landscapes; however, even the Natural Heritage Sites provide cultural services because they attract many tourists, often because of their attractive landscapes. More generally, the landscapes, rivers, lakes, species, and ecosystems of the Alps, and the opportunities that they provide for diverse sports and other activities, mean that they are of European, and even global importance for tourism and recreation. In some locations, the scale of tourism and recreation may mean that these activities can negatively affect or even destroy the services that once attracted visitors. Nevertheless, the Alps also include many 'wild' areas, as mapped in terms of population, road and rail density, distance from the nearest road or railway, and naturalness of land cover (Carver, 2010). In comparison to much of the rest of the densely-settled

continent of Europe, these relatively empty and quiet landscapes provide opportunities for other types of recreation. In addition, many cultural traditions (such as oral heritage), the diversity of language (Figure 11) and local forms of heritage (rural architecture, traditional techniques) are important contribution to Europe's common heritage and diversity.

The provision of ecosystem services often implies trade-offs. For instance, the building of dams for hydropower affects river flows, which may be beneficial for flood regulation but have negative impacts on freshwater ecosystems, affecting both the species that live in them and the opportunities they provide for recreation. With regard to skiing, changes to slopes and vegetation to create smooth ski slopes may increase their attractiveness to skiers, but decrease their ability to regulate natural hazards; and the use of water for snowmaking may have negative impacts on both vegetation and water flows. Equally, the provision of ecosystem services cannot always be guaranteed; for instance, land abandonment may increase the likelihood of natural hazards and make landscapes less attractive. In the long-term, the provision of almost all ecosystem services may be affected both directly and indirectly by climate change.

Part 2. Evaluating progress with sustainable mountain development in the Alps

Over the past 20 years, and also before, a great number of activities have been designed and undertaken, explicitly or otherwise, to contribute to sustainable mountain development in the Alps. To attempt to summarise all these activities, and the involved actors, would be a massive task, which is beyond the scope of this report. Very many actors are active at many spatial scales (from the all-encompassing "Alpine Space" down to individual mountain farmers in their local communities), in many thematic fields (e.g., from climate change to tourism, from energy to cultural identity), using a great diversity of mechanisms (from international treaties to marketing campaigns). Many of these are in turn inter-connected. Last but not least, it is not always obvious whether an activity deserves the attribute "sustainable": for example, hydropower installations, some of which are promoted as "sustainable energy production" by their initiators, but criticized by nature protection groups for destroying habitats. Neither is it always obvious whether a "sustainable" activity was in fact designed for a mountain area or just coincidentally occurred in a mountain area. This part of the report comprises two sections: first, an overview of the main institutions (*sensu lato*) that are actors in the Alps; and, second, a description and analysis of a selection of activities that they have initiated and implemented.

2.1. Actors at different scales

In terms of governance, the Alps encompass two ministates (Liechtenstein and Monaco), large proportions of small- to medium-sized States (Austria, Slovenia, and Switzerland) and quite small proportions of three (in the European context) large ones (France, Germany, and Italy). These constitute the highest level of governance, recognising also that five of the States are members of the European Union. The next level of governance comprises Provinces (Austria), Régions and Départements (France), Länder (Germany), Regions and Provinces (Italy), Municipalities (Slovenia) and Cantons (Switzerland). The lowest level of governance is represented by nearly 6,000 municipalities (or communes), which vary in area from 0.11 to 466.8 km² (Tappeiner et al., 2008). In recent decades, their number has been considerably decreased, especially in Austria, Germany and Slovenia, with the goal of improving administrative structures and increasing efficiency. These multiple levels of governance – with significant variations in degrees of autonomy of resources both within and between countries – and the varying proportions of States that are included in the Alps greatly influence the priority given to sustainable mountain development.

Superimposed on this multi-level set of national and sub-national institutions are many others (Figure 12). As a starting point, a schematization according to their different spatial scales is proposed. In decreasing order of spatial extent, these are:

- the cooperation area of the EU Alpine Space Programme, defined within the third objective of EU Cohesion Policy, 'European territorial cooperation', in order to support interactions across borders. It comprises all of Austria, Liechtenstein, Slovenia and Switzerland, and the NUTS 2 areas of France, Germany and Italy that have at least part of their area within the Alps. This area has a population of about 70 million, and includes the surrounding foothills and lowlands of the "peri-Alpine belt" with all their metropolises, as well as the Jura on the French/Swiss border, and the Slovene part of the Dinaric mountains. Although few people or institutions would regard this very extensive area as 'the Alps', it is included in this analysis because it emphasizes linkages between the Alps and their surrounding areas, and because the Alpine Space Programme has been a major source of funding for projects in the Alps, with partners drawn from the cooperation area, since 2000.
- the 'Alpine' level, with a perimeter officially defined in relation to the Alpine Convention, with a population of about 14 million. Several institutions work on this

level: not only the Alpine Convention, but also CIPRA and several networks including ALPARC, Alliance in the Alps, and others discussed below.

- the inter-regional scale. In recent years (especially since 1989 when the EU launched Interreg) cooperation across national borders - from region to region - has become increasingly important. Many initiatives receive significant financial support from the EU, but some have emerged independently, such as the three Working Communities in the Alps, which began from 1972 to 1982.
- the national level, mainly referring to initiatives taken by a national government for the Alps (such as the *Comité de massif des Alpes* in France or the National Mountain Fund in Italy), but also including non-governmental institutions that are active within the whole country (such as the *Schweizer Berghilfe* in Switzerland).
- sub-national (regional) and local levels – but due to constraints of time and space (and also to avoid a confusing amount of detail), this level is not a focus of this report.

2.1.1. Alpine level

The oldest international organization active in the Alps is the International Commission for the Protection of the Alps (CIPRA), established in 1952[5]. It was originally founded by representatives of Austria, France, Italy and Switzerland, as well as of German nature protection and mountaineering organizations and the International Union for Conservation of Nature (IUCN) but, in 1975, was restructured to include only NGOs. It now has about 100 member organizations and national coordinating structures in seven Alpine countries and also in South Tyrol. CIPRA defends the interests of the Alps among policymakers, acts as an information platform by disseminating knowledge about the Alps via different channels, and is a partner in different projects. In addition, it has initiated a number of organizations that have now adopted a “life of their own”.

From its founding, a key goal of CIPRA was a convention to protect the Alpine environment and its natural resources. This finally became reality when the Alpine Convention was signed in 1991 by Austria, France, Germany, Italy, Switzerland, Liechtenstein and the EU (Slovenia signed the Convention in 1993 and Monaco became a party on the basis of a

[5] Some national institutions have a much longer history – for instance the Swiss Alpine Club was founded in 1863, and the German Alpine Club in 1869. However, these national organizations did not form a transnational cooperation – the Club Arc Alpin (CAA) – until 1995.

separate additional protocol). The Convention entered into force in 1995. Its main organs are the Conference of Parties, which meets every two years as the Alpine Conference, and the Permanent Committee, which meets two or three times a year and, inter alia, sets up ad-hoc working groups are set up for a two-year term [6]. Since 2003, following years of debate about its location, there has been a permanent secretariat.
CIPRA did not only contribute significantly to the realization of the Alpine Convention, but also acted as the main initiator of one of the networks 'implementing' it: Alliance in the Alps. This network of communities was founded in 1997. It allows its members to exchange experiences and also implements projects. In this way, it aims to achieve its stated goal of "implementing the provisions on sustainable development of the Alpine Convention at the local level". Bringing the Alpine Convention closer to the population at the local level is also recognized as important by another network: The Alpine Town of the Year. Since 1997, one town in the Alps has been awarded this title for a year, marking its particular commitment to the implementation of the Alpine Convention. A third network was established in 1995, at the initiative of French institutions, with the main goal of implementing the protocol on Nature Conservation and Landscape Planning of the Alpine Convention. This Alpine Network of Protected Areas (ALPARC) connects all protected areas (national parks, nature parks, biosphere reserves, etc) within the perimeter of the Alpine Convention. It organizes knowledge exchange between protected area managers, participates in biodiversity-related projects, and coordinates common communication campaigns. In 2006, the ALPARC coordination team became the Task Force for Protected Areas, attached to the Permanent Secretariat of the Alpine Convention. Also relevant in this context isthe International Scientific Committee on Research in the Alps (ISCAR), created in 1999 to promote international and interdisciplinary cooperation in Alpine research and also recognized as an official observer of the Alpine Convention in 2000. ISCAR has fostered dialogue between science and policy by organising, to date, nine ForumAlpinum meetings in all Alpine countries since 1994..

2.1.2. National level

A few countries have a long tradition of accommodating the special needs of mountain areas and mountain people through national legislation (Castelein et al., 2006). In Switzerland, laws directly supporting mountain farmers date back to the 1920s. In 2008, the long-standing Law on Investments in Mountain Regions (established in 1974) was replaced by the New Regional Policy (NRP). Even though the NRP is not exclusive to mountain regions (it also addresses border regions and the "wider rural area"), many mountain dwellers profit from projects co-financed under the NRP or from its option of low-interest credits. In France, the *Loi Montagne*[7] of 1985 defines the particular status of mountain massifs and mandates the establishment of committees for each massif. The Comité de massif des Alpes takes over this role for the Alps and has adopted a Schéma interrégional d'aménagement et de développement du massif des Alpes (Interregional Scheme for the administration and development of the Alps massif). The most recent dates from 2006 and has its own implementation documents. Together these documents sketch a vision for the future development of the French Alps and design measures and action programmes for their realization. In Italy, the "precarious environmental conditions" and the "particular needs" of mountain areas are even acknowledged in the constitution, and Law 97 of 1994 established the national mountain fund. Legislation also provides broad legislative powers for the regional authorities, and established specialized local entities to enhance the status of, and living conditions in, mountains – the mountain communities (*comunità montane*).

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[6] http://www.alpconv.org/theconvention/conv06_PC_en.htm
[7] *Loi sur le Développement et la Protection des Régions de Montagne :* www.legifrance.gouv.fr/affichTexte.do?cidTexte=LEGITEXT000006068895&dateTexte=20110901

Separate from institutions that are part of the formal governance structure are others acting at the national scale. In France and Italy, national associations of elected officials from mountain areas exist: the *Association Nationale des Elus de montagne*, established in 1985, and the *Unione Nazionale Comuni Comunità Enti Montani*, established in 1952. In Switzerland, two organisations founded in 1943 remain very active: the Swiss Working Group for Mountain Areas (SAB), which brings together several cantons, *régions de montagne/Berggebiete*, and professional associations, and the *Schweizer Berghilfe*, which collects donations that are used to support projects which improve the living conditions of people in mountain areas.

2.1.3. Inter-regional cooperation

Cooperation between regions from different countries (i.e. cooperation across national borders) has become increasingly important – in the Alps as in other parts of Europe – after the launch of the European Community Initiative Interreg in 1989. However, some cooperation structures predate the Community Initiative, notably the three Working Communities: Arge Alp in the Central Alps (founded in 1972), the Alps-Adriatic Working Community in the Eastern Alps (1978) and the Working Community of the Western Alps (COTRAO) (1982). Apart from exchanges at 'official' level (i.e. the deliberations and decisions between the representatives of the participating regions), the Working Communities organize events, participate in projects and publish position papers, all with the goal of uniting people from different administrative regions and thus contributing to a common understanding. It should be noted that, as institutions whose members are large administrative regions, the boundaries of all three working communities extend considerably beyond the perimeter defined for the Alpine Convention. In addition, following conferences of Alpine regions in 2009, 2010 and 2011, a Network of Alpine Regions has been established, with the aim of coordinating regional policies on the implementation of the Alpine Convention within the territory of the Alps. Its members include Slovenia, three Italian Provinces, three Austrian Provinces, and two French Regions.[8]

In the last two decades, the number of Euroregions (or Euregios) and similar crossborder cooperation structures has multiplied. As opposed to the Working Communities – which have a set structure with a regular plenary assembly of heads of government and other bodies – the structure of Euroregions in the Alps varies greatly. They can be associations under the private law of a participating Member State (e.g., the Euregio Inntal) or they can act without any legal personality (e.g., Espace Mont-Blanc); their members can be communities (e.g., the Euregio via salina) or regions (e.g., the European Region of Tyrol - South Tyrol – Trentino); they can create new structures (e.g., the Euregio Zugspitze-Wetterstein-Karwendel which works with a council and an executive committee) or utilize pre-existing structures (e.g., EUREGIO Styria – Slovenia); and – exceptionally – they can maintain a Common Representation in Brussels (such as the European Region of Tyrol - South Tyrol – Trentino). Some aspire to the status of a European Grouping of Territorial Cohesion (EGTC) – a European legal instrument designed to facilitate and promote cross-border, transnational and interregional cooperation – while others do not; some maintain a common office, others do not; and the list could be continued.

The main (but not exclusive) source of funding for the Euroregions is Interreg: i.e., initiatives are co-funded by the European Regional Development Fund (ERDF) and regional or national authorities. Several Interreg IVA (cross-border cooperation) programmes exist within the Alps, most applicable to a certain section of a border between two States, of which only one must be an EU Member State; hence, many include parts of Switzerland. Thus, Euroregions maintain contacts between officials from all participating regions and implement cross-border projects – and many have also set up a Small Projects Fund which offers co-

[8] http://www.alpconv.org/theconvention/conv07_b_en

funding to very small-scale initiatives in the area, subject to a reduced bureaucratic burden. Most of these projects and initiatives can be deemed to contribute – at least indirectly – to the goals of sustainable mountain development. However, this is not necessarily recognized by all the involved actors. During this study, one representative of a Euroregion strongly defended the position that its work has benefits for the local economy, but that mountains were not a focus in any way.

2.1.4. Sub-national and local level

The abundance of actors at the sub-national/local level cannot be included in this report. However, some main features and trends can be given. In federal States, sub-national institutions (Swiss Cantons, Austrian Provinces, German Länder) have had important initiatives on mountain issues for decades. As an example, many of the Austrian Provinces have developed specific instruments focusing on mountain issues, often working through the EU's Leader programme (Oedl-Wieser et al., 2010). In other States, the trend to decentralization (France, since 1982-83), and regional autonomy (some regions in Italy) has given new competencies to sub-national entities. For example, in France, both Régions (Provence-Alpes-Côte d'Azur**,** Rhone-Alpes) and Départements (e.g. Haute Savoie**,** Isère) have developed their own mountain policies. In almost all the Alpine States, the municipal level has been said not to be strong enough to address contemporary issues. Germany and Switzerland have encouraged the fusion of municipalities. Italy, Switzerland and France have promoted inter-municipal institutions, but their existence has been widely discussed in recent years. Thus, the future of Italian *comunità montane* is not clear; in Switzerland, the new regional policy and new level of regional cooperation no longer refer to the *régions de montagne / Berggebiete*; the French policy for promoting '*pays'* (areas of concerted development) has been recently stopped, yet the more institutional '*communautés de communes*' are still promoted, especially for dealing with land use and landscape issues. A further type of governance relates both to restructuring institutional relations between subnational and local levels to contributing to environmental protection and development: the creation of regional/nature parks. These have been created in Austria, France, Germany, Italy, Slovenia, and Switzerland. In 2010, over a dozen new regional park projects were in different phases of preparation or establishment in Switzerland (Baumgartner, 2011). Therefore, despite the great variety of constitutions and political cultures in Alpine countries, most of them exhibit a clear trend to decentralization, empowerment of the regional level, and the restructuring of local institutions.

2.1.5. "Alps plus": the level of the Alpine Space Programme

The most recent – and most comprehensive – "level" of the Alps emerged in 2000 when the EU Community Initiative Interreg IIIB Alpine Space Programme (ASP) was set up for a period of six years. As with other Interreg Programmes, projects are co-financed by the ERDF and regional/national authorities. As a transnational (Strand B) Interreg Programme, the ASP applies not to the area straddling the border between two (or more) countries, but to the whole area of the Alps and many adjacent territories. Projects must include partners from at least three different countries.

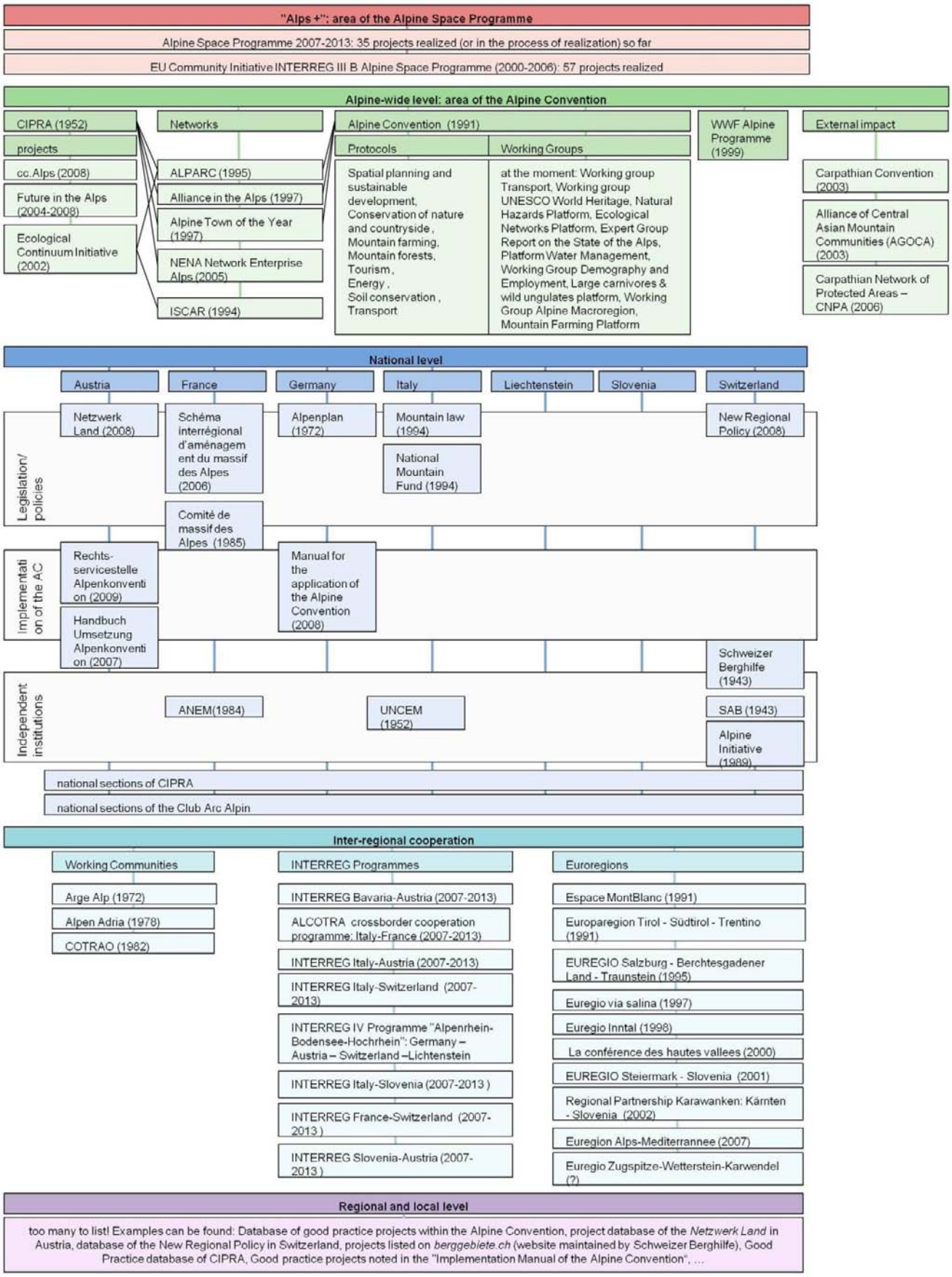

Figure 13: Institutions and initiatives in the Alps, in order of decreasing spatial scale

2.2. Evaluation of initiatives

This section addresses initiatives which have been undertaken at the various spatial scales described above to address sustainable mountain development (SMD) in the Alps. Annex 1 provides a summary of significant initiatives which have emerged (together with the policy instruments and resources which underpin them) in the two decades since the 1992 UN Conference on Environment and Development (see also Figure 13). The profusion of apparently diverse initiatives listed in Annex 1 exhibit, individually or in combination, the four basic resources – *information*, *finance*, *coercion* and *organization* (Hood, 1986) – with which policy-makers can manage public policy issues. In turn, these resources are packaged within specific policy instruments (for example, legislation, funding schemes, taxes) designed to achieve specific policy outputs and outcomes (Howlett, 1991). As it is beyond the remit and resources of the current study to provide a comprehensive account of all of these initiatives, this section provides a analysis of a selection of initiatives, underpinned by consideration of key issues of relevance to the continuing evolution of SMD in the Alps as we approach 'Rio 2012'.

These issues include:

- the major themes of initiatives and the opportunities and/or challenges which they have addressed;
- the extent to which integrated (cross-sectoral) or sectoral initiatives have predominated and associated implications;
- the emergence or development of institutions and/or governance mechanisms supporting SMD since 1992;
- the engagement or targeting of particular types of stakeholders through action or funding;
- the extent to which it is possible to measure an overall balance of positive and negative outcomes in economic, environmental and socio-cultural terms;
- key factors in determining the success, or otherwise, of initiatives in pursuit of SMD.

The remainder of part 2 examines these issues as they pertain to the various spatial scales of interest. The discussion concludes by drawing together and summarizing lessons to be learned and utilized for scaling up and scaling out, particularly with regard to the Rio+20 themes of 'green economy in the context of sustainable development and poverty eradication' and 'institutional framework for sustainable development', discussed further in section 3.3.

2.2.1. Alpine Space Programme

The Alpine Space Programme (ASP) is at the forefront of policy instruments designed to address issues of SMD in wider 'Alpine space', as described in section 2.1. Originally established by the EU as part of Strand B (Territorial co-operation) of the Interreg III Community Initiative for 2000-06, it adopted four specific objectives aligned to both the EU's Lisbon Agenda for a competitive and knowledge-driven economy and its Gothenburg Agenda for sustainable development:

- to establish the Alpine Space as a powerful area in the European network of development areas;
- to initialize and support sustainable development initiatives within the Alpine Space under consideration of the relationship between the Alpine core region and the fringes of the Alps;
- to find efficient solutions in the domains of accessibility and transport by promoting sustainable modes of transport and communication;
- to safeguard the diversity of the natural and cultural heritage and to protect the population and infrastructure from natural hazards.

The 2000-06 programme specified the following priorities:

1. promotion of the Alpine Space as a competitive and attractive living and economic space in the scope of a polycentric spatial development in the EU;
2. development of sustainable transport systems with particular consideration of efficiency, inter-modality and better accessibility;
3. wise management of nature, landscape and cultural heritage, promotion of the environment and the prevention of natural disasters.

The current programme (2007-13) aims to "increase competitiveness and attractiveness of the cooperation area by developing joint actions in fields where transnational cooperation is required for sustainable solutions", and has widened its objectives to emphasize, in addition to those of the previous programme, the themes of innovation and support for small and medium-sized enterprises (SMEs)[9]:

1) to encourage innovation, entrepreneurship and strengthen research and innovation capacities for SMEs;
2) to enhance a balanced territorial development to make the Alpine Space an attractive place to live, work and invest;
3) to improve accessibility of the Alpine Space and to manage economical and environmental consequences of transport systems;
4) to improve accessibility to services and connectivity within the Alpine Space;
5) to protect, manage and enhance natural and cultural assets for sustainable development;
6) to prevent and mitigate natural and technological hazards and manage their consequences, with specific regard to climate change impacts.

Types and themes of initiatives

As a policy instrument focusing on transnational co-operation for regional development, the ASP places significant emphasis on knowledge generation and sharing to build stakeholder capacity to address particular sustainability issues. Common outputs of funded projects therefore include the creation of networks, data-sets and practical tools, and the undertaking of pilot projects for sustainability. Moreover, the programme's relatively wide-ranging priorities and related sub-measures allow for considerable diversity in terms of the focus of supported initiatives.

In the 2000-6 programme, there was a distinct emphasis on projects relating to priority one (competitiveness and attractiveness: 24 of 54 funded projects), and priority three (wise management of nature, landscape etc: 22 projects) (Bausch et al., 2005). By contrast, comparatively few projects (8) were approved in relation to priority two's focus on sustainable transport systems. In both the 2000-06 and the current Alpine Space Programme – under which 35 projects have so far been started – there has been considerable diversity in relation to the sustainability themes addressed within the broad parameters of programme priorities. The majority of initiatives appear to be predominantly sectoral in orientation, focussing on tourism, cultural and natural heritage, forestry, agriculture, energy or transport. Others focus on non-sectoral themes, including ICT, services of general interest (public services) and SME capacity building and gender equality. Relatively few projects appear to adopt a cross-sectoral or integrative approach, and there appears to be some variation in terms of the extent to which projects attempt to make explicit mutually reinforcing positive linkages between the economic, environmental, social and cultural aspects of sustainable development. One notable exception in this regard has been **DYNALP** (Valorisation of natural and cultural heritage for marketing and tourism in the

[9] http://www.alpine-space.eu/about-the-programme/objectives-and-strategies/

Alpine Space - dynamic rural alpine space), a project coordinated by Alliance in the Alps[10], which is discussed further in section 2.2.2.

Perhaps surprisingly, the sustainable development challenges presented by climate change provided an explicit focus for only one project, **ClimChAlp** (Climate Change, Impacts and Adaptation Strategies in the Alpine Space)[11] during the 2000-06 programme. However, the current programme has supported nine projects which explicitly address climate change issues. These include two projects which have concluded:

- **ClimAlpTour** - Climate Change and its Impact on Tourism in the Alpine Space[12];
- **CLISP** - Climate Change Adaptation by Spatial Planning in the Alpine Space[13];

and two which are currently running:

- **C3-Alps** - Capitalising Climate Change Knowledge for Adaptation in the Alpine Space**;**
- **MANFRED** - Management strategies to adapt Alpine Space forests to climate change risks[14];
- **PARAmount** - imProved Accessibility: Reliability and security of Alpine transport infrastructure related to mountainous hazards in a changing climate[15].

Recent studies have called into question the strategic focus and impacts of both the 2000-06 and current programmes. The mid-term evaluation of the 2000-06 programme noted that "The objectives and indicators are generally not quantified. […] Thus, the success of the programme is very difficult to justify" (Österreichisches Institut für Raumplanung, 2005). An impact assessment of the 2007-13 programme indicated a gap between funded projects and programme objectives in terms of measurable impacts (Metis, 2010). These apparent gaps in programme architecture suggest a lack of strategic focus. In this respect, what might arguably be viewed as policy instrument design flaws have the capacity to blur the linkages between knowledge exchange, policy development, impacts and beneficiaries which lie at the heart of sustainable development. Moreover, the relative absence of cross-sectoral or integrative projects supported by the ASP risks exacerbating a silo mentality which can further impede the pursuit of SMD within the Alpine context. This is particularly significant, given the widespread recognition that sustainable development solutions demand holistic and integrated policy and practitioner approaches. There are also related issues of concern regarding the visibility of the programme (Metis, 2010) and the level and range of stakeholder engagement. Such concerns are captured in the following generally positive comment from a contributor to our study:

> [The Alpine Space Programme is] [t]he most important event in the Alpine Space……This led to concrete initiatives as opposed to the [rhetoric] of the Alpine Convention. The Alpine Space Programme has strengthened the co-operation of the actors in the Alpine Space and led to a better networking of the actors. However, there are hardly any visible impacts on the ground. Outside the small circle of the directly involved, the population of the Alpine space hardly knows the programme"[16] .

Despite the above-noted concerns regarding policy instrument and project 'fit', it is clear that the ASP has helped to support many projects which are aligned with the knowledge generation and associated activities envisaged in Chapter 13 of Agenda 21. Such initiatives include:

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[10] http://www.alpenallianz.org/en/projects/dynalp-1
[11] http://www.climchalp.org/
[12] http://www.climalptour.eu/content/
[13] http://www.clisp.eu/content/
[14] http://www.manfredproject.eu/
[15] http://www.paramount-project.eu/index.php
[16] Thomas Egger, SAB

- **Econnect** (Restoring the web of life)[17], with 17 partners throughout the Alpine Space (apart from Slovenia), aiming to protect biodiversity through an integrated and multidisciplinary approach to encourage the promotion of an ecological continuum across the Alpine region;
- **MONITRAF** (Monitoring of Road Traffic: Related Effects in Alpine Space and Common Measures)[18], with 8 partners from all Alpine countries except Germany and Slovenia, aiming to strengthen interregional exchange of data on traffic related effects and monitoring results in the Alps using existing monitoring data;
- **CulturALP** (Knowledge and Enhancement of Historical Centres and Cultural Landscape in Alpine Space)[19], with 7 partners from all Alpine countries except Germany and Slovenia, aiming to protect the common cultural heritage by improving knowledge of characteristic features of historical alpine settlements;
- **ALPSS** (Alpine Public Procurement Services for Small and Medium Size Enterprises (SMEs))[20], with 7 partners from France, Germany, Italy and Switzerland, aiming to implement solutions to improve the access of SMEs to public contracts in the Alpine Space;
- **Alplakes** (Alpine Lakes Network)[21], with 9 partners from France, Italy and Slovenia, aiming to promote a better ecological condition of lakes, enhance ecotourism as a sector for the sustainable development of lakesides, and encourage sustainable development practice in areas by lakes;
- **Via Alpina**[22]**,** officially recognized by the Environment Ministers of all Alpine states as an implementation mechanism of the Alpine Convention. It consists of 5 international hiking routes covering over 5000km and is viewed as a mechanism for local development via the tourism sector and for networking between the Alpine States.

Stakeholder Engagement

Lack of data makes it difficult to arrive at a definitive conclusion as to the range and types of stakeholders who have been targeted and engaged with initiatives funded via the two Alpine Space Programmes. However, it appears that specific (often sectorally-orientated) public authorities at the regional and local levels are the dominant driving force in terms of initiating and co-ordinating projects. The types of stakeholders engaging in particular projects inevitably depend on their focus. However, it is not clear from the available data which stakeholder groups are being targeted by specific projects. The relative lack of information in this regard echoes the concern raised above regarding the robustness of linkages between projects, practice and beneficiaries.

Key Success Factors

Consideration of the case-study projects highlighted earlier in this section suggests a number of inter-linked factors of significance in determining the success of funded initiatives. These include the following:

Mobilising and retaining the support of political stakeholders

This is of particular significance, given that such stakeholders can provide powerful endorsement of initiatives and their objectives, which can act as a catalyst for resources and the participation of partners at local and regional levels. In a similar vein, the levels of

[17] http://www.econnectproject.eu/cms/
[18] http://www.monitraf.org/
[19] http://www.culturalp.org/index.asp
[20] http://www.alpps-online.com/
[21] http://www.alpine-space.org/alplakes.html
[22] http://www.via-alpina.org/

horizontal and vertical integration between project partners and other stakeholders can be a key determinant of success. For example, **CulturALP's** focus on cultural Alpine heritage generated networking activities which focused on local authorities within participating regions and their commitment to piloting actions. The emphasis on vertical integration of local authorities within the framework of pilot projects led to mobilization of financial resources for implementation of pilot activities and to further follow-up actions by local authorities.

Involving Local Actors

There is some evidence that ensuring input from local actors can enhance the quality of initiatives. For example, **Econnect's** efforts to encourage an ecological continuum throughout the Alps have encouraged the participation of stakeholders such as hunters, as their activities are particularly sensitive with regard to ecological issues. For similar reasons, farmers were also identified as important stakeholders with whom to engage in relation to the project. The direct involvement of local stakeholders (whether public authorities, the business community or general public) can also lead to positive unanticipated consequences: for instance, in **Alplakes,** where the direct involvement of relevant stakeholders resulted in the implementation of new policies for ecotourism in some participating regions.

Matching Stakeholder Needs and Initiative Objectives

It is important that the objectives of initiatives actually address the needs of stakeholders so as to ensure their active participation in projects. This was recognized by **AlpFrail** (Alpine Freight Railway)[23], a project with 17 partners seeking to shift freight traffic from road to rail, in order to contribute to reductions in CO_2 emissions without creating additional infrastructure. To do so, **AlpFrail** realized the importance of using existing organizational models and pilot projects to help involve key stakeholders with an interest in operationalizing the project concept. Identifying the needs of project partners and other stakeholders was also a key ingredient in shaping the **ALPSS** project in relation to SME access to public contracts.

Barriers to Success

There are also factors which have, to a greater or lesser extent, impeded the successful achievement of project objectives within the ASPs. These include the following:

- A focus on data analysis and indicators, rather than on concrete proposals for measures to address identified challenges. This was an issue for **MONITRAF:** the traffic monitoring system did not have a good fit with measures to alleviate the volume of transit traffic in practice. It also echoes the earlier point regarding the congruence of the 'fit' between projects and policy and practice in support of sustainable mountain development within the Alps.
- Short-term focus of projects and lack of follow-up initiatives. The ASP as a whole has been criticized for not taking a medium-term perspective on sustainability issues; this is reflected in some (but by no means all) of the projects. To some extent, this was an issue for **Alplakes,** which was unable to maintain a network to enable the development of a common approach for supporting ecotourism after the project ended. For **ALPSS,** the practical guide for SMEs regarding public contract procurement was not updated after the project was completed. Partners in **AlpFrail** also considered that its timescale was too short to implement all project ideas.
- Conversely, there are also examples where synergies have been developed with other initiatives and follow-on projects have been established. **MONITRAF** has been

[23] http://www.lkzprien.de/en

succeeded by **iMONITRAF**[24], which aims to continue and enlarge the original partnership established within the framework of the original project. Similarly, **ClimChAlp** has been succeeded by two projects funded by the 2007-13 ASP: **AdaptAlp**[25], with 16 partners systematically collecting data across the entire Alpine region for analysis and application to improve models for climate prognosis and impact analysis; and **CLISP**, with 14 partners focussing on challenges to spatial planning relating to climate change and contributing to climate change adaptation by providing climate-proof spatial planning solutions.

- Language barriers have been identified as having a potentially negative impact on project success. This has been experienced in relation to **CulturALP** and was a significant factor, given its close links to language as a culture-oriented project. Language barriers were also identified as impeding a common understanding of project issues in **Alplakes**.

2.2.2. Alpine level

As indicated above, the Alpine Convention and its associated protocols bestow a unique legal status upon the Alps by comparison to the world's other mountain ranges. Part 2.1 also notes the rather complex web of often overlapping institutional frameworks and myriad actors in the Alpine Convention area which directly or indirectly contribute to the objectives of the Convention. This subsection first briefly presents key elements of the implementation of the Alpine Convention, and then considers some of the most important of these institutional frameworks and associated initiatives with regard to the key themes outlined above.

The Alpine Convention

As the Alpine Convention is a framework convention, its application is primarily through protocols. Consistent with the rules of international law, ratification makes them binding on the States. During the first 10 years after the signature of the Convention, a primary focus was on the preparation of protocols, of which eight have been signed by all the Parties: on Spatial planning and sustainable development, Conservation of nature and countryside, Mountain farming, Mountain forests, Tourism, Energy, Soil conservation, and Transport[26] Austria, France, Germany, Liechtenstein, and Slovenia have ratified all the protocols, so that they are effectively in force in these countries. However, Italy and Switzerland have not yet ratified any protocols. The EU has only ratified the protocols on Mountain farming, Tourism, Energy, and Soil conservation; and has not signed the protocol on Solution of litigation, which all other Parties have signed, providing a basis for actions in relation to disputes relating to the interpretation or application of the Convention and its protocols. The two most recent protocols, on Transport and Solution of litigation, were first signed in 2000. Subsequently, the Alpine Convention has focused on their implementation and on other types of instruments, such as the Ministerial declarations**,** on Population and culture and on Climate Change, adopted in 2006, and on a Macro-regional Strategy, adopted in 2011; and the Action Plan on Climate Change, adopted in 2009.

In recent years, the Permanent Committee has established a number of ad hoc groups, each for two years (sometimes renewed), on specific themes, some deriving from the 12 thematic fields mentioned in Article 2 of the Convention – most of which, apart from population and culture, prevention of air pollution, water management, and waste management – have led to protocols, and the others relating to key themes of relevance to the Alps. At present, there are:

[24] http://www.imonitraf.org/i4Def.aspx?TabId=364&lang=en
[25] http://www.adaptalp.org/
[26] See: http://www.alpconv.org/theconvention/conv02_en.htm

- Working groups on Alpine Macroregion, Demography and Employment, Transport, and UNESCO World Heritage;
- Platforms on Ecological Networks; Large Carnivores, Wild Ungulates, and Society; Mountain Farming; Natural Hazards; and Water Management;
- an Expert Group Report on the State of the Alps.

The responsibilities of these various groups[27] include developing recommendations and implementing measures[28]; studying current developments, usually leading to the publication of documents, both in the two series Report on the State of the Alps (PSAC, 2007, 2009, 2010, 2011a) and Alpine Signals (e.g., PSAC 2011b), and other thematic documents[29]; and reporting progress to the Alpine Conference and Permanent Committee.

While a number of papers have been published regarding various aspects of the implementation of the Convention (e.g., Bätzing et al., 2004; Treves et al., 2002, 2004; Quillaq and Onida, 2010), there has been no recent systematic evaluation of its implementation as a whole, although this was addressed by the Permanent Committee during the Slovene Presidency (2009-11). Very briefly, positive achievements include: the fact that the Convention was the first to consider an entire mountain range; and this has fostered a regional identity and joint working; its formal implementation through protocols and other instruments, especially in certain countries; contributing in various ways to the development of the many networks described below; and serving as a possible model for other regional mountain conventions. Nevertheless, a number of challenges to effective implementation remain; these are discussed further in Part 3.

CIPRA

CIPRA has a particular emphasis on knowledge exchange, maintaining an extensive website and also publishing a wide range of publications, including a newsletter, reports, a feature magazine, background reports, information bulletins and thematic dossiers. All are available in the four Alpine languages (French, German, Italian, Slovene) and many in English. It has also published three wide-ranging reports on the state of the Alps (CIPRA, 1998, 2002, 2007).

As noted above, CIPRA has contributed to the development of many other Alpine networks which contribute to the implementation of the Alpine Convention, and continues to work in partnership with them. It has also implemented a number of projects involving diverse partners, including 'Future in the Alps' (2004-7), a knowledge management project aimed at promoting sustainable development in the Alps through encouraging people, businesses and institutions to network in order to share and implement know-how and information and thus stimulate sustainable development (CIPRA, 2007). Pfefferkorn (2008) reviewed the implementation of 'Future in the Alps' and concluded that it was successful in achieving nearly all of its aims, and even exceeded some; and that a particular reason for success derived from regular meetings between the project team and a 'reflection group' of diverse stakeholders. One additional measure of success was that it also led to two projects funded by the Alpine Space Programme: DYNALP², coordinated by Alliance in the Alps (see below); and Network Enterprise Alps - Enhancing sustainable development, competitiveness and innovation through SME and cluster co-operation (NENA, 2005-9). Each of these in turn led to further Alpine Space projects coordinated by other organisations.

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[27] See http://www.alpconv.org/theconvention/conv06_WG_en.htm

[28] Such as the Recommendations on integral risk management; Common guidelines on the use of small hydropower in the Alpine Region; Guidelines on large carnivores, wild ungulates and society.

[29] Such as a Report on Cooperation on Alpine railway corridors, Study on Alpine Sites and the UNESCO World Heritage, Situation report on hydropower generation in the Alps focusing on small hydropower.

Since 2004, a major emphasis has been on climate change, beginning with the 'climalp' project, on the transfer and implementation of knowledge and know-how for energy-efficient building, with timber from Alpine forests. This project still continues, however, from 2008, the focus broadened with the 'cc:alps' project, starting with a competition across the Alps aimed at finding successful activities and projects relating to climate protection. Subsequently, measures to address climate change in the Alps were investigated, to analyse their impacts on the environment, economy and society, and a series of books on aspects of climate change were published (e.g., CIPRA, 2009, 2010a, b, c; 2011a).

WWF European Alpine Programme

The WWF European Alpine Programme was initiated in 1999 by WWF Austria, Germany, Italy and Switzerland "to co-ordinate WWF activities in the Alps while developing a long-term vision with the important parties involved and preserving the eco-region's ecological integrity for future generations" (WWF, 2005). A key initiative developed under the auspices of the programme has been the development of a 'long-term biodiversity vision for the Alps' in collaboration with CIPRA, ISCAR and ALPARC which identified the following priority themes:

- *Priority species* (WWF participated in the projects "Status and Conservation of the Alpine Lynx Subpopulation" and "Bearded Vultures on the Move");
- *Natura 2000 and Emerald Network* (WWF largely contributed to the completion of the official lists of Natura 2000 and Emerald sites);
- *Freshwater* (the WWF European Alpine Programme has allowed the sharing of the lessons learned from successful river restoration projects across the Alps);
- *Education* (WWF initiated the Kids for the Alps" project with a corresponding website).

Much of the WWF European Alpine Programme is concerned with the co-ordination of activities between the national WWF organisations and the development of specific conservation strategies/areas and knowledge exchange networks. Examples of the former include strategies for the conservation of the pan-Alpine brown bear and wolf, and the development of 24 'priority conservation areas'. Examples of the latter include the concept of 'wild river networks' developed by WWF France and intended for use in other Alpine countries.

A main indicator of success has been the co-ordination of activities between the national WWF organisations operating within the Alpine States[30]. Closely related to this is the organization's co-ordinated lobbying of national ministries and administrative units in support of its objectives. Key factors contributing to success in this regard include the strategic visioning approach adopted by WWF and implementation of that vision by large organisations. WWF's lack of reliance on government funding (only 2% of funds come from government sources) enables it to adopt an independent approach to pursing its activities without fear of undue influence from government.

Barriers to success include occasionally contradictory messages coming from WWF organisations at national level, such as those relating to the shooting of a brown bear in Germany in 2006 – described by WWF Germany as "understandable" as it had been eating sheep, but as a "barbaric decision" by WWF Italy. Other challenges include finding appropriate funding sources, as there are many environmental NGOs active in the Alps and consequently strong competition for available funds (e.g., from foundations). Language barriers are also viewed as problematic.

[30] Interview with Sergio Savaio, senior co-ordinator of the WWF European Alpine Programme, 25th August 2011

Alliance in the Alps

Alliance in the Alps now consists of over 300 communities from 7 Alpine states. Within its aims of overcoming national borders and language barriers and implementing the provisions on sustainable development of the Alpine Convention at the local level, it undertakes mutual visits, excursions and information exchange, and organizes projects. The main ones have been funded within the ASP:

- DYNALP (2003-2006), supporting projects developed by the 52 towns and regions participating in the initiative in support of the protocols of the Alpine Convention on tourism, conservation of nature and the countryside, mountain farming, and spatial planning and sustainable development;
- DYNALP² (2006-2009), supporting projects in communities which contributed towards implementing sustainable development and the Alpine Convention[31];
- DYNALP-Climate (2009-2011), supporting 20 projects, many of which focus on aspects of energy efficiency and sustainable energy production and consumption[32];

A further activity has been to support the establishment and implementation of the Alliance of Central Asian Mountain Communities.

A key positive outcome of the Alliance is a "feeling of solidarity" (Del Biaggio, 2011) emerging in participating communities due to a sense of having shared challenges. Other identified important factors of success include the involvement of local leaders in the network, a feature also noted in relation to other projects funded by the ASP. There are also similarities regarding barriers to success, as there is a perceived lack of involvement in the network by local populations despite the network's stress on the importance of the participation of these stakeholders in its activities (Del Biaggio, 2010). Language barriers and the distance within the Alpine arc that actors have to cover to attend meetings, together with a lack of administrative capacity, are also viewed as obstacles to success (Del Biaggio, 2009).

Alpine Town of the Year

The title of Alpine Town of the Year is awarded by an international jury representing Alliance in the Alps, CIPRA International and Pro Vita Alpina (International, Austria and South Tyrol) to one town which has demonstrated commitment to implementing the aspects of the Alpine Convention with reference to the following objectives: strengthening awareness of the Alps; involving the population; consolidating ties with the region; shaping the future sustainably; and developing co-operation. To date, 14 towns have been awarded this accolade: each commits to implementing at least two sustainable development projects. These can be quite diverse in their focus and have included a traffic plan to promote public transport and alternative models of transport in Gap (France), a nature park near Trento (Italy), and a path information system for sustainable tourism in Bad Reichenhall (Germany). In turn, the town profits from the marketing efforts of the organization.

Several success factors have been identified in relation to this initiative, particularly the role of public participation from the bottom-up in promoting projects. In this respect, the award can act as a catalyst for public participation in projects for sustainable development. However, this requires a clear and transparent communication strategy to alert citizens and engage them in the initiative as a whole, and associated projects in particular. Additionally,

[31] DYNALP² projects focused on one or more of the following topic areas: Regional Value Added, Governance Capacity, Protected Areas, Mobility, New Forms of Decision Making, and Policies and Instruments.

[32] For details of all 20 projects, see http://www.alpenallianz.org/en/projects/dynalp-climate-1/good-practice/?set_language=en

sustainability benefits can arise from towns using their regional assets to establish a Unique Selling Proposition, thereby helping to establish a regional identity (Buchl, 2010).

ALPARC

ALPARC's primary objective is to "promote and support the pooling of experience and expertise among managers of Alpine protected areas on all common issues". Secondary aims are to create an ecological network and raise awareness among the general public and local residents about the importance of the natural and cultural heritage of the Alps. The network includes 1000 protected areas (>100 ha), representing approximately 25% of the Alpine Convention area. Many of these protected areas have a rather weak nature protection status, giving a higher priority to topics such as landscape or tourism activities. However, the area of national parks and nature reserves set aside specifically for safeguarding biodiversity is considerable (7% of the Alpine Convention area) (Heinrichs et al., 2010).

ALPARC's actions are organized around a number of themes including: Alpine Ecological Network; climate change; environmental education and awareness raising; ecological buildings and innovations; Research Platform; transport, access and mobility; Alpine Protected Areas experiences; Carpathian Network. The principal means of action comprises a wide range of working groups[33] which focus on topics of relevance to ALPARC's overall aims and provide a mechanism for technical exchanges between administrators of protected areas and a basis for specific projects and publications designed to facilitate knowledge exchange and build capacity to deal with particular challenges. As ALPARC's website notes:
These groups work on concrete projects such as the reintroduction or monitoring of species of fauna, welcome policy and tourist flow management, common communication and the management of protected areas or, again, on measures against climate warming (human-powered mobility,, ecological constructions…) and can give rise to international projects (LIFE Bearded Vulture, Interreg Habitalp and Alpencom…) or to common productions (travelling exhibitions, common communication tools…)[34].

Mountain farming

As noted above, a principal aim of ALPARC is to implement the Protocol on Nature Conservation and Landscape Planning of the Alpine Convention. In 1997, SAB and Euromontana began an initiative to create a comparable network for mountain farming, to implement the Protocol on this topic[35]. The Swiss Federal Office for Environment (BUWAL) funded two meetings in 1998 to discuss this; these were attended by farmers' organisations, such as the Präsidenten-Konferenz der Landwirtschaftskammern (Austria), the Deutscher Bauernverband (Germany), the Fédération Nationale des Syndicats d'Exploitants Agricoles (France), and Italian and Slovenian farmers' organisations. However, they tended not to view the Alpine Convention positively, and thus were not willing to participate in the proposed network by providing funds or in-kind contributions. For SAB, Euromontana and BUWAL, it did not make sense to continue this initiative, based only on funding and in-kind contributions from Swiss institutions; a decision not to continue further was taken by the Permanent Committee of the Alpine Convention in 1999. A further possible reason that this

[33] These Working Groups are on the following topics: 'large mammals and raptors', 'large carnivores', 'habitats', 'sustainable tourism, cultural heritage and soft mobility', 'mountain agriculture and products of quality', 'common communication and environmental education', 'traditional know-how and ecological constructions in the protected areas', 'water resources', 'databases and GIS' and 'environmental performance evaluation and ecological balance'.
[34] http://www.alparc.org/the-alparc-network/a-thematic-network
[35] Sources: Thomas Egger (SAB), Jörg Wyder

initiative was not implemented is that the Alpine Convention was perceived as having little impact on mountain agriculture, as the policies of the States-Parties, as well as the EU, were more advanced than the Protocol on Mountain Farming.

More recently, in March 2011, the 11th Alpine Conference decided to launch a new Platform on Mountain Farming, chaired by Austria. A month later, in the context of the negotiation of a new EU Common Agricultural Policy, the Ministers of Agriculture of the six larger Alpine States signed the 'Oberammergau Declaration', which advocates the principle of protection through use', i.e., active management is required to preserve customs and handicrafts, contribute to tourism, and ensure continue settlement in mountain areas. The declaration also states that the countries will jointly develop measures to deal with the impact of globalisation and climate change and to market quality agricultural products. Thus, an important difference is that, while the former initiative was begun by NGOs, with the primary support on one State, the current initiative has wide backing from a number of States in the formal context of the Alpine Convention.

Conclusions

Networks such as ALPARC, Alliance in the Alps, the Alpine Town of the Year, and CIPRA have been praised by many for enhancing the visibility not just of the Alpine Convention itself but also of a general Alpine 'spirit', a perception of common goals and challenges throughout the range. These networks are generally deemed to be working well, even where the Alpine Convention is faced with challenges due to political blockades, as discussed further in part 3. Indeed, there is a view that networks such as ALPARC and Alliance in the Alps have superseded the role of States in implementing the Convention (Del Biaggio, 2009). The factors of involvement of local leaders and a strong central co-ordination unit with sufficient financial resources are viewed as significant in determining the success of both ALPARC and Alliance in the Alps. They represent a 'bottom-up' mobilization of inhabitants, local representatives, researchers, managers of protected areas, and ecological associations, as compared to the "top-down" identification of the Alpine massif via the Alpine Convention and Alpine Space Programme (Del Biaggio, 2009). Nevertheless, as shown by the lack of success of a mountain farming network to date, in some cases, such a bottom-up approach is not always sufficient; to create an Alpine network also requires support from stakeholders in a number of different countries and the appropriate political conditions.

2.2.3. Inter-Regional Initiatives

Annex 1 indicates the wide range of inter-regional initiatives which have been established in relation to SMD in the Alps. As noted earlier in this section, some of these initiatives predate the publication of Agenda 21 by at least a decade – particularly the three Working Communities. In addition, the proliferation of Euroregions and their associated activities has added considerably to the institutional and project implementation landscape for SMD in the Alps. It is also evident that, as with the ASP, the EU's Interreg funding mechanisms have provided an important and prominent source of support for many projects, particularly in the current EU budgetary period of 2007-13.

Data and other resource constraints preclude detailed analysis of the range of SMD projects undertaken across the expanse of inter-regional co-operation. However, it is worth noting that according to the classification contained in Annex 1, very many initiatives (and by implication, the projects they support) appear to be cross-cutting in nature. In contrast, the relatively small number of sectoral initiatives identified focus on tourism, agriculture or culture.

Arge Alp

Arge Alp[36] occupies a unique position as the first association of State and non-State units below the level of national States in Europe, following its formation in 1972. As such, it has been described as a pioneer in the field of 'bottom-up' regional cooperation (Schmitt-Egner, 2009). Its spatial focus is on Bayern (Germany), Salzburg, Tirol, Voralberg (Austria), Trentino and Südtirol (Italy), St Gallen, Tessin and Graubünden (Switzerland).

Through the work of its member regions, Arge Alp aims to address common problems and issues of relevance to stakeholders – particularly in the fields of ecological, cultural, social and economic development – in order to promote common understanding among the peoples of the Alpine Space and strengthen awareness of their common responsibility for the Alpine living space. This has led to a diverse range of initiatives including events, studies, awards and services which collectively target a wide range of stakeholders. Recent examples include:

- events such as a conference on climate change (2010); "JuniorAkademie", a cultural exchange for young people (2008); and a mountain film festival (2010);
- studies such as that on energy policies in the areas of the Arge Alp members which provide recommendations for action;
- award of a prize to "best practice communities" for the use of renewable energies.

The relatively homogenous political orientation of Arge Alp has been identified as one explanatory success factor in relation to developing and implementing the association's initiatives. Size is also considered an important factor; a larger institutional structure (for example covering the whole of the Alps would be too unwieldy to achieve Arge Alp's aims in practice[37]. On the other hand, there is a view that Arge Alp cannot achieve some of its objectives because the responsibility for some fields of activity resides at other levels of governance (Michelmann and Soldatos, 1990).

[36] http://www.argealp.org/

[37] Interview with Fritz Staudigl in Alpenmagazin: http://www.alpenmagazin.org/index.php?option=com_content&view=article&id=598:qwir-vermeiden-die-buerokratieq&catid=154:alpenraum&Itemid=241

Alpine Gastgeber

Alpine Gastgeber ("Alpine hosts")[38] is an example of a sectoral project focused on tourism and recreation in the regions of Tirol, Salzburger Land, Allgäu (Austria) and Oberbayern (Germany). It originated in 2005 within the framework of the Österreich-Deutschland/Bayern Interreg IIIA project *Qualitätsoffensive Alpine Gastlichkeit*, followed by the Interreg IVA project, *Innovationsnetzwerk für alpine Angebotsentwicklung*. The *Alpine Gastgeber* network has enabled member SMEs to better compete in the tourism sector through a marketing platform established by the network which emphasizes their small scale (fewer than 40 beds), cordial atmosphere and high-quality service.

The initiative is considered to be successful in terms of achieving its objectives. A target of 450 members (mainly guest houses and holiday homes) in the network has been achieved, and they appear to have benefitted through increased occupancy rates. In Tirol, sample checks indicated that members of the initiative received, on average, more tourists than non-participating SMEs. A final report on the project (Bundesministerium für Wirtschaft und Arbeit, 2010) states that it represents a cross-border strategy for quality marketing which is open for weaker suppliers. In addition, members improved quality by focusing on services, professionalization and specialization. Significantly, an extension of the tourist season was achieved, as was an increased number of overnight stays and added value. The project leader regards the networking of partners and the availability of training opportunities and seminars, in the low season, on quality, service and marketing as key success factors. Over 5,100 people participated in these training events and seminars.

Small Project Fund – Kärnten – Slowenien

The Small Project Fund – Kärnten – Slowenien**,** funded via the Interreg IIIA Austria Slovenia programme from 2004 to 2008, provides an example of cross-cutting inter-regional co-operation at the micro-scale. The project has targeted Kärnten (Austria) and Gorenjska, Koroska and Savinjska (Slovenia), with a focus on supporting the following themes through funded initiatives: culture; women; youth; environment; tourism; economy; health; integration; and dialogue. Recognising that a Small Project Fund would be necessary to reduce bureaucratic hurdles and time-consuming procedures for projects of a very small scale, the initiative aimed to intensify active co-operation between stakeholders across borders to establish economic, social and cultural contacts and support innovative ideas (Kilian and Kanzian, 2008). It was co-ordinated by 7 different regional institutions which selected and approved projects for funding.

The Fund supported 38 projects; it is considered to have encouraged intense co-operation between partners (Kilian and Kanzian, 2008) and to have helped overcome cultural differences between the collaborating regions. The Fund is also claimed to have contributed to strengthening the private sector in the regions and forging of cross-border connections (European Commission, 2007). Its main negative impacts were identified as being process issues relating to a need for simpler guidelines, greater harmonization of procedures between Karnten and Slovenia and more flexible timelines (Kilian and Kanzian, 2008).

2.2.4. National Initiatives

Austria has made a particular effort towards the implementation of the Alpine Convention by publishing a manual for its implementation (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, 2007) and by establishing a dedicated Rechtsservicestelle (Legal Service Point). Both aim to aid policymakers by giving non-binding guidance in cases where the interpretation of the Alpine Convention is uncertain,

[38] http://www.alpine-gastgeber.com/

thus contributing to (Austria-wide) coherent jurisprudence and to a smoother decision-making process. Germany has published a similar manual, strongly modeled on the Austrian original.

In Switzerland, the New Regional Policy (NRP) was established in 2008, replacing the LIM (Law on Investments in Mountain Regions) in existence since 1974 and the previous Swiss Regional Policy. The NRP has also incorporated transnational co-operation within the framework of Interreg, shifting the focus of policy from redistribution towards competitiveness, with a particular focus on endogenous potentials of regions. Its spatial focus is on mountain regions, border regions and the wider rural area which are perceived as facing particular challenges due to economic and structural changes. Fields of activity include (Egli, 2011):

- direct promotion to strengthen innovation, added value and competitiveness;
- co-operation and synergies between regional policy and sectoral policies;
- knowledge system regional development policy.

A variety of policy instruments including grants, low interest credits and some private business cases, tax reductions can be used by the Cantons and federal government to support projects. Over 600 projects have been initiated and supported since the NRP was established. Examples of good practice projects in mountain cantons include:

- 'Bioburn', a facility to generate energy from different biomass facilities in Luzern;
- 'The Ark', a foundation in Wallis which aims to diversify the economy by supporting innovation in SMEs and supporting new businesses;
- the development strategy "San Gottardo" in Graubünden, Tessin, Uri and Wallis which aims to support the region by jointly developing and marketing tourism services, improving mobility and supporting communication strategies;
- 'Qualifutura Grimselwelt', which aims to support young people in finding employment by giving them the possibility of gaining work experience in local agricultural businesses or SMEs.

Although the NRP is generally viewed positively, some negative factors have been identified in relation to its implementation. These include criticisms from some Cantons that the policy is too strongly focused on export-orientated growth, and is not flexible enough to include other measures which only contribute indirectly to exports. Furthermore, the principle of sustainability was found not to have been respected in all cases of funded projects, with only sporadic communication with cantonal administrations responsible for sustainability (Egli, 2011).

2.2.5. Sub-national level

Tourism and support for local rural development have been major foci for initiatives and projects at the sub-national level. In Switzerland, the new protected areas mentioned above have enjoyed wide acceptance from early on, since it is the immediately affected population who decides (in a municipal assembly or via local parliament) whether a region should become a park (Weissen, 2009). Across the Alps, numerous initiatives have also taken place in the field of 'quality food' production and its marketing. A relatively well-known example is the *KäseStrasse Bregenzerwald* ('Cheese Route Bregenzerwald) in Austria, a network of cheese producers and restaurants aiming to enhance the profile of local quality cheeses.[39]

Evidently not all initiatives at local level can be dubbed "sustainable", some even run counter to the idea of sustainability. One trend that is strongly deplored by CIPRA and environmental

[39] http://www.kaesestrasse.at/

protection organizations is the expansion of ski areas into environmentally-sensitive areas and their excessive reliance on artificial snow. Examples can be found in every country: in Austria, the planned extension of the ski area Schmittenhöhe would necessitate the permanent use of snow cannons; and the connection of the ski areas Vorder- and Hinterstoder would entail the construction of a cable car through the nature reserve Warscheneck; in France, plans to extend a ski resort onto Mont Chaberton would open access to the wild parts of the mountain; in Germany, the connection of the ski resorts Grasgehren and Balderschwang would cut into the "Zone C" of the Alps Plan, in which infrastructure construction should normally only take place in exceptional cases. Proponents of the initiatives argue that the ski resorts maintain employment in the area. Similar controversy surrounds some mega-projects such as the infrastructure around Torino built for the 2006 Winter Olympic Games.

2.2.6. Conclusions

There is a long history of institutional frameworks, governance mechanisms and policy instruments relating to sustainable mountain development in the Alps which predates the publication of 'Agenda 21' in 1992. As noted above, CIPRA has been an active and highly influential organizational actor in the Alps for more than five decades. The Alpine Convention aimed to heighten and consolidate policy for SMD between its Parties and with other stakeholders, an increasing number of which have become Observers. Moreover, there is a well established tradition of inter-regional co-operation through the Working Communities. There is also a long history of using legislation and other policy instruments, such as grants and taxes, within the Alpine States to address particular problems facing mountain regions and the people who inhabit them.

Aside from the above, and as the preceding discussion in this section illustrates, there has been an enormous proliferation of new institutional frameworks and initiatives specifically concerned with SMD in the Alps since 1992. Networks such as ALPARC, Alliance in the Alps, Alpine Town of the Year and the WWF European Alpine Programme have all played important roles in generating and strengthening knowledge in relation to the management of fragile ecosystems and integrated watershed development as envisaged in Chapter 13 of 'Agenda 21'. Alongside these initiatives, EU regional policy instruments, in the form of the ASP and various other Interreg programmes, have had a catalytic influence in contributing to the implementation for SMD outlined in Chapter 13.

Data limitations and the sheer number of projects which have been developed via the above mechanisms make it impossible within the context of this study to arrive at a definitive view as to the major themes addressed. The most obvious emergent theme has been that of adapting to, and mitigating against, the effects of climate change. Many of the transportation projects funded by the ASP and similar initiatives directly address these issues as they pertain to that sector; CIPRA has also undertaken a number of studies on climate change, as noted in Part1. There is also a strong nature conservation theme to many of the initiatives supported, particularly through ALPARC and the WWF European Alpine Programme.

Although we have classified programmes such as the ASP and other Interreg programmes as cross-cutting, it is not readily evident that many of the projects funded within the context of such initiatives are genuinely cross-cutting in terms of integrating activities across sectoral boundaries. Some projects still have a sectoral focus, such as tourism, agriculture or forestry. There is some evidence of 'joined-up thinking' in projects highlighted above, with linkages between, for example, tourism, cultural and natural heritage and economic development opportunities. Such approaches are also encouraged in the latest 'State of the Alps' report from the Permanent Secretariat of the Alpine Convention (2011) and recent political statements that are related to mountain farming, yet take a wider viewpoint.

However, there is undoubtedly scope for encouraging more cross-sectoral activity in supported projects than appears to have been evident to date.

Given the wide range of projects supported at the various spatial scales and through the differing policy instruments described earlier, it is also difficult to be definitive in terms of identifying all targeted stakeholders. The range of stakeholders varies greatly depending on the focus of specific projects. They include sector-based SMEs; particular sections of local populations (e.g., young/older people, women, people with disabilities); public authorities at local, regional and national levels; non-governmental organizations; and education/research institutions.

One issue of concern is the apparent lack of awareness of particular funding initiatives and associated projects beyond the confines of sometimes quite closely defined stakeholder communities. It is not necessary that the ultimate beneficiaries of a particular project are aware of its genesis. However, the perceived lack of awareness of networks and their associated activities amongst the general Alpine public raises important issues regarding the relationship between knowledge generation/dissemination for SMD, policy development, and project impact 'on the ground' which can be measured as contributing towards the overall goal of SMD. There are instances where supported initiatives have led to the development of new policy approaches (e.g., Alplakes). However, such instances appear to be rare. Many projects also display good practice in aspects of SMD which can be shared and replicated elsewhere (e.g., Alpine Town of the Year). Nevertheless, the lack of consistent and clear impact measures of programmes (such as the ASP) and projects raises an important and fundamental question regarding the practical and *measurable* difference they make in relation to the SMD of the Alps. In turn, the absence of reliable data with which to measure project impact makes it impossible to draw quantifiable conclusions as to the balance of positive and/or negative outcomes relating to initiatives in economic, environmental and socio-cultural terms.

In conclusion, a considerable number of factors appear to facilitate or impede the success of initiatives. Mobilizing and retaining political support, the existence of a homogenous political orientation within the spatial scale of the project, involvement of local actors; matching stakeholder needs and project objectives, effective vertical and horizontal integration and co-operation between regional and local actors, and ensuring an appropriate scale for the project's focus have been identified as significant factors which can positively influence the extent to which projects are successful. In contrast, emphasis on data analysis and indicators (rather than on concrete project proposals), a short-term focus and lack of follow-up initiatives, language barriers, conflicting messages at different spatial levels from project partners, scarcity of match funding sources, lack of the involvement of local people in project activities, and minimal partner participation in project working groups have all been identified as factors which can impede the achievement of success in projects.

Part 3: Emerging challenges and opportunities

3.1. Trends, challenges, and opportunities for sustainable mountain development in the Alps

Three sets of issues can be recognised for sustainable mountain development in the Alps. The first is polarization and the increase of spatial contrasts, which primarily presents a range of challenges. The second relates to migration and social cohesion, and includes both challenges and opportunities. Both of these sets of issues need to be considered within their macro-geographical contexts.

3.1.1. Polarization and the increase of spatial contrasts

Polarization

Numerous studies have stressed a polarization and internal differentiation process in the Alps between prosperous areas and peripheral areas over the past four decades. The prosperous areas are agglomerations and major tourist regions, facing the challenge of optimizing land uses. The peripheral areas are essentially agricultural and forested areas, facing demographic and economic decline. This may lead to the emergence of two Alps: one overexploited and one "abandoned". Based on 1991 data and through an analysis of the 5,700 alpine municipalities, the REGALP research project showed that "the Alpine cities and their suburbs lying mostly in the valley floors, contain 57% of the Alpine population and 71% of the alpine working places" (Favry et al., 2004: 5). While they represent 28% of the municipalities, they cover 23% of the Alpine surface. This trend of polarization raises concerns, as it is the outcomes of the two processes (growth and decline) that are identified as the greatest threats for the Alps.

Peri-Alpine metropolization

This polarization occurs not only within the Alps, but also at the interface between Alpine and peri-Alpine areas. One could argue that the specificity of the Alps is that it is a mountain range surrounded by metropolises: peri-Alpine metropolises (Lyons, Marseille, Milano, Munich, Torino, Vienna, etc.) and polycentric metropolitan areas (Lake Constance, Lake Geneva, Venice, etc.). The peri-alpine metropolises will increasingly influence the Alpine regions, so that the destiny of the Alps becomes inseparable from the development of these metropolises (ISCAR, 2010: 1-29). The metropolises offer job opportunities and transform parts of the Alps into 'dormitories', leading to suburbanization or peri-urbanization (Convertino, 2006). As services become more and more concentrated in these peri-alpine metropolises, inner Alpine cities lose some of their functions as regional centres (Torricelli, 1999; Perlik, 2001, 2010). This trend is likely to increase. The relationship between the metropolises has mainly been depicted as detrimental to the inner Alpine cities, as their resources are unilaterally captured for the benefit of the peri-alpine metropolises (Bätzing, 2003). However, potential synergies between the two could also emerge (see 3.2.4). Indeed, and especially in a context of global competiveness, these metropolitan areas can be conceived as "centres of competitiveness which will drive the entire Alpine economy" (Bausch, 2005: 18). Functional connections between these centres and their peripheries are undisputable. There are major flows (biophysical, economic, social) between them. This interdependence has to be acknowledged politically.

Growth and consumption of land in polarized areas and corridors

Urban sprawl and infrastructure development lead to the consumption of large areas of land (Moyon, 2011; Duvillard, 2010), significantly modifying landscapes and leading to the fragmentation of habitats. This is particularly relevant when the development of valley floors

leads to losses in ecological connectivity and the isolation of habitats (see Ecological Continuum Initiative in section 3.2.1). Moreover, increased competition for land in the developed areas of the Alps is leading to increases in land prices, which makes it more difficult for local people to stay and to maintain agricultural activities.

Periphery decline

The risk of marginalization and the decline of peripheral areas have been best expressed by the controversial notion of 'Alpine fallows', defined as "zones of degradation and slow decay" (Diener, 2005: 216). These regions, characterized by a weak economy, cover most of the Alps, apart from some intensively developed areas such as major tourist resorts (Schuler et al., 2007; Frey, 2010). The decline of the periphery has social, economic and environmental features. It is mainly related to economic factors, i.e. activities which are no longer competitive, such as extensive cattle raising and forest management. This leads to migration and to the subsequent decrease of social capital. It has often been stated that the landscape is the reflection of human activities (Lehmann et al., 2007). With the abandonment of agricultural land use practices, landscapes are changing. The generalized increase of forest cover in the Alps on former pastures illustrates this trend. In Switzerland, forest cover increased from 1983/85 to 2004/06 by 14.8% in the Northern Alps and 15.8% in the Southern Alps (Brändli, 2010), mainly in summer pastures (Gehrig-Fasel, et al. 2007). The banalization of landscape and the loss of some of its traditional aspects lead to the impoverishment of local heritage and touristic assets. The abandonment of agriculture activities also leads to the impoverishment of biodiversity (Chemini and Rizzoli, 2003). Overall, the decline of the periphery has important negative impacts on the delivery of many ecosystem services.

Transit and accessibility

The Alps have been considered as an obstacle or at least as a "switch" (Raffestin, 1989) in "North-South mediation" (Bausch, 2005) at the European scale. The development of new major transport infrastructures will continue to enhance transit through – and also beneath – the Alps. Major transalpine tunnels (Brenner, Gotthard, Lötschberg, Lyon-Turin) are a key element of this architecture. This trend will reinforce the large peri-alpine and European centres and bypass small and middle-sized Alpine cities. This development echoes Nicolas Céard, the engineer in chief of the Simplon road, who stated at the completion of the road in 1805: "You can say to His Imperial Majesty [Napoléon] that there are no more Alps" (quoted in Salamin, 1978: 52). The improvement of the crossing of the Alps will improve the connections between major cities, but may compromise transport services (frequency, rapidity) connecting centres and smaller settlements within the Alps. However, in some places, populations and their authorities are eager to see the North-South flows go fast through, or beneath, the Alps in order to avoid the nuisances and pollution related to traffic (Alpnap, 2007). Opposition also leads to more radical actions, such as the demonstrations in Val di Susa, Italy, rallying several thousand people against the project of a high-speed train between Lyons and Turin.

Mobility

There are two main drivers concerning mobility in the Alps: local people moving year-round within the Alps; and tourists and second homeowners moving into the Alps for holidays and week-ends. Both types rely heavily on private motorized transport (Tschopp et al., 2011). Mobility has been increasing drastically as peripheral regions become increasingly dependent on urban centres in terms of jobs and services. Therefore, the connection to centres is a central component of maintaining living peripheral communities, if it leads to commuting and not to definitive emigration. Mobility related to leisure and commuting leads to traffic, which causes congestion and has environmental impacts, such as air pollution and

noise (PSAC, 2007), as discussed in section 1.2.4. A stronger focus on public transport would be a possibility in this regard – but the maintenance and improvement of cost-effective public transport options poses a challenge, particularly in peripheral Alpine regions without significant tourism where the demands are low.

3.1.2. Migration and social cohesion

Migration

Through emigration processes towards regional centres and touristic regions, there is an increase of residential mobility in Alpine municipalities. Parallel to this process, there is a process of amenity migration towards the Alps (Perlik, 2006). Retired people and teleworkers who can work anywhere as long as they can have access to information and communication technologies (internet, phone) have moved to the Alps in order to enjoy the environment. Some of these migrants rely on cheap air connections to major European centres. Residential trajectories are becoming more complex and more individualized (Camenisch and Debarbieux, 2010). The risk of having inhabitants less anchored to local communities, detached from professional relations at local scale, is clear.

Social cohesion

The social cohesion of Alpine communities is threatened by the growing diversity of inhabitants, social networks, and residential trajectories. Individuals adopt a growing diversity of ways of life related to personal networks which span various scales. Daily commuters live in the community but work in the regional centre and may have most of their social relations there. In-migrants coming for work, such as the seasonal work force in tourist resorts, are frequently poorly adopted by local communities. Peripheral areas are still experiencing long-lasting demographic changes, with a general tendency of the older generations to stay, and the younger ones to move to cities (PSAC, 2007). This imbalance is a concern if mountain communities are to remain living communities and if social ties and common visions are to be kept alive at the local scale.

Social capital

The social transformations of Alpine populations lead to contrasting trends. Through brain-drain, some regions lose some of their economic and potential elite, drawn to metropolises. In contrast, through peri-urbanisation and secondary residences, the competences of highly qualified populations with networks can offer potential inputs for the Alps. The success of projects and the long-term future of communities of all sizes in the Alps will highly depend on social capital (Wiesinger, 2007). Intellectual local resources, collective willingness to get involved in projects, and the capacity to participate in networks will be crucial. It is essential to ensure that both qualified people who have left the region, but retain ties to it, and newcomers with a high level of social capital give inputs to local projects that promote environmental management and sustainable economic development.

3.1.3. Macro-geographical contexts

Climate change

Mountains have been identified as early indicators of climate change because their altitudinal gradient leads to high sensitivity. As discussed in Part 1, the Alps have already been, and will be increasingly, affected by this global process (BMU, 2007). Climate change will impact water availability, with the melting of glaciers and changes in precipitation, especially snow (EEA, 2009). The impacts of climate change also raise issues relating to

natural hazards, with increased numbers of landslides relating to the melting of permafrost, floods and, in drier areas, fires. A large part of the Alpine debate focuses on the effects of climate change on winter sports (Agrawala, 2007). At the same time, the relatively cool summer temperatures in the mountains, compared to ever higher temperatures in lowland cities, could bring new opportunities of tourism development, with the development of new tourist niches. People with double residences would be more and more interested by this kind of residential "summering". Nevertheless, as climate change and the abandonment of marginal land progress, the resulting new types of landscapes may be less attractive to tourists and amenity migrants.

Europeanization

Decisions taken by, and the strategic orientations of, the EU have tremendous impacts on the Alps. Transport in the Alps should mainly be viewed through a European lens, even though local and regional traffic has become an issue by itself. EU strategy promotes polycentrism, regarding metropolises as the drivers of development. What place is left for mountain regions? The recent promotion of the notion of territorial cohesion on the EU political agenda (Goulet, 2008; Faludi, 2005) raises hope that the specificity of mountain massifs could be taken into account, even if mountains have never been fully recognized in the EU regional policy (Debarbieux and Rudaz, 2010). Standard policies compensating territorial handicaps are being challenged and replaced by policies investing in territorial assets (Faludi, 2005). The Lisbon strategy stresses the role of innovation. Focused on sustainability, the Gothenburg Strategy is a key political step towards complementing the Lisbon strategy with more attention to spatial equilibrium and the promotion of the green economy.

Territorial competition

In a competitive global world, the Alps are challenged in every economic sector. For many decades, national (and some EU) policies have taken into account the harsher conditions of agricultural production in Alpine areas (Debarbieux and Price, to be published; Vivier, 1992; Gerbaux, 2004). After decades of supremacy, tourism in the Alps is challenged by other destinations in the global tourism market. It will be essential to stress the specificity of products and services which derive from the Alps, and that this specificity has a territorial plus-value. The symbolic images associated with the Alps and their heritage dimension will play a significant role in differentiating these products (Euromontana, 2004).

Energy

Recent events (Fukushima, March 11, 2011) and subsequent political decisions, such as the reconsideration of nuclear energy and the willingness to move towards carbon-neutral sources of energy, as well as economic considerations, highlight the potential of the Alps as sources of renewable energies (hydroelectricity, wood, wind). It is crucial to capitalize on these resources and to retain part of the income provided by this economic sector within the region and also to use the energy locally and not merely export it.

3.2 Means to address trends/challenges and harness opportunities

3.2.1. Planned initiatives, and actions, and necessary resources

A number of initiatives, of many different types, have begun, or are being considered, in order to address the various challenges outlined in section 3.1 and Part 1, and build on the opportunities outlined in section 3.1 and in Part 2. The following describes such initiatives, some of which are not new, but are considered here as they will probably expand in the future.

Strengthening small regional centres

To counterbalance the trend of economic and demographic polarization, there is a need to reinforce the competitiveness and innovative capacity of small regional centres. Because they barely have the critical mass to launch or support an endogenous process of development, a crucial strategy is to connect them through urban networks and polycentric regions. A well-known example is the 'Sillon Alpin', bringing together the energy of the cities between Grenoble and Annemasse (a French suburb of Geneva), aiming to counterbalance the polarization towards Lyons, by promoting more economic and institutional cooperation between them (Debarbieux, 1996). The Lake Constance region, which is only partly in the Alps, was recognized by Germany as an urban region, with the specificity to be a cross-border region comprising parts of Germany, Liechtenstein, Austria and Switzerland (Harrison and Growe, 2010). The State of Valais has launched a similar process, by putting its main regional centres (Brig, Sierre, Sion and Martigny) in a network entitled "The Ark" promoting innovative industries, and linking the various cluster competencies found in each node of the network. At the Alpine scale, the Network Enterprise Alps (NENA) project, established by CIPRA with funding from the EU Interreg programme, promotes an Alpine-wide network of small and medium enterprises specialized in innovative technologies. By strengthening clusters and co-operation, the network aims to reduce the polarization in strong urban areas in the valley floors to the detriment of less favoured and declining areas. These attempts show the need to reduce the polarization at two levels: within the Alps; and between the Alps and peri-Alpine metropolises. The discussion surrounding the delineation of a perimeter for the Alpine Convention is a good illustration of this tension (Bätzing, 1993).

Spatial planning

There is increasing pressure on land in peri-urban and touristic regions, as the resource become scarce: an issue addressed through spatial planning policies. After decades of soft planning policies, some municipalities have reduced their construction zones, in order to increase the density of development within them. As tourist development is major driver in land consumption, there are key debates how to regulate the effects of this economic sector. It is increasingly acknowledged that zoning policies need to be completed by other spatial planning tools, like systems, moratoria or taxes (Clivaz and Nahrath, 2010). A key issue is the lack of occupation of secondary homes, which may be occupied a few weeks per year, yet municipalities have to provide services year-round. Municipalities, such as the resort of St. Moritz (Switzerland), are considering taxing homes with low occupancy rates and favouring the development of hotels rather than second homes. As a response to habitat fragmentation due to urban sprawl and the development of infrastructure (Figure 14), a number of initiatiives have been developed to promote a high degree of habitat connectivity throughout the Alps. The establishment of an ecological network in the Alps was identified as a key objective of the Protocol "Conservation of Nature and Landscape Protection" of the Alpine Convention. For this purpose, the Platform on Ecological Network of the Alpine Convention was set up in 2006. In 2007, ALPARC, CIPRA and ISCAR launched the 'Ecological Continuum Initiative'[40], linked to the ASP Econnect project. Though, at this early stage, the work is carried out in pilot regions, the final goal is clearly to promote connectivity at the Alpine scale.

[40] http://www.alpine-ecological-network.org/about-us/ecological-continuum-initiative.

Transport infrastructure and policies

To support SMD in the Alps, it will be essential that the major North-South trans-Alpine transport axes remain connected to cities and sub-networks within the Alps. The accessibility to the Visp-Brig region (Switzerland) has been greatly improved thanks to the building of the Lötschberg base tunnel, enhancing the region's connection to the rest of the country. On the other hand, and also in Switzerland, after an enthusiastic welcome, the project 'Porta Alpina' (Alpine Gate), aiming to connect the Gotthard base tunnel with the inner Alps with an underground railway station, was abandoned due to economic feasibility concerns. This infrastructure would have boosted tourism in the region, as well as commuting to major peri-Alpine city regions, and would have improved the connection of the economically challenged Alpine region to the European transit network. Accessibility remains a key motivation for working at a pan-Alpine scale. Indeed, the integration of schedules and the coordination of infrastructures are essential for achieving an efficient mobility system both within and through the Alps. One key element, linked to the green economy, is the shift from truck to freight train transport. As they are concerned by the 4 transalpine transit corridors – Brenner, Fréjus, Gotthard, Mont-Blanc – the regions of Tyrol, South Tyrol, Central Switzerland, Ticino, Piemonte, Rhône-Alpes and Valle d'Aosta launched the ASP-supported MONITRAF project to develop a sustainable strategy for trans-Alpine freight traffic and set the transfer from road to rail as a key priority (Monitraf, 2008). Two other ASP projects also address the modal shift: AlpFRail (investigating the acceptance of the railway) and TRANSITECTS (concerned particularly with trans-Alpine freight traffic).

Public policies, as in Switzerland, and technical innovations such as that adopted for the Lyons-Torino corridor, play a decisive role here. Based on the 'polluter pays' principle, different options are being discussed to tax the trans-Alpine freight traffic. In a recent study

commissioned by the Zurich process – the formal platform of cooperation of the Ministers of Transport of the Alpine countries – three main tools have been examined: the Alpine Crossing Exchange (ACE), the Alpine Emission Trading System (AETS) and the vignette (TOLL+) (Zurich process, 2011). The ACE proposes tradable certificates, whose numbers are limited based on safety, environmental and political concerns and infrastructure constraints. The launch of an 'Alpine transit fund' would fit in such a strategy. The AETS would offer certificates based on either noise or $C0_2$ emissions, according to which the carrying capacity would be defined, the latter criterion being more likely to be chosen due to the wider debate on climate change. The difference between the two is that ACE focuses on the transit route, while the AETS focuses on the whole crossing of the Alps. Finally, the TOLL+ defines a price to use a transit route, like a vignette. Restrictive measures like ACE or AETS are options only where the necessary infrastructure is available.

Tourism and transport

Given the huge numbers of tourists drawn to the Alps, some tourist destinations offer public transport alternatives to their guests for reaching their destination. Through its Snow'n Rail program, the Swiss Railroad company offers a combined discounted package of train and ski passes. In some resorts, a discount applies for customers who reach the resort by public transport. The 'Alpine Pearls' network brings together 24 destinations in six Alpine countries which promote soft mobility, providing car-free mobility for their guests, by optimizing and combining public transport and shipping and lift services. The network won the 2011 'Tourism for tomorrow' award in the category 'Destination Stewardship' at the Travel and Tourism Summit. While options for on-site mobility have been broadly established among Alpine tourist destinations, competitive eco-friendly options for long-distance travel to and from those destinations still need to be developed on a broader basis. Improved cross-border access to traffic and tourist information – e.g. through real-time information accessible on smartphones – poses a challenge and an opportunity at the same time. The Working Group Transport of the Alpine Convention is currently addressing this issue. However, mobility concerns not only exogenous but also endogenous actors. For instance, some municipalities have promoted soft mobility for their inhabitants, for instance through the ASP Mobilalp project, which included partners from Austria, France and Italy. In recent years, the Chamonix valley (France) has been developing a tram-train offer to deter tourists and inhabitants from relying on private transportation.

Intellectual capital

Alpine peripheral regions face the issue of experiencing further declines by losing their potential 'elites' (Working Group Demography and Employment, 2011). Brain drain is a major threat for Alpine regions; for example, in Switzerland, 80% of young people do not return in their canton of origin after completing their university degree (Egger et *al.*, 2003). Therefore, some regions, such as the Swiss Cantons of Valais and Uri, have launched websites publicizing jobs in the region that require highly qualified people, in order to promote their return. An Arge Alp project on brain drain showed the potential of having key players outside the region for the benefit of the region[41]. The study identified numerous networks in the eastern Alps with the aim of ensuring connections between "emigrants" and their regions of origin, in both Austria (Network of Tyroleans Abroad, Network Voralberg), and Italy, in Südtirol (Network of South Tyroleans Abroad, Network of Ladiner in the World; South Tyrol Global Forum) and Trentino (New Energy for Trentino; Social network for the Trentin community). People who have left a region can play a very positive role as ambassadors of their region of origin in the new area where they settle. This kind of initiative seems particularly relevant for tourist regions.

[41] Arge Alp, "Brain Drain in den ARGE ALP Länder – ein Gewinn oder ein Verlust?", http://www.argealp.org/projekte/

Climate change

While Alpine regions will be affected by climate change induced by global trends, they also share responsibility for it. Initiatives have been undertaken in numerous fields to reduce CO_2 emissions in the Alps. A Climate Action Plan was approved by the Xth Alpine Conference in 2009 (PSAC, 2011). Two main strategies are considered to tackle the issue of climate change: mitigation and adaptation (PSAC, 2008). Strategies to mitigate climate change have been undertaken at various scales, especially through promoting carbon-neutral activities and practices. The project ALPSTAR – which is supported by the ASP and was initiated by Germany in the Permanent Committee of the Alpine Conference as an implementation measure of the Action Plan on Climate Change - will, from 2011 to 2014, support the collection and testing of climate protection measures and implement them in the designated pilot regions. The Alpine Cities network aims, through exchanges of best practices, to become carbon-neutral by 2050. The CC.Alps programme (CIPRA) and the DYNALP-Climate project (Alliance in the Alps) support the exchange of experiences between Alpine municipalities with regard to the reduction of energy consumption. Some regions – Murau and Voralberg (Austria), Achental (Germany), Goms (Switzerland) – have implemented projects to become energy-independent through renewable energy (CIPRA, 2010a). Individual cities such as Bolzano (Italy) and small municipalities such as Reit im Winkl (Germany) have implemented their own strategies. Adaptation strategies complement these mitigation strategies. These have been implemented especially in the fields of hazards and tourism. As recognized in the ClimChAlp project, rock stabilization at the summit of the Hoher Sonnblick in Germany, the building of dams protecting Pontresina, Switzerland, from rock falls and mudslides after the melting of the permafrost, or the drainage of ice-dammed lakes, like that of Gruben in the Swiss Alps, illustrate the costs of adaptation strategies related to climate change (). Similarly, technical measures have been also implemented in the field of tourism, such as the generalized use of snow cannon artificially producing snow and the more recent installation of canvas covers on glaciers in order to help maintain ski trails. Other strategies, observed throughout the Alps, especially in lower-altitude ski resorts concerned by a rising snowline, promote the diversification of the touristic offer according to the climate change scenario (Abegg, 2011).

Renewable energies

There is potential for the Alps to become the ‘battery’ of Europe. This will be mainly achieved through hydroelectricity, which should be enhanced in the future thanks to the development of pump-storage. In line with the provisions of the EU Water Framework Directive as well with ecological needs, and taking cumulative effects into account, more holistic assessment and regional-scale planning should take place for new modifications affecting water status. This includes the impact on the ecological status of the river at the site and downstream and, for several projects in one catchment, cumulative effects. The Alpine Convention’s Platform Water Management designed guidelines for the use of small hydropower (Platform Water Management in the Alps, 2010). The development of other renewable electric energies (sun, wind) could benefit from existing infrastructure related to hydroelectricity to inject energy in the grid. On the slopes of the ski resort of Surselva (Grisons, Switzerland) at 2400 meters, 40 to 60 wind turbines are planned, which would cover the energy needs of all the households of the Canton of Grisons (about 190,000 inhabitants). In St. Antönien im Prättigau (Switzerland), the largest Swiss solar plant is planned, which would cover the energy needs of 1,200 households. The solar panels will be fixed to existing avalanche barriers. However, all these developments related to the energy production in the Alps have environmental impacts and lead to tensions among stakeholders according to their views of sustainability, focused particularly on the protection of the landscape. This tension certainly reached a peak when the Swiss Parliament (*Conseil national*) recently (June 8, 2011)

proposed to remove the right of appeal of environmental organizations for energy projects in order to allow a faster exit from dependence on nuclear energy.

Branding

In a competitive world, strategies are being undertaken and could be deepened for differentiating and labeling the products that a region offers. In the highly competitive tourism market, both the Alps, and specific places within the range, have global recognition. Numerous companies use the strong symbolic images of the Alps to sell their products. Some retailers have their own Alpine label. The promotion of Alpine food products relies on two key images associated with mountains: a pure environment and traditional know-how (Euromontana, 2004). The organic food sector is therefore central. Some countries, such as France, Italy and Switzerland, have passed legislation regarding the designation of mountain products. For some, it is essential not only that the raw product should come from mountain areas but also that the transformation process should be undertaken there too. However, a common Alpine label seems too ambitious and could be, in a way, counterproductive. Indeed, the relevance of a label is based on its connection to a specific territory. Each territory has to work on the image and strengths it communicates externally.

The reputation of a product depends particularly on its connection to local know-how. A good example is cheese. Alpine cheeses could easily deepen their economic niche, taking advantage of their huge diversity. Local and regional labeling still appear to be a good tool for promotion: e.g., mountain cheese from the Grosses Walsertal Biosphere Reserve in Austria or the AOC (controlled designation of origin) from Gruyère, Switzerland. With clearly geographically identified products, there are opportunities to improve regional added value by strengthening regional economic circuits, for example farmers selling their products to hotels (e.g., Villgrater Nature Products or the Cheese Route through the Bregenzerwald in Vorarlberg, Austria). The German Alpine Club launched the project '*So schmecken die Berge*' which promoted local products in the mountain huts it manages. Local development projects based on landscape resources have been undertaken by regional natural parks in several alpine countries. These initiatives generate incomes that oppose to the decline scenario. They may also reinforce the identity of a region and local social ties between producers and inhabitants.

3.2.2. Approaches that seem most promising to support and promote sustainable mountain development

Pluriactivity

The Alps, like many other mountain regions, have a strong tradition of pluriactivity, i.e. a combination of two (or more) professional activities, mainly agriculture and industry or agriculture and tourism, in order to support a household's budget. This trend started centuries ago with seasonal migrations to the lowlands to offer both general labour and specific trades. With the installation of different industries in the Alps, pluriactivity gained a new momentum. This type of organization of work developed strongly with the development of winter sport tourism, as the work demands for farming are least in winter. Pluriactivity was particularly reinforced in regions where inheritance law favoured the extreme division of agricultural parcels. On one hand, due to the time involved in combining two professional activities, pluriactivity is declining. There is a shift in the agricultural sector from cattle to sheep, as the latter are less demanding. On the other hand, agrotourism, which offers a more integrated combination than combining employment in farming and tourism, is booming. For decades, the provinces of Tyrol, Austria (Herbin, 1978) and Alto Adige, Italy (Tomassini, 2000) have implemented policies that promote this combination. As agricultural production in the Alps faces economic difficulties, the capacity of farmers to obtain additional revenues will be crucial to maintain the primary sector. However, the motivations should be

considered not only from an economic but also from a cultural perspective, as the links to the farming activity, traditions and the territory are central in motivating both the pluriactive worker and the whole household, which is usually involved (Biche et al., 1996).

Multifunctionality

Rather than sectoral approaches, an integrative perspective should prevail in order to promote sustainable development: the Alps should be considered through the broad lens of the various services they offer (Wyder, 2001). Agriculture is not only about producing agricultural products. Its roles in providing ecosystem services through maintaining landscapes, conserving biodiversity, protecting against natural hazards, and providing a setting for tourism have to be taken into account. Another example is forestry. As discussed in section 1.2.6, though timber production in the Alps is barely economically profitable, forests have to be managed according to other functions they provide, such as protection against natural hazards or places for recreation. Both national agencies, as in France, and regional agencies, as in Tyrol, have developed specific policies for reaching this goal.

Greater focus on investments, rather than subsidies

National policies have played an essential role in promoting sustainability in the Alps. Historically, policies aiming at compensating handicaps of living and production in peripheral Alpine areas were among the first measures towards these areas. The corresponding strategy was the development of infrastructure and financial support for activities, notably agricultural production. Such direct support towards peripheral mountain regions is now being challenged. As public finances are scarcer, public policies have evolved towards support based on the valorization of assets and the provision of public benefits. This more dynamic approach privileges investments over subsidies. These policies are on contractual basis: the beneficiaries obtain funding or subsidies when fulfilling certain objectives and meeting specific targets. As policies are increasingly defined in the context of sustainability, actors are encouraged to act according to this agenda.

Multi-level governance

The pan-Alpine scale is not the best spatial context to address all issues. For climate change, actions have been undertaken by municipalities, NGOs and the Alpine Conference, i.e., the Environment Ministers of Alpine countries. Multi-stakeholder approaches that help to integrate divergent perspectives should be implemented. A platform of exchange should help to develop and support partnerships between Alpine and non-Alpine stakeholders, especially involving those at the edge of the Alpine space. One example is Espace Mont-Blanc, which aims to develop a sustainable strategy around the Mont Blanc Massif, shared by France, Italy and Switzerland, is an attempt to bring diverse stakeholders around the table, at least as stated in concept.

Balance between development and conservation

Alpine history has been full of controversies about the balance between conservation and development. While several national policies have supported the shift of so-called ‘backward’ communities towards ‘modernity’, other national policies aimed to preserve the environment and cultural heritage. For decades, these territorial projects were conceived as incompatible. The establishment of Vanoise National Park in France has been a good example of such a tension, as some local communities wished to establish ski resorts and others were concerned to protect the mountain environment (Mauz, 2003). The issue of large carnivores, with a clash between conceptions of the Alps as natural space and as a space of living for communities, is another good illustration of this tension, as discussed in section 1.2.7. This has led many stakeholders to adopt radical positions that have led to

time-consuming debates. Local communities have shown great concern about becoming second-class citizens, deprived of autonomy in creating their own futures. More recently, middle grounds appear to be easier to reach. Sustainable and environmental concerns do not appear just as the meddling of exogenous stakeholders, but offer new opportunities of positioning for local stakeholders. This is a long process, but both the guidelines on large carnivores, wild ungulates and society, adopted at the XIth Alpine Conference in 2009, and the creation of regional natural parks throughout the Alps (Austria, France, Germany, Italy, Switzerland) appear to confirm that new ground could be reached. Also, environmental organizations have tended to move from a narrow conservationist perspective to propose and implement local development projects that integrate environmental concerns. The subsequent strategies do not focus on specialized areas devoted to only to nature protection or to mass tourism, but on more integrated forms of development.

Capitalizing on experiences

Based on the idea of sharing a common space, which is undeniably related to the existence and implementation of the Alpine Convention, horizontal relationships between Alpine territories have developed. As noted above, the Alps are now home to numerous networks promoting exchange of experiences. Interreg and the ASP, as well as CIPRA have been instrumental in promoting such a perspective. Based on the assumption that actors and communities throughout the Alps face similar problems, they can benefit from exchanging their experiences about approaches to resolving challenges. Therefore, there are several compilations of “best practices”, i.e. initiatives aiming towards sustainable development. Alliance in the Alps is the quintessence of such an approach. Due to support from programmes such as the ASP, these exchanges are likely to increase.

3.2.3. Necessary changes in institutional frameworks and governance mechanisms

Consensus is building on the need for transnational cooperation at the scale of the Alps. The Alpine Convention has been a key institutional arrangement in this regard and can be seen as a major innovation in sustainable mountain governance. Nevertheless, after 20 years, some consider its implementation as unsatisfactory (CIPRA, 2011b), for having achieved little on the ground. Alliance in the Alps was partly born out of this frustration in 1997. The Alpine Convention was signed in 1991 by the Ministers of the Environment. As an inter-governmental initiative, it was fast denounced as a top-down approach. Given its full title, ‘Convention on the Protection of the Alps’, there was widespread concern that an environmentally-focused approach would prevail, some lobbies even using the word “green colonialism” to define the process (Rudaz, 2005). The associations of mountain people in Switzerland (SAB) and France (ANEM) lobbied for a better balance with development concerns and asked for the development of a socio-economic protocol (Gerbaux and Zuanon, 1995). The reactions to the Alpine Convention showed certain differences between Latin (Southern and Western Alps) and Germanic (Eastern and Northern Alps) in their sensitivity to the issue.

Nevertheless, the work done under the Alpine Convention, as well as various complementary outcomes (e.g. pan-Alpine networks of stakeholders), should not be underestimated. The Convention is, above all, a platform for international cooperation which can facilitate the coordination and harmonization required for the effective implementation of SMD. It also has been a basis for the emergence of networks (regions, cities, villages, protected areas, NGOs) which play a decisive role in SMD initiatives and awareness-raising at the local scale. The effective implementation of the Convention will depend on its re-appropriation by these sub-levels.

Recently, there has been considerable debate regarding the possible creation of a European Alpine ‘macro-region’ (following the model of the Baltic Sea or the Danube Basin). However,

there are concerns regarding governance issues and the possible extent of such a region. Indeed, when the Alpine Convention perimeter was delineated, it was feared that a broad definition of the Alps, i.e., including some of the peri-Alpine metropolises, would lead to a political imbalance detrimental to the inner-Alpine communities (Bätzing, 1993). The possible creation of a European Alpine 'macro-region' could give a new impulse to pan-Alpine multi-level cooperation and increase the political weight of the Alps at the EU level. However, if such a macro-region were to emerge, its relationship to the Alpine Convention would have to be clear, and the institutional approaches related to the various needs of Alpine cooperation (nature conservation, sustainable development, improved governance, etc.) would have to be renewed.

3.2.4. Necessary increases in stakeholder involvement and partnerships

The processes of decentralization and empowerment at the sub-national level currently taking place in the once centralized countries will probably continue to increase. This implies that the role of the regional (sub-national) institutions in the implementation of sustainable strategies in the Alps will be reinforced. However, the modalities of their involvement in Alpine policy implementation and management are still being debated. The absence of these institutions in the key institutional arrangements of the Alpine Convention has definitely been a major impediment in its implementation. After two decades, the future of the Alpine Convention will highly depend on the willingness of regions to take ownership of the Convention. Italy showed a path of institutional integration with the promulgation in 1999 of a national law launching a consultative platform between the State and the Regions of the Alpine Arc. For some regions, a key challenge is that their administrative area includes not only part of the Alps, but also other lowland geographical and metropolitan regions; an issue recognized in the spatial scope of the ASP, but only for projects, not broader policy implementation.

Given the infinite number of ways in which the Alps are connected to their surrounding areas, to consider them as an island is quite counterproductive. Some consider the Alps as a European if not global commons. How will Alpine actors be able to make their voices heard by such powerful economic and political players? The necessity to integrate exogenous stakeholders in debates regarding the future of the Alps is widely recognized. Mainly on a conceptual basis, numerous discussions have focused on the relations between the Alps and surrounding cities and metropolises, claiming the need for partnership between the two (ISCAR, 2011). The contents of such a partnership are not yet defined. It should avoid the specialization of major cities in wealth production and of the Alps in nature conservation and recreation (Perlik, 2010), fuelling the argument of local stakeholders who do not want to live in a so-called 'Indian Reserve'. Rather, it should bind local activities and social needs together. For example, the Zurich mountain region benefits from the proximity of the city of Zürich for promotion of tourism and agricultural products, with the launch of a platform for agrotourism and of the 'Naturli' label. For regions close to economic centres, there might be opportunities of development through residential economies, i.e. the economic impact of people living in the region (Schubarth et al., 2009). The influence of European policy is also important in this field. Recent pan-Alpine initiatives have stressed the need to have the EU institutions on board, because of the need to coordinate European funding and initiatives within the region.

Within and close to the Alps are many research centres with expertise on the region. ISCAR and international research programmes have improved their networking and the building of trans-national academic practices. However, a strong political will to promote an Alpine research agenda, support applied research with stable funding, and organize the dissemination of scientific knowledge is still lacking. It is still a challenge to have pan-Alpine scientific expertise recognized by national administrations, who prefer to have national expertise and, when addressing pan-Alpine issues, bring these national expertises together.

To date, despite the Alpine Space DIAMONT project and the resulting Atlas of the Alps (Tappeiner et al., 2008), the failure to effectively implement the System for the Observation and Information on the Alps (SOIA), which should provide pan-Alpine geo-referenced information, is an illustration of this challenge. Its recent reactivation by the PSAC in relation with the European Environment Agency could lead to significant improvements. Also, the Working Groups and Platforms of the Alpine Convention might become important reference knowledge centres in specific fields.

To avoid a polarization process in the Alps, the economic development of Alpine regions has to be encouraged. Though inner Alpine cities have not been considered in the debates about the issues in the Alps for decades, they will play a decisive role as economic drivers and in preventing outmigration (Perlik and Messerli, 2004). Therefore, institutional partners will not be the only ones. The participation of enterprises will be crucial, as they are essential economic drivers. As enterprises in the Alps are mainly SMEs, creating and strengthening clusters and networks for exchanging experiences, promoting cooperation with R&D and training institutes, and providing the necessary infrastructure will be essential to reinforce them. In this context, the work of the PSAC in enhancing innovation is important. It recognizes that, although many instruments exist at the EU and national level to encourage innovation, specific actions need to be taken in the Alps (PSAC, 2011a).

3.3. Specific actions needed to contribute to the Rio+20 priorities in the Alps

3.3.1. Policy measures to promote a shift towards a green economy

Public policies will play a decisive role in supporting the shift towards a green economy in four key Alpine sectors: tourism, agriculture, energy and transportation.

Environmentally-friendly tourism can generate growth, without destroying its own resources. There is a consensus that the attractiveness of the Alps for tourism and as location factor for residents and for companies is related to the specific Alpine landscapes, in which continued agricultural activities are central. Therefore, agricultural policies will remain key policies in the Alps. However, the EU's Common Agricultural Policy, under the pressure of the World Trade Organization, will define most of the rules and, based on its neoliberal philosophy, its support to environmentally-friendly agriculture is challenged. The trend of decreasing income from farming production means that young people often do not consider this an attractive sector to work in. Agriculture which includes new revenues related to the provision of environmental services or more integrated modes of trading could be more competitive. Administrative procedures should not be crippling to farmers who wish to diversify their income. The industrial and construction branches could also be redesigned through the green economy paradigm, in developing the existing know-how in many sectors (energy, building, etc.).

Especially in the context of sustainable development, the Alps, which have been long considered as left aside from modernity, can be regarded as territories of innovation. The role of renewable energy in supporting a green economy in the Alps has to be stressed (see section 3.2.1). Sun, wind, wood, water: all these natural resources could lead the Alps to be at the forefront of the green economy path. This could be carried out through small developments, such as small hydro-electric plants, and also through the upgrade of large dams using pump-storage. A key policy for supporting renewable energy is to guarantee its purchase at cost price. Energy production plays an important role in regional development as it provides revenues to the municipalities. New added value chains for decentralized energy production, such as small hydro-electric plants and wood transformation, are emerging. In Austria, it has been estimated that 25 to 30% of the installation costs of wind farms benefit local industries. To these economic benefits should be added the maintenance costs: from 5 to 7% of the installation costs (Haubner-Köll, 2002). There are currently

debates about how revenues related to fees for the use of hydroelectric energy and other resources should be disbursed, in Switzerland and Northern Italy for example. However, municipalities, such as Wildpolsried (Allgäu, Germany), could not only cover their energy needs through renewable means, but also become exporters of energy. This is particularly relevant in the context of a market labeling and promoting green energy. Opportunities exist in terms of not only energy production, and the efficient use of energy. For example, the Italian region of South Tyrol has since long promoted a regional policy towards energy saving in buildings, which led to the creation of the *KlimaHaus-CasaClima* label in 1992. A recent study showed that this brings an annual contribution of 65 million Euros to the construction branch (Lechner and Perkmann, 2010).

The challenge is that the Alps should not be a region whose resources are principally exploited by exogenous forces (e.g., investors, energy producers, construction companies) for the benefits of exogenous actors (e.g., those just mentioned and also lowland, especially urban, populations), but also a region where technical innovation and added-value production are possible. Some major orientations may be defined at the national level, but room should be left for bottom-up initiatives, such as dynamic communities launching innovative projects. The need for innovation and capital calls for partnerships with large centres surrounding the Alps as well as networking among Alpine partners, including not only enterprises, but also training, research, and education institutions, which may need to develop new programmes supported by either private capital or government (or EU) investment.

The green economy is highly dependent on innovations, which need to be supported through targeted policies. Research centres, not only within the Alps but also in the metropolises surrounding them, should consider the path towards a green economy, notably through energy; one example is the Institute for Renewable Energy at the European Academy of Bolzano, Italy. Innovation centres within the Alps, such as the Technopole in Sierre, Switzerland and the TIS innovation park in Bolzano, Italy, will play significant roles. In Voralberg (Austria), the cooperative Holzbau was created to favour synergies between various economic actors of the wood sector (forest owners, sawmill owners, carpenters, architects…). The Bolzano region also supported the creation of a cluster for wood, based on the observation that the wood companies in the region were essentially very small, family-run, enterprises. Their small size was considered as an impediment to innovation and to access to market. Therefore, through the impulse of the regional authority, the platform '100% wood cluster' was launched, now involving about 200 companies. Also in Italy, 'Business Location Südtirol', a government agency that helps industries set up business in the region, has been established, provides support on issues such as tax, location, land purchase, and networking[42]. As Südtirol is a pioneering region in Italy regarding green energy, the agency aims to bring more businesses oriented towards a green economy into the region.

3.3.2. New institutional/governance arrangements to promote sustainable mountain development

For centuries, Alpine communities have established common property regimes leading to sustainable resource use (pastures, forests, water) (McNetting, 1981; Ostrom, 1990). However, the uses changed through time and the relevance of such regimes is debated (Kissling-Näf et al. 2000). The municipality, which has long been a key level in the management of resources, increasingly faces significant challenges in addressing contemporary issues. Often, municipalities work beyond their administrative borders to address common issues; this sometimes leads to the fusion of administrative entities, or at least to inter-municipal entities. Regional instruments should aim to reduce extreme territorial

[42] http://www.bls.info

competition between localities. Such regional coordination proved to be priceless at the time when every municipality dreamed of having its own ski resort. The ASP-supported project Comunis supports coordinated and concerted strategies of commercial development using regional and local potentials, rather than focussing only on the municipal level. The project aims to enhance economic diversification and efficiency.[43] 'Vision Rheintal' also promotes coordination among the 29 municipalities of the Rhine valley (Vorarlberg, Austria) to promote the sound development of the region and as a quality living space. Harmonisation and the coordination of policies and infrastructures between the various territorial units are key elements in achieving SMD.

Classic and historically false images related to so-called "Alpine autarchy" should be abandoned (Viazzo, 1989). Alpine development has always been influenced by both endogenous and exogenous drivers. A key challenge for the Alps will be to find the balance between both types of force, and between exogenous and endogenous aspirations. Among the exogenous actors, the peri-Alpine metropolises will definitely be key players with increasing influence in the Alpine hinterland. Also, Alpine actors have to ensure that Alpine specificities are taken into account at various political levels. A macro-regional strategy for the Alps could represent an opportunity for better integrating the Alps within EU policies. Partnerships will have to involve all kinds of actors, from States to enterprises and civil society. One of the key institutional scale-levels will be the regional one. Based on this diversity of actors, these arrangements will have to be participatory. Platforms are needed to support exchanges and facilitate the participation of diverse stakeholders. More and more, engaged citizens play a decisive role in the development of their community. For example, '*Üses Muotital*' ('Our valley of Muota', Schwyz, Switzerland) offers a platform for citizens to define the future of their valley – which led to the development of agritourism. In Slovenia, in the scenic Logar Valley, local stakeholders established an organization to manage tourist activities. In complementarity to these local and regional initiatives, pan-Alpine organizations, initiatives, and networks are likely to reinforce their actions. Transboundary organizations are essential and will remain crucial to give an impulse to pan-Alpine initiatives. Exchanges of ideas and experiences with other mountain ranges will also gain in importance. Based on the Alpine experience, processes have already begun in relation to the establishment of regional Conventions for the Carpathians, Caucasus and Southeast Europe, a network of mountain communities in Central Asia, and regional cooperation in the Andes. With the 'mountain solidarity' reaffirmed in the context of Rio+20, such international cooperation will likely gain impetus.

[43] www.comunis.eu

Process

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ANNEX 1: Initiatives

Name	Type	Area	Theme	Time	URL	Budget
Alpine Space Programme						
Alpine Space Programme 2007-2013	INTERREG Programme	Alpine Space	crosscutting	2007-2013	www.alpine-space.eu	almost € 130,000,000
Alpine Space Programme 2000-2006	INTERREG Programme	Alpine Space	crosscutting	2000-2006	www.alpine-space.org	118 Million €
Alpine Convention						
Alpine Convention	International treaty	Alps	crosscutting	signed in 1991 (entered into force in 1995)	www.alpconv.org	
Protocols of the Alpine Convention: Spatial planning and sustainable development, Conservation of nature and countryside , Mountain farming, Mountain forests, Tourism, Energy, Soil conservation, Transport	Protocols	Alps	different	different	www.alpconv.org/theconvention/conv02_en.htm	
Working Groups of the Alpine Convention: currently: Working group Transport, Working group UNESCO World Heritage, Natural Hazards Platform, Ecological Networks Platform, Expert Group Report on the State of the Alps, Platform Water Management, Working Group Demography and Employment, Large carnivores &	Working Groups	Alps	different	Working Groups are set up for 2 years	www.alpconv.org/theconvention/conv06_WG_en.htm	

Name	Type	Area	Theme	Time	URL	Budget
wild ungulates platform, Working Group Alpine Macroregion, Mountain Farming Platform						
Database of good practice projects within AlpConv	projects	Alps	crosscutting		http://217.199.4.34/Alpine/searchThesaurusAdvancedSearch.do?type=good%20practices	
SUPERALP! - The sustainable crossing of the Alps	event	Alps	Transport	since 2007 every year	www.alpconv.org/themes/superalp11_en.htm	
Alpine Convention support programme	prize	Alps	municipalities / youth /culture	prize will be awarded for first time in 2011	www.alpconv.org/themes/Award_en.htm	EUR 45.000 overall
Climate Action Plan of the Alpine Convention	non-binding treaty	Alps	climate change	12.03.2009	www.alpconv.org/NR/rdonlyres/193D7A9E-0F5E-475D-A48D-E3276F11D292/0/AC_X_B6_en_new_fin.pdf	
Implementation Manual of the Alpine Convention and Best Practices - The French Municipalities	Report (manual with good practice examples)	French municipalities in the Alps	sustainable development / implementation of the AlpConv	published in 2010	www.alpconv.org/documents/Permanent_Secretariat/web/library/Comuni_2010_FR.pdf	some of the described projects are co-financed by EFRD or EAFRD
Network of Alpine Regions	network	13 Alpine regions of Austria, France, Switzerland and Italy	crosscutting / implementation of the AlpConv	first conference in 2009	www.alpconv.org/theconvention/conv07_b_en	

Name	Type	Area	Theme	Time	URL	Budget
"External impact" of the Alpine Convention						
Carpathian Convention	International treaty	Carpathians	crosscutting	since 2003	http://www.carpathianconvention.org/index.htm	
Carpathian Network of Protected Areas – CNPA	Network of protected areas	Carpathians	Biodiversity	since 2006	www.carpathianparks.org/index.php?option=com_content&task=view&id=127&Itemid=314	
Alliance of Central Asian Mountain Communities (AGOCA)	Network of mountain villages	Kyrgyzstan, Kazakhstan and Tajikistan	crosscutting	since 2003	www.alpenallianz.org/de/infoservice/downloads/files/zentralasiatische-bergdorfallianz-agoca-en	
Networks						
AlpArc	Network of protected areas	Alps	Protected Areas	since 1995	www.alparc.org	
Alliance in the Alps	Network of municipalities	Alps	crosscutting / implementation of the Alpine Convention	since 1997	www.alpenallianz.org	
Alpine Town of the Year	award	Alps	crosscutting / implementation of the Alpine Convention	since 1997	www.alpenstaedte.org	
NENA Network Enterprise Alps	Network of small and medium-sized businesses	Alps	Energy efficiency	since 2005	www.nena-network.eu	
CIPRA activities						
cc.alps	Project run by CIPRA	Alps	Climate change	2008-2012	www.cipra.org/en/cc.alps/about-the-project	EUR 1,2 million for the first project phase

Name	Type	Area	Theme	Time	URL	Budget
Future in the Alps	Project run by CIPRA	Alps	Dissemination of knowledge about sustainable development of the Alps	2004-2008	www.cipra.org/en/future-in-the-alps/about-the-project	
Ecological Continuum Initiative	Cooperation between ALPARC, CIPRA and ISCAR	Alps	Biodiversity (Habitat connectivity)	since 2002	www.cipra.org/en/ecological-networks/ecological-continuum-initiative	
infoservice alpMedia	infoservice and newsletter	Alps	Dissemination of information	since 2002	www.cipra.org/en/alpmedia	
Good Practice database of CIPRA	list of "good practice" projects	Alps	crosscutting	?	www.cipra.org/en/alpmedia/good-practice#08_en	
ISCAR activities						
ForumAlpinum	Conference (biennial) organized by ISCAR	Alps	research	since 1994	www.iscar-alpineresearch.org/forumalpinum_alpweek/forum_alpinum/	
Alpweek	Conference	Alps	research	first in 2004, second in 2008	www.alpweek.org/2008/e/	
Others						
European Alpine Programme	project by WWF	Alps	Nature conservation	1999-2010	www.wwf.ch/de/derwwf/themen/alpen/wwf_projekte/	
dynalp2	project by Alliance in the Alps	Alps	crosscutting	2006-2009	www.alpenallianz.org/en/projects/dynalp2/about-dynalp2	€ 1,775,000

Name	Type	Area	Theme	Time	URL	Budget
dynAlp-climate	project by Alliance in the Alps	Alps	Climate Change	2009-2011	www.alpenallianz.org/en/projects/dynalp-climate-1/good-practice/?set_language=en	€ 300,000
Club Arc Alpin (CAA)	Association of national Alpine clubs	Alps	Alpinism / mountaineering	since 1995	www.club-arc-alpin.eu/index.php	
Best of the Alps	Network / Joint promotion effort	Alps	Tourism	?	www.bestofthealps.com	
National activities: Switzerland						
New Regional Policy NRP	Policy	Switzerland	crosscutting (main goal: enhanced competitiveness)	in force since 2008	www.regiosuisse.ch/projekte/datenbank/projektdatenbank	For 2008-11, CHF 118 million are foreseen as grants under priority 1, CHF 202 million as credits under priority 1 and about CHF 18 million for priorities 2 and 3 together
Schweizer Berghilfe ("Help for mountain people")	Foundation	Switzerland	crosscutting	since 1943	www.berghilfe.ch	in 2010 Schweizer Berghilfe financially supported 497 projects with 20,4 million CHF

Name	Type	Area	Theme	Time	URL	Budget
Online platform berggebiete.ch, maintained by Schweizer Berghilfe	Online platform	Switzerland	crosscutting	since 2008	www.berggebiete.ch	
SAB	NGO / association	Switzerland	crosscutting	since 1943	www.sab.ch	
Prix Montagne (awarded by SAB and Schweizer Berghilfe)	Prize	Switzerland	Added value/economic diversity / employment	first award in 2011	www.berggebiete.ch/prixmontagne/	the prize is endowed with 40.000 franc
Alpine Initiative	NGO / association	Switzerland	Transport	since 1989	www.alpeninitiative.ch/e/Home.asp	
Swiss parks network	Network of protected areas	Switzerland	Biodiversity / protected areas	since 2007	www.netzwerk-parke.ch/en/index.php	
National activities: Austria						
Netzwerk Land	Network and platform for rural development	Austria	Rural development	since 2008	www.netzwerk-land.at	3.911,50 million EUR from EU for Rural Development in Austria from 2007 to 2013
Rechtsservicestelle Alpenkonvention (legal service point for the Alpine Convention)	Service point	Austria	Legal advice, Alpine Convention	since 2009	www.cipra.org/de/CIPRA/cipra-oesterreich/rechtsservicestelle	
Handbuch Umsetzung Alpenkonvention (manual for the implementation of the Alpine Convention)	"manual"	Austria	Legal advice, Alpine Convention	2007	www.alpconv.org/NR/rdonlyres/EAD6B5EF-7A97-4F0C-B173-BA4EF9FD8D1A/0/Alpenkonvention_Umsetzungshandbuch.pdf	

Name	Type	Area	Theme	Time	URL	Budget
Bergsteigerdörfer ("Mountain climber villages")	Project under Rural Development Programme for Austria	Austria	Tourism	since 2008	www.bergsteigerdoerfer.at	
Federal Institute for Less Favoured and Mountainous Areas	Research institute	Austria	Research	since 1979	www.berggebiete.at	
National activities: Germany (mainly Bavaria)						
Alpenplan and Landesentwicklungsplan (regional development plan)	Legislation	Bavarian Alps	Sustainable development, focus on infrastructure	Alpenplan adopted in 1972, later integrated into LEP	www.landesentwicklung.bayern.de/instrumente/landesentwicklungs-programm/download-lep-2006.html	
Manual for the application of the Alpine Convention	Manual	Germany	Legal advice, Alpine Convention	since 2008	www.bmu.de/files/pdfs/allgemein/application/pdf/alpenkonvention_leitfaden_2008.pdf	
Environmental Research Station Schneefernerhaus	Research station	Zugspitze, Bavaria	Research	since 1999	www.schneefernerhaus.de/en/home.html	
Mapping of Alpine Habitats	mapping	Bavarian Alps	Biodiversity / habitats	2008	www.lfu.bayern.de/natur/biotopkartierung_alpen/index.htm	

Name	Type	Area	Theme	Time	URL	Budget
National activities: France						
Comité de massif des Alpes (Committee of the Alps massif)	Committee	départements Haute-Savoie, Savoie, Hautes-Alpes, Alpes- de Haute Provence ; parts of Isère, Drôme, Alpes Maritimes	crosscutting	"Loi Montagne" adopted in 1985; current formation of the Committee decided in 2004	no website!	
Schéma interrégional d'aménagement et de développement du massif des Alpes (Interregional Scheme for the administration and development of the Alps massif)	Convention between the Committee of the massif and the regions; strategic document	French Alps	crosscutting	adopted in 2006	http://territoires.gouv.fr/sites/default/files/datar/1-shema-massif-alpes-2407.pdf	
Convention Interregionale pour le Massif des Alpes 2007 – 2013 (Interregional Convention for the Alps Massif)	Convention between the state and several of the regions; implements the *Schéma*	French Alps	crosscutting	adopted in 2007, pertaining to 2007-2013	www.regionpaca.fr/uploads/media/CIMA_12_03_2007.pdf	for 2007-13: 61,73 M€ by the state, 30,85 M€ by the Région Provence-Alpes Côte d'Azur, 36,71 M€ by the Région Rhône-Alpes

Name	Type	Area	Theme	Time	URL	Budget
Programme Opérationnel Européen Interrégional F.E.D.E.R. 2007-2013 Massif des Alpes	Programme implementing the *Interregional Convention*	French Alps	crosscutting	adopted in 2007, pertaining to 2007-2013	www.europe-en-paca.eu/fileadmin/documents/Europe-en-PACA_Programmes-Operationnels/PO-MASSIF-DES-ALPES-2007-2013.pdf	34,9 M Euro from the EFRD for 2007-2013
Commissariat du massif	Agency of the DATAR (Interministerial delegation for spatial planning)	French Alps	crosscutting	since 1985		
Conseil national de la montagne (National Mountain Council)	consultatory agency	France: all mountain areas	crosscutting	since 1985	? No website	
National activities: Italy						
Mountain Law	Legislation	Italy	crosscutting	1994	for example: www.mountainpartnership.org/files/pdf/faolawstudy.pdf	
National Mountain Fund	Fund	Italy	crosscutting	1994		
Mountain communities (Comunità montane) and UNCEM	Administrative units under Italian law	Italy	crosscutting	UNCEM established in 1952	www.uncem.it	
INTERREG Programmes						
INTERREG Bayern-Oesterreich 2007-2013	INTERREG programme	Bavaria and Austria	crosscutting	2007-2013	www.interreg-bayaut.net/interreg_iv/sitemap.html	72 Mio. EUR
ALCOTRA 2007-2013 crossborder cooperation programme	INTERREG programme	Italian-French border	crosscutting	2007-2013	http://medalp.eu/fr/?p=2856, http://www.interreg-alcotra.org/2007-2013/?pg=idea_deposito&lang=fr	237,5 million EUR

Name	Type	Area	Theme	Time	URL	Budget
INTERREG Italy-Switzerland 2007-2013	INTERREG programme	Italian-Swiss border	crosscutting	2007-2013	www.interreg-italiasvizzera.it/interreg/index.php?id=1	
INTERREG Italy-Austria	INTERREG programme	Italian-Austrian border	crosscutting	2007-2013	www.interreg.net/de/default.asp	80 million EUR
INTERREG IVA France-Switzerland	INTERREG programme	French-Swiss border	crosscutting	2007-2013	http://ec.europa.eu/regional_policy/country/prordn/details_new.cfm?gv_PAY=FR&gv_reg=691&gv_PGM=1310&gv_defL=9&LAN=7	about 90 million EUR
INTERREG IV Programme "Alpenrhein-Bodensee-Hochrhein": Germany – Austria – Switzerland – Lichtenstein	INTERREG programme	border areas around Liechtenstein (German, Austrian and Swiss border areas)	crosscutting	2007-2013	http://ec.europa.eu/regional_policy/country/prordn/details_new.cfm?gv_PAY=DE&gv_reg=ALL&gv_PGM=1260&gv_defL=7&LAN=7	around EUR 39.8 million
Operational Programme Slovenia-Austria 2007-2013	INTERREG programme	Slovenian-Austrian border	crosscutting	2007-2013	www.si-at.eu/start_en/	74.217.398,00 EUR
Crossborder Cooperation Programme Italy-Slovenia 2007-2013	INTERREG programme	Italian-Slovenian border	crosscutting	2007-2013	www.interreg-it-si.org/	
Activites of Euroregions and other cross-border cooperation						
Arge Alp (Arbeitsgemeinschaft Alpenlaender)	Working community of regions	9 regions around AT, CH, DE, IT	crosscutting	since 1972	www.argealp.org	
Alpen Adria	Working community of regions	10 regions around AT, SL, HR, DE, IT	crosscutting	since 1978	www.alpeadria.org	

Name	Type	Area	Theme	Time	URL	Budget
COTRAO	Working community of regions	8 regions around IT, FR, CH	crosscutting	since 1982	no website	
Espace MontBlanc	cross-border cooperation structure	35 communities around MontBlanc	crosscutting	since 1991	www.espace-mont-blanc.com	
EUREGIO Salzburg - Berchtesgadener Land - Traunstein	cross-border cooperation structure	97 communities	crosscutting	since 1995	www.euregio-salzburg.eu/system/web/default.aspx	
Alpine Gastgeber	"association of hospitable establishments" (originated in an Interreg project)	Upper Bavaria, Allgäu, Salzburger Land, Tyrol	Tourism	since 2005	www.alpine-gastgeber.com	
AlmErlebnisBus	bus line	national park Berchtesgaden & nature park Weissbach	Tourism	since 2005	www.almerlebnisbus.com	
Crossborder – Regionale Partnerschaft Karawanken: Kärnten - Slovenia	cross-border cooperation structure	Carinthia - Slovenia	crosscutting	since 2002	?	
Small Project Funds Kärnten-Slovenia	Funding line under INTERREG	Carinthia - Slovenia	crosscutting	2004-2008	final report: http://www.ktn.gv.at/40597p_DE-Downloads-Small_Project_Fund_Kaernten_-_Slowenien.pdf	overall: 560.000
NARAVA – Sustainable, regional and transboundary production and marketing of farm products from Zell/Sele	project of the Crossborder Regional Partnership Karawanken	Carinthia - Slovenia	Agriculture / tourism	?	http://www.kosuta.at/projekt/	
Schafzucht ohne Grenzen (sheepbreeding without frontiers)	Interreg project	Carinthia - Slovenia	Agriculture	?	no website	?

Name	Type	Area	Theme	Time	URL	Budget
Hemma pilgrimage rout	Interreg project	Carinthia - Slovenia	Tourism	since 2004	www.hemmapilgerweg.com/index1.htm	53,7 Mio. Euro
Ferraculorum: smithy museum	Interreg project	Carinthia - Slovenia	Culture	?	no website	?
Euregio via salina	cross-border cooperation structure	Allgäu, Außerfern	crosscutting	since 1997	?	
Small Projects Fund via salina	Funding line under INTERREG	Allgäu, Außerfern	crosscutting	?	www.oberallgaeu.org/index.shtml?foerdermoeglichkeiten	
Euregio Zugspitze-Wetterstein-Karwendel	cross-border cooperation structure	20 communities along AT-DE border	crosscutting	?	http://www.euregio-zwk.org/	
Small projects fund Euregio Zugspitze-Wetterstein-Karwendel	Funding line under INTERREG		crosscutting	current period: 2010- 11	www.euregio-zwk.org/de/projekte/11/kpf-periode-2010-2011.html	
Europaregion Tirol - Südtirol - Trentino	cross-border cooperation structure	Tyrol, South Tyrol, Trentino	crosscutting	since 1991		
Three Provinces' Parliament (Dreier Landtag)	common meeting of the parliaments of the three regions	Tyrol, South Tyrol, Trentino	crosscutting	since 1991		
Environment prize	Prize	Tyrol, South Tyrol, Trentino	Environment protection		www.europaregion.info/en/573.asp	7000 Euro
Diagnose:Gewalt (diagnosis: violence)	Interreg project	Tyrol, South Tyrol, Trentino	Gender equality	2008-2010	www.diagnose-gewalt.eu/front-page	
La conférence des hautes vallees	cross-border cooperation structure	7 regions in France and Italy	crosscutting	since 2000	www.altevalli.org/fra_index.htm	?

Name	Type	Area	Theme	Time	URL	Budget
EUREGIO Steiermark - Slovenia	cross-border cooperation structure	Steiermark, and 3 Slovenian regions	crosscutting	since 2001	the official Austrian homepage is not working; http://www.eu-regionalmanagement.at/EUREGIO-Steiermark-Nordost-Slowenien.54.0.html	
Euregio Inntal	association under private law	Rosenheim, Traunstein, Kufstein, Kitzbühel	crosscutting	since 1998	www.euregio-inntal.com/	
Small projects fund Euregio Inntal	Funding line under INTERREG	Rosenheim, Traunstein, Kufstein, Kitzbühel	crosscutting	follows the INTERREG cycle	www.euregio-inntal.com/foerderungen/kleinprojektefonds	
Euregion Alps-Mediterrannee	cross-border cooperation structure	P.A.C.A., Rhone-Alpes, Piemont, Vallée d'Aoste et Ligurie	crosscutting	since 2007	http://association.medalp.eu/index.html and the associated portal http://medalp.eu/fr/	

In 1992, at the United Nations Conference on Environment and Development – commonly referred to as 'Rio 1992' or 'the Rio Earth Summit' – mountains received unexpected high political attention. They were granted a chapter in the 'Agenda 21' as fragile ecosystems that matter for humankind.

Since then, efforts by different actors have been undertaken to promote Sustainable Mountain Development. Some of them relate to the above event, others just emerged on their own. However, in view of the UN Conference Rio+20 – United Nations Conference on Sustainable Development in 2012 it seemed relevant to assess and understand what has been achieved by whom and how. It appears equally important to learn what has worked and what has not worked, and why, in order to draw lessons for more effective interventions in future. The anticipation of possible future challenges or opportunities may further help to be better prepared for their management. This will certainly encompass the adaptation to and mitigation of global change as the mainstream concern of the last decade as well as the new, albeit disputed paradigm of a Green Economy. As in the past, major unexpected and unpredictable political, social, economic or technological innovations may overshadow such mainstreams.

The Swiss Agency for Development and Cooperation, committed to sustainable mountain development since many decades, has commissioned a number of regional reports to assess achievements and progress in major mountain regions such as in particular Central Asia, Hindu Kush-Himalaya and the South East Pacific, South and Meso America or the Middle East and North Africa. The Swiss Federal Office for Spatial Development has commissioned - in the context of the Swiss Presidency of the Alpine Convention 2011/12 – a report on the European Alps. In addition, UNEP has facilitated the production of the report on Africa's mountains and mountains in Central, Eastern and South Eastern Europe; and the Aspen International Mountain Foundation together with the Telluride Institute has prepared a report on the mountains of North America.

The insights gained through these reports, which were presented at the Lucerne World Mountain Conference in 2011, and in which key local, regional and global actors have been actively involved provided the inputs for a mountain section in the outcome document of Rio+20. They are also meant to feed into future global and regional processes, institutional mechanisms, and initiatives that emerge as a result of Rio+20 in support of Sustainable Mountain Development.

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

UNEP

UNESCO MaB

ZOI environment

UNIVERSITÄT BERN

CDE
CENTRE FOR DEVELOPMENT AND ENVIRONMENT

mri
mountain research initiative

TELLURIDE INSTITUTE

IMS International Mountain Society

ICIMOD

CONDESAN
Consorcio para el Desarrollo Sostenible de la Ecorregión Andina

UCA UNIVERSITY OF CENTRAL ASIA
MOUNTAIN SOCIETIES RESEARCH CENTRE

ASPEN INTERNATIONAL MOUNTAIN FOUNDATION
AIMF

Mountain Partnership