



INTER-RELATIONAL TERRITORIES

a new interplay between pre- and inner-alpine areas for
future water use under the framework of institutional thickness

Colophon

Inter-relational territories

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for future water use under the framework of institutional thickness

Graduation project
P5 Report

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Research studio

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'Imagining (European) regions'
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‘El Río’

Javier Heraud

...

Yo soy el río que viaja en las riberas,
árbol o piedra seca

Yo soy el río que viaja en las orillas,
puerta o corazón abierto

Yo soy el río que viaja por los pastos,
flor o rosa cortada

Yo soy el río que viaja por las calles,
tierra o cielo mojado

Yo soy el río que viaja por los montes,
roca o sal quemada

Yo soy el río que viaja por las casas,
mesa o silla colgada

Yo soy el río que viaja dentro de los hombres

...

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Introduction

The EU-Strategy for the Alpine Region (EUSALP) was established in 2015 and is recently moving towards its implementation phase. Therefore, many questions and doubts arise concerning its future development and identity. What is the spatial dimension of EUSALP? What does it mean for the regional and local scale? These questions in combination with my fascination for the Alpine region itself motivated me to start this graduation project and explore further how it could possibly evolve in the future.

The focus thereby lies on the Alps as the ‘water tower’ of Europe and its direct and indirect interrelations between pre and inner alpine areas. The four biggest European river basins spring in the mountain range and connect thereby to surrounding areas in South, East, North and West. Due to climate change the freshwater availability will decrease in time, but above all higher temperatures will lead to a changing seasonal run-off pattern. Simultaneously, water-intensive economies, as e.g. hydropower generation and winter tourism, are over-exploiting freshwater as a resource and still tend to continue in the same pattern. Hence, the result is a conflict of interest between these economies and the river ecosystems affecting thereby inner and pre alpine areas.

This graduation thesis takes the framework of EUSALP in order to tackle the aforementioned conflict and explores at the same time to what extent a macro-regional strategy can be used as a planning tool to create a more socio-ecological resilient relationship between pre and inner alpine territories.

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Abstract

The Alps, also called the 'water tower' of Europe, are one of the biggest freshwater reserves of the continent, extending over seven countries. However, due to climate change, resulting in melting glaciers and more frequent dry periods, the availability of fresh water is seasonally changing and overall, decreasing in the future. This conflicts not only with the growing demand provoked by ongoing urbanization processes in and around the Alpine Arc, but also a rising interest in economic sectors like tourism and hydro power. This project proposes a new interplay between pre- and inner-alpine areas by giving particular consideration to the natural environment. It seeks to coordinate the use for water as a resource under the framework of institutional thickness. Thereby it explores national planning cultures, existing cooperation programmes and the added value of a macro-regional strategy for the integral management of hydraulic resources in the alpine context. Finally, a seasonal development strategy in a case study region is designed as a possible translation of a macro-regional strategy into space.

Key words: Macro-regional strategies, cross-border cooperation, socio-ecological resilience, water as a resource, European Alps



Figure 1: The river Loisach along 'Ehrwalder Straße'
Source: Author

I. CONTEXTUALIZING

I.I Introduction of the Alpine region

Mountain regions in the European context

The European Union is trying to implement its cohesion policy in mountain areas but acknowledges that its developments are dynamic and can not be generalized. Especially population trends in mountain areas are not static, so there is no general trend of depopulation as it may be expected (The mountain dimension of cooperation, 2018). However, there are common challenges European mountain massifs are facing. Often they attract a large number of tourists, generate amenity migration and face related challenges to the physical and natural environment. Also, limited accessibility occurs often in these areas. The European Commission stated in the past that mountain areas have 'permanent natural handicaps', due to topographic and climatic restrictions on economic activity and/or peripherality, but currently the discussion is guided more under the approach of finding common opportunities for 'specific types of territories' (ESPON, 2017). As the Treaty of Lisbon of 2007 states:

"In order to promote its overall harmonious development, the Union shall develop and pursue its actions leading to the strengthening of its economic, social and territorial cohesion. In particular, the Union shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favored regions. Among the regions concerned, particular attention shall be paid to rural areas, areas affected by industrial transition, and regions which suffer from severe and permanent natural or demographic handicaps such as the northernmost regions with very low population density and island, cross-border and mountain regions".

Europe inhabits some major mountain massifs all over the continent, however, the Alps are the highest and biggest. The mountain range covers nearly 190.700 km2 and 1,5% of it are glaciers with 'Mont Blanc' as the highest peak of 4.810m (EEA, 2009). Not only their natural capital is unique, but also their socio-economic conditions are outstanding. Situated in between two really high performing economic areas, which are part of the so-called "Blue Banana", the inner-alpine area itself is performing over the European average as well. Nevertheless, there are differences in the region due to national pre-conditions and their ability to recuperate after the economic crisis. On the following page, the economic history and therewith territorial development are explained in a more detailed way.

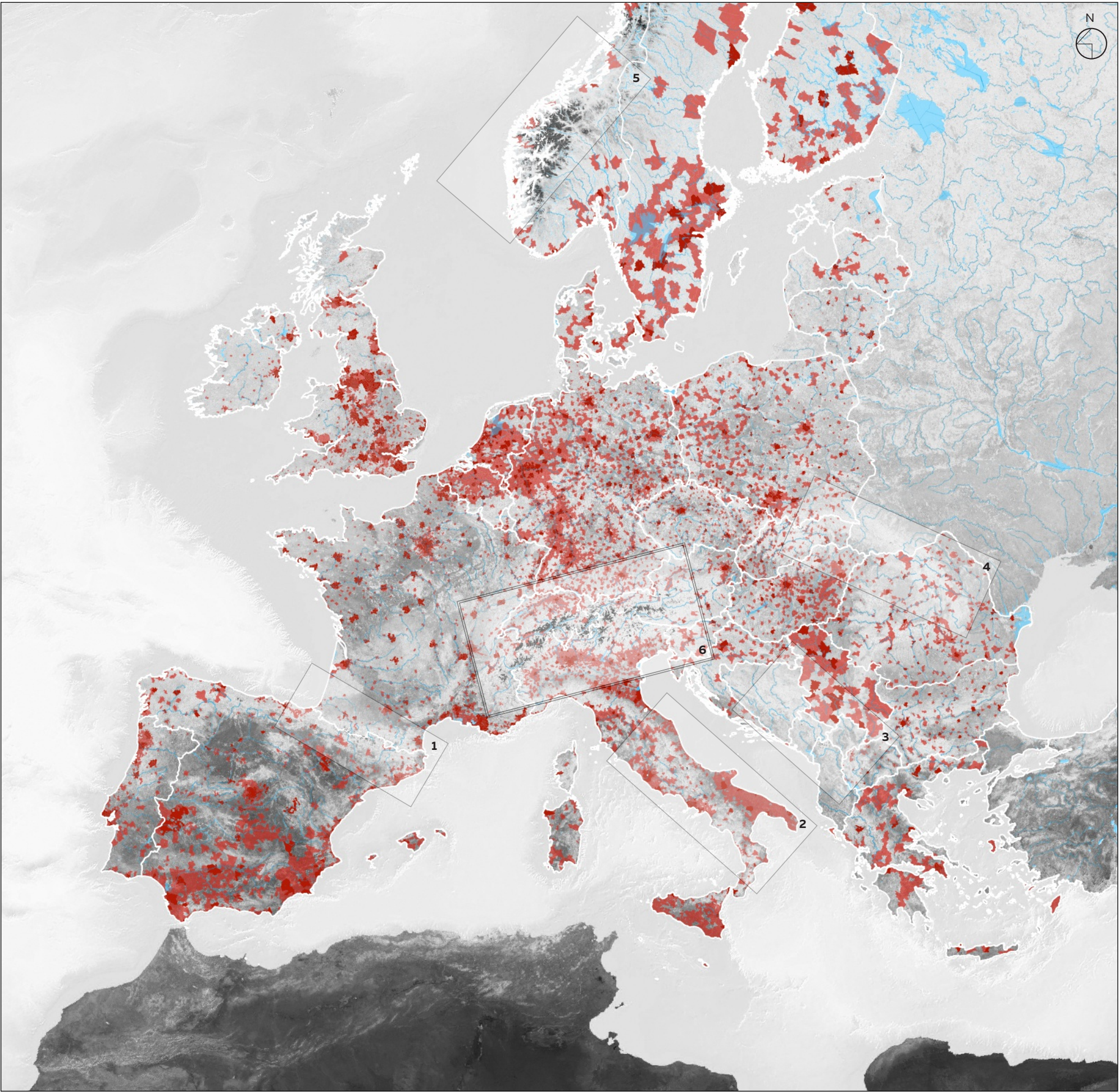
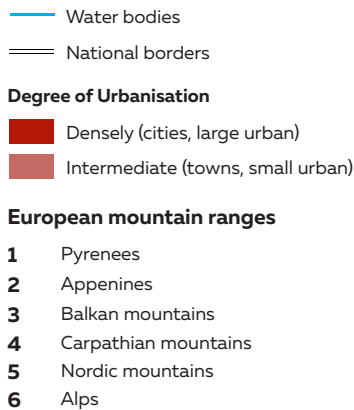


Figure 2: European mountain massifs, Source: DGURBA 2014, Eurostat

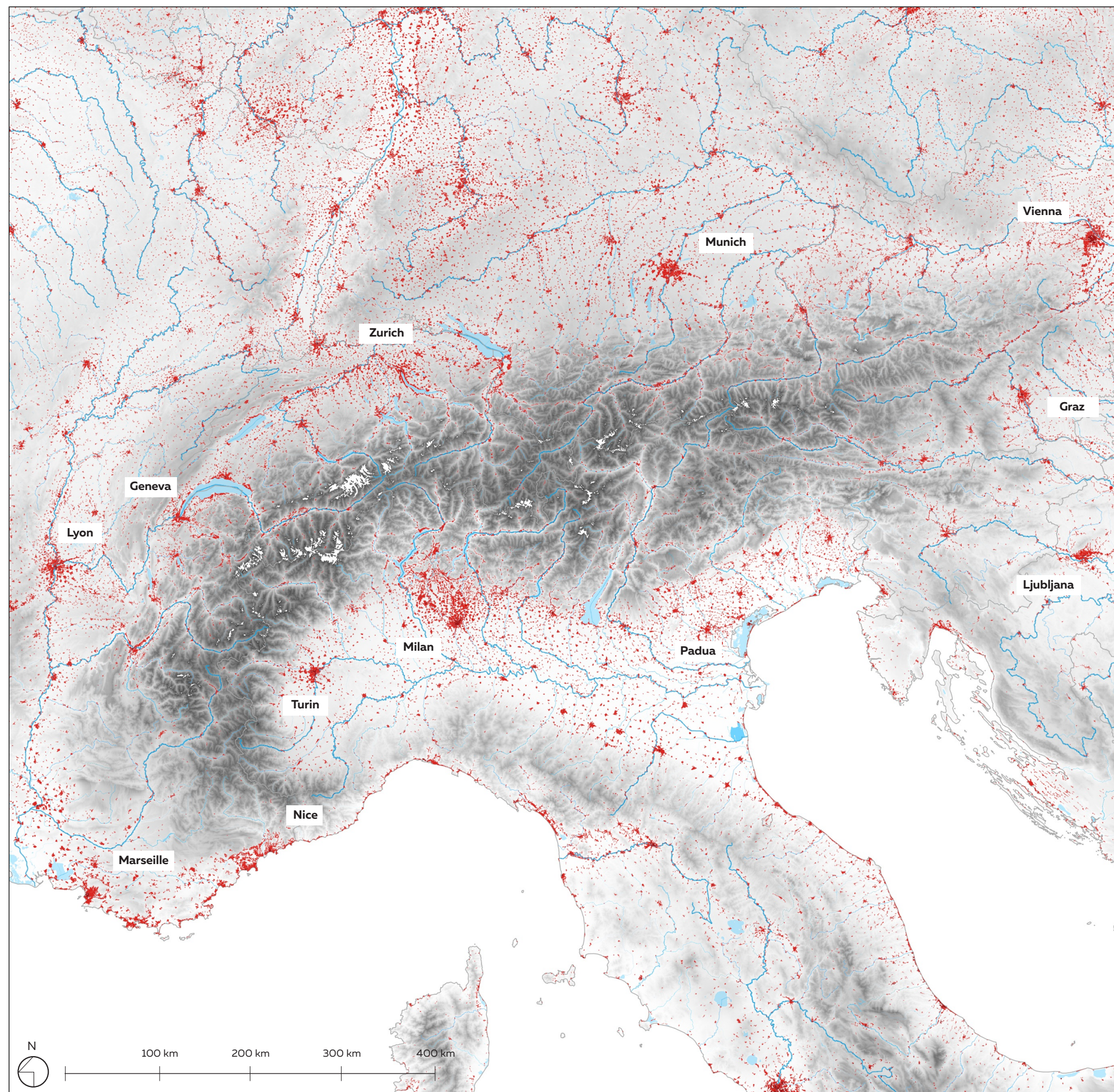


Figure 3: Territorial development, Source: Corine Land Cover 2016, COPERNICUS

Territorial development of the Alps

Figure 3 shows the strong demographic discrepancies in the Alpine region. Whereas cities located in the agglomeration ring around the Alpine arc (Munich, Zurich, Geneva, Milan, Turin, Vienna) are constantly growing, some mountain areas, especially in the east are shrinking (Alpine Convention, 2015). Nevertheless, it becomes clear, that also towns in the Alps experience a population growth (Bolzano, Innsbruck, Grenoble, ...), which is caused mainly through their supply function (ESPON, 2018a). It can be stated that growing cities around the Alpine arc produce higher demand for mountain water as a resource (hydro-energy, production, drinking water, ecosystem services), but also increased the importance for tourism and leisure of the inner Alps. This stimulates the building of second homes and tourism resorts in the inner alpine valleys, especially in higher lateral ones, which were unexplored beforehand (Perlik & Messerli, 2004). Finally, the Alpine region shows a more concentrated agglomeration pattern, but at the same time the effects of urban sprawl in isolated valleys. This leads to a high degree of landscape fragmentation and therewith a disturbed ecosystem (ESPON, 2018a).

Permanent and temporary population

In the case of the alpine region, it is important to be aware of the difference between permanent and temporal population. Due to the tourism influx, the population size is growing remarkably in winter and summer. The permanent population in the inner-alpine area is around 14 million people (Alpine Convention, 2015), but during high season it can rise up to the double counting tourists, second homes owners and seasonal workers (YEAN, 2013). According to WWF, around 120 million tourists visit the Alps every year. The project 'Tirol City' by YEAN researched the Inn valley and created the term 'Elastic City', which describes the high adaptability of alpine valleys for fluctuating population.

Urbanization in pre-alpine areas

Urban agglomerations around the Alpine Arc are constantly growing (ESPON, 2018a). Especially urban centers like Munich, Zurich, Geneva, Vienna, and Milan offer a closeness to nature, but at the same time a diversity of economic opportunities and are therefore popular for all kind of migration. These centers of urban growth are complemented by urbanized areas with lower density in direct proximity to the mountain range. Small towns with 10.000 to 30.000 inhabitants occur often in this area and provide direct access to tourism in the inner-alpine areas, but also offer a commuting opportunity to close-by economic centres.

Urban concentration and urban sprawl in inner-alpine areas

In the case of the inner-alpine area, territorial development is more complex due to its given topography. Just limited areas in the alpine valleys can be inhabited since the accessibility in higher and remote areas is barely given. This special conditions led to high urban concentration in lower and good connected valleys, but also to urban sprawl in higher lateral valleys through the exploration of tourism (Löffler et al., 2016). E.g. villages like Chamonix, Ischgl or Sölden, were founded exclusively driven by the economy of tourism and show a comparatively low permanent population.

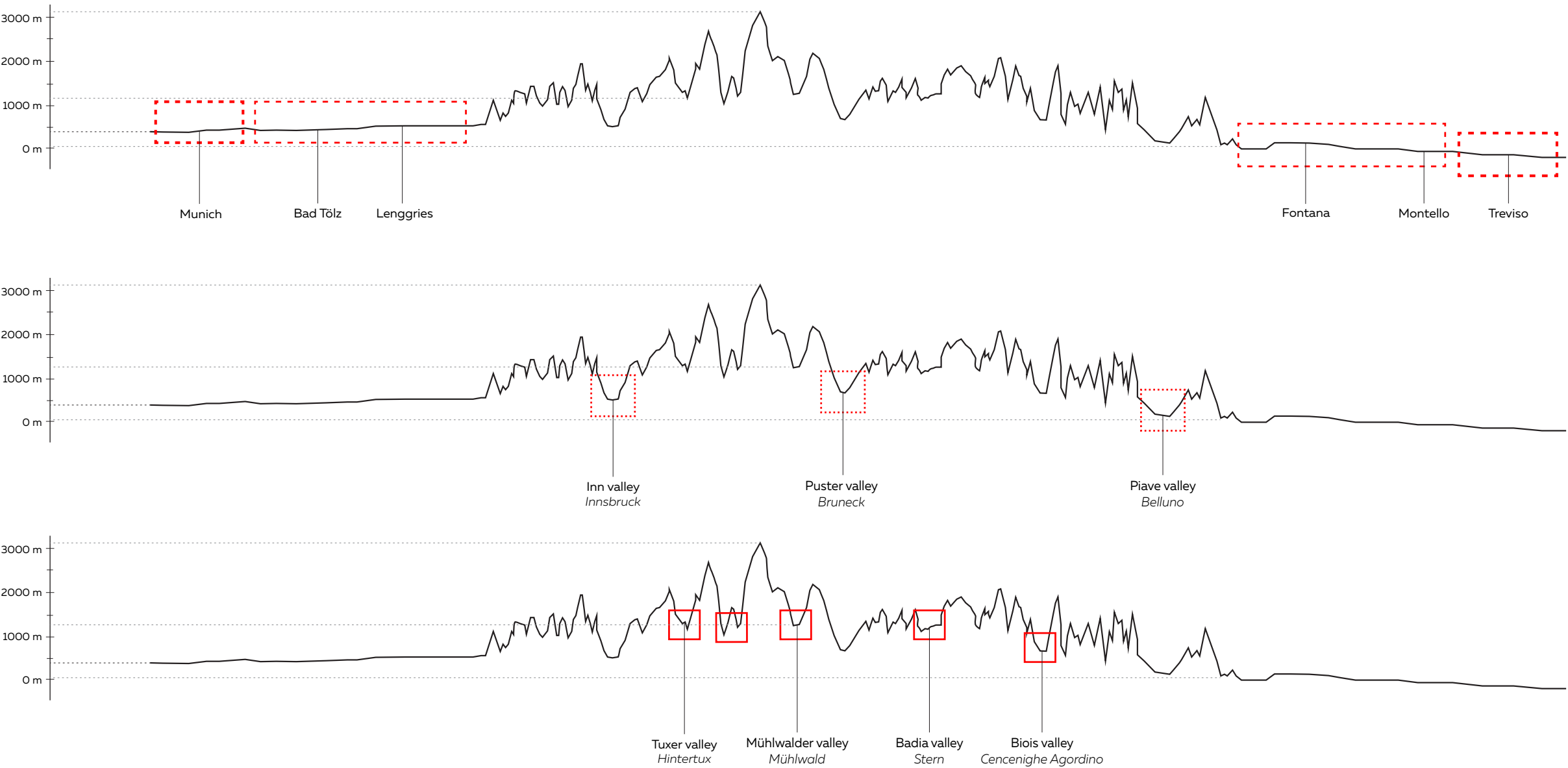


Figure 4: Different types of territorial development in an Alpine section, Source: Google Earth



- Rivers and water bodies
- Glaciers and perpetual snow
- Continuous urban fabric
- Discontinuous urban fabric

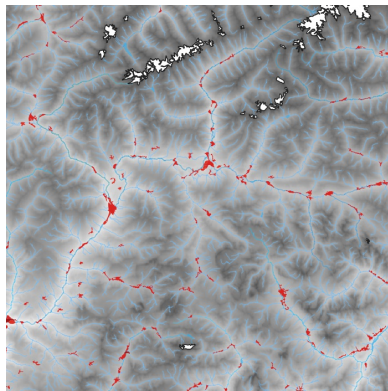
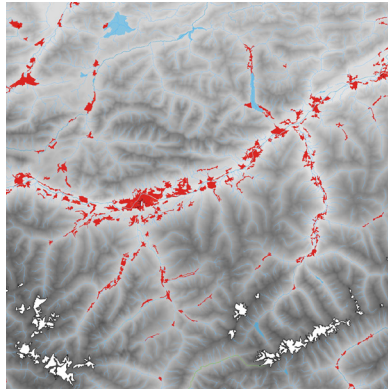
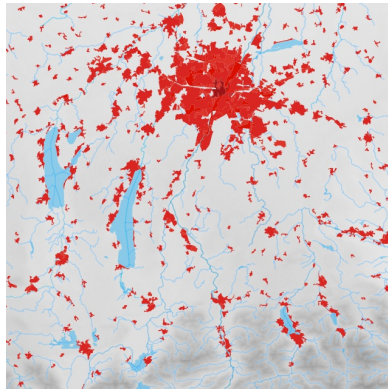


Figure 5: Territorial developments, Source: Corine Land Cover 2016

Economic transitions in the Alps

As mentioned in the previous paragraph, the economy of the Alps is nowadays high performing in comparison to the European context (ESPON, 2018a). But looking back in history it becomes clear, that the integration of the Alpine Arc in an economic network began early. The Fuggers and Medici started already in the 14th century to use the mountains as an important trading route and exploited thereby the best accessible valleys, which form nowadays still the main infrastructural axis. Nevertheless, this primary economic development did not lead towards a permanent inhabitation of the Alps. Just when agriculture and pastoral activities were introduced to the region, first people started to settle down. Nowadays this dispersed territorial development driven by agriculture is partly still existent but was mainly replaced by the industrialization in the 19th century. (Poulsen et al., 2018)

The industrial revolution in 1850 had direct and indirect effects on the Alpine region. Through the discovery of energy production via hydro-power plants in the late 19th century a new economy was given the way, and with that mining and manufacturing activities dominated in this era (Figure 5). Mining took place with different resources, such as woods extracted and processed into paper and pulp, or iron extracted directly from the mountains, especially in Austria in the ‘Erzgebirge’. Whereas manufacturing economy was predominantly found in Switzerland with watch-making and screw cutting factories, and iron processing in Aosta, Italy. Hence, the local production of energy allowed the settlement of manufacturing and extraction facilities in the inner-alpine areas, but also attracted diverse metallurgic and chemical industries in the western mountain range. This shift led to territorial development changes and small villages in lateral valleys got depopulated, because labor was more concentrated in the lower and more accessible valleys. A lot of these industrial complexes are no longer viable because of foreign competition, high transport costs into alpine valleys and the exhaustion of resources. (Poulsen et al., 2018)

After the second world war tourism was introduced to the Alpine region as an alternative economy and experienced a true boom in the 1960s. The seasonal activities attracted more and more people and are currently still rising. Besides, enforcing the service sector in the region, it also changed the built environment. The aforementioned depopulation process of higher lateral valleys was partly dammed by introducing tourism in these areas. But not just remote areas experienced a change by this economic shift, also lower and better accessible valleys exploited the benefits of tourism as much as possible. This led to new competitiveness between and in-between countries. (Poulsen et al., 2018)

Nowadays the economy of the Alps is still based on all aforementioned sectors. Mountain farming is experiencing new popularity and agriculture in lower valleys is being intensified, the potential of hydro-energy production is explored continuously, manufacturing activities are declining, but still existent, and overall the scope of tourism and employment in the service sector is growing extensively. Nevertheless, most of these economic activities have a negative impact on the natural environment and are depending on freshwater as a resource. Due to climate change, the temperatures are rising, with that glaciers melting and the result is diminished freshwater availability and a transforming seasonal runoff pattern in the future. The Alps are currently facing a paradigm shift and need to explore alternative and more sustainable ways of economic development



Figure 6: Mountain pastures in Hintertux, Source: www.klausnerhof.at



Figure 8: Hydroelectric power complex, Source: www.assets.knowledge.allianz.com



Figure 7: Mining at the ‘Erzberg’, Source: www.austria-forum.org



Figure 9: Zermatt ski resort’, Source: www.sopranovillas.com

I.II Motivation

European's future

Being a European citizen, I can experience daily benefits through the cooperation of different EU members. Borders seem to become seamless in this process of Europeanisation. However, recent occurrences and movements show, that the ideology of a common European, in some parts even a common national identity has opponents. The most obvious case is the UK and the Brexit, but also Catalonia and Ireland want to reorganize their identity and border. Besides that, the migration issue is causing a lot of disagreements in a European and national scale. Rising votes for right-wing parties and manifestations against migrants can be found in some European countries. Recently more and more issues and political discussions occur and the discourse of borders and identity is illuminated from another perspective. A multitude of books was published in the last years, which are all scrutinizing the future of Europe, whether it will fall apart or if the European state is still possible. Cooperative approaches of the European Union like Interreg projects, the cohesion policy, and macro-regional strategies have also been applied in the multi-national Alpine region. My motivation is to reflect on the future of Europe, but especially research the meaning of borders and the feasibility of cross-border cooperation in this area. Can seven countries (incl. two non EU-member states), that share one territory with similar characteristics and dynamics cooperate and if yes, how?

Relation human - nature

Humans, at least in the western context, tend to feel superior to nature. For example, ski tourism in the Alps is forced with snow cannons even though there is no natural precipitation. We, humans, have planned in the previous times not with nature, but ignoring, invading and exploiting it. Current concepts like urban ecology, landscape urbanism, and ecosystem services are aiming towards a paradigm shift and integrate the nature in planning, and so in our environment. The Alpine region is a unique territory: a mountain chain in the middle of Europe, separating north and south. Just a few man-made infrastructural connections allow to cross this transit-region and thereby connect and allow our globalized market. Infrastructure provides accessibility and with that the attractiveness of an inhabitable space rises. The Alps have been inhabited for a long time, but nevertheless, currently, they are experiencing the phenomenon of urbanization and demographic change. My motivation is to rethink the relationship between humans, city, and nature in this unique territory and to develop an integral approach, where we can literally coexist with nature. The challenge thereby is, that our human systems are by nature socio-technical systems and the way to make them sustainable is difficult. I do not think that just replacing our socio-technological system by a socio-ecological one is the solution, but it is a combination of them.



Figure 10: Protests in Germany 2015,
Source: www.paselackenrepublikbrd.wordpress.com

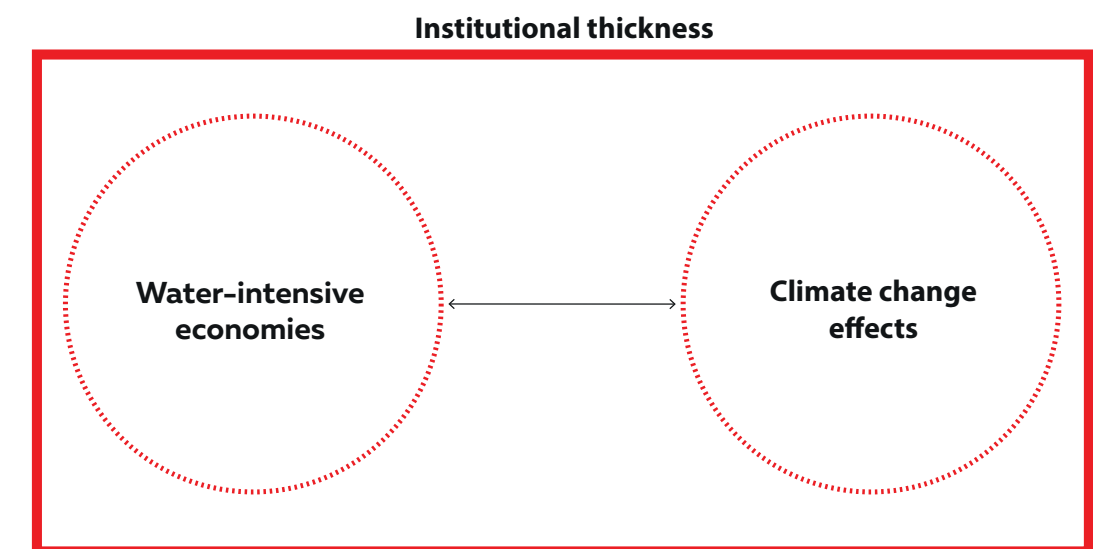


Figure 11: Hydro power plant in Austria,
Source: www.blog.recharge-green.eu

I.III From problem field to problem focus

The following chapter explains the three problem fields selected for my research: Institutional thickness, climate change effects in mountain regions and water-intensive economies. Firstly, the context in a bigger picture is described, and afterwards,

the problem analyzed, which leads to the problem focus. In the final problem statement, the complex interactions between the aforementioned problem fields and focuses are explained and illustrated in a scheme.



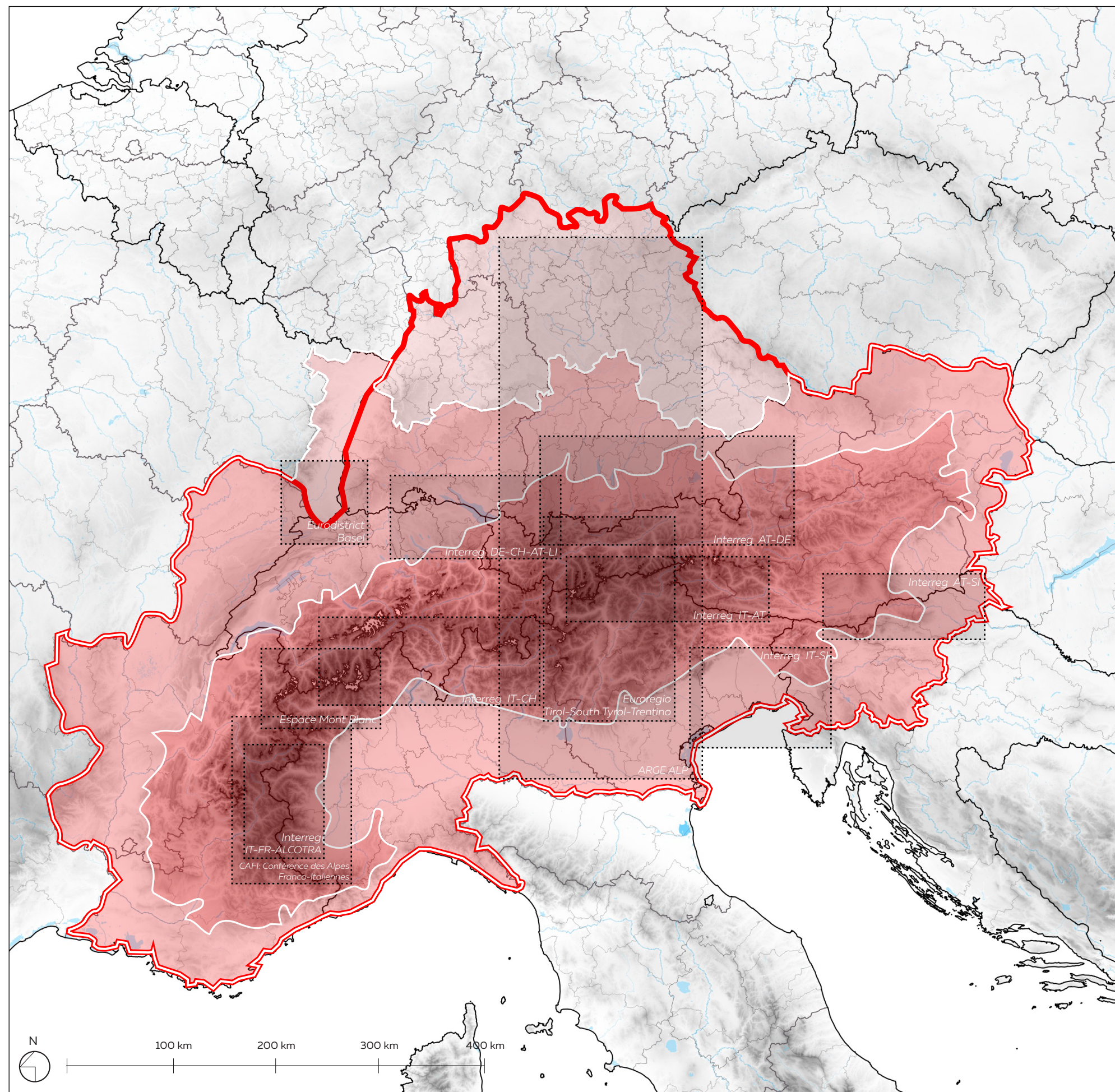


Figure 12: Transnational and cross-border cooperation programmes
Source: Alpine Convention

I.III.i Institutional thickness

The Alps are a geomorphological territory with enormous natural capital, but at the same time divided through administrative borders of seven countries. This hampers the governance of common issues, especially in the areas of transport, natural protection, water use, and migration. Hence, a multitude of cooperation programmes was founded as well by national states and civil society, as the European Union. The main problem is, that this 'mad chase for spatial integration' (Faludi, 2016b) results in transnational cooperation programmes focusing on different scales and aiming for distinct objectives. Whereas the Alpine convention, for example, is an international treaty focussing on the inner-alpine area and targeting mainly natural protection, the Alpine Space Programme initiated by the European Union promotes not only natural conservation projects in the inner-alpine areas, but also acknowledges the functional relations with surrounding agglomerations and aims for the economic integration of the mountains. Besides addressing different main objectives, also their organizational structure is not the same, which impedes possible cooperation. The most recent approach is the macro-regional strategy for the Alpine region (EUSALP) developed in 2015, which was designed as a 'soft space' (Sielker, 2017) and is supposed to align existing cooperation programmes and funds in all different scales. Recently EUSALP is moving towards the implementation phase and a lot of questions emerge about the execution and future development of this soft space. Common concerns are East-West discrepancies of regional governance capacities, the interplay between various cooperation programmes in the context of institutional thickness, and how the communication between sectional action groups can work in order to achieve an integral development.



NATIONAL PLANNING FRAMES

Austria

Austria is a federal country and has the most developed multi-level governance in the Alpine context. The four institutional scales, national state, 'Länder', regions and municipalities have the power to develop strategies and policies. In the national scale, they work with the so-called 'Raumentwicklungskonzept', a concept for the development of space, and in the sub-regional scales, they operate with development programmes (Landesentwicklungsprogramm, Regionales Entwicklungsprogramm) with mission statements ('Leitbilder'). By using structural concepts the municipalities also hold considerable responsibilities for strategic spatial planning within their territories as well as for the preparation of land-use plans. However, according to the recent ESPON Study 'COMPASS – Comparative Analysis of Territorial Governance and Spatial Planning Systems in Europe' spatial planning is moving towards centralization on a sub-national level.

France

The national government is active in land-use governance primarily through its responsibility for the legal framework concerning land-use planning, environmental policy, and other policy fields. The influence of regions on land use comes primarily through their involvement in the planning and financing of large scale infrastructure projects. Furthermore, regions prepare a general strategic plan that outlines their policy priorities and develops a spatial vision for the region. Especially inter-municipal associations in larger urban areas play an important role in the French planning system. They are responsible for creating strategic plans that focus on providing a coherent strategy for the entire urban agglomeration. Municipalities are responsible for creating local land-use plans and for issuing building permits. (OECDlibrary, 2017)

Germany

Germany is a federal country with four operating scales of territorial governance. Whereas the national state works mainly with mission statements ('Leitbilder') instead of a comprehensive spatial plan, the first regional scale ('Länder') operates with development programmes for landscape and territories ('Landesentwicklungsplan'). The second sub-national level, the so-called 'Kreise', is responsible for strategies and land-use guidelines and so for the coordination of regional, municipal and sectoral planning. Their instruments are regional, landscape and green structure plans (OECDlibrary, 2017). The local level's power is limited to the development of land-use plans, but current trends show that territorial planning is aiming for decentralization towards local (ESPON, 2018b).

Italy

Italy is a unitary country, but its land-use planning system follows a model generally observed in federal countries, with regional laws and regulations as the main source of legal provisions outlining the planning process. The second level of sub-national government, the provinces, produces the Provincial-Territorial Coordination Plan to coordinate land-use decisions across municipalities and plan major infrastructure projects. In 2015, 10 provinces were replaced by Metropolitan Cities. They are expected to adopt a metropolitan strategic plan that replaces the provincial plan. Actual land-use decisions are primarily made at the local level by municipalities through the Local Development Plan, which consists of zoning regulations. (OECDlibrary, 2017)



Figure 13: Decisive institutional level of spatial planning
Source: Author

Slovenia

Slovenia is a unitary country and its territorial governance follows the same model. The national state is responsible for a spatial development strategy including strategic objectives, and national spatial plans, which handles with the implementation of land-use regulations for areas and developments of national importance. The local level creates municipal spatial plans, which work via zoning regulations, but also develops detailed municipal land-use plans. First attempts of a sub-national level have been made by introducing regional spatial plans, but by now just one is elaborated. (ESPON, 2018b)

Switzerland

Responsibilities for spatial planning lie with the cantons, while the federal government defines guiding principles for land-use planning and co-ordinates the efforts of the cantons. National government enacts the framework law that structures the planning processes of the cantons. It also enacts legislation in other fields such as transport, environmental protection, housing and energy that has relevance for land-use planning. The federal government is directly involved in the preparation of five sectoral plans and two sectoral concepts on issues that have relevance beyond individual cantons. Cantons exercise their responsibility for spatial planning mostly through the preparation of strategic regional plans. While formal responsibilities of cantons are similar across Switzerland, actual planning practices vary between them. Some cantons are known for more liberal approaches than others. While details vary between cantons, municipalities are central actors in land-use policies, as they prepare binding land-use plans. (OECDlibrary, 2018)

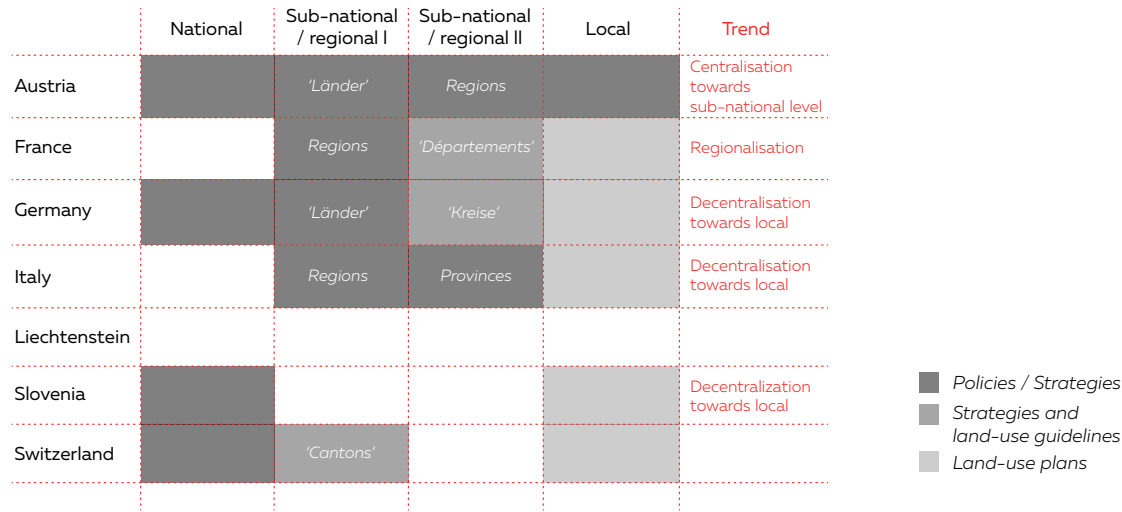


Figure 14: National spatial planning systems, Source: ESPON, 2018 & OECDlibrary, 2018

ALPINE PLANNING FRAME

Endogenous regional territorial cooperation

The first regional approach appeared already in 1952 when representatives of Austria, France, Italy, and Switzerland, as well as of German nature protection organizations and the International Union for Conservation of Nature (IUCN), founded the International Commission for the Protection of the Alps (CIPRA). It is a non-governmental organization consisting of various sub-associations, which originally aimed for natural protection of the entire mountain range under a single institution. Nowadays CIPRA shifted its focus and proposes a more general sustainable development of the Alps not limited to natural protection. Currently various projects about migration and socio-economic development are on their agenda (Debarbieux, 2013). In 1972 regions of Switzerland, Germany, Austria, and Italy came together and founded the committee ARGE ALP ('Arbeitsgemeinschaft Alpen'), which in the first years emphasized on the exchange of experience and information, but nowadays increasingly acts as a network and lobby group representing the interests of the Alpine countries on the European level.

The role of national governments

After some heavy natural disasters at the end of the 1980s and increasing awareness of environmental degradation, CIPRA, IUCN, ARGE ALP, and other working committees came together and compiled a draft for future cooperation. In 1991 all alpine states and the EU signed the resulting Alpine Convention. This cooperation is an international treaty and binding for all participating states. The support of the European Commission was the beginning of involvement in various trans-boundary initiatives in mountain regions. The most common critic is based on the state-centered model of governance since sub-national constitutional regions are not recognized. (Debarbieux, 2013)

The role of the European Union and empowerment of regional governance

Since 1990 the European Commission promotes the integration of regions in Europe and therefore introduced the so-called Interreg projects, which are divided into different sub-categories: Interreg A for cross-border cooperation, Interreg B for transnational cooperation and Interreg C for interregional cooperation. The project period, and with that also the funds, of every Interreg programme lasts seven years and can be extended for the same period several times. In the case of the Alps there exist currently seven Interreg A projects, but since 2000 also one Interreg B programme, called Alpine Space, which includes all inner and outer alpine states and regions. These projects aim for better cross-border cooperation with a special emphasis on regional integration and are financed through the European Regional Development Fund (ERDF) as well as through national public and private co-funding of the partner states. It provides a framework to facilitate the cooperation between economic, social and environmental key players in seven Alpine countries, as well as between various institutional levels such as academia, administration, business and innovation sector, and policy making. Besides the Interreg projects, also the so-called 'European Grouping of territorial cooperation' (EGTC) are present in the alpine area and promote cross-border, transnational and interregional cooperation in a long-term perspective. Since 2011 the Euroregion Tyrol-South Tyrol-Trentino forms a legal entity, and as such, will enable regional and local authorities and other public bodies from different member states, to set up cooperation groupings with a legal personality.

From legal national regions to functional cross-border regions: Towards a multi-level governance

The newest cooperation was introduced in 2015 and is based on the idea of European macro-regional strategies. Its objectives are similar to the pre-existing Alpine Convention, but on a larger scale and directly involving the regional level and promoting multi-level governance (Gänzle et al., 2018). The concept is based on the idea of a soft space and works with the three NO's: no new institution,

no new funding, and no new legislation. The strategy is divided into four main objectives: Economic growth and Innovation, Mobility and Connectivity, Environment and Energy, and finally Governance (Figure 15). These objectives are discussed and implemented by nine different action groups, which are supposed to cooperate with each other in order to achieve an integral approach. Moreover, the desired involvement of actors from different sectors and regions should lead to long-

term multi-level governance with a direct and fast communication without any new legal institution necessarily needed, as the concept of soft spaces describes. Conclusively it can be said, that this new approach aims for territorial, social and economic cohesion as also previous programmes like Interreg A and B do, but in an innovative, more direct way and thereby stimulating cooperation and communication. The added value of the EUSALP strategy will be explained in the next chapter.

- Italy
- Germany
- Austria
- France
- Slovenia
- Switzerland
- Liechtenstein

Territorial Agenda (2021 - 2027)
Enhancing the efficiency and effectiveness of Cohesion Policy by a place-based approach

Europe 2020 (2010)
Strategy aiming towards a smart, sustainable, inclusive growth with greater coordination of national and European policy

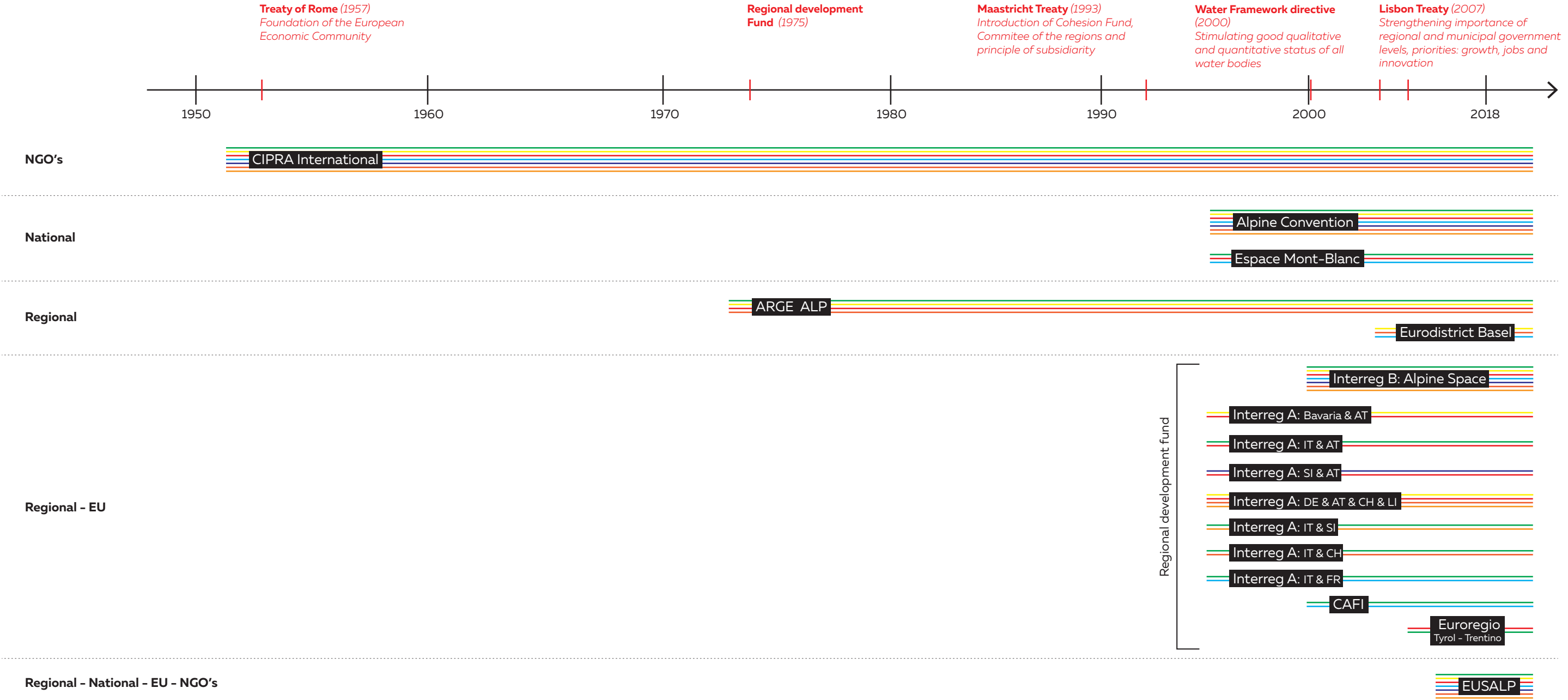


Figure 15: Cooperation programmes in the Alpine context, Source: Author

Added value of a macro-regional strategy

The macro-regional strategy for the Alpine region was established in 2015 and is just recently entering its implementation phase. This construct raises questions about its political intentions in the European context, possible future developments of the so-called ‘soft spaces’, the implementation of multi-level governance, the interplay with co-existing cooperation programmes, and finally, until what extent it is a bottom-up approach.

According to official documents, territorial cohesion and European integration are the main political objectives behind macro-regional strategies. Thereby the regions are perceived as driving forces and provide therefore the main accessibility to funds. Nevertheless, this vision of a “Europe of Regions” contradicts with the still present state territoriality and also runs the risk of equipping a platform for regions

to become more independent from their national states. Andreas Faludi states, that this can result in a difficulty of democratic legitimacy because nowadays decisions are still made within administrative borders and therefore a legal framework is needed (Faludi, 2014). The aforementioned missing legitimacy is responded by the concept of ‘soft spaces’. Instead of seeing a problem in this, they see it as a new alternative of cooperation, which stimulates direct communication, re-territorialization and re-scaling processes (Sielker, 2017). However, the further development of soft spaces is still unclear, since they can stay, disappear or harden in time (Chilla & Streifeneder, 2018). Moreover, the aim of multi-level governance is aligning in the alpine context, because seven countries and 48 regions share a territory with common threats and opportunities. The power and le-

gitimacy of regions depend strongly on the national organization of each state. However, there exists a proposed governance structure for EUSALP (Figure 17), but it is still very broad and suitable for the planning phase. The project AlpGov by the Alpine Space programme is still in process and supposed to elaborate mechanism for government structures in the implementation level until June 2019 (Chilla & Streifeneder, 2018). The macro-regional strategy is definitely aiming for multi-level governance, but nevertheless, the operability is not easy due to the pre-existing institutional thickness. This brings me to my next point, the interplay with co-existing cooperation programmes. Besides varying national and regional planning contexts, also cross-border cooperation is already present in the Alpine region. According to EUSALP, their intention is to align previous objectives, future projects, and funds to the macro-regional strategy in order to create a working organism (ESPON, 2018a). This describes clearly the added value of EUSALP. Instead of being a new transnational cooperation initiative, its new nature of a ‘soft space’ tries to coordinate and stimulate communication. However, the implementation demands a steady coordination and alignment process.

Furthermore, the EUSALP describes itself as working under a bottom-up approach. Indeed, regions and previous cooperation programmes asked for the establishment of a macro-regional strategy in the alpine context. Decision groups in politics, coordination, and implementation consist of regional and national representatives from all different areas (Figure 14). The official task of the EU-Commission is to act as an independent facilitator and ensure strategic coordination in areas where it can provide added value for the macro-region (ESPON, 2018a). However, common critiques often focus on the missing involvement of the civil society and if the EU commission could maybe take a more active role in this process (EU week of cities and regions 2018).

Conclusively, it needs to be reflected until what extent a macro-regional strategy is supposed to operate in order not to exceed expectations. EUSALP is a political strategy made to give guidelines, stimulate communication and coordination between regions, national states, and existing cooperations. Finally, the added value lays basically in this stimulating function pitching a new and still vague entrepreneurial way of governance.

Cross-cutting Policy Area	Thematic Policy Area	Objective	Action Group
Governance A sound macro-regional governance model for the Region, to improve cooperation and the coordination of action	Economic Growth and Innovation	Fostering sustainable growth and promoting innovation in the Alps: from theory to practice, from research centers to enterprises	AG 1: Development of an effective research and innovation ecosystem AG 2: increase the economic potential of strategic sectors AG 3: to improve the adequacy of labour market, education and training in strategic sectors
	Mobility and Connectivity	Connectivity for all in search of a balanced territorial development through environmentally friendly mobility patterns, transports systems and communication services and infrastructures	AG 4: To promote inter-modality and interoperability in passenger and freight transport AG 5: To connect people electronically and promote accessibility to public services
	Environment and Energy	Ensuring sustainability in the Alps preserving the Alpine heritage and promoting a sustainable use of natural and cultural resources	AG 6: To preserve and valorise natural resources, including water and cultural resources AG 7: To develop ecological connectivity in the whole EUSALP territory AG 8: To improve risk management and to better manage climate change, including major natural risks prevention AG 9: To make the territory a model region for energy efficiency and renewable energy

Figure 16: Action plan of EUSALP, Source: European Commission 2016

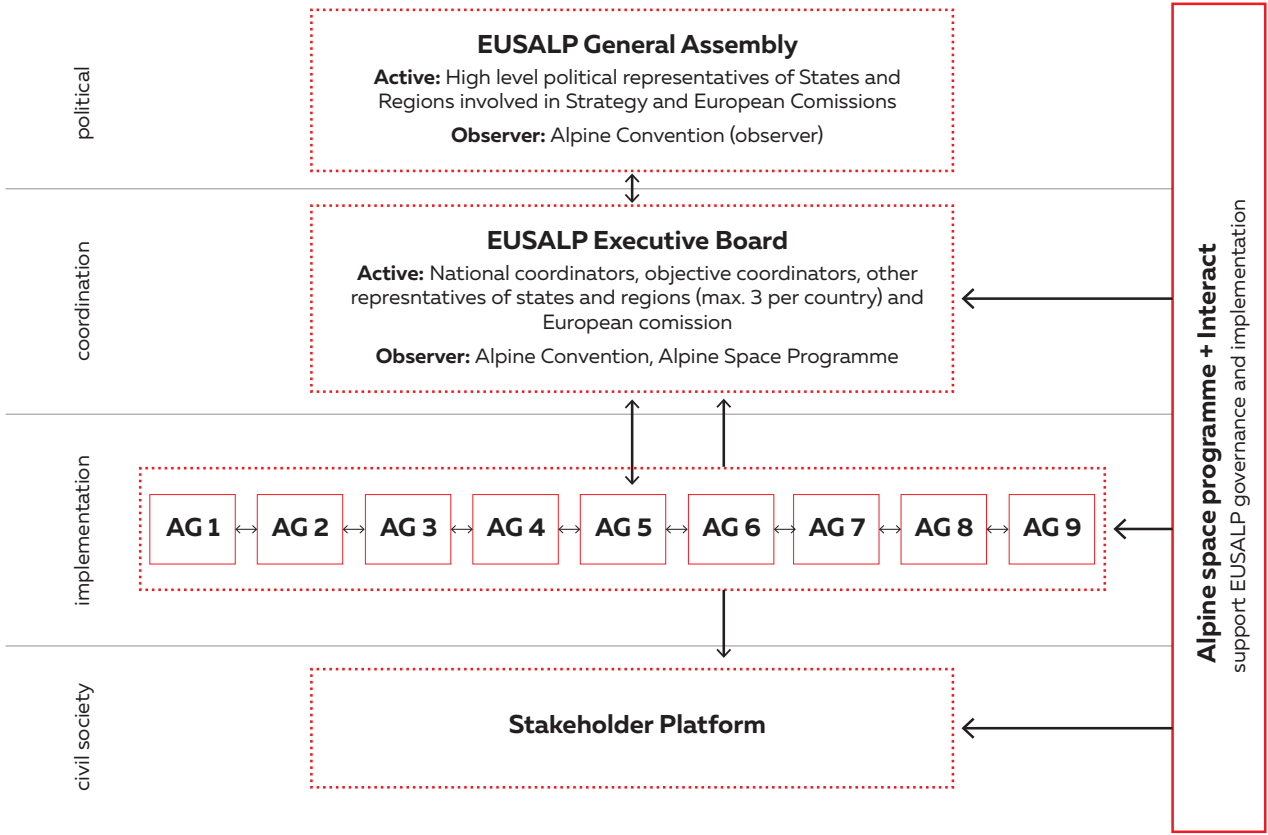


Figure 17: Proposed government structure, Source: European commission 2016

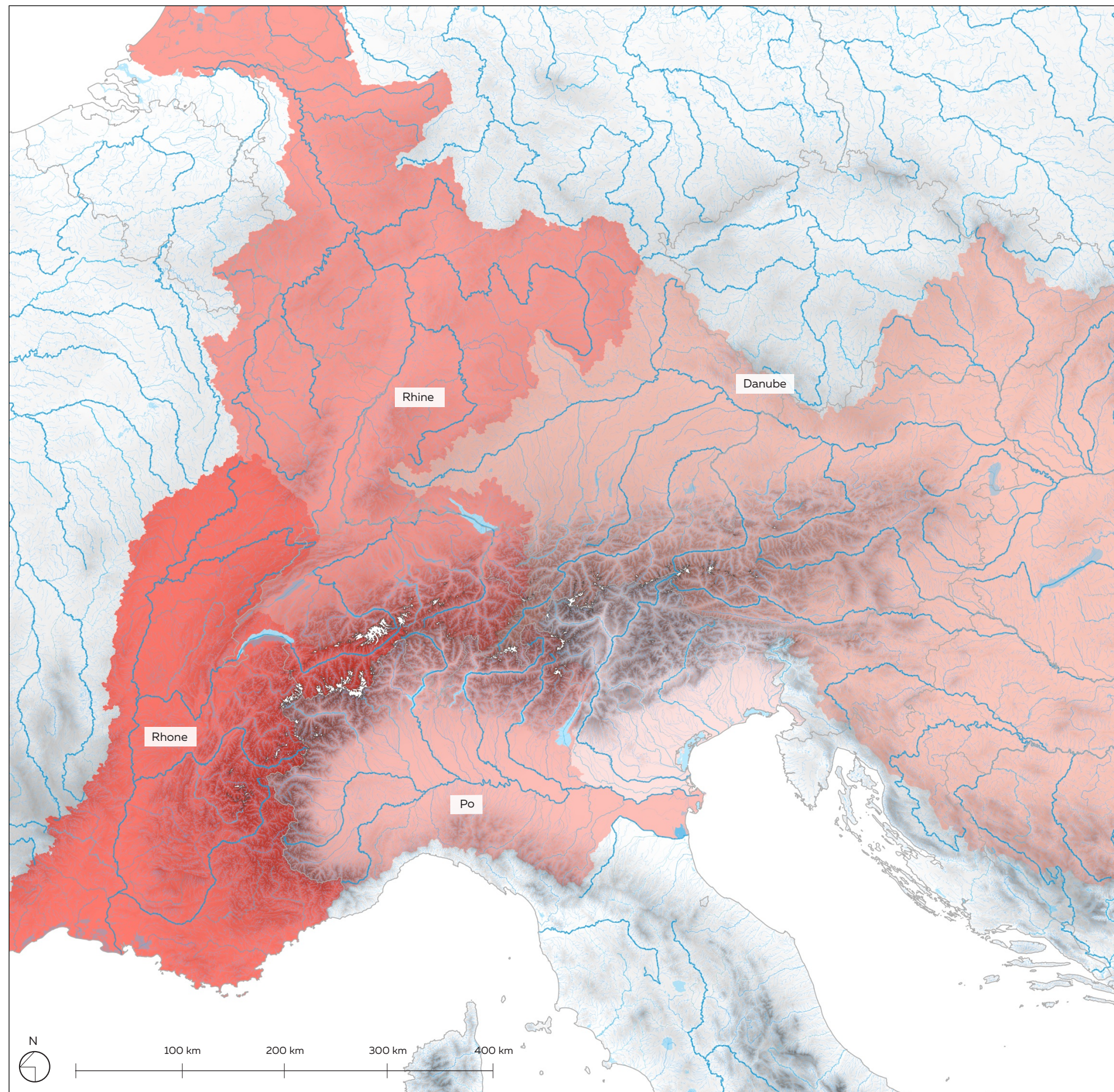
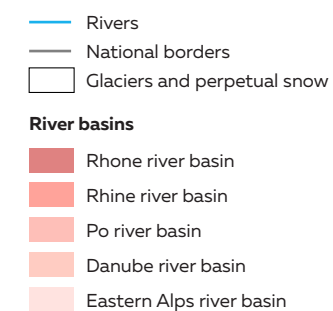


Figure 18: River Basins of the Alpine region, Source: European commission 2016

I.III.iii Climate change effects

Disturbance of the hydraulic system

Climate change affects the Alpine region due to its given topography harder than other areas in Europe. In the 20th century the temperature rose already 2 °C, twice the global average, and is expected to increase even 2,6 - 3,9 °C more until the 21st century (EEA, 2009). The result are melting glaciers. They have lost about half of their ice volume since 1850 and loss rates have accelerated strongly since the mid-1980s. Besides rising temperature, also the annual precipitation will decrease and more frequent extreme events will occur, which results in droughts, floods and landslides in winter (EEA, 2010). The most recent example is the heat wave of the summer 2018, when certain areas experienced up to 85% less rainfall than the 10 year average. This led to water shortage in and around the Alps affecting especially agriculture, provoked high water temperatures and low water levels of rivers, which caused dying of fish species and limited water transport possibility (Pfarrhofer, 2018). The most dangerous threat of climate change effects is the future scarcity of water as a resource. Since the Alps are called "The tower of water" and home of the four biggest river basins of Europe (Danube, Rhine, Po and Rhone) the disturbances and changes of its hydraulic system do not only affect the people and nature inhabiting the inner-alpine area, but also the surrounding areas (EEA, 2009). Its importance for the generation of hydraulic power or any other kind of production, the operability of tourism or just drinking water are not secured for the future.



The way mountains collect and store water in winter and distribute it again in spring and summer is under pressure. The hydraulic ecosystem in the upstream areas is influenced by rising temperatures and this results in melting glaciers and permafrost thawing. Hence, the snowmelt and therewith connected runoff are facing changes throughout the seasons (figure 19). During winter the runoff increases, whereas in spring, summer and autumn the runoff is decreasing. In summer it is even expected to halve by the end of the 21st century (EEA, 2009). This causes problems of water availability for anthropogenic uses within the Alps, but also in the downstream regions. In order slow down these ongoing processes, remaining glacier tongues are being covered (figure 20). Furthermore, the snowline will rise due to higher temperatures. This implies the operability of alpine winter tourism exclusively in higher areas, which is currently ignored by the extensive use of artificial snow making. Besides that, also the biodiversity will need to adapt and move towards higher areas.

Downstream areas are directly affected by more extreme climatic events like droughts and floods (EEA, 2010). Nevertheless, these meteorological phenomena are enhanced by the aforementioned intervened runoff dynamics caused by melting glaciers.

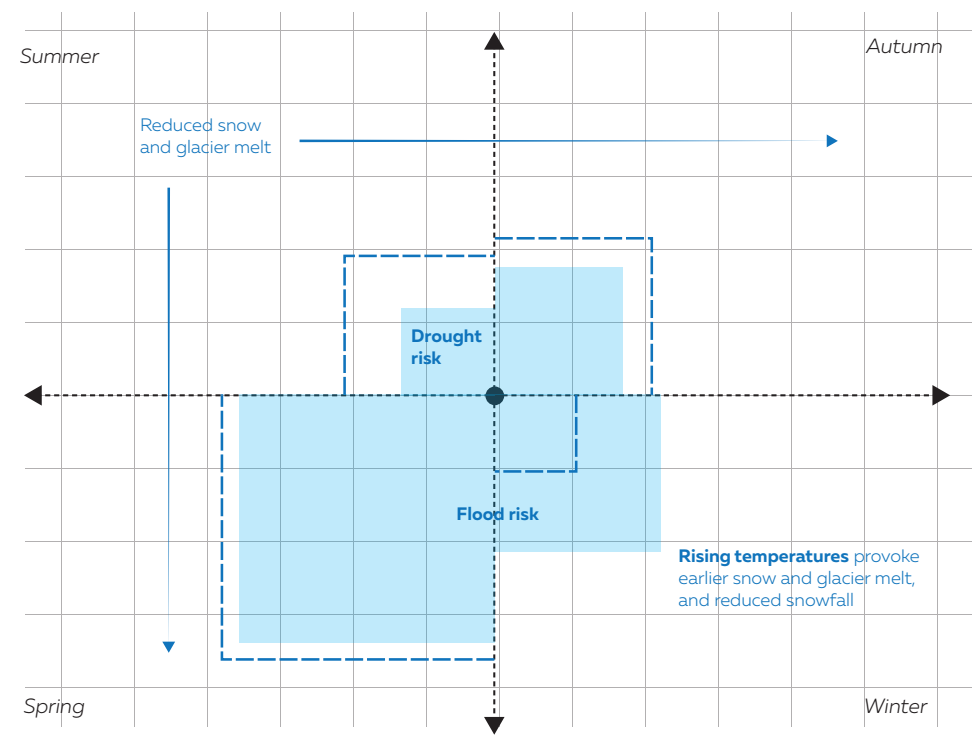


Figure 19: Changing river runoff patterns
Source: Author



Figure 20: Covering of the Rhone glacier
Source: Laura Mallonee, www.wired.com

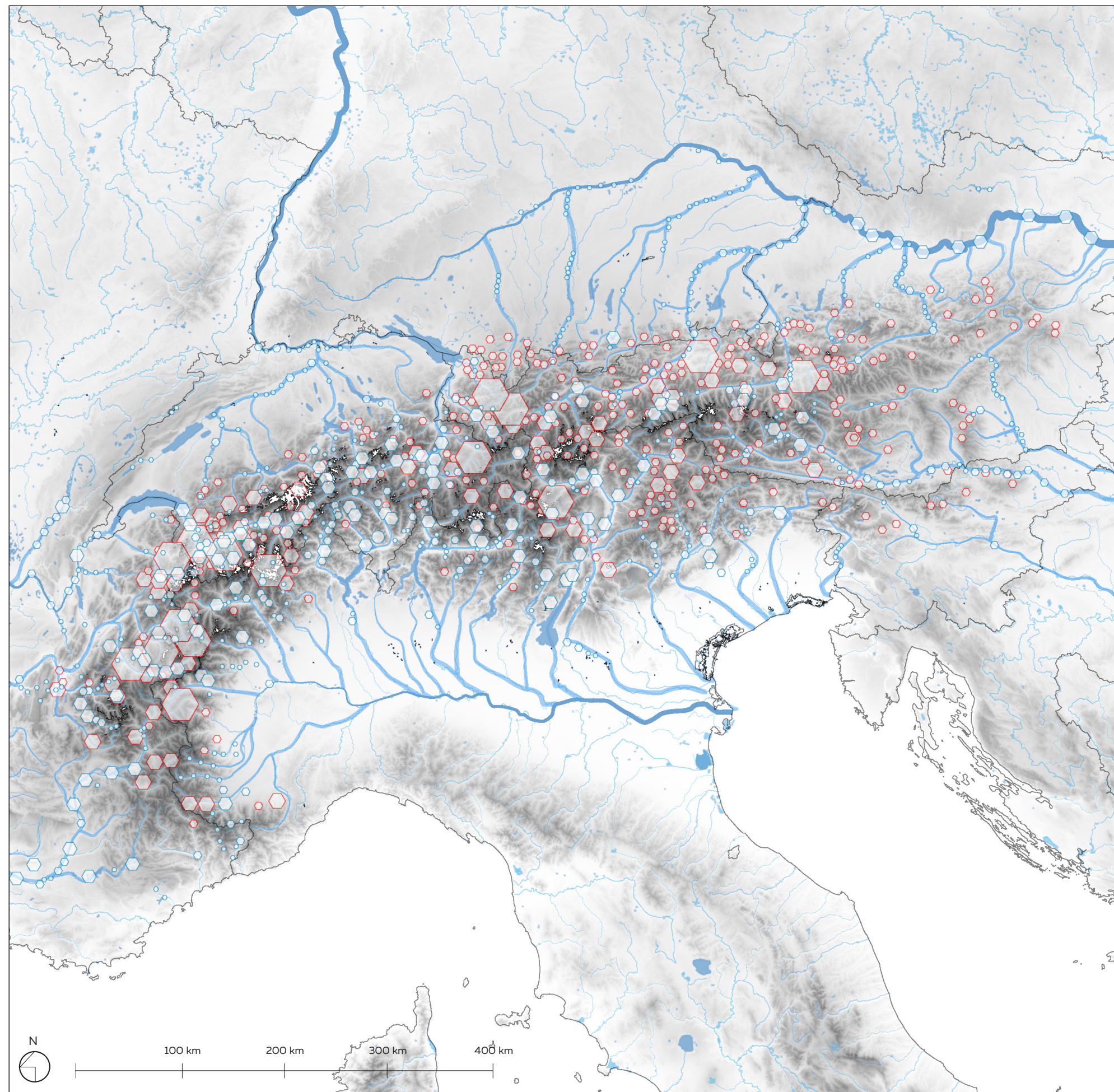


Figure 21: Water-intensive economies in the alpine region, Source: *Alpine Convention*, 2016

I.III.iii Water-intensive economies

Exploitation of a territory

The inner-alpine territory is filled with water-intensive economical activities. All rivers starting in the Alps are highly intervened by (pumped) storage and run off river plants and affect thereby the river ecosystem, but especially downstream areas. Inner-alpine areas count with more than 1.019 hydropower plants and around 168 TWh annual output (Alpine Convention, 2015). Delayed water releases lead to unnatural river flows, change the pattern of water availability and intervene the natural habitat of aquatic species. Moreover, a multitude of ski resorts predominates in the inner Alps. Due to rising temperatures and the connected rising snowline, most areas invest in artificial snowmaking for a profitable winter season. However, the water extraction and therewith linked underground infrastructure affects the natural environment throughout the year. Inner-alpine areas depend highly on water-intensive economies, but are facing at the same time climate change effects with importance for further economic development. Hence, this challenge based on the interrelation of pre- and inner-alpine areas connected through freshwater ecosystems asks for a paradigm shift.

- Rivers
- National borders
- Glaciers and perpetual snow
- Water-intensive economies**
- Ski resorts
- Hydropower plant

The generation of hydropower depends strongly on snowmelt and precipitation pattern. Hence, a changing river runoff due to climate change influences the performance of future power production. Storage power plants work with reservoirs and can be used therefore more flexible, but still depend on sufficient water availability. In turn, run-off river plants perform according to the natural runoff and experience their peak in spring and summer. National states and the European union have big plans for the energy transition, and subsequently, for the further exploitation of hydropower. However, negative externalities on the river ecosystem and the location of intervention are often not considered in this process. Further exploitation of hydropower would lead to an even more de-naturalized flow pattern and influence pre- and inner-alpine regions.

Moreover, the seasonality of tourism entails challenges in terms of water use. Depending on the destination, the focus lies on winter, summer or in some cases both. This can double the amount of people in a tourist destination and so also the water and

electricity demand. Especially in winter, alpine ski tourism is the most popular activity. This entails often artificial snowmaking to provide a 'punctual' start and end of the season, which is interlinked with water and electricity consumption. A lot of ski resorts are already struggling with their existence due to a rising snow line and warmer temperatures. Therefore, a new economic development approach considering negative externalities on the natural environments needs to be put forward.

Previous explained challenges need to adapt to future runoff and precipitation pattern. With a more sustainable paradigm the interrelation between pre- and inner-alpine areas can be improved and intervened.

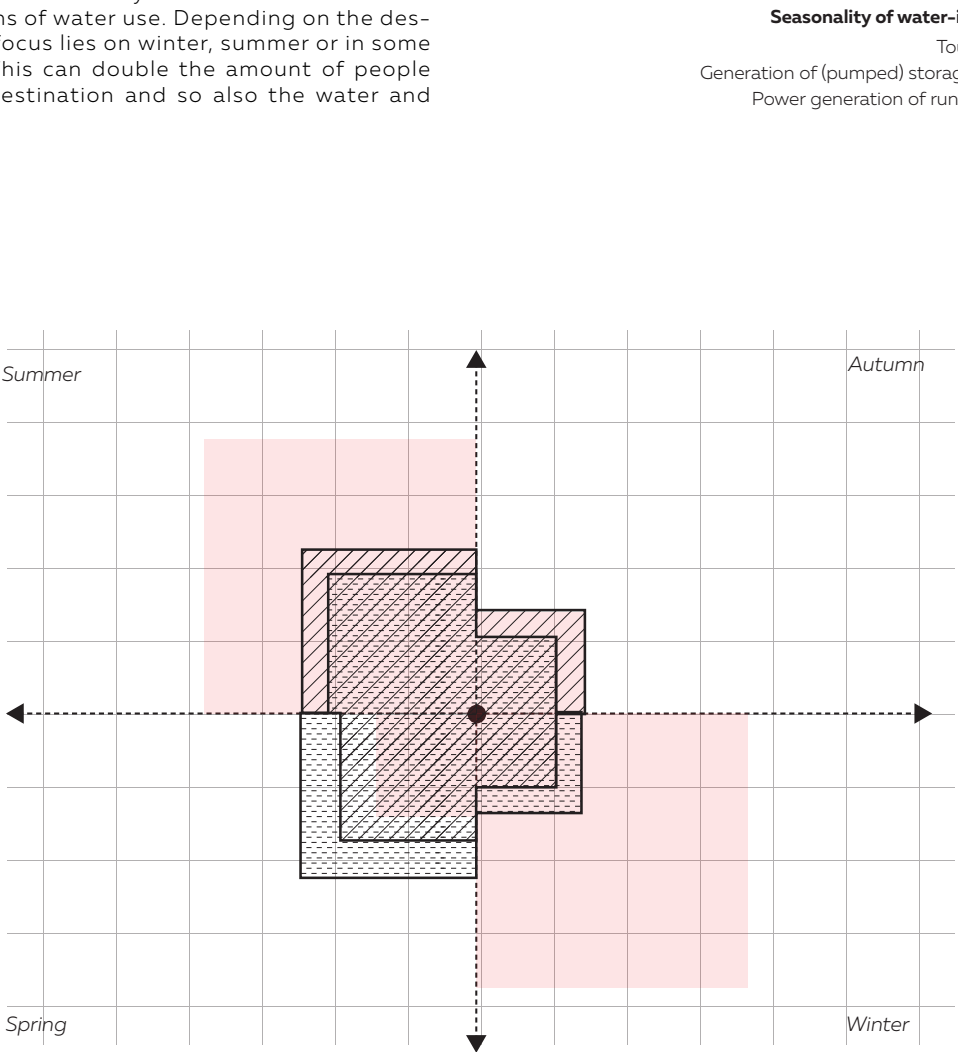


Figure 22: Seasonality patterns of hydropower and tourism
Source: Author



Figure 23: Artificial snowmaking and reservoir in Kühtai
Source: Author

I.IV Problem statement

The Alps, also called the 'Water tower' of Europe, are one of the biggest freshwater reserves of the continent, but its enormous natural capital is threatened by climate change and the exploitation of water-intensive economies. Especially inner-alpine areas, but also the surrounding agglomeration ring are affected by rising temperatures resulting in glacier melting and therefore a disturbed hydraulic system. This leads to a seasonally changed and overall reduced freshwater availability in the future (EEA, 2009). The resulting conflict of interest occurs between economic sectors, the civic society and above all, the natural environment. There are not only conflicts between these three categories claiming rights for freshwater use, but also in between the sectors exist competition. High seasonal tourism influx and hydro-power production are demanding economies for freshwater use. Nevertheless, currently the natural environment does not get a strong voice, which results in degrading ecosystem services and that is why it needs protection and conservation. In summary, this results in a currently unsustainable relationship between pre- and inner-alpine areas, since both territories are connected directly through freshwater ecosystems.

The European Union, nations and regions acknowledged this challenge and developed various cross-border and transnational cooperation programmes in the past. The most recent one is a macro-regional strategy for the Alpine region established in 2015 by various actors, which includes inner-alpine and surrounding metropolitan areas. However, the existing institutional thickness is challenging, because some programmes are targeting different objectives and are not aligned. The macro-regional strategy aims for territorial cohesion and the coordination of the institutional thickness, but is just moving recently into the implementation phase (ESPON, 2018a). This stage raises a lot of questions about the ways of co-operation, implementation and further development in sub-regional and

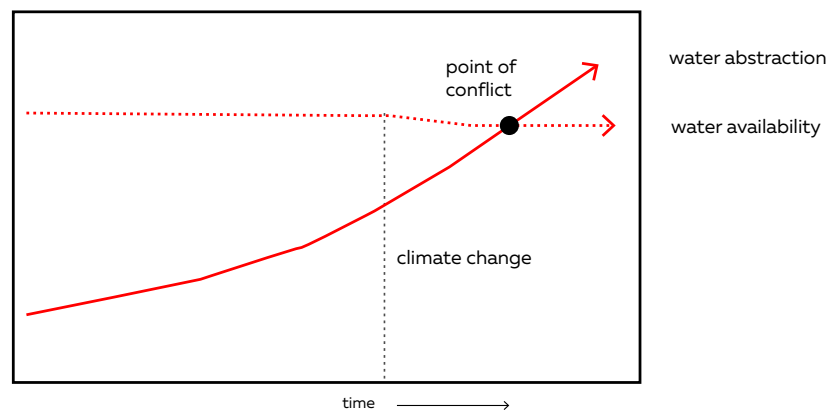


Figure 24: Conflict development based on water demand and supply in mountains, Source: Carmen de Jong, 2009

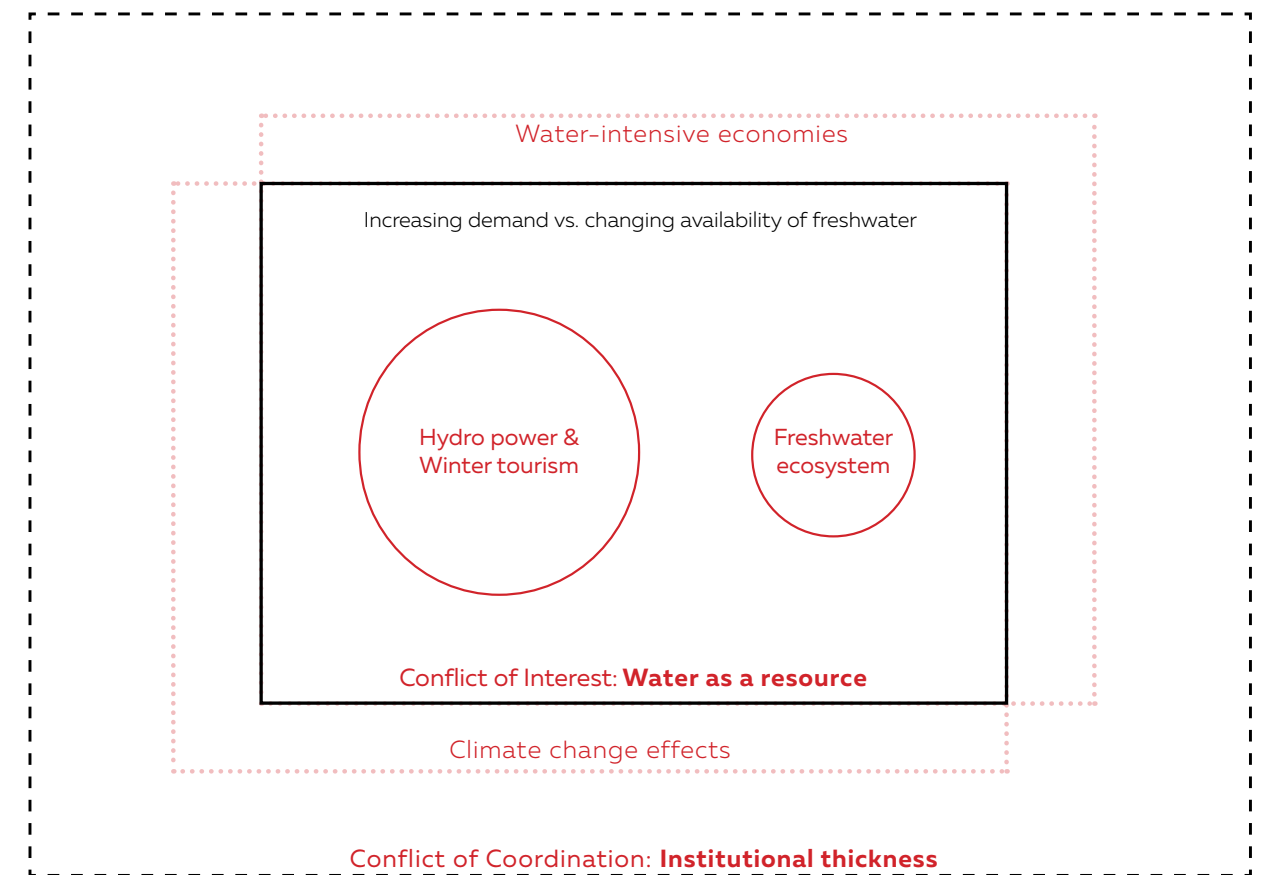


Figure 25: Scheme of problem statement, Source: Author



Figure 26: Transmission line in the Alps
Source: Author

II. RESEARCH DESIGN

II.I Introduction on methodology

This chapter explores the methodology applied during the research. It follows a clear structure contesting the questions what, how, when and why and concludes with a final overview of the research framework.

It starts with answering the 'WHAT', so describing the hypothesis, research aim, research questions, and expected outcomes. The following paragraph responds to the core of methodology, the 'HOW'. Firstly, the overall research approaches are explained, succeeded by the conceptual and theoretical framework. Afterward, the used methods are defined with an emphasis on the rationale and its relation to research questions and expected outcomes. Finally, the aforementioned answers to the 'HOW' are combined in an applied research plan describing key literature, data collection, and analysis. The following step contains the time planning of the project and answers thereby the 'WHEN'. The subsequent part responds to the 'WHY' and this includes societal and scientific relevance and ethical considerations. To summarize, a graphic of the final overview of the research is showed in the last part of this chapter.

II.II WHAT?

Hypothesis

As it is explained in the aforementioned problem statement, the conflict of interest for water use results out of tensions between different ‘stakeholders’: Economic sectors, civic society and natural environment. There are not only strains between these actors, but also within one actor group. In order to overcome this complex conflict of interest and imagine a possible and desirable scenario for the future, the reasons for the increased freshwater demand and its decreased availability have to be tackled. Currently the economic sector possesses still a lot of power to determine the use of water, whereas the natural environment does not get a strong voice.

By reorganising ecosystem services and adapting water intensive economies including hydro power generation and winter tourism, a more sustainable and socio-ecological resilient relationship between inner- and pre-alpine areas can be achieved.

EUSALP acts as a pre-given framework, and a possible role as facilitator for cross-border and cross-sectoral cooperation is tested within the aforementioned hypothesis in a smaller scale.

Research aim

This thesis aims to design a socio-ecological resilient relationship between pre- and inner alpine areas with a focus on freshwater ecosystems under the pressure of climate change. Therefore, the role and added value of EUSALP is investigated and subsequently, translated into a spatial strategy in a regional and local scale.

Research question(s)

The main research question resulting from problem statement, hypothesis and research aim is:

What are the potentials of a macro-regional strategy to develop a more socio-ecological resilient relationship between inner- and pre-alpine areas for future water use?

The following sub-research questions explore different aspects of a macro-regional strategy, the interrelation between inner- and pre-alpine areas with a special emphasis on water as a resource, a possible future scenario and finally, how the framework of a macro-regional strategy can be spatialized in a regional and local scale.

Sub-RQ1: What is the added value of a macro-regional strategy in the Alpine region?

Sub-RQ2: What are the interrelation between inner-alpine areas and the surrounding agglomeration belt?

Sub-RQ3: To what extent can the Alpine region adapt to the pressure of climate change and current development of water-intensive economies?

Sub-RQ4: To what extent can a macro-regional strategy be spatialized in a regional and local scale?

Expected outcomes

This research aims for outcomes in three different levels, however, the main product will be a regional vision and strategy of the interplay between the metropolitan area of Munich and its nearby inner alpine area within one watershed. Expected outcomes for the macro-scale are limited to a vision for the interrelation between pre- and inner-alpine areas, and in the micro-scale the spatial strategy will be translated into design interventions.

II.III HOW?

II.III.i Overall approach

Design research methodology

The overall structure of the research leans on the design research methodology by Blessing and Chakrabarti (Blessing & Chakrabarti, 2009). It is suitable, because it is a goal directed, but flexible approach. As it is explained in the previous chapter, EUSALP is moving recently from the planning to the implementation phase and therefore questions and uncertainties emerge. Thus, a pure quantitative or review-based research design is not viable.

The first stage, ‘Research clarification’, is review based and works accordingly with literature analysis. The main deliverable is an overall research plan defining the research focus, problem, aim, research questions, hypothesis, methods, expected outcomes and a time schedule. The second stage, ‘Descriptive study’, is a comprehensive study and implies as well literature review, as empirical data analysis. Main outcomes for this step are the definition of a final reference model and success criteria.

The following stage of ‘Prescriptive study’, forms the main design part. It follows a comprehensive study consisting of literature study and an assumption experience synthesis. Deliverables encompass a final intended impact model and after that, the ‘support’, i.e. the applied solution, is possible to develop. The last stage, ‘Descriptive study II’, is an initial study. This closes the project and involves first few steps of a particular stage to show the consequences of the result and prepare the results for use by others (Blessing & Chakrabarti, 2009). However, this step is hardly measurable due to he limitations of the macro-scale.

As is it explained in the next paragraph, this methodology is applied in two different scales. Therefore, its ability of iterations and parallel execution of stages is useful in many aspects (Blessing & Chakrabarti, 2009).

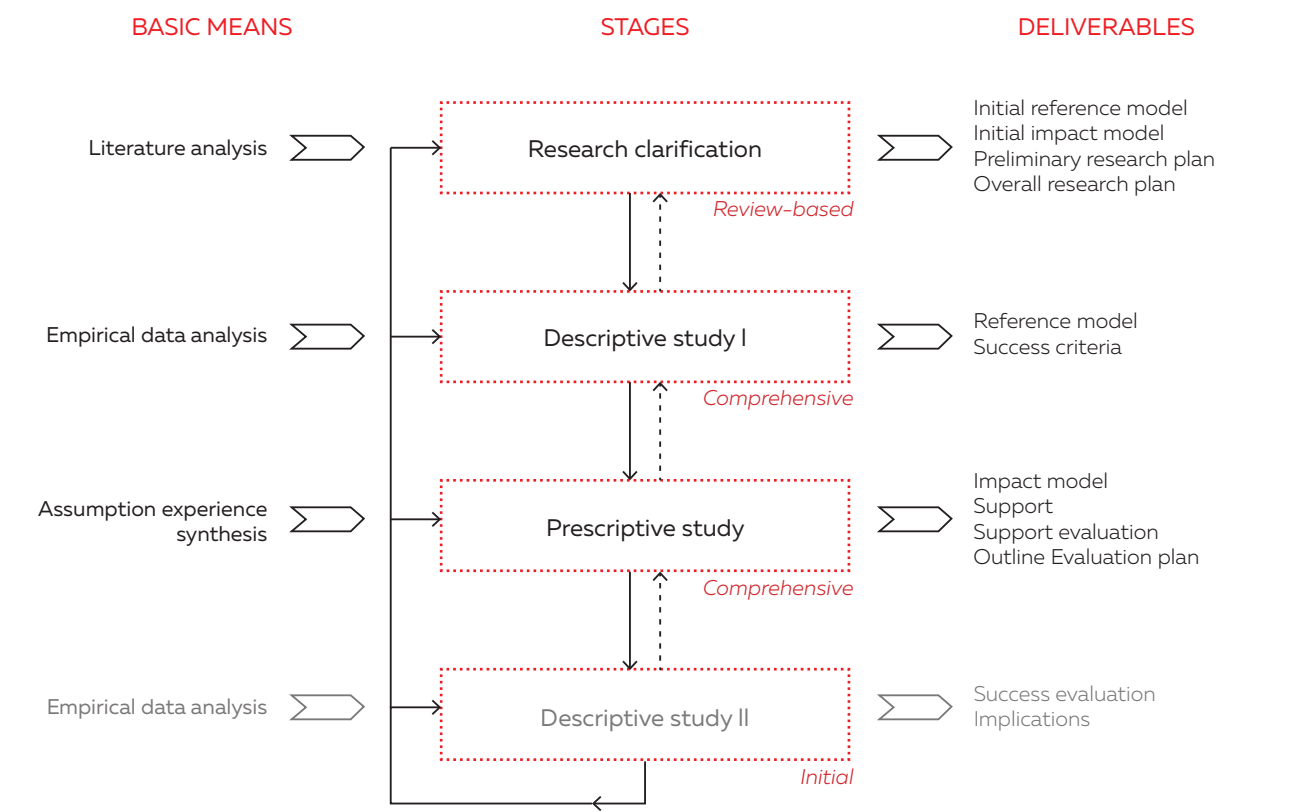


Figure 27: Design research methodology framework, Source: Lucienne T.M. Blessing, Amaresh Chakrabarti

‘Case study’ as a research strategy

The previous explained design research methodology is applied in two scales. However, the main expected outcome focuses on the scale of a sub-macro region forming the scope of the case-study. This approach allows to bridge between abstract theory in a big scale and practical knowledge in a smaller scale (Yin, 2014). Briefly, to translate the MRS in a smaller scale and understand its spatial implications. The selected approach is a single case study of a typical region, so showing clearly the before detected problems in the scale of EUSALP, and uses thereby multiple units of analysis. The following paragraph names the different scales and explains how the case study approach is situated within the design research methodology.

[L] Metropolis – Mountains // Alpine macro-region

This scale is the starting point of the investigation. The entire research clarification, so the preliminary research plan and problem statement are based on the findings of this scale. Also the main primary descriptive study takes place in this perimeter. Measurable success criteria and scenarios for a desirable future are defined in this scale and build the base for further research in smaller perimeters. The prescriptive and second descriptive study in this scale is less important. The expected outcome is limited to a vision for the interrelation between pre- and inner-alpine areas.

[M] Munich – Mountains // Inn & Isar watershed

This scale is the scope for the case-study and also the main outcome of the research. As it is explained in the previous paragraph, the findings of ‘Research clarification’ and ‘Descriptive study I’ are the base to start the methodology in this perimeter. However, these same steps have to be repeated in M-scale in order to define exact measures for the reference and impact model. Nevertheless, the main step in this perimeter is the prescriptive study, so to develop a ‘support’.

[S] Local strategic design interventions within the M-perimeter

This scale derives from the previous bigger scales and focuses nearly exclusively on the stages of ‘Pre-prescriptive study’ and ‘Descriptive study II’. Knowledge gained about the reference and impact model in M-scale are spatialized in a local level in order to exemplify what the developed strategy means visually.

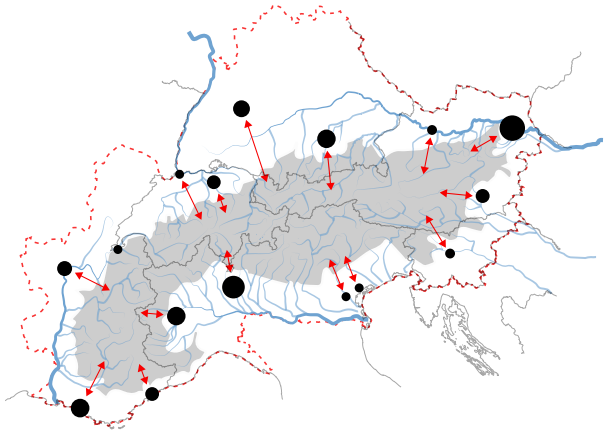


Figure 28: L-scale, Source: Author

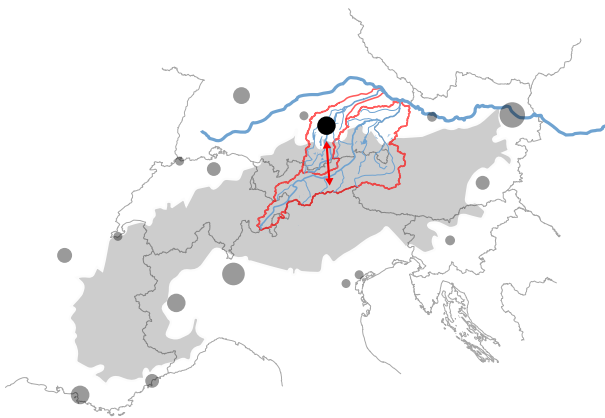


Figure 29: M- and S-scale, Source: Author

II.III.ii Conceptual framework

The conceptual framework is based on the aforementioned problem fields: Institutional thickness, water-intensive economies, and climate change effects. It elaborates relevant concepts, variables and its interrelations within each other, but also with studied theories (Figure 32). Figure 31 shows the process and connections of concepts and theories to research questions.

Conceptualizing the problem

The starting point is to conceptualize the problem statement in two main independent variables. Firstly, water as a resource deriving from a future conflict of interest through climate change effects and water-intensive economies, and secondly, institutional thickness resulting in a challenge of cooperation and implementation.

Most western countries depend for a large part of their freshwater on the permanent availability of rain-fed supplies. However, current environmental mismanagement aiming for unconditional availability and supply constructed the perception of water as an unlimited natural resource and a free economic good (Jones, 2004).

In the case of the Alps, enormous reservoirs of freshwater are used extensively by inner- and pre-alpine population, but above all by water-intensive economic sectors: tourism and hydro-power. The fact, that we are facing a decreased availability in the

future due to climate change effects is barely considered by now. So the present use provoked the perception of water as a freely available, unlimited resource, and for tourism and hydro-power generation also as a free economic good. The negative externalities of current water use affect above all the natural environment and result in degrading ecosystems.

The aforementioned conflict of water use, but also other predominant challenges in the Alpine region lead to the formation of a multitude of territorial co-operation, and this in turn to institutional thickness. It is a concept deriving from economic geography and describes a strong institutional and organizational presence in an area. According to Amin and Thrift, it is associated with an opportunity for mainly positive regional development (Amin & Thrift, 1995). However, the institutional thickness can also hinder the successful development of regions due to a lack of cooperation and coherence (Zukauskeite et al., 2017). As it is further explained in the first chapter, the Alps is a territory divided through administrative borders of seven countries and counts with several transnational cooperation programmes. The main problem thereby is, that some of the countries are organized more federal or unitary and existing transnational cooperation programmes focus on different perimeters, aim partly for distinct objectives and possess a differing organizational structure. This can hamper possible cooperation and implementation.

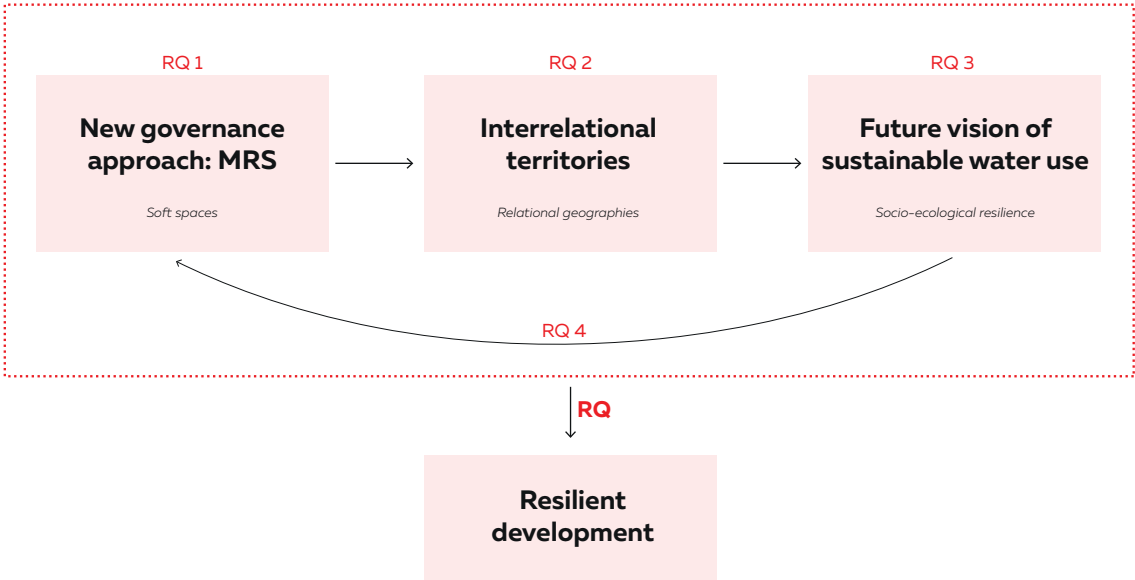


Figure 30: Abstract scheme of conceptual framework, Source: Author

Basic concepts

The next step is to define concepts which build a framework of the research. Firstly, macro-regional strategies, which react to institutional thickness, and secondly, inter-relational territories conducted from the aforementioned conflict of water as a resource.

The construct of European macro-regional strategies refers to a strategy tackling common challenges and opportunities in an area including territory from a number of different countries or regions. It is supposed to align existing cooperation programmes and funding in different scales (Sielker, 2017) and operates thereby with the so-called three NOs: no new institution, funding, and legislation. Its aim is to use existing institutional structures and funding in a comprehensive, coordinated and cross-sectoral way and thereby enhance European integration and territorial cohesion (Gänzle et al., 2016).

Regarding the development and process of macro-regions, Franziska Sielker states that they lead to new soft borders, which not necessarily develop towards own institutionalized entities with formal territorial mandates, but nevertheless, imply the rescaling of networks, policy rationales, and instruments (Sielker, 2017). The theory and principles of soft spaces are ingrained in macro-regional strategies. Thus, it is a stimulating platform of direct communication and therefore embedded in the hard spaces of institutionalized co-operation, legal states, and regions.

Another key concept of this research is inter-relational territories. This refers to the reciprocal relation between different spaces. In terms of spatial planning, this concept acknowledges multiple 'time-space' relations embedded in an open and fluid context (Healey, 2006).

In the case of my research, this concept applies to the inner- and pre-alpine areas in terms of supply and demand. Strong economic sectors of the Alps are tourism and hydro-power generation. These sectors do not only produce for their own territories but above all for the surrounding pre-alpine regions. This interdependence is supplemented by the supply of ecosystem services for the encompassing areas. Theory and principles of relational geography is an important pillar for the understanding of this concept.

Dependent variables

Next, dependent variables for the spatial and institutional outcome are defined in order to answer the final research question.

The slogan of the ESPON Seminar 'New narratives about territorial development' in December 2018 about a future vision of European post-2020 development was 'All places matter'. Previously just a limited amount of places was benefiting from EU and national development investments and there-

fore the focus lays now in concentrating especially on this area with the so-called 'place-based approach' (Rodriguez-Pose, 2018). However, other experts prefer the term 'place-sensitive' or 'place-informed' approach, they do not ignore the effects of globalization (ESPON Seminar, 2018).

The concept of a 'place-based approach' means that instead of a 'spatially-blind approach', the geographical context is considered as important for development policy-making and thereby acknowledging the social, cultural and institutional character of every place. The logic of a 'place-based approach' lays in the balance between exogenous policy action and endogenous changes, so general conditions are defined by external elites and specific targets and design projects by local groups (Barca et al., 2012). It is a soft policy and therefore a stimulating interaction between these two groups is necessary in order to overcome previous 'one-size-fits-all' development approaches.

Now changing from an institutional outcome to the first spatial dependent variable: Ecosystem services. According to the official definition by the 2006 Millennium Ecosystem Assessment, ecosystem services are 'the benefits people obtain from ecosystems', so still a human-centered concept. These ecosystems can differ in four categories: supporting, provisioning, regulating and cultural. In the case of the Alps, the amount of ecosystem services is enormous, but the focus will be on freshwater ecosystems and its direct and indirect related services. They can be assessed and thereby threatened areas detected.

Another dependent variable for the spatial outcome is water intensive economies. Currently, they and indirectly connected networks are the main causes of negative externalities on ecosystems. The generation of hydropower and tourism are the main variables selected for this research. They illustrate the aforementioned concept of inter-relational territories and can be intervened. This variable can attribute to a change of currently degrading freshwater ecosystems between inner- and pre-alpine areas.

Conclusive concept in spatial planning

Finally, a conclusive concept for the outcome of spatial planning is defined. It derives from previous concepts and describes the final aim of this research: A sustainable development for the relationship between inner- and pre-alpine areas. This outcome is also fed by theories about socio-ecological resilience, relational geographies, and soft spaces. The combination and synergy of spatial and institutional concepts frame the main added value since they consider the necessity of policies and governance to be spatial.

The new approach of soft governance of macro-regional strategies will be tested on a smaller scale, thereby counteract the future conflicts of water use and aim towards a sustainable development.

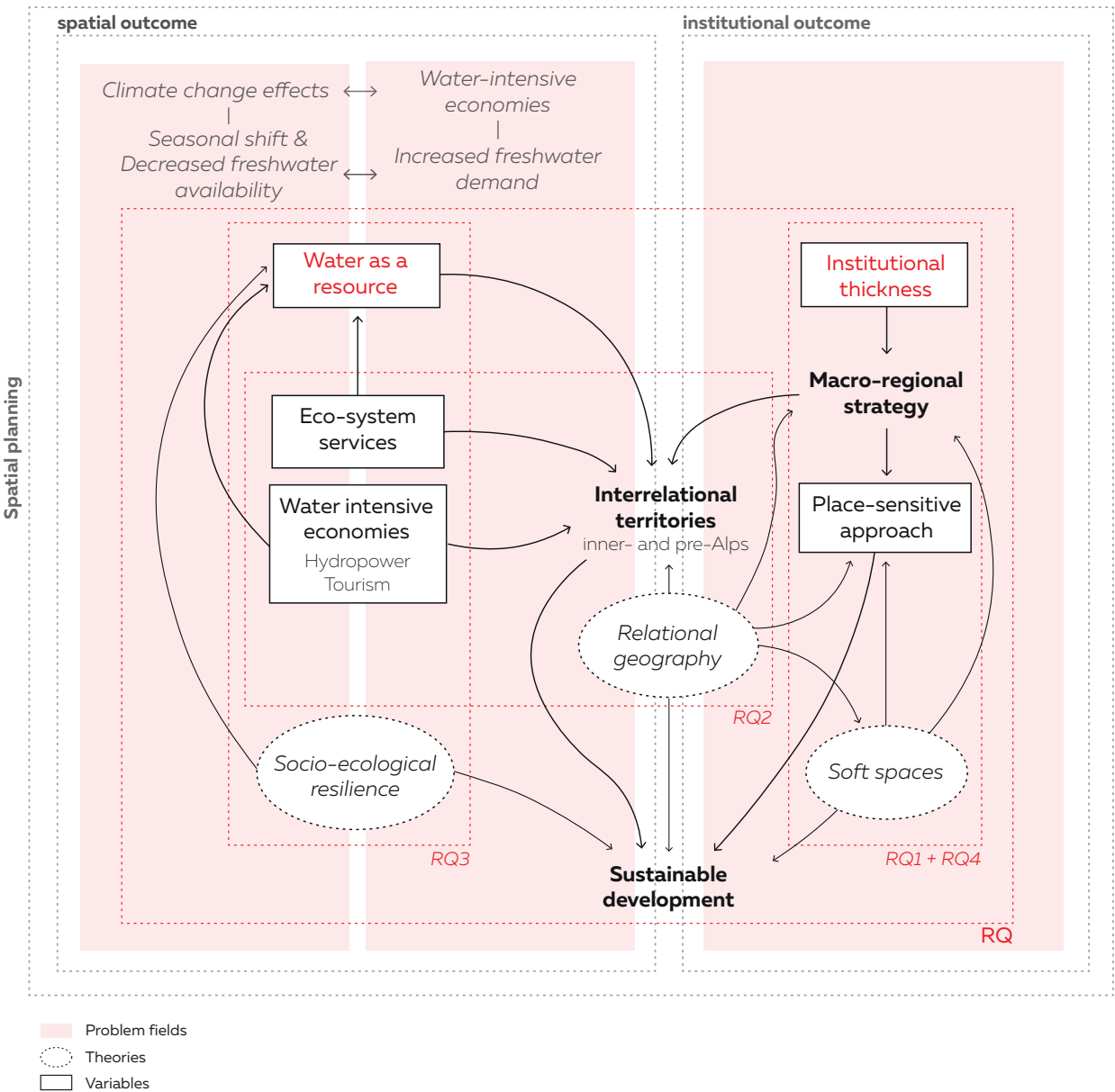


Figure 31: Conceptual framework
Source: Author

II.III.iii Theoretical framework

Relational geography

The first theoretical pillar is ‘relational geography’. It derives from human and economic geography and focuses on socio-spatial relations from a more philosophical stance. The main idea is to think of space relationally (Jones, 2009). According to Healey spatial dynamics and governance processes need to be understood in a relational way and always consider spatial consciousness (Healey, 2006). This becomes clear in a short historical recap: In the 1960s socio-spatial relations were predominated by an object centered perception, also called Euclidean conception of space, so spatial relations between cities were not acknowledged. (Graham & Healey, 2006). Whereas with the emerge of neoliberalism, the influence of economies on spatial organization increased strongly and this resulted in a lack of ‘spatial consciousness’ (Healey, 2006). This refers to the spatially-blind approach of policy-making in this globalized era. (Graham et al., 2007). However, nowadays the trend strives for non-euclidean forms of planning and recognizes the existence of many time-space geographies illustrated in fluidity and open-ended processes. In summary, Healey stresses out, that the interrelations between a place quality and multiple place-time relational dynamics need to be acknowledged. Similar to Graham and Healey, also Jones points out, that in regions it should not network against territories, but a co-existence of structure and flows and thereby considering the evolutionary nature of space (Jones, 2009). He calls this approach ‘moderate’ relationalism or a phase space due to its sensitivity to historical geographies.

Soft spaces

‘Soft spaces’ in planning is a quite contemporary concept in the European context. According to Allmendinger and Haughton, planning increasingly has to work with and through new scales of governance and makes thereby use of fuzzy boundaries (Allmendinger & Haughton, 2007). The relationality of socio-spatial relations is the main reason for the introduction of soft spaces in practice. They define soft spaces as ‘... new multi-area subregions for strategy making and policy delivery, evident at various scales of regeneration, planning, and other domains, breaking away from the rigidities associated with the formal scales of statutory plan-making” (Allmendinger & Haughton, 2009). Especially in the European spatial planning context, this concept is experiencing increasing popularity in the last decade. Forming of cross-border and transnational co-operation, sub-regions and the most recent construct, macro-regional strategies are examples of this paradigm shift. However, Andreas Faludi states that the approach of the EU territorial cohesion policy is contradicting with the occurring state territoriality (Faludi, 2016a). For national states is can be hard to accept the EU territory as a relevant frame, but nevertheless, there is a need for new spatial concepts. He describes Europe

as a ‘club of self-contained nation-states’ (Faludi, 2009), so national states proceed with its ‘container view’, but coexist in a networked world of functional areas. The most recent research on this topic is focusing on possible future scenarios of soft spaces and which kind of governance could complement the concept. Tobias Chilla states that regionalization processes often start with “soft spaces”, so fuzzy boundaries and limited political focus (Chilla & Streifeneder, 2018). Nevertheless, there is a possibility, that these soft spaces may harden in time and lead to formal arrangements. In this case, they can influence institutional capacities, stimulate reterritorialization and rescaling processes (Sielker, 2017). Conclusively it can be said, that ‘soft responses’ are exactly the theories governments are currently aiming for concerning its city-regions concept – greater co-operation rather than institutional re-organization. The most recent European construct, macro-regional strategies, embodies this approach strongly since they work without new legislation, financial resources or new institutions.

Socio-ecological resilience

Theories about social-ecological resilience are based on the assumption that ecosystems and human systems are linked (Wilkinson, 2011). Thereby the attention to human – nature interaction always played a central role for spatial planning, since its perception and therefore strategies and designs were evolving in time. In the beginning, human and natural systems were perceived as independent systems and the world view about environmental modeling was based on an “...equilibrium, the maintenance of a predictable world, and the harvesting of nature’s excess production with as little fluctuation as possible.” (Holling, 1973). The first relevant shift towards a more integrated approach between human and nature was introduced by Holling in 1973 when he questioned the assumptions of stability and predictability of ecosystems and their management (Wilkinson, 2011). Social-ecological systems became the basis of contemporary understanding of the complex relationship between the built environment and ecosystems. New concepts, such as life cycle assessment and environmental accounting allow grasping the multiple-related metabolism in varying scales (Moffatt & Kohler, 2008). According to Moffatt and Kohler (2008), the management of long-term evolution of this socio-ecological system can only be assured through appropriating ecological concepts in time, including resilience based models, and through integrating the history of nature with the history of human culture. In the case of the Alpine region, theories of socio-ecological resilience play a relevant role, because its enormous natural capital next to expanding human processes demands a new paradigm in spatial planning.

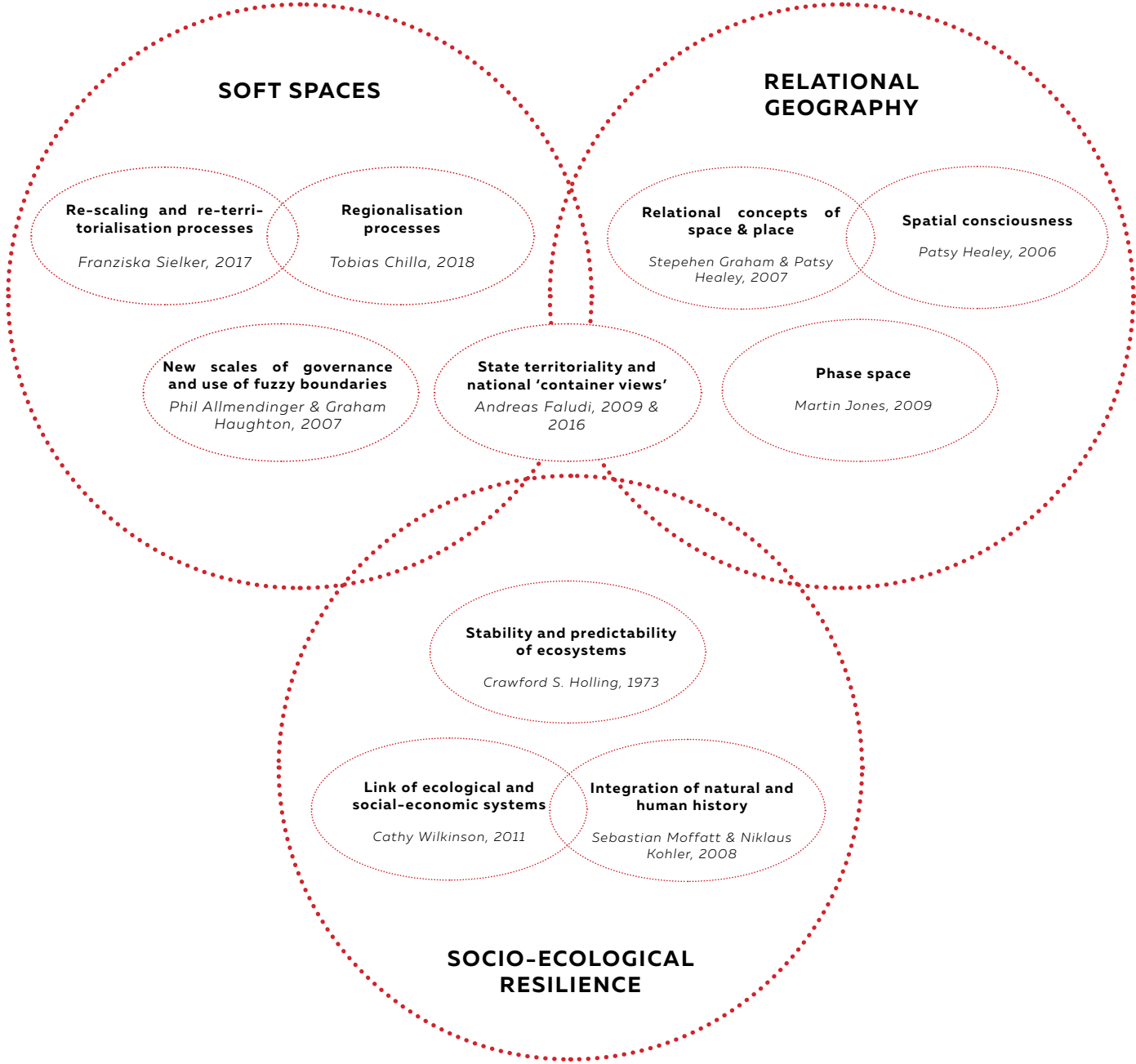


Figure 32: Theoretical framework, Source: Author

II.III.iv Methods

For this project, a mix of quantitative and qualitative research methods has been used. Since the project region is located in the European Union, a big amount of data is provided, which facilitates methods of quantitative research. On the other hand, the construct of European macro-regions is quite contemporary and recently moving to the implementation phase, which explains the use of qualitative research in a more exploratory nature.

The verification of the gathered data is done through the methodology of triangulation. Thereby cross-referencing of data allows a more complete and accurate picture of the outcomes. This method is applied to answer all four sub-research questions. The two permanent pillars of source form literature study mostly concerned with academic literature and secondary literature study existing of official reports by EEA, EU and involved states and regions. The third source acts as a gap filler and derives from interviews or/and observations during field trips and conferences.

By using a set of methods, the aforementioned sub-research questions will lead to the expected outcomes as it is explained in figure 34. The research aims for outcomes in three different levels, however, the main product is a regional vision and strategy of the interplay between the metropolitan area of Munich and its nearby inner-alpine area.

In the following paragraph, the set of methods is justified and the use of them specified in a more detailed way.

[1] Primary literature study
This method is used especially to understand the constructs of European spatial planning and to build the theoretical framework. Non-site specific theories about relational geographies and socio-ecological resilience are explored with this method and contribute finally to a regional strategy and design.

[2] Secondary literature study
The use of secondary literature is essential as EUSALP is a recent project and the implementation phase just started. Governmental and research reports about the current state of the region and common spatial perspectives are just being published and provide an irreplaceable research source to follow the ongoing process.

[3] Mapping
As the European Commission is one of the initiators of the EUSALP, open source (geo-)data is provided in portals like EEA and GISCO by Eurostat. However, more detailed research through quantitative research and mapping is needed in order to conclude the emphasis on inter-relational territories.

[4] Observations
This method is used in field trips to understand the specific spatial context. Moreover, by participating in several conferences (10/2018: EU weeks of cities and regions in Brussels, 11/2018: 'The mountain dimension of cooperation' by DG Regio in Brussels, 11/2018: EUSALP Annual Forum 2018 in Innsbruck), impressions about the cooperation in a macro-regional scale are collected, but also about the future implementations of the strategy in smaller scales.

[5] Interviews
This method is used to investigate the future of the Alps, but also economic and environmental adaptation possibilities beyond primary and secondary literature. Therefore actors from academia, EUSALP, Alpine Space programme, and the NGO WWF are interviewed about their future imagination of space and governance. Finally, these results contribute to the development of a sub-macro-regional vision and strategy and provide thereby an additional, qualitative input.

[6] Micro-stories
This method is applied in M-scale because it provides an efficient way to analyze qualitative information received during interviews. It allows illustrating complex issues by anecdotes in a more simple way.

[7] Research by design
This method is used for the development of a regional development strategy, and later for the design interventions on a smaller scale. It allows exploring the implementation of EUSALP on a smaller scale, which demands an approach more onto the ground for its imagination.

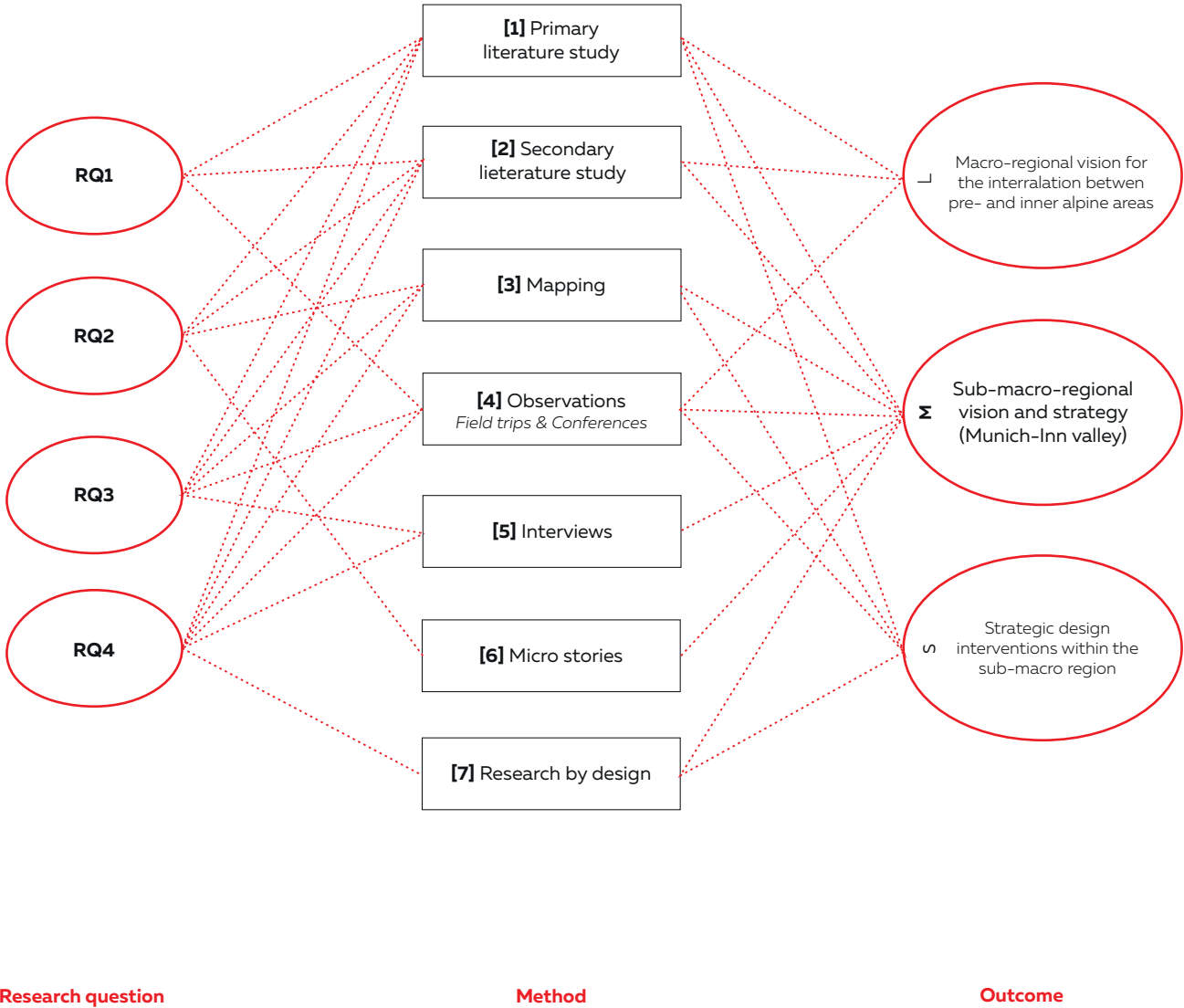


Figure 33: Research methods, Source: Author

[Research Question]				[Methods]								CASE STUDY [M]
RQ1	RQ2	RQ3	RQ4	1	2	3	4	5	6	7	8	
												<p>After the previous steps, the scope goes down to the scale of the case study. The approach is a single case study of a typical region, so showing clearly the before detected problems in the bigger scale and uses thereby multiple units of analysis. The previous steps of 'research clarification' and 'descriptive study I' are repeated briefly in order to define exact measures for the reference and impact model.</p>
												<p>c. RESEARCH CLARIFICATION [M]</p> <p>Understand the planning context [M] This part of the research explores national and regional planning contexts, and predominant cross-border cooperation programmes. The intended outcome of this section is to sharpen the outcomes of RQ1, and to start answering RQ4, so to investigate how a macro-regional strategy for the Alpine region can be spatialized in a smaller scale.</p> <p>Methods used for this part are primary and secondary literature review, however governmental documents by regions and national states build the base of this step. This is supplemented by observations of conferences.</p>
												<p>Understand the spatial context [M] This part of the research is composed by an analysis of existing territorial structures and systems. The intended outcome of this section is to sharpen the outcomes of RQ2, and to start answering RQ4, so to investigate how a macro-regional strategy for the Alpine region can be spatialized in a smaller scale.</p> <p>Methods used for this section are secondary literature review and mapping. Governmental Reports serve as a main source to understand the current situation and existing interrelations. This is complemented by mapping through GIS-data. Main sources are the COPENICUS Corine Land Cover of 2016 and various datasets of regional and national governments, as well as of EEA. This is supplemented by observations of a field trip and conferences. Finally, this leads to a better understanding of the region.</p>
												<p>Understand the interrelations [M] This part of the research explores the interrelations between one metropolis and its surrounding inner-alpine areas, and answers thereby RQ2 in the scale of the case study. Deriving from the pre-</p>

[Research Question]				[Methods]								previous research made in M- and L-scale, relational patterns of hydro-power production and consumption, winter tourism and ecosystem services are analysed in detail.
RQ1	RQ2	RQ3	RQ4	1	2	3	4	5	6	7	8	
												<p>The main method used for this part are micro stories, since it provides an efficient way to analyse considering the big scale. Interrelations can be made visible by investigating the flow of just a few products, which describe the aforementioned patterns. This method is supported by primary and secondary literature review and mapping in order to prove and spatialize the findings.</p>
												<p>d. DESCRIPTIVE STUDY [M]</p> <p>This part of my research envisions a future for the M-scale considering the aforementioned diagnosis and vision in L-scale. The intended outcome of this section is to sharpen the outcome of RQ3.</p> <p>Similar to the first descriptive study, the methods used for this part are primary and secondary literature review, mapping and additional interviews in order to sharpen the outcome. In this step the factor of seasonality is added and builds the base for the next step.</p>
												<p>e. PRESCRIPTIVE STUDY [M+S]</p> <p>The next step of the research seeks for a solution. Thereby a seasonal development strategy is designed and finally, leads to specific strategic interventions in a smaller scale. This step answers RQ4.</p> <p>Methods used for this step are primary literature study for the theoretical base, mapping and research by design. Further, all previous made analysis feeds the outcome of this step.</p>
												<p>f. PRESCRIPTIVE STUDY [L]</p> <p>After finishing the prescriptive study of the case study, findings are reflected in the macro-scale. Thereby transferability in other regions and scales is elaborated and contributes to RQ1 and RQ4.</p> <p>Main methods used are primary literature study and mapping</p>

II.IV WHEN?

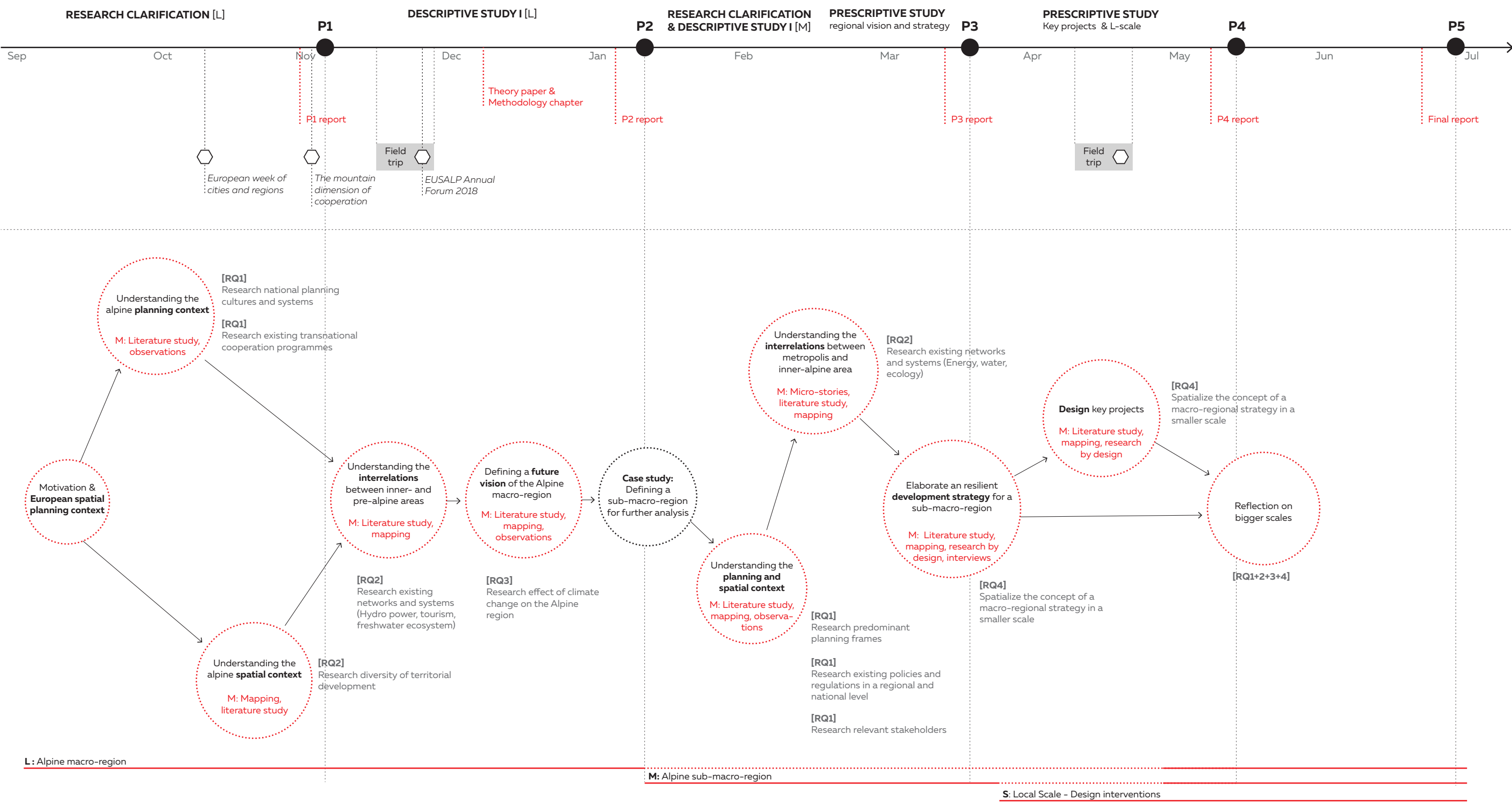


Figure 34: Research time plan
Source: Author

II.V WHY?

II.IV.i Societal relevance

The societal relevance of my project is to answer questions of water ethics in the future and with that give solutions for upcoming conflicts of interests. Thus, central questions of my projects are, if water is a public good and who gets how much and why. This is important for the society, because freshwater reservoirs will diminish in the Alps due to climate change and the current use of water as a resource will not be sustainable any more. A responsible production and consumption aligned to ecological protection is essential to provide a future for the inner- and pre-alpine areas (Grunwald, 2016). Therefore the natural environment needs to be considered as an active actor next to civic society and economic sectors such as tourism and hydro-power production.

II.IV.ii Scientific relevance

The main territorial planning challenge in the alpine region is its institutional thickness and that is why the macro-regional strategy EUSALP was created in 2015. Nevertheless, just recently it is entering the implementation phase and the translation into smaller scales is still not defined clearly. The scientific relevance of my project is to go beyond policies and objectives in a macro-scale and introduce an integral regional strategy, which translates the aforementioned objectives into space in a regional and local level. So knowledge gaps like the cooperation of cross-border planning in an implementation level are tackled, but also to understand the water as resource-conflict in a bigger picture will be addressed.

II.IV.iii Ethical considerations

This project is based on two moral pillars. Like the previous analysis showed, a conflict of interest for water as a resource is coming up in the future. Tourism is highly dependent on the climatic conditions and especially in winter the use of snow cannons demands a high volume of alpine freshwater. As the temperatures are rising, the production of artificial snow will be more and more necessary to maintain the inner-alpine economy. At the same time, the EU and national governments have big plans with the hydro-power potential of the Alpine Arc, because it gives the opportunity to reach the aims of renewable energy production. However, this would also imply interventions and disruptions of the ecosystems. As Adrian Armstrong states ‘...a thing is right if it preserves the ability of the water within the ecosystem to sustain life; and wrong if it decreases that ability’ (Armstrong, 2006). But above all, the biggest interest should be the right to water in connection to basic needs. The Alps are currently providing drinking water for over 180 million people in and around the Arc (Chilla & Streifeneder, 2018), but its range in the future is uncertain under these conditions. Conclusively this brings me to the question if water in the Alpine context can be seen as a public good or rather as a commodity? Any solution my project will provide, should prioritize the use of water for basic needs, and find an alternative to the currently economically dominated use of water in order to maintain this unique freshwater reserve as good and long as possible.

The second moral pillar is the context of cross-border planning. Thereby the question of identity plays a major role since the alpine region is part of seven different nations. Hence, it is important to scrutinize when cross-border cooperation brings added value and can actually work and when it complicates the situation. The purpose of this project is to serve as a direction. To show different actors a sustainable alternative to the current model of water use and thereby propose a feasible coordination between cooperations, regions and stakeholders.

II.VI Overview research framework

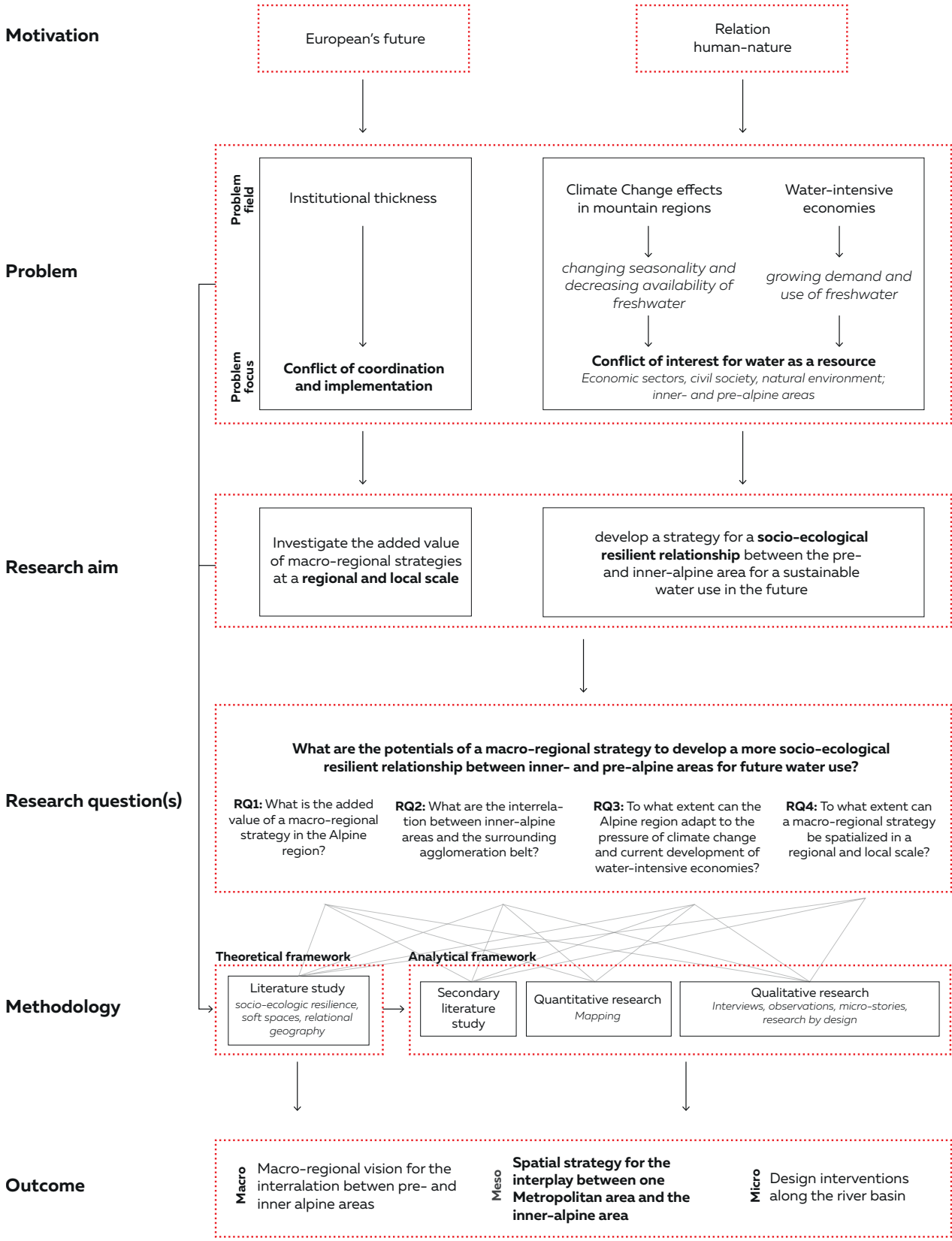


Figure 35: Overview research framework, Source: Author



Figure 36: Snow cannons in Kühtai
Source: Author

III.

INTERRELATIONAL TERRITORIES

This chapter explores the interrelations between pre- and inner-alpine areas in two different sections: Firstly, the economy of water including hydro power generation and winter tourism and secondly, freshwater ecosystem services. Thereby trends, spatial implications, external influences and externalities are analysed and lead finally to a first approach for a future vision of the Alpine region.



Figure 37: Kühltal in November 2018
Source: Author

III.I The economy of Water

III.I.i Electricity through hydro power

Trends in the European and alpine context
The objective of the EU is to supply the energy demand by 32% renewable sources in 2030. The role of hydropower is exclusively to produce and store electricity. It is one of the main sources in this challenge and makes out 14% of the existing share of renewable energies (Eurostat, 2016). According to official statistics, 40% of it is produced in the Alpine region. Currently, the EU, as well as national governments push towards greener energy generation. This implicates often the exploitation of the hydropower potential, especially in mountain areas due to their high freshwater availability and electricity storage capacities. Nevertheless, compared to other renewable energy sources like biomass, PV and wind energy the future growth potential is relatively low (EUSALP, 2017).

The electricity generated by hydropower plants in the EUSALP perimeter amounts to 176 TWh and is therefore responsible for around 80% of all electricity produced by renewable sources. Thereby national differences occur (Figure 40). However, in total electricity consumption, it just stands for 32% next to fossil fuels and nuclear energy (EUSALP, 2017).

Comparing now inner- to pre-alpine areas, it becomes clear, that most of the mountain regions cover their electricity demand by local renewable resources. Regions with most of their territory in the pre-alpine area, in turn, depend highly on electricity import or nuclear and fossil fuel (Figure 39).

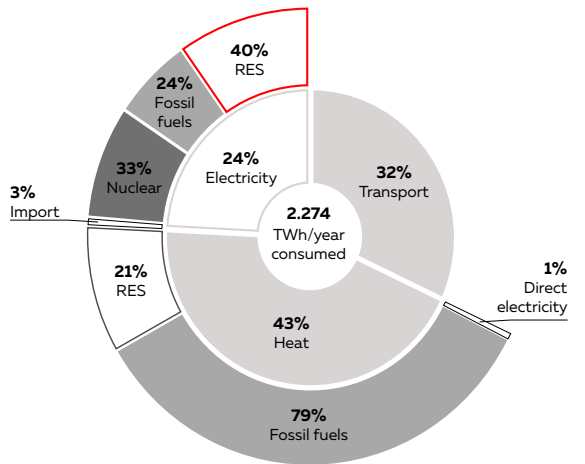


Figure 38: EUSALP Energy consumption
Source: Eurac research, EUSALP Energy survey 2017

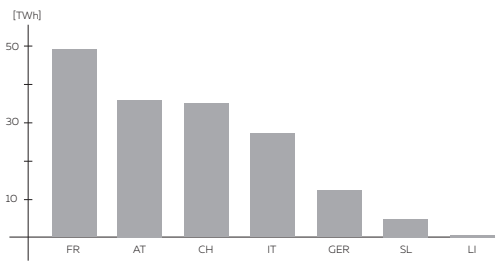


Figure 40: Hydro power production in EUSALP perimeter
Source: Arbeitsgemeinschaft Alpine Wasserkraft, 2017

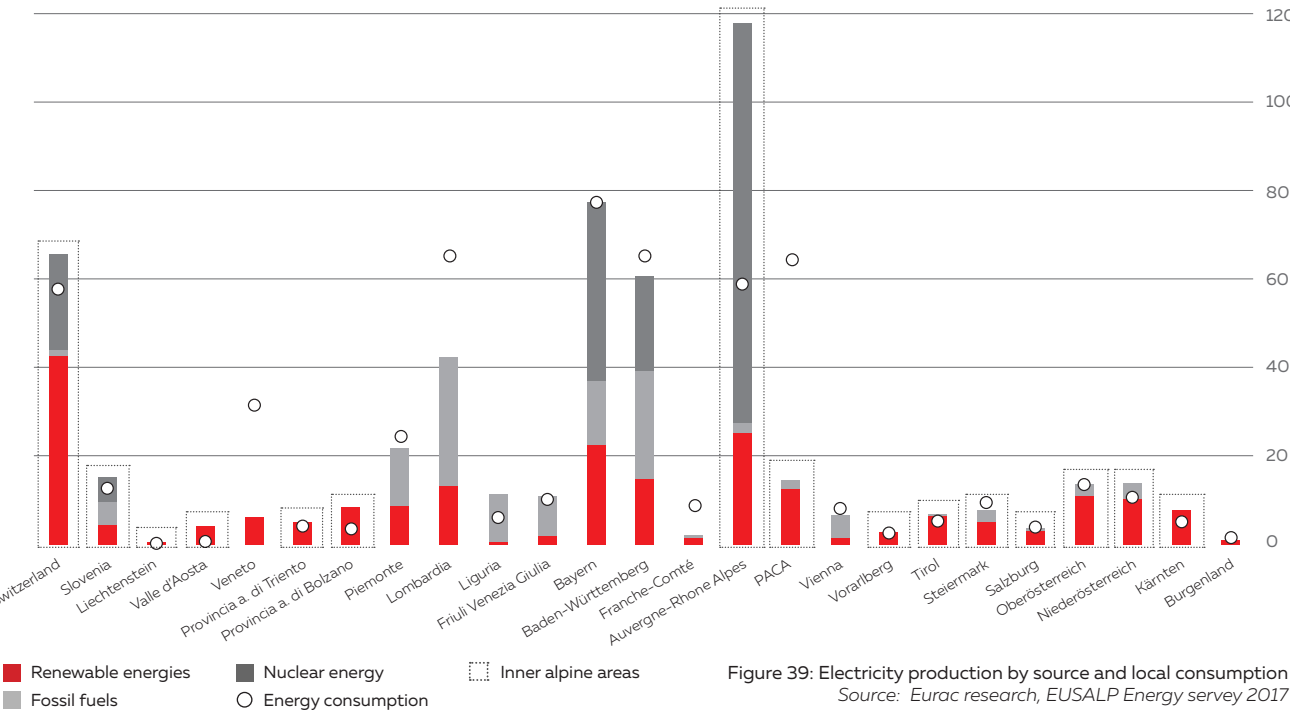


Figure 39: Electricity production by source and local consumption
Source: Eurac research, EUSALP Energy survey 2017

The spatiality of hydro power generation
The infrastructure needed to generate and distribute hydroelectric energy consists out of five main elements. Firstly, water needs to be retained in dams or reservoirs. Secondly, the natural gravity of water is used to transform kinetic into electric energy and discharges the water to a river. The previously described process takes place in a storage power plant. In turn, a pumped storage power plant can steer seasonal imbalances and pump the water back up from the lower reservoir and so repeat the process. The third type, a run of river plant, dams water directly in the river, diverts apart and uses the natural height difference. The electricity produced by all three types of hydropower plants is transferred by high voltage lines (220V-400V) to a substation. The transformed electricity is finally transmitted via low voltage lines to the final consumers.

External influences and externalities
The generation of hydropower is currently threatened by climate change effects and above all, shows negative externalities for the natural environment. Climate change leads to a changing river flow regime through a change in precipitation and temperature (EEA, 2017). Rising temperatures provoke glacier melting and therefore an increased run-off in winter, a snowmelt decline in spring and a strong decrease in the summer run-off (EEA, 2009). This changing pattern is reflected in the temporal variability of hydro energy production. Furthermore, heavy rainfalls and strong run-offs result also in increased sedimentation, which in turn leads to reduced water quality especially in downstream areas. Secondly, dams and reservoir often do not follow natural flow patterns, in turn, they release water when power is needed. This has especially environmental impacts on the aquatic ecosystem in downstream areas. Lowered river flows can alter water temperature and degrade habitat for plants and animals, which becomes clear in problems of fish migration (WWF, 2014).

In summary, climate change is threatening and pushing the future of hydropower at the same time. Current discussions about a green energy transition promote the further exploitation of hydropower, whereas environmental impacts foresee water scarcity and a changing river flow regime affecting up- and downstream areas. This paradox can be observed also in the Alpine region. Especially downstream areas experience the changing river runoff patterns due to climate change and hydropower generation, but at the same time the growing demand of electricity pushes forward an increase of this so-called 'green energy'. However, it needs to be stressed out, that these two networks, the river ecosystem, and the electricity grid, often do not necessarily overlap and therefore interrelations of action and reaction are not considered.

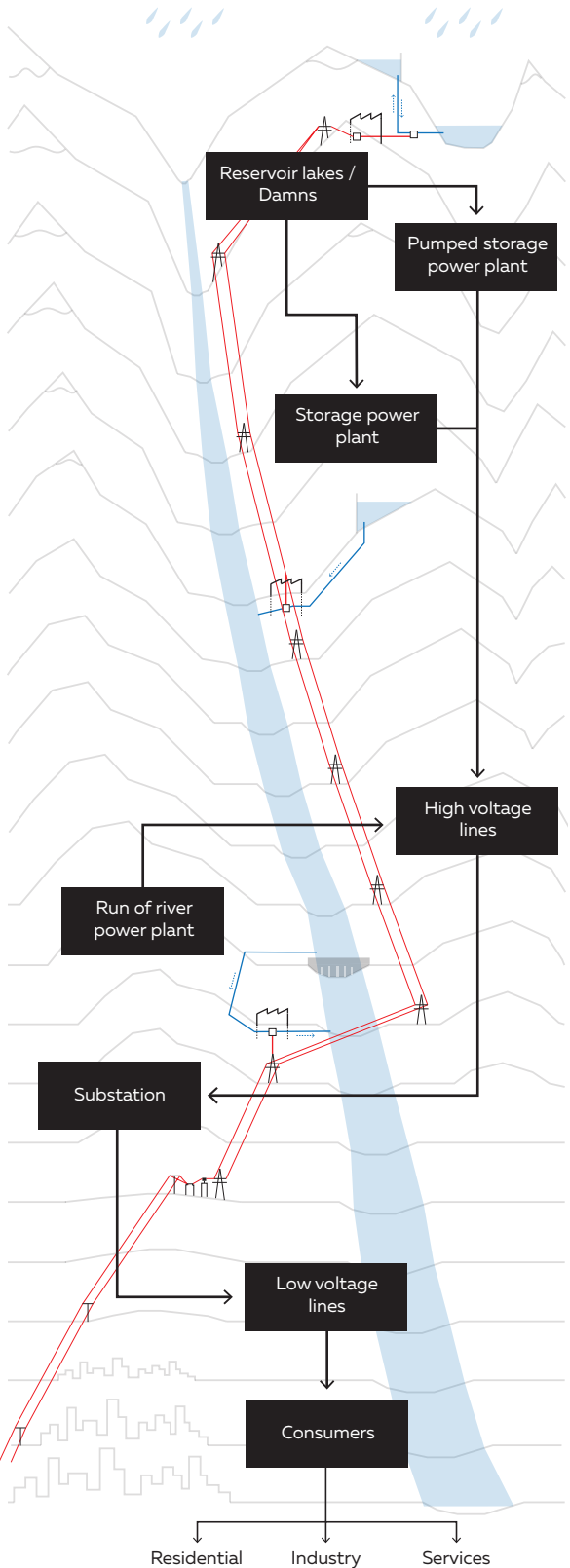


Figure 41: System diagram of hydro power generation
Source: Author

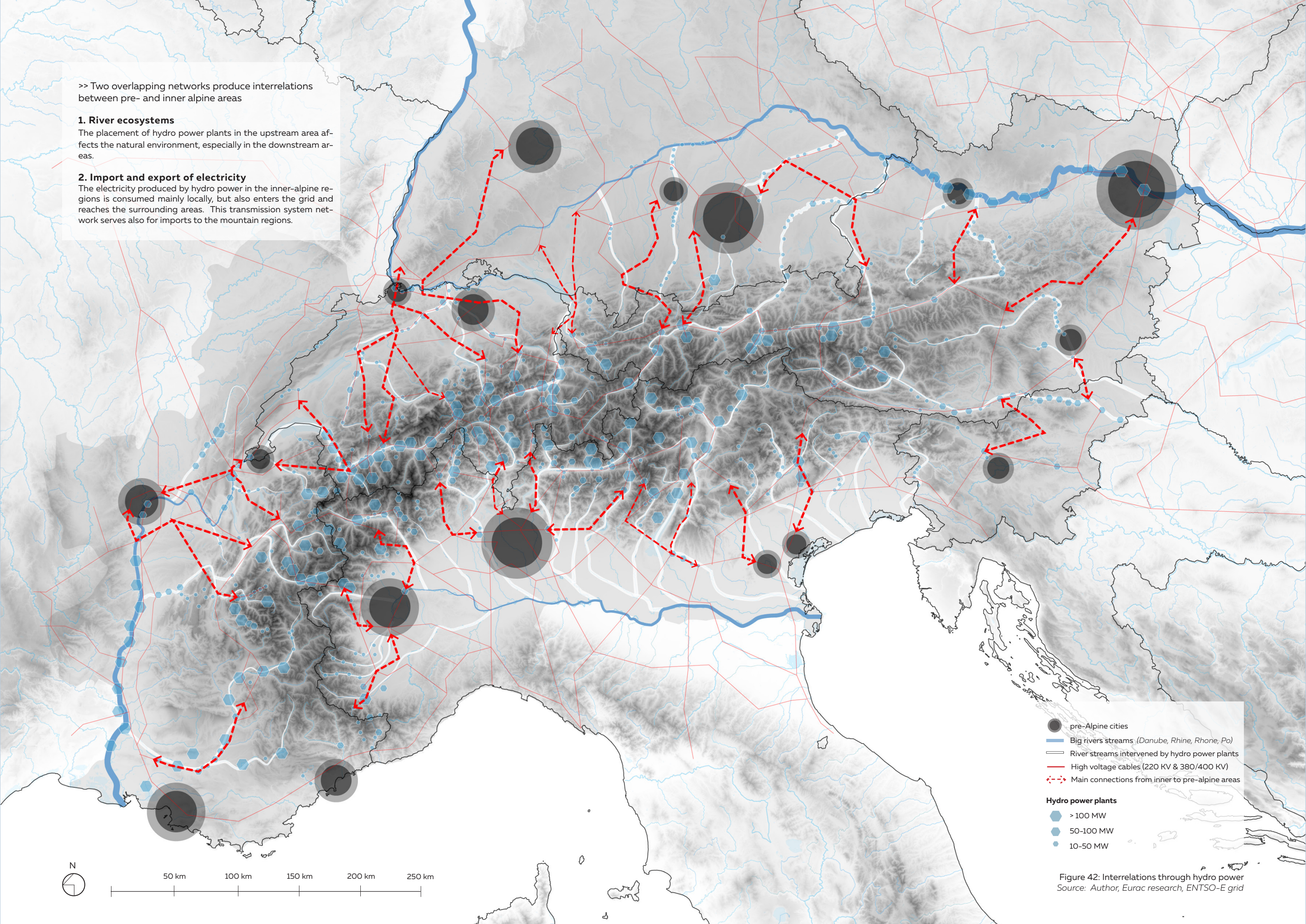
>> Two overlapping networks produce interrelations between pre- and inner alpine areas

1. River ecosystems

The placement of hydro power plants in the upstream area affects the natural environment, especially in the downstream areas.

2. Import and export of electricity

The electricity produced by hydro power in the inner-alpine regions is consumed mainly locally, but also enters the grid and reaches the surrounding areas. This transmission system network serves also for imports to the mountain regions.



- pre-Alpine cities
 - Big rivers streams (Danube, Rhine, Rhone, Po)
 - River streams intervened by hydro power plants
 - High voltage cables (220 KV & 380/400 KV)
 - Main connections from inner to pre-alpine areas
- Hydro power plants**
- > 100 MW
 - 50-100 MW
 - 10-50 MW

Figure 42: Interrelations through hydro power
Source: Author, Eurac research, ENTSO-E grid

III.I.ii Winter tourism

Trends in alpine context

Winter tourism in the European Alps plays an important economic role. Counting with the biggest amount of ski infrastructure and ski resorts worldwide, also visitor numbers reflect a similar pattern. Around 44% of the worldwide skier visits, and so also of the market share, take place in the Alps (Vanat, 2015). Figure 45 shows that especially mountain areas in Austria and France, but also Switzerland and Italy present a high share of skier days. In Figure 43 regional comparisons demonstrate, that above all in Austria and Italy the population in mountain areas is relatively low, but overnight stays exceed other regions.

However, this economic dependency on tourism is currently threatened by global warming and so decreasing snow reliability. More and more ski resorts use artificial snowmaking or even snow farming to guarantee their 100-day season and financial profitability. In order to operate this artificial process, water and electricity is needed and increases thereby the price for the leisure consumers, the tourists. This phenomenon affects above all lower skiing areas, whereas the higher, western part of the Alps still experiences comparably good natural conditions.

Currently, tourists prefer the transport to winter leisure destinations by individual car traffic, affecting thereby the natural and local environment of skiing resorts (Figure 44).

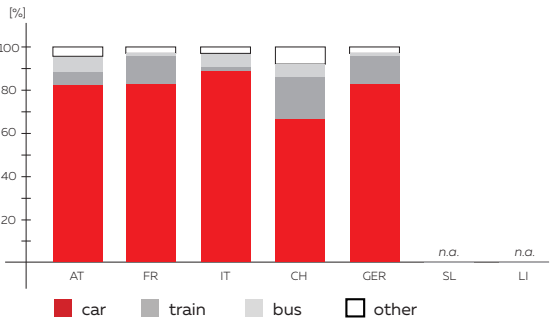
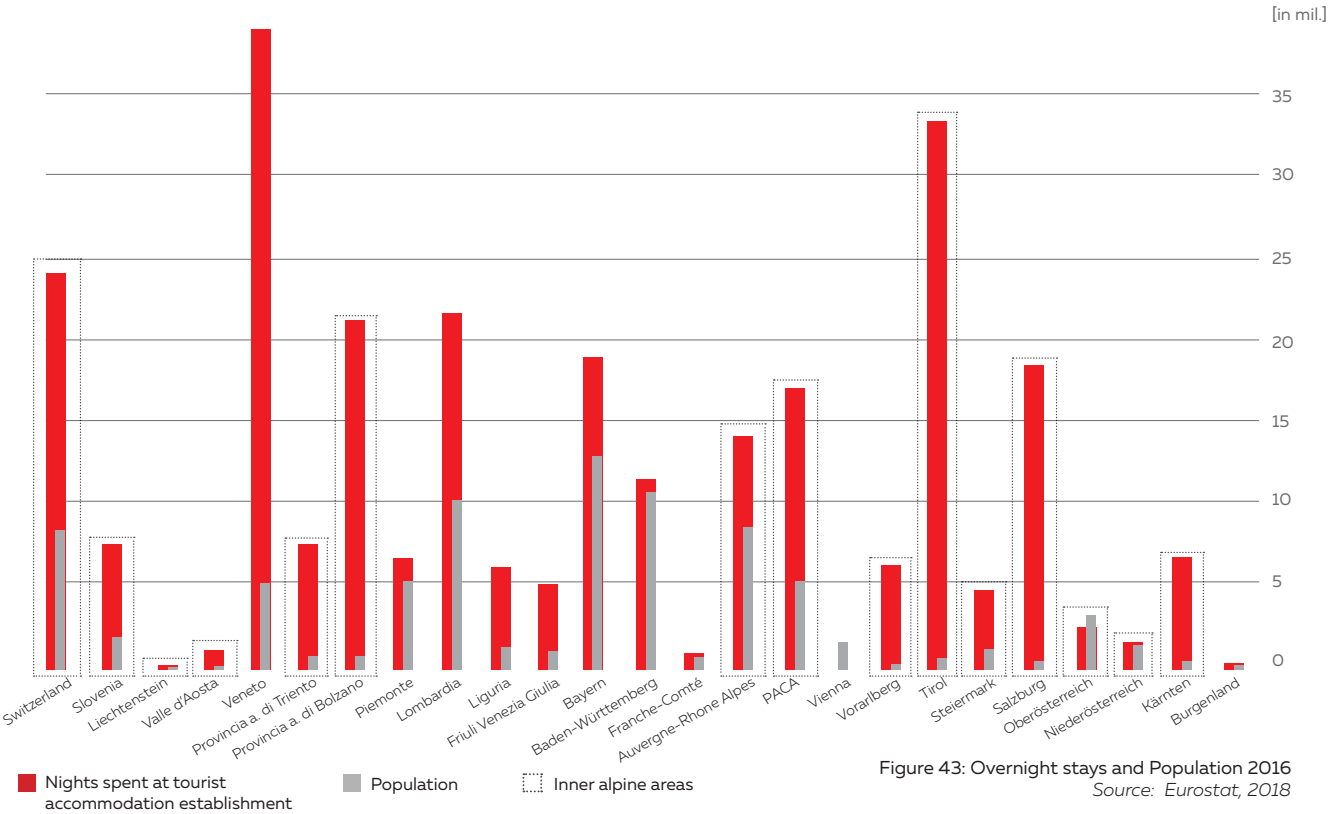


Figure 44: Modal choice in tourism
Source: Vanat, 2018

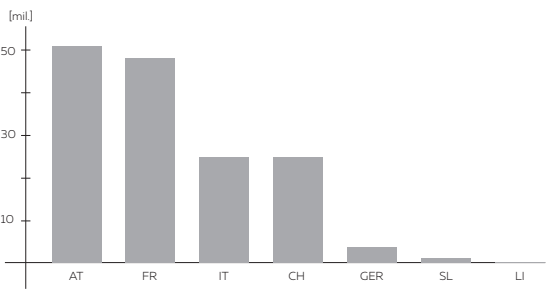


Figure 45: Skier days in 2015
Source: Vanat, 2018

The spatiality of winter tourism

The infrastructure needed nowadays to provide a season proof winter tourism in the Alps exists of over- and underground elements to transport water and electricity. Firstly, water is accumulated in artificial reservoirs and after that, transported to a pumping station. When temperatures are not low enough for artificial snowmaking, the water is cooled down in this stage. From the pumping station, the water is pumped to the snow canons via underground pipes underneath the ski run. Additional to water, also electricity is needed for this process. Electricity lines connect underground to the snow cannons and ski lifts, and over the ground to the pumping station, cable railways and the ski resorts. Another spatial implication is the current transport infrastructure for skiing destinations. Streets and big parking areas can be found in alpine tourism valleys.

External influences and externalities

The future of alpine winter tourism is threatened by climate change effects and above all, anthropogenic enforcement shows negative externalities for the natural environment.

Climate change leads to a rising snow line and affects snow reliability in a negative way. Snow comes later and tends to melt earlier. According to previous researches, the snow line will rise by 150m for each degree. This affects above all lower skiing areas, which are already dependent on artificial snowmaking, and enforces them to shortened and more variable ski seasons (Steiger et al., 2017). A study by Steiger about natural snow reliability of 300 ski areas in the eastern Alps states, that about 70% of them would no longer survive with 2°C more warming, and 90% would be endangered with 4°C (Steiger et al., 2018).

However, most skiing areas close their eyes to previously described climate change effects and invest in costly snowmaking or even snow farming in order to maintain their 100-day season. The production of artificial snow contributes to erosions effects and impacts thereby grass- and wetlands (De Jong, 2013). Compared to natural snowmelt, artificial melting water contains four times more minerals and nutrient. This effects vegetation growth and biodiversity. As trends show, most tourists just come for the day and travel by individual car to the destinations, which leads to highly congested alpine valleys and air pollution. Nevertheless, the main impact on the environment is that artificial snow demands electricity and is, therefore, no renewable resource as natural snow. Many ski resorts' budget will be exceeded by the additional costs of snowmaking and their operations will not be financially viable in the future. Besides that, also reduced river streams through water extraction and climate change, especially in autumn, will increase and influence thereby the aquatic life.

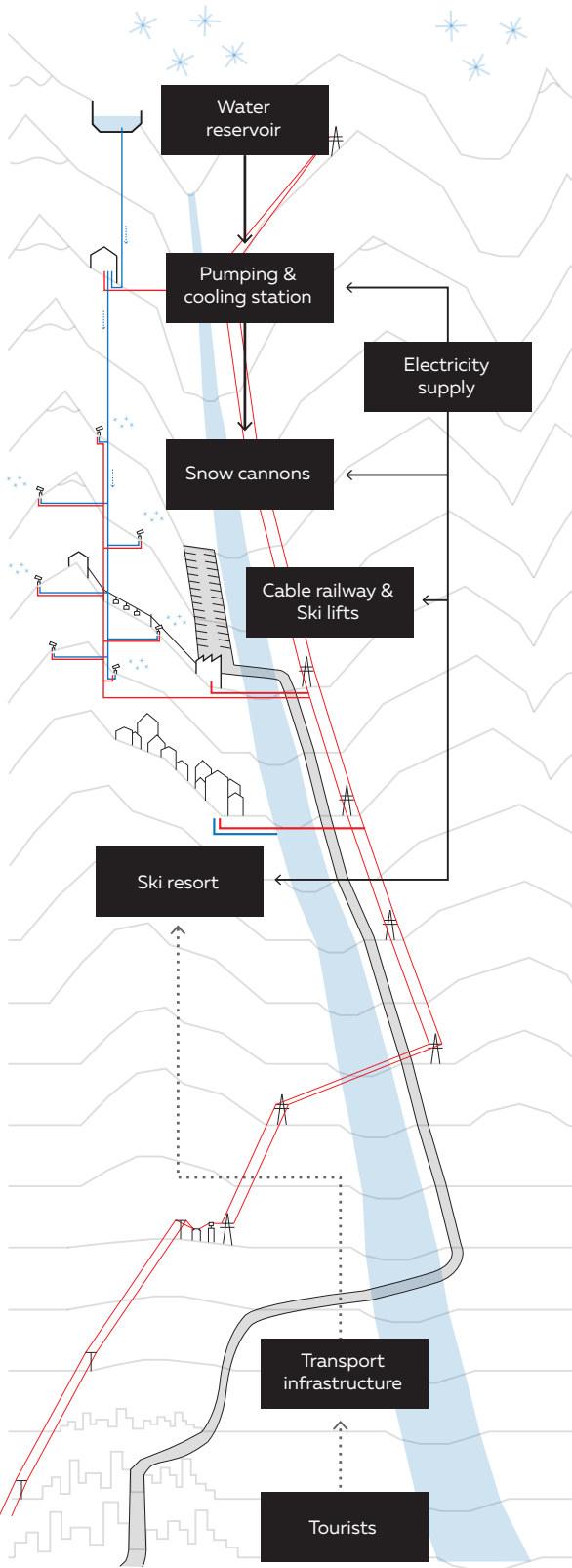


Figure 46: System diagram of hydro power generation
Source: Author

>> Three overlapping networks produce interrelations between pre- and inner alpine areas

1. River ecosystems

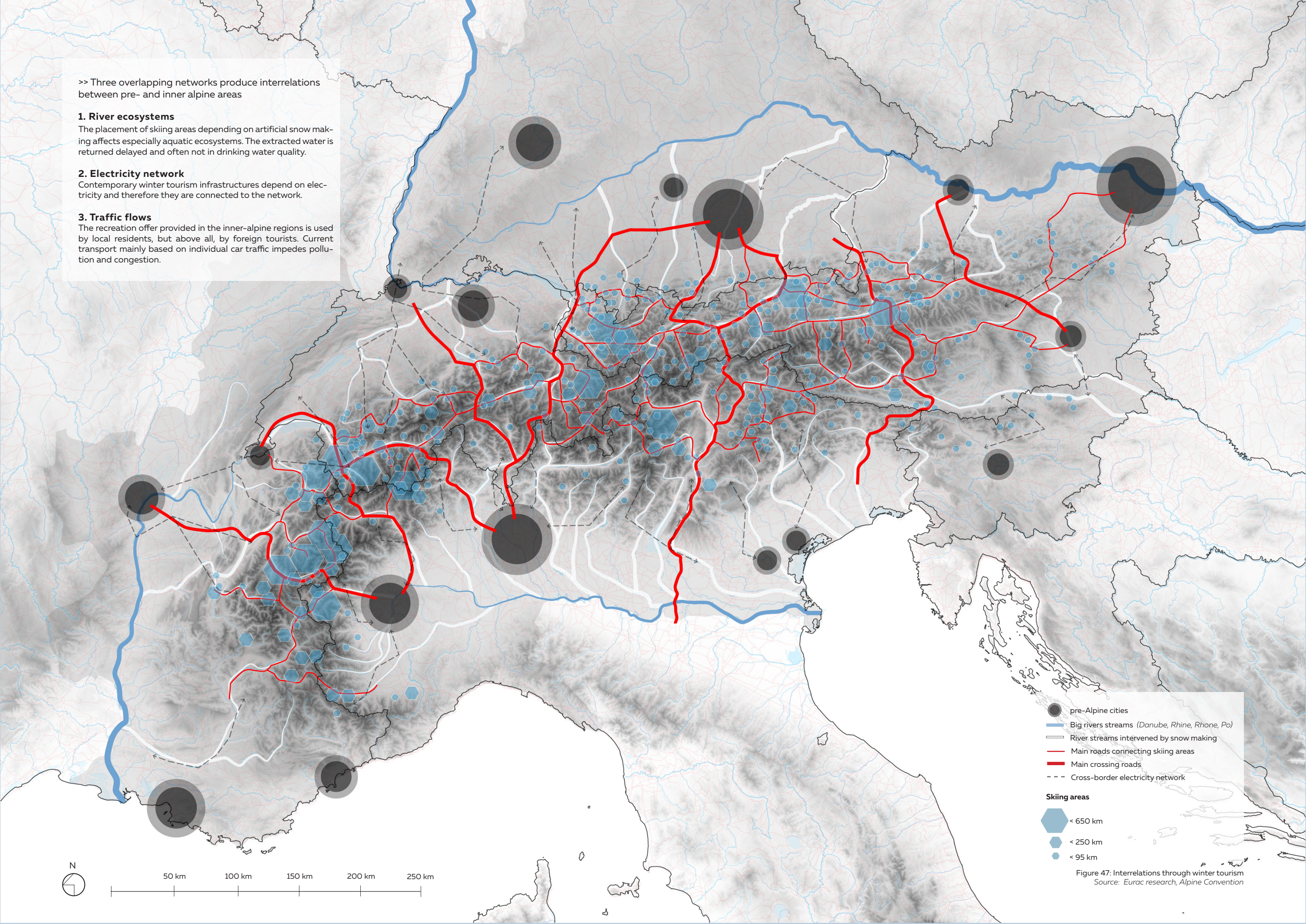
The placement of skiing areas depending on artificial snow making affects especially aquatic ecosystems. The extracted water is returned delayed and often not in drinking water quality.

2. Electricity network

Contemporary winter tourism infrastructures depend on electricity and therefore they are connected to the network.

3. Traffic flows

The recreation offer provided in the inner-alpine regions is used by local residents, but above all, by foreign tourists. Current transport mainly based on individual car traffic impedes pollution and congestion.



- pre-Alpine cities
 - Big rivers streams (Danube, Rhine, Rhone, Po)
 - River streams intervened by snow making
 - Main roads connecting skiing areas
 - Main crossing roads
 - - - Cross-border electricity network
- Skiing areas**
- < 650 km
 - < 250 km
 - < 95 km

Figure 47: Interrelations through winter tourism
Source: Eurac research, Alpine Convention

III.II Freshwater ecosystem services

Pressures on the aquatic ecosystem

An indirect driver and pressure on freshwater ecosystems in the Alps is climate change (EEA, 2018b). Especially in mountain regions it leads to a temperature rise larger than the European average, a decrease in glacier extent and volume, and thereby also to changes in hydropower potential and a possible decrease in ski tourism.

A direct driver and pressure on freshwater ecosystems is the anthropogenic perception of water as an unlimited resource (Aylward et al., 2005). This led to degrading freshwater ecosystem services in time. Through over extraction less water remains in the ecosystem, and the distribution and availability of the remaining water has different patterns. In the case of the Alpine region, extraction takes place in different surface waters like rivers, streams, lakes, and wetlands for a consumptive and non-consumptive reason (Eurac research, 2018). Another important driver is hydro-morphological pressures through physical alterations like dams. This affects the natural water flow and results in delayed and artificial flow patterns (EEA, 2018b). For example, for the generation of hydropower, the water is released according to demand and leads thereby to the high variability of water discharge compared to the natural pattern. Thirdly, diffuse source pollution through agriculture, but also atmospheric deposition affects the aquatic ecosystems (EEA, 2018b). This refers especially to the emissions by seasonal traffic congestion in alpine valleys. Degrading ecosystems have a direct impact on the flora and fauna in the water, and it also affects other species and humans, depending on clean water (EEA, 2018a).

Freshwater ecosystem services

Provisioning services in the Alpine context are freshwater for consumptive, so for drinking, domestic, agricultural and industry and ski tourism, and non-consumptive uses, like power generation and river transport (Aylward et al., 2005). Currently, these provisioning services are used heavily by hydropower generation and ski tourism as it is explained in the previous chapters.

In turn, regulating and supporting services of freshwater are declining through direct and indirect driving forces. This affects physical services like climate and air quality control, prevention of erosion, but above all the natural water flow (Aylward et al., 2005). Besides that, also biological services such as natural water purification, buffering of flood flows and nutrient cycling are altered negatively by current developments focusing on provisioning services.

Moreover, the importance of freshwater cultural services is rising in time (Eurac research, 2018). This includes above all recreation and aesthetic values. In the case of the Alps, the 'cultural landscape' is often maintained compulsively or even artificially in order to provide these services for the tourism industry. However, current climate changes need to be acknowledged and the biodiversity maintained to provide authentic and natural cultural services.

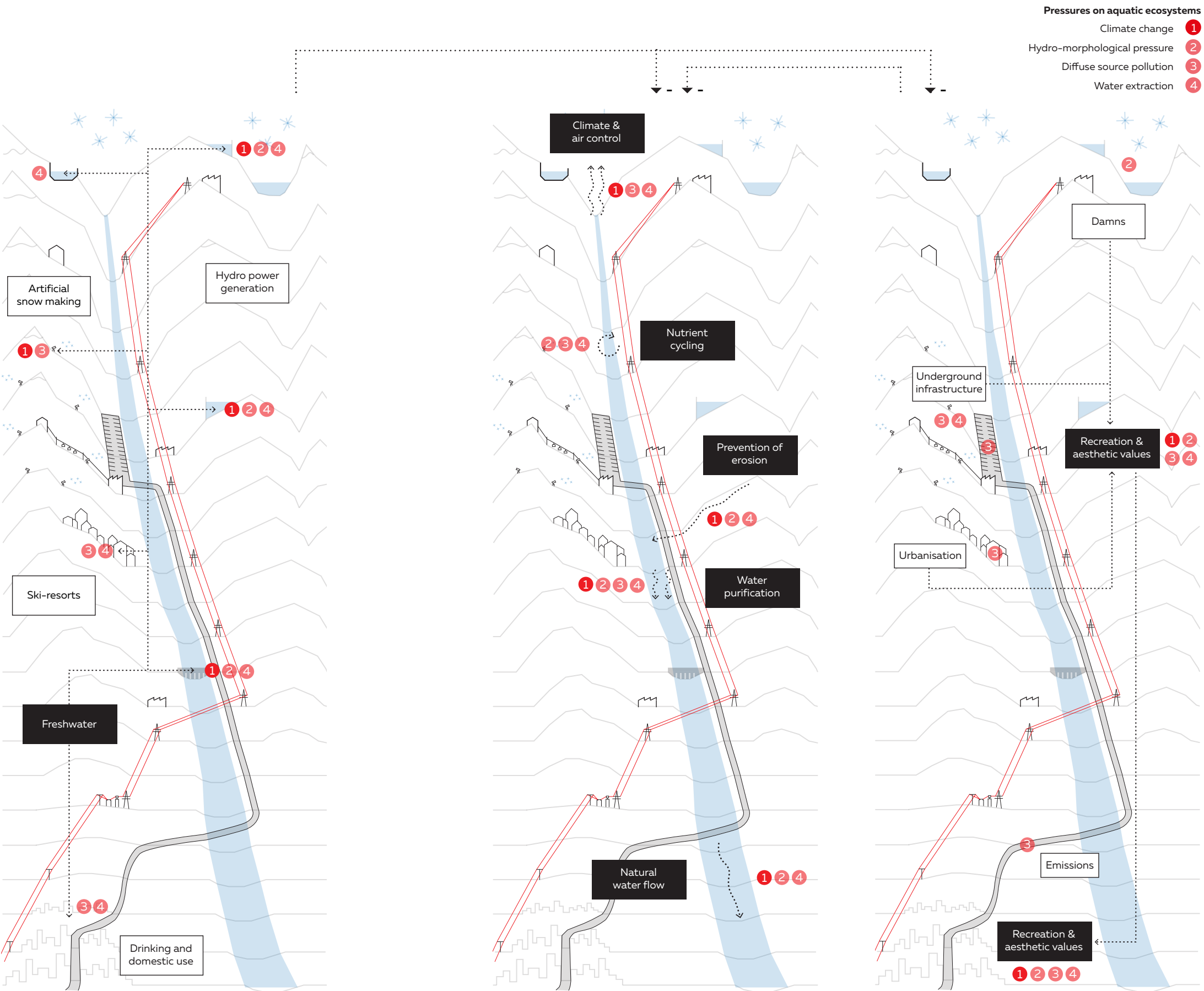


Figure 48: Interrelations through freshwater ecosystem services
Source: Author

>> The freshwater ecosystems connect directly inner- and pre-alpine areas and that is why pressures affect both, upstream and downstream areas.

1. Freshwater ecosystems

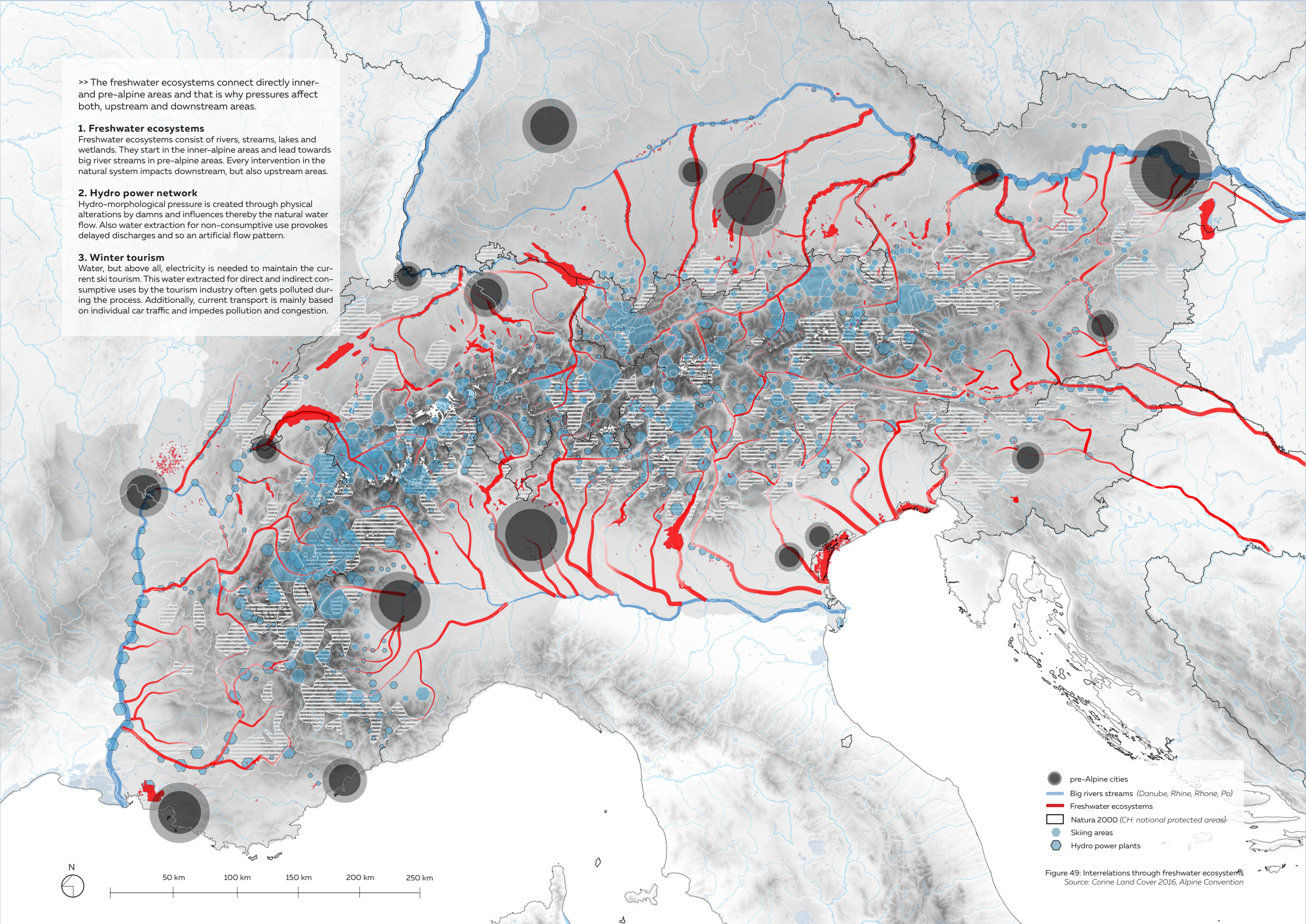
Freshwater ecosystems consist of rivers, streams, lakes and wetlands. They start in the inner-alpine areas and lead towards big river streams in pre-alpine areas. Every intervention in the natural system impacts downstream, but also upstream areas.

2. Hydro power network

Hydro-morphological pressure is created through physical alterations by dams and influences thereby the natural water flow. Also water extraction for non-consumptive use provokes delayed discharges and so an artificial flow pattern.

3. Winter tourism

Water, but above all, electricity is needed to maintain the current ski tourism. This water extracted for direct and indirect consumptive uses by the tourism industry often gets polluted during the process. Additionally, current transport is mainly based on individual car traffic and impedes pollution and congestion.



- pre-Alpine cities
- Big rivers streams (Danube, Rhine, Rhone, Po)
- Freshwater ecosystems
- Natura 2000 (CH: national protected areas)
- Skiing areas
- Hydro power plants

Figure 49: Interrelations through freshwater ecosystems
Source: Corine Land Cover 2016, Alpine Convention

III.III Conclusion

In order to summarize the interrelations between pre- and inner-alpine areas, it is necessary to reflect on the water cycle and its connection to other ecosystems. The general scheme follows the circular order of evaporation and transpiration, condensation, precipitation, surface runoff, groundwater flow and infiltration (Figure 52). However, this cycle is strongly interconnected with the air and soil ecosystem. So if these systems get polluted or intervened, it also affects the aquatic ecosystem negatively. For example, the air gets polluted by emissions through leisure traffic in the alpine valleys and the rain absorbs it partly and brings it to the soil. Afterward, it enters the groundwater and pollution reaches thereby the aquatic ecosystem. Moreover, big ski resorts and their underground infrastructure intervene the natural soil conditions by compaction and pollution and reach then also the groundwater. In downstream areas, especially

urban areas, similar patterns occur. However, the amount of people living in these areas is way higher and so the consumption of water and electricity. This leads to higher soil pollution through agriculture and domestic use, and to higher air pollution through traffic, industries and energy production. So all pollutants, which enter via air and soil into water affect the freshwater ecosystem in the Alpine region.

In summary, pre- and inner-alpine areas are directly related through hydropower generation, winter tourism and above all, the freshwater ecosystem. This includes also indirectly connected networks like the transport infrastructure and the electricity grid. In terms of water quantity, inner-alpine areas have just a mainly supportive function for the pre-alpine areas but are more important for water storage, purification and regulation. These crucial services are

currently threatened by high intensive winter tourism and increasing hydropower generation. They stress the aquatic ecosystems by water exploitation, hydro-morphological pressure, and diffuse source pollution. Additionally, climate change plays a major role in upstream and downstream areas in the present and future. This phenomenon claims for a change and adaptation because it will affect the aforementioned industries and above all the natural ecosystems.

The previous explained findings lead to the first approach for a future vision of the Alpine region. Conditions, therefore, are to acknowledge and consider the present and future effects of climate change on freshwater ecosystems, winter tourism, and hydropower generation. Instead of closing the eyes and continuing with the status quo, the idea is to rethink the relationship between inner- and pre-alpine ar-

eas. Thereby the focus lies on increasing regulating and supporting rather than provisioning ecosystem services (Figure 53). However, this implies partly the development of economic alternatives responding to these environmental challenges created by human and nature and therefore spatial implications.

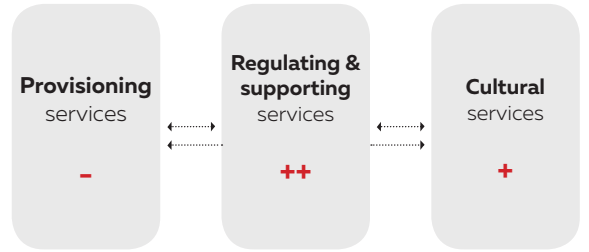


Figure 51: Intervention in ecosystem services
Source: Author

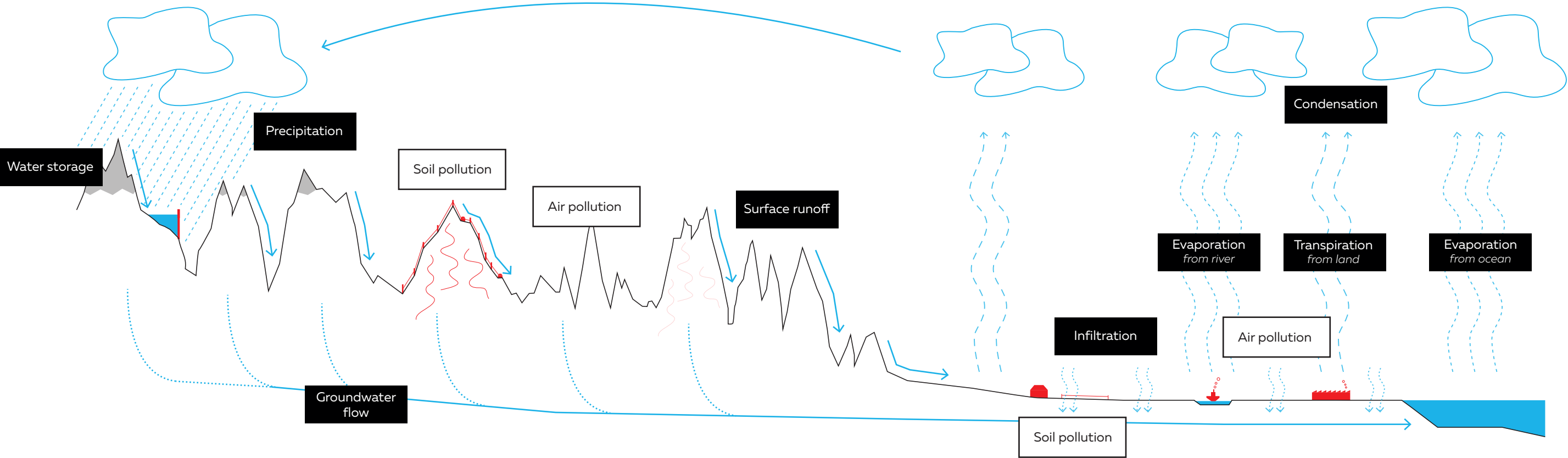


Figure 50: Reflection on the hydraulic cycle
Source: Author



Figure 52: Heating power plant in Lermoos
Source: Author

IV. A VISION FOR THE ALPS

defining a desirable future

This chapter explores and defines the future vision of the Alpine region. Thereby previous findings are integrated, references and relevant theories analysed, potential intervention areas detected and this leads finally to the definition of a future vision.

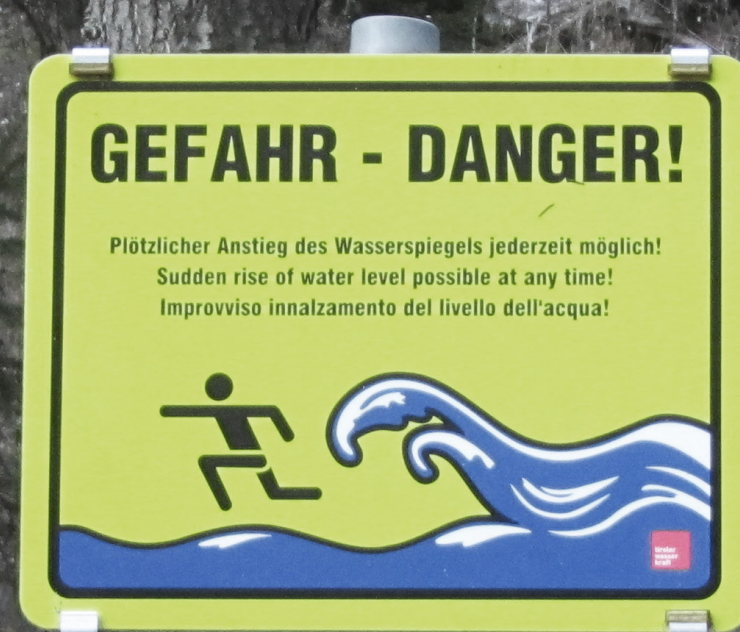


Figure 53: Sign of the TIWAG Silz hydro power plant
Source: Author

IV.I Introduction: elements of the vision

The vision for the Alpine macro-region is built upon various steps. Firstly, the resulting vision objectives of the previous chapter ‘Interrelational territories’ are enhanced and translated in the theoretical base of ‘socio-ecological resilience’. Next, the results of ESPON ‘Alps 2050’ workshop are taken as a reference and build guidelines for the vision. Thereby the vision objectives are situated in the four different elaborated scenarios by the workshop and lead to

the next step. After defining objectives, theories and guidelines for a future vision of the Alpine region, key areas for intervention are detected by spatial analysis. Thereby climate change effects, winter tourism intensity, and hydropower potential are analyzed and localized. Finally, all previous steps lead to the definition of a future vision of the Alpine region and allow me to select an area for the development strategy.

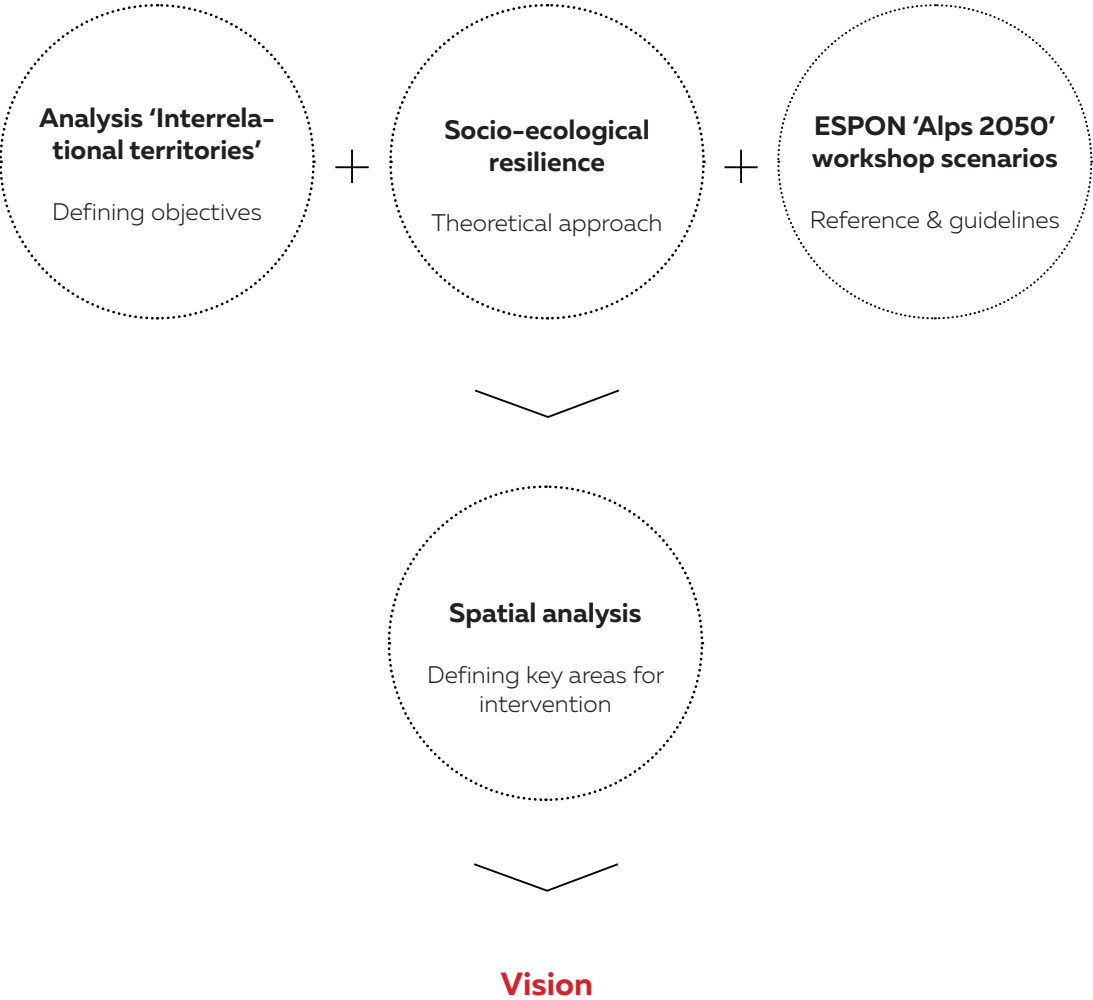


Figure 54: Methodological chart for vision building
Source: Author

IV.II From objectives to theories

As it is described in the previous chapter, the objective is to rethink the relationship between inner- and pre-alpine areas. Thereby the focus lies on increasing regulating and supporting ecosystem services, rather than on provisioning services.

In order to achieve this change, it is necessary to understand that human and ecological systems are interrelated and shape each other, in other words, a socio-ecological system (Figure 55). Currently, anthropogenic processes in the Alpine region are expanding, especially driven by the economy, and affect thereby negatively the natural aquatic systems, and this in turn the human well-being. This illustrates the complex relationship between the built environment and ecosystems and leads to my theoretical approach for the vision building. I propose the concept of socio-ecological resilience to plan and intervene in territorial developments (Figure 56). This describes the capacity to adapt or transform social-ecological systems in moments of expected and unexpected change and continues thereby to support human well-being (Folke et

al., 2016). In the stage of the vision this is visible by intervening especially exposed areas to expected change like temperature and snow line rise, but also unexpected change, like extreme rainfalls or draughts. The focus lies in the adaptation and modification of anthropogenic systems affected by the aforementioned expected and unexpected changes.

Therefore further research about the development strategy in a smaller scale needs to focus on possible changes and interventions of the socio-ecological system, so considering the interrelation between human and natural processes. For example, areas exposed to climate change effects and at the same time highly dependent on winter tourism need economic alternatives and a new ‘softer’ way of tourism. Moreover, ecologically friendly energy generation affects all areas with still high hydropower potential. The possibility of small hydropower plants or other sources like solar and biomass need to be explored.

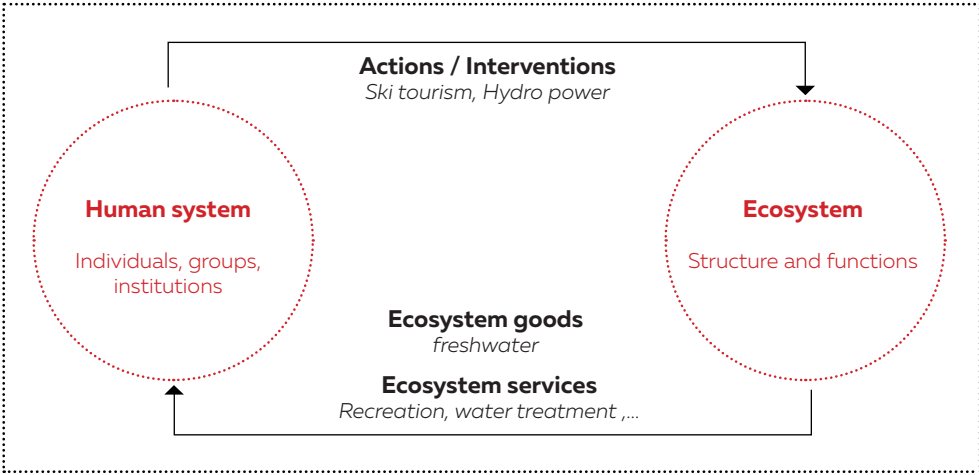


Figure 55: Elements of a socio-ecological system
Source: Resilience Alliance, 2007

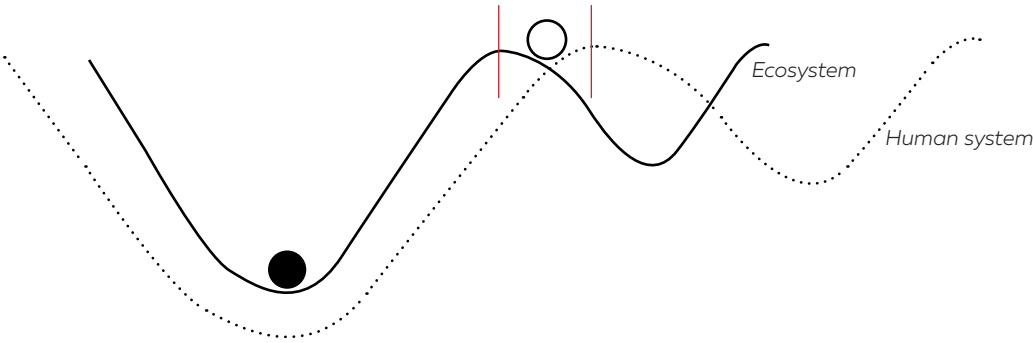


Figure 56: Socio-ecological resilience
Source: Arctic Resilience. Interim Report 2013, p.16

IV.III Defining guidelines: ESPON 'Alps 2050' workshop

This stakeholder workshop was organized in 2018 in Munich exclusively for experts. It is based on the results of the ESPON 'Alps 2050' study and explores possible future scenarios for the Alpine region (Figure 59). Thereby the Delphi method was applied and results in a vision based on three layers: settlement system, linkages, and territories. The final vision derived from a previous elaboration of four different scenarios, which are composed of three distinct themes: People and territories, economy, environment. This allows the combination of various sub-scenarios to define the final version.

The first scenario, 'status quo', refers to ongoing fragmentation and increased climate change issues, economic growth performance with strong metropolisation trends and increasing territorial frictions. Secondly, 'protected Alps' describes a vision of harmonized connectivity and priority on climate change adaptation, a focus on green economy and endogenous potential, and lastly, concerning people and territories, limited growth dynamics in the inner-alpine areas and more sustainable devel-

opment in pre-Alpine areas. In the third scenario 'functional space' the focus lays in the reorganization of ecosystem services and cross-border management, a balance in endogenous potential and competitiveness, and the mitigation of border effects, which can allow stronger functional linkages. The last scenario 'European core' refers to the focus on the unique landscape and ecosystem services from a European context, the development of particular assets and overcoming bottlenecks on a global scale, and finally the development of 'hub qualities' ensuring flows on a large scale (ESPON, 2018a).

The scenarios elaborated by the workshop focus on many aspects of future alpine development, however, the scope of this investigation is limited to freshwater use. Therefore just parts of the outcomes can be taken as a guideline. So in the next step, my vision based on previously established objectives and theories is taken as a reference and situated in the framework of the 'Alps2050' scenarios and results finally in guidelines for the further vision definition.

The vision is situated between the scenarios of 'Protected Alps' and 'Functional space'. This results out of the previous research of interrelated territories, which clearly states that pre- and inner alpine areas are connected, so a functional space. On the other side, the investigation focuses on ecosystem services and climate change effects and claims thereby for protection of the inner-alpine areas, so also a certain decrease in functional interlinkages. This describes the need for a vision in a transitional stage.

For the category 'People and territories' my vision supports guidelines of both scenarios. Firstly, it backs up 'Protected Alps', because it pushes further the ecological role of the mountain area on the political agenda and demands limited growth dynamics to avoid further soil sealing and ecological disconnection trends. Therefore touristic infrastructure erection is restricted, and in the most vulnerable areas, even forbidden. In turn, 'Functional space' wants to strengthen the relationship between pre- and inner-alpine areas in order to over-

come border effects. Besides that, also domestic, international and cooperation forms are linked and promote thereby financial support of 'soft instruments'. For the category 'Economy' my vision aims for regional value chains, so exploiting the endogenous potential, but at the same time acknowledge necessary functional inter-linkages of pre- and inner-alpine areas. For the category 'Environment' my vision supports guidelines of both scenarios. On the one hand, climate change adaptation and energy issues deriving from 'Protected Alps', and on the other hand, acknowledging the functional linkage of ecosystem services between pre- and inner-alpine areas according to 'Functional space'.

In summary, the vision deriving from the 'Alps2050' scenarios does not aim for pure protection and isolation of inner-alpine areas, but a sustainable transition of the interrelations between pre- and inner alpine areas. However, economic interlinkages will decrease in time, but ecological interrelations need to experience more attention and importance (Figure 60).

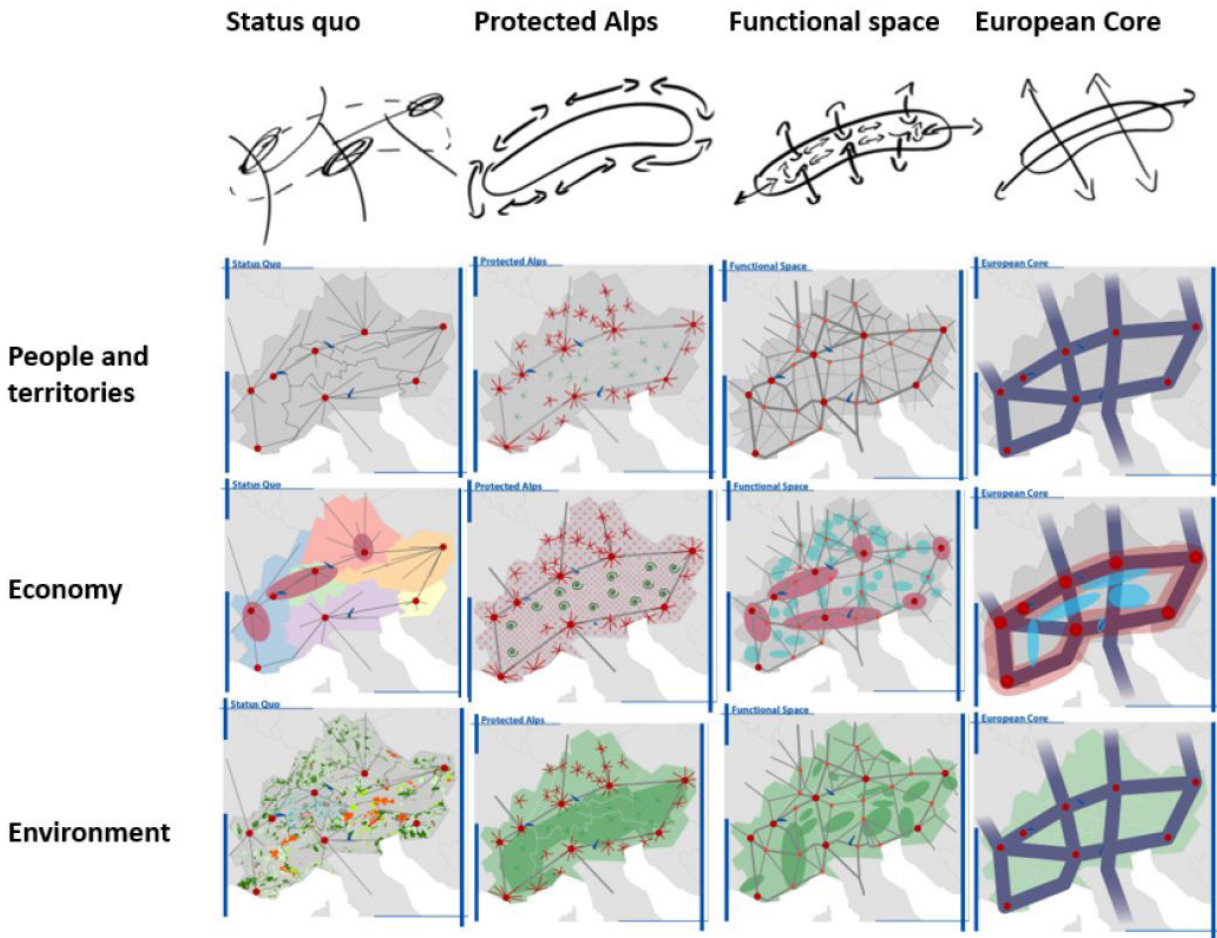


Figure 57: Results of ESPON 'Alps 2050' workshop
Source: Tobias Chilla, EUSALP annual forum 2018

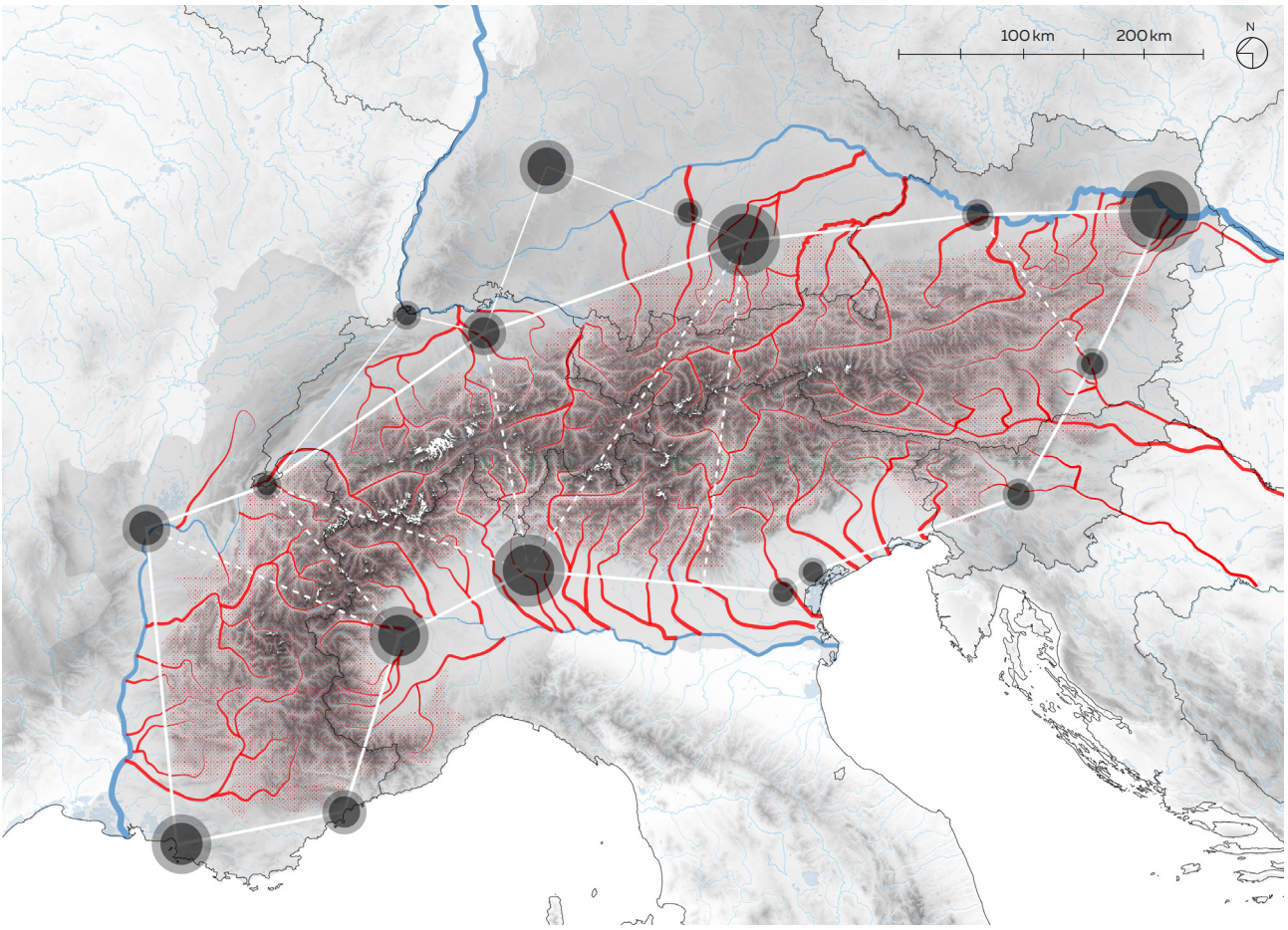


Figure 58: Vision guidelines deriving from ESPON 'Alps2050' workshop - Ecological and functional linkages
Source: Author

IV.IV Defining key areas

Climate change effects

The first step towards a vision is to detect and localize especially vulnerable areas affected by climate change. In Figure 60 it becomes clear, that especially the higher areas of the Alpine Arc will experience significantly higher temperatures in the future. However, these changes affect the freshwater ecosystem and therefore also the surrounding areas. Figure 61 illustrates an overview of the present precipitation pattern and trends for the future. Thereby it becomes clear, that especially in the already dryer south-west precipitation will decrease, and in the wetter north-west increase.

Now overlapping these two changes, it is possible to detect vulnerable areas affected by both phenomena. Figure 59 shows that especially the western part of Austria suffers from precipitation increase and high-temperature change at the same time. In turn, the western Alps in Italy and France are experiencing a temperature increase combined with precipitation decrease and provokes thereby a different challenge.

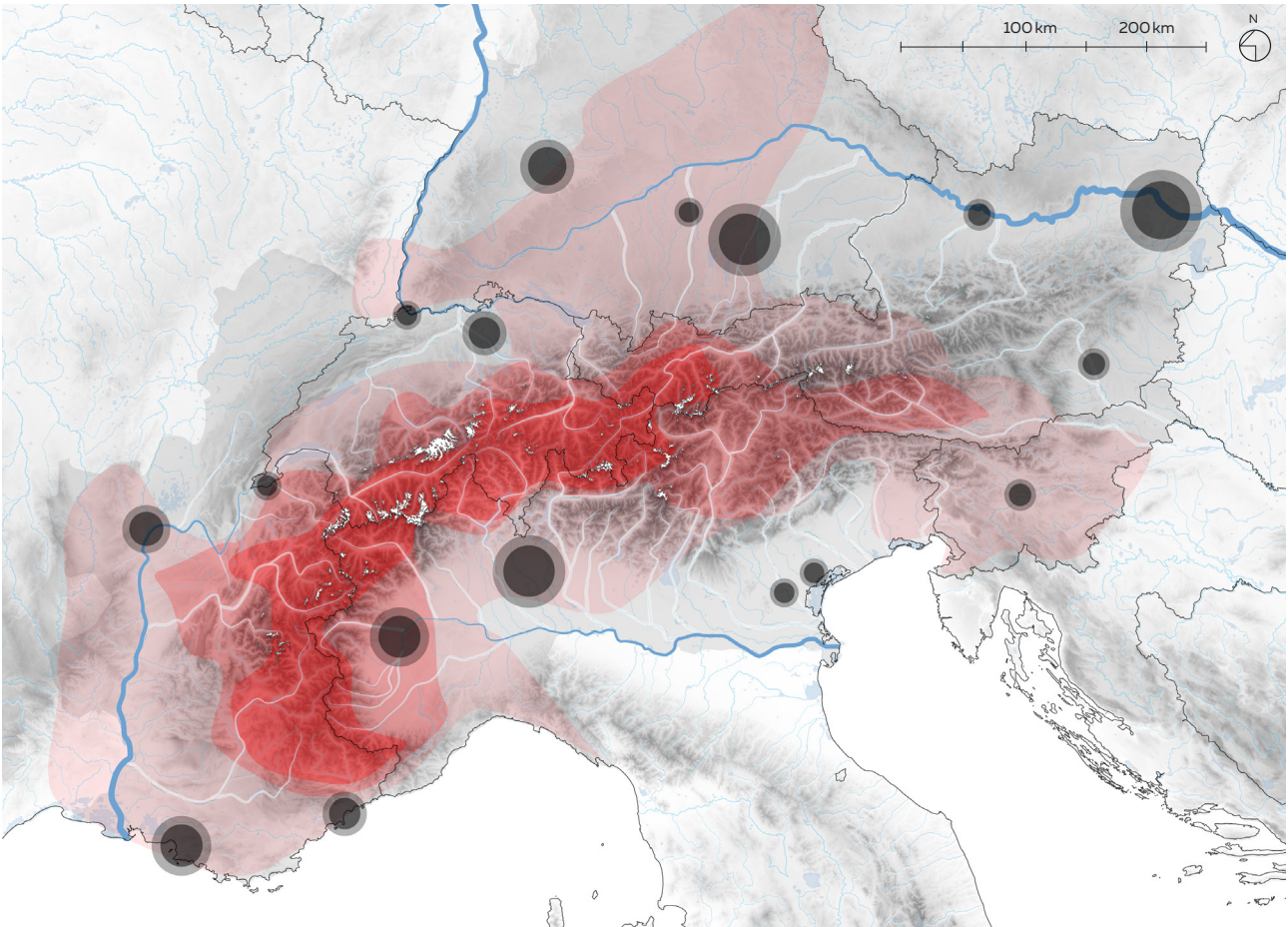
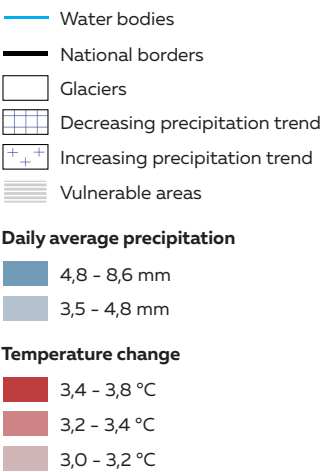


Figure 60: Temperature change in annual mean temperature until 2100
Source: ESPON report 'Alps2050', 2018

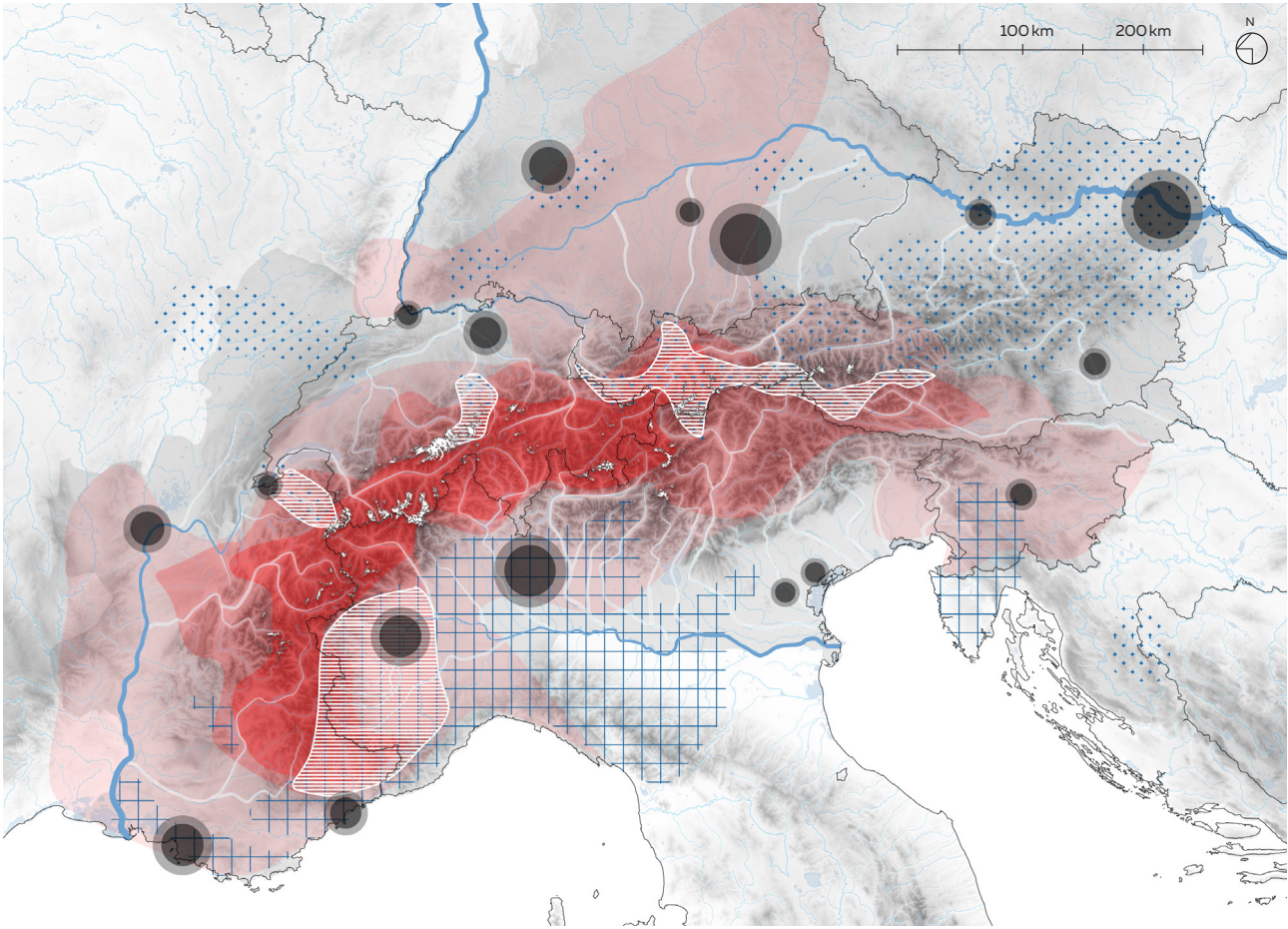


Figure 59: Most vulnerable areas affected by climate change
Source: ESPON report 'Alps2050', 2018; Alpine Convention report 'The Alps in 25 maps', 2018

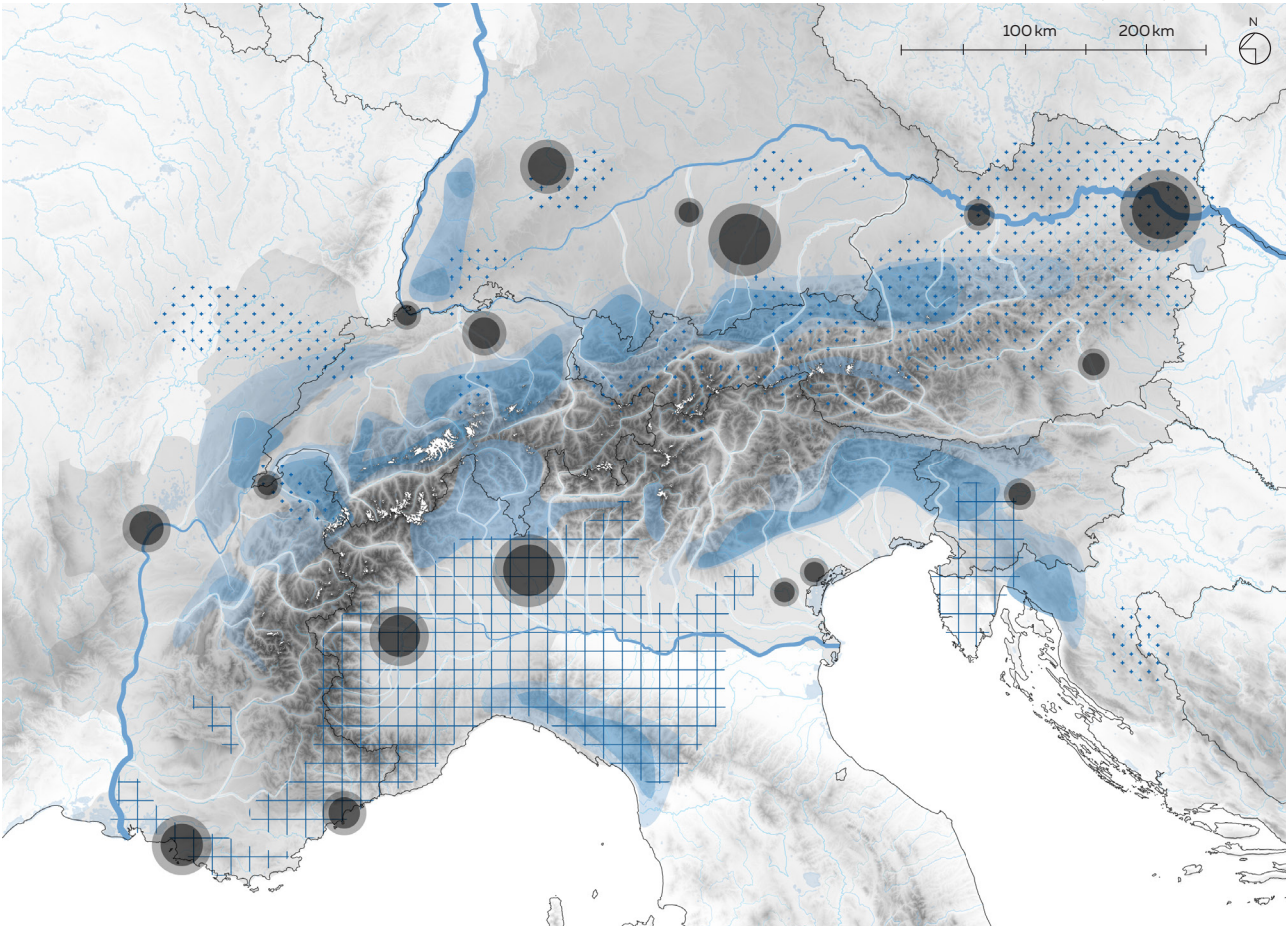


Figure 61: Average daily amount of precipitation (1971-2008) and future trends
Source: Alpine Convention report 'The Alps in 25 maps', 2018

Tourism intensity

Figure 62 shows the tourism intensity of alpine regions. Thereby the nights spent at tourist accommodations establishments are divided through the number of inhabitants and built a measurable index for 2016. It becomes clear, that especially Austrian regions like Tirol and Salzburger Land, but also the Italian independent province Bozen count with the highest tourism intensities. The data used for these calculations refer to overnight stays of the entire year, but only around 40% count for winter tourism. This depends from region to region, but especially Tirol and Salzburger land are popular for its ski resorts.

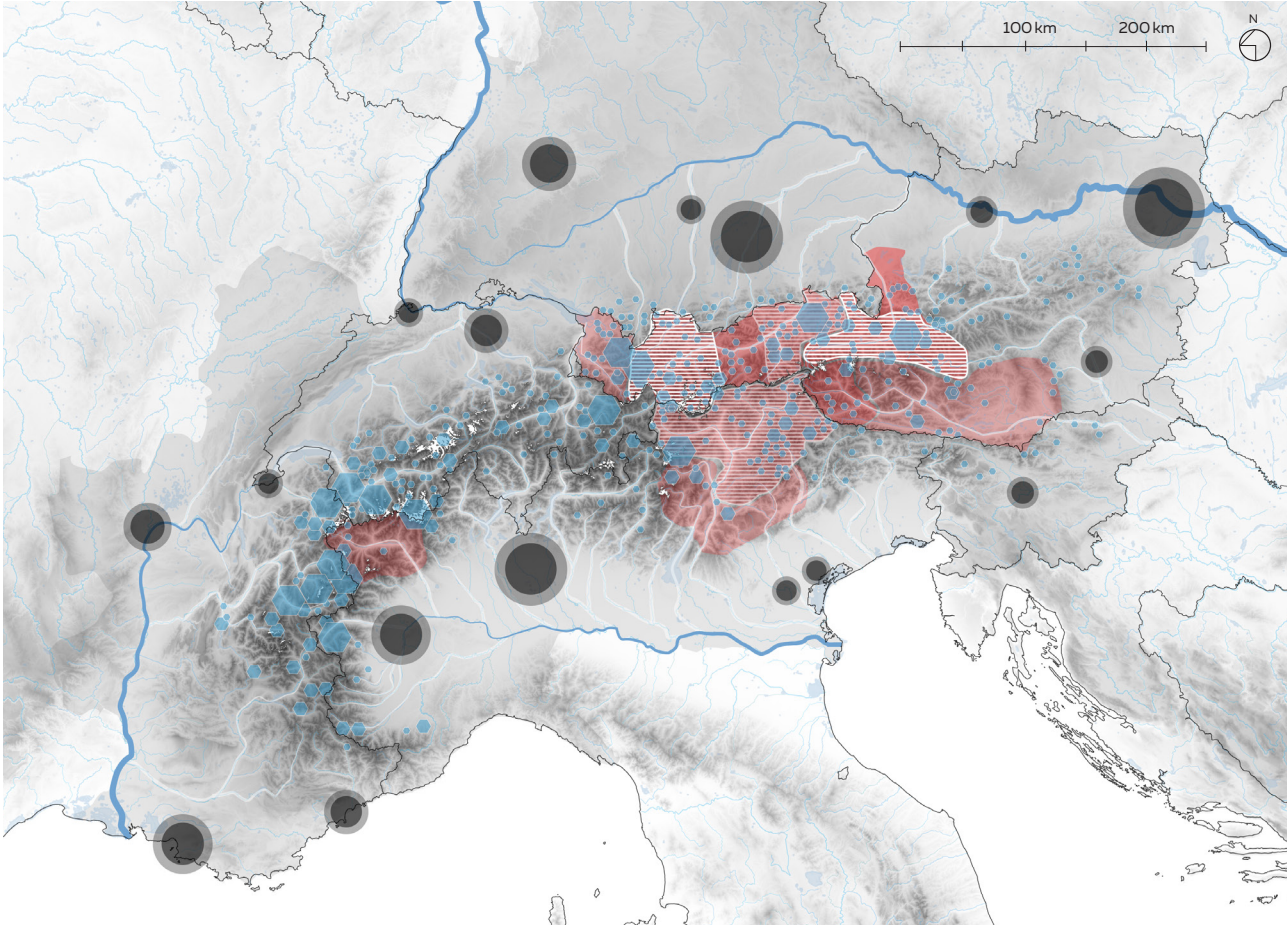
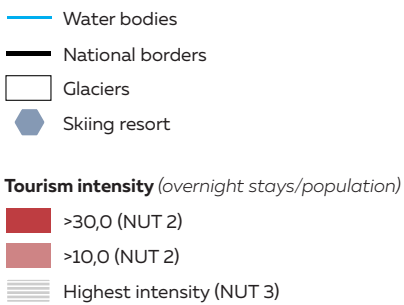


Figure 62: Areas with high tourism intensity 2016
Source: Eurostat 2018, Alpine Convention

Hydro power potential

Figure 63 shows the remaining technically feasible hydropower potential. Thereby different national sources needed to be taken into the account since the data is not provided by the European Union. However, it becomes clear, that Slovenia is the country with the highest potential remaining with around 67% (Ministry of Environment and Spatial Planning Slovenia, 2017). Followed by that, Austria still remains 30% to exploit (Umweltdachverband Österreich, 2017). In turn, Italy and France already reached their limits and have a relatively low growth potential amounting maximum to 5% (Balat, 2016). Germany and Switzerland are situated in the middle and count with a remaining potential of 20% and 15% (Deutsches Umweltbundesamt, 2017; BAFU 2017).

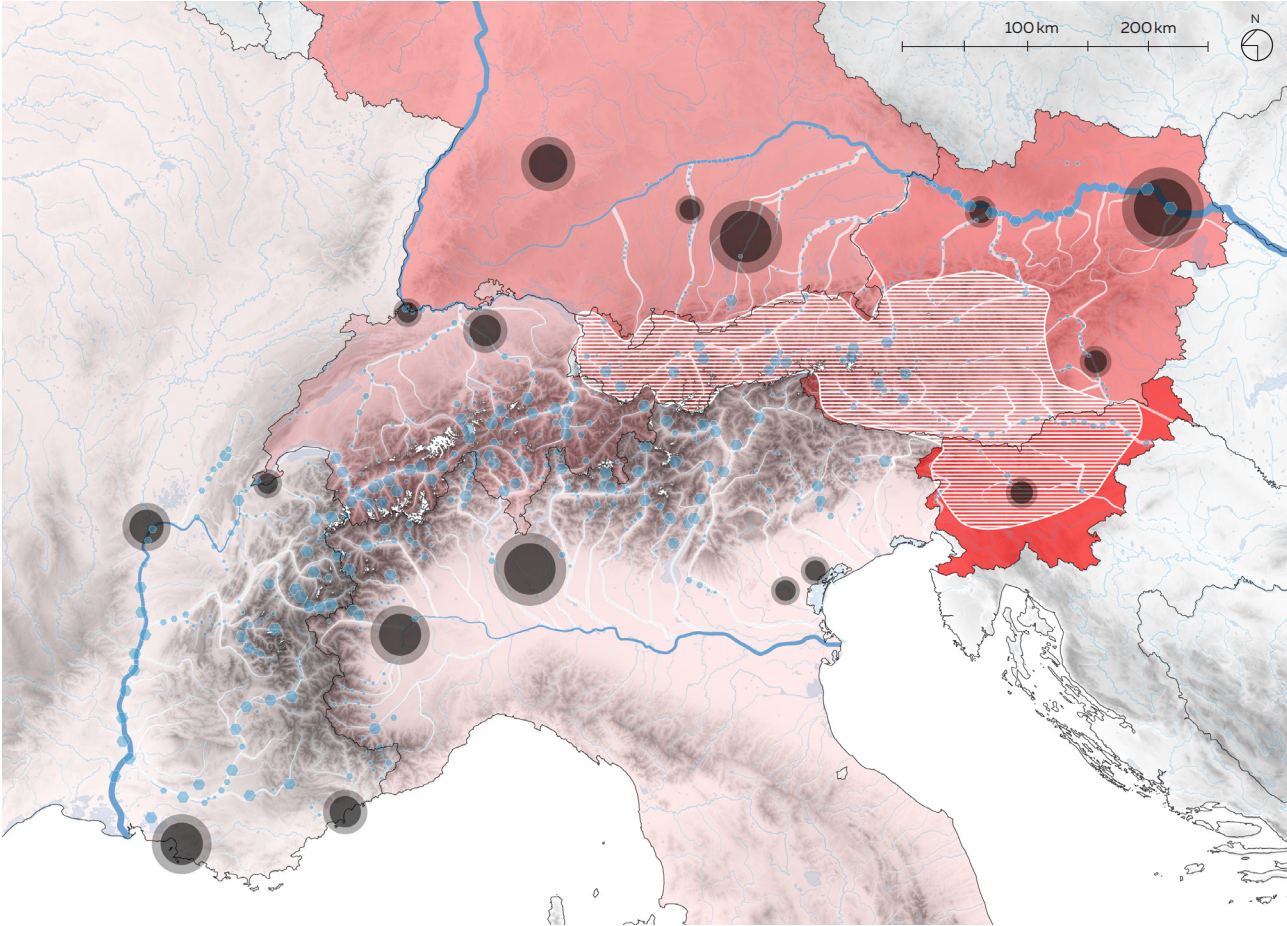
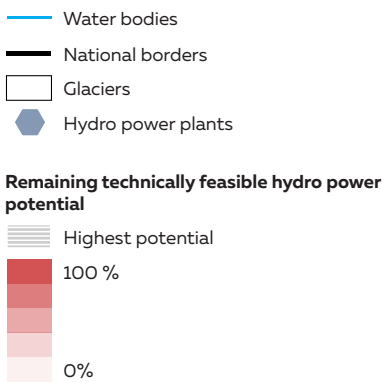


Figure 63: Hydro power potential
Source: Eurac research, Umweltdachverband Österreich, Deutsches Umweltbundesamt, BAFU, Ministry of environment and spatial planning Slovenia; 2017

Conclusion vulnerable areas

This map shows the previous findings of winter tourism intensity, hydropower potential, and climate change effects. It is clearly visible, that especially areas in the eastern, lower Alps are affected by more than one factor. Especially the Austrian province Tirol is facing a high vulnerability in the future since various areas are influenced by all three aspects. However, for the definition of a vision different factors need different responses, but especially the overlapping areas need prioritized attention. Besides that, it is important to reveal, that these especially vulnerable areas located in the inner-mountain range affect the entire connected freshwater ecosystem, including downstream areas.



- pre-Alpine cities
- Big rivers streams (Danube, Rhine, Rhone, Po)
- River streams
- Areas strongly affected by climate change
- High intensive winter tourism areas
- Areas with high hydro power potential
- Especially vulnerable areas

Figure 64: Key areas for intervention
Source: Author

IV.V Vision map

The spatial vision (figure 67) derives from the previous analysed steps and aims for the following goals:

- 1 Make anthropogenic networks more sustainable**
All man made networks connecting pre- and in-ner-alpine areas need to be transformed in a sustainable way and partly decreased.
- 2 Prioritize interrelations through freshwater ecosystems**
Acknowledge the importance of inter linkages between upstream and downstream areas and enhance regulating and supporting ecosystem service.

These main vision goals are achieved by the following step:

- 3 Create economic and environmental adaptation**
Particular sensitive areas for change need a future perspective and therefore economic alternatives in especially lower areas, and environmental adaptation are an important element.

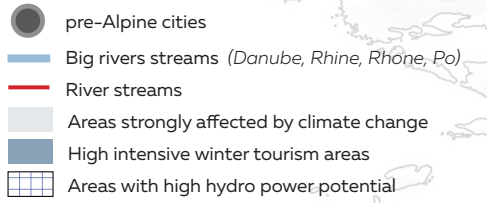


Figure 65: Vision map
Source: Author



Figure 66: Transmission lines in Lermoos
Source: Author

v. CASE STUDY

V.I Introduction of case study area

V.I.i Selection of area

The case study area is selected based on the previously defined vision for the Alps in a macro-regional scale and its most vulnerable areas seeking intervention. The second criteria are the interrelation between the metropolis and the inner alpine areas so in this case the city of Munich and its surroundings. However, the borders of the case study area are defined by the corresponding watersheds of Isar and Inn, since the most relevant system of this research is the freshwater ecosystem.

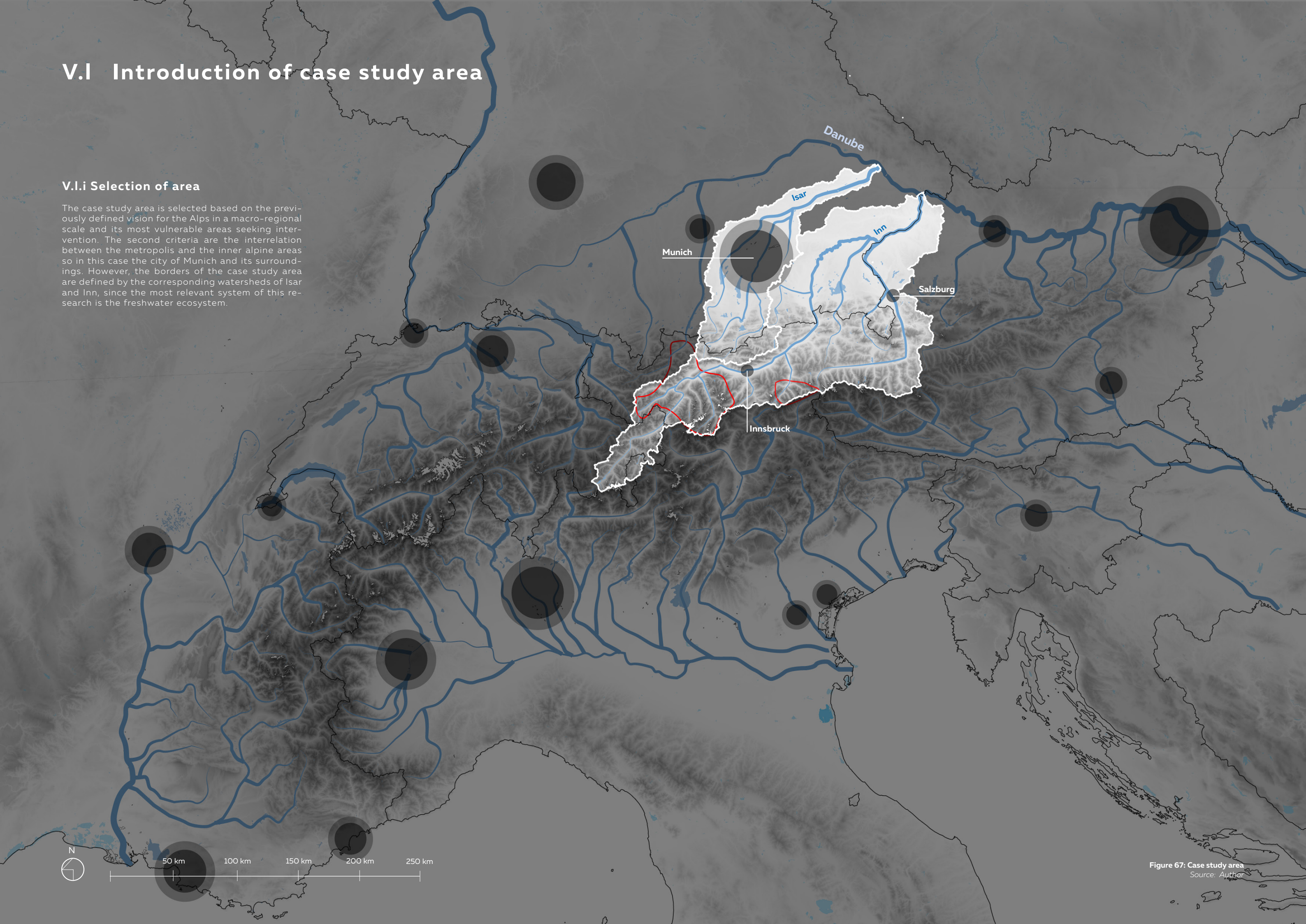


Figure 67: Case study area
Source: Author

V.I.ii Introduction of the region

Blue network

The case study area contains two sub-watersheds, Isar and Inn, which are part of the main Danube watershed. The Isar starts in the northern alpine part of Austria and crosses the city of Munich. The river Inn springs already from eastern Switzerland and runs along the Inn valley with big Austrian con-urbanizations and reaches finally through Bavaria towards the Danube.

- Danube

1

Isar

2

Inn

3
- River

River basins

National borders

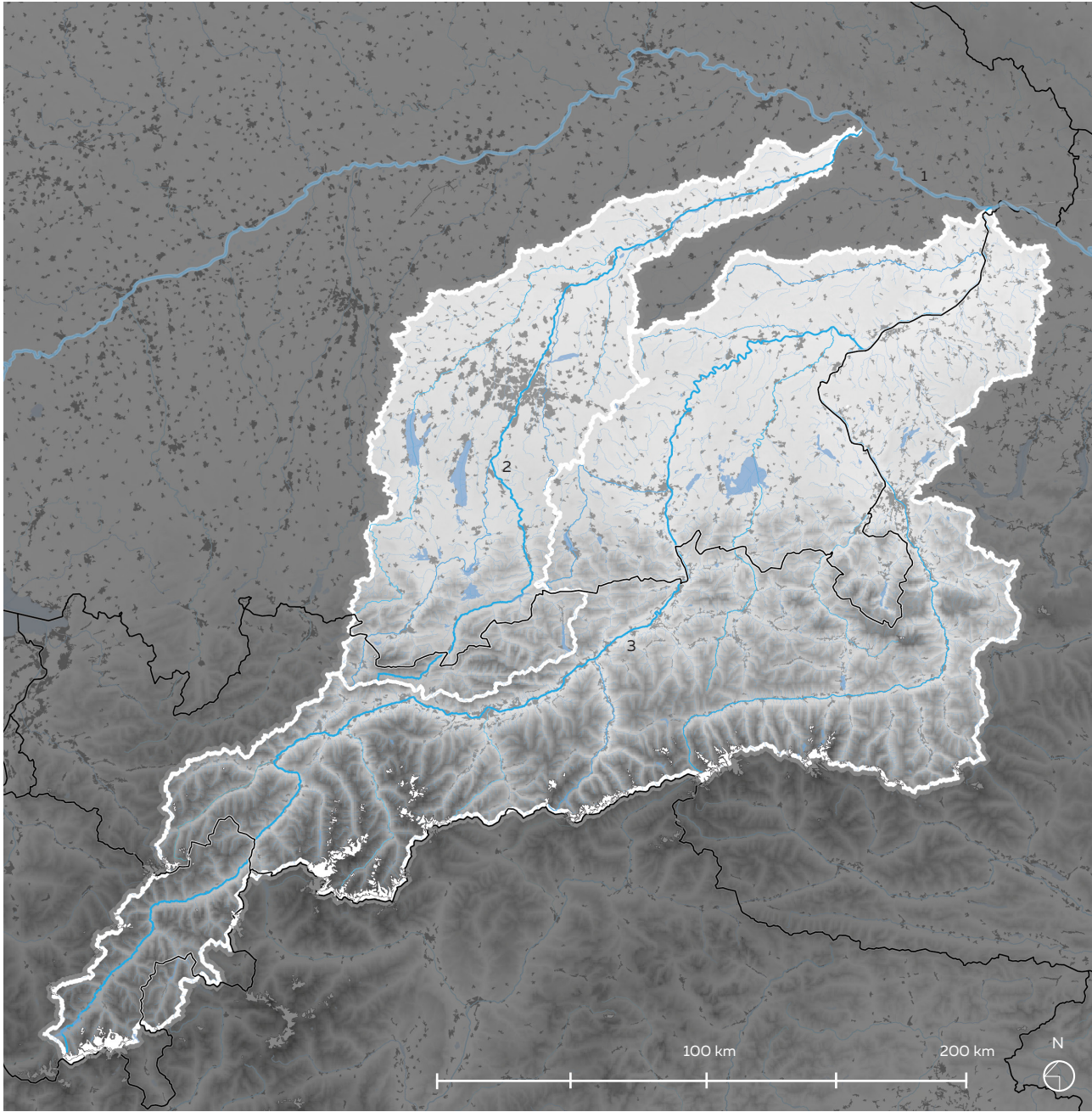


Figure 68: Blue network of case study area
Source: Author

Urban structure

The urban structure is strongly influenced by geomorphological conditions. In the pre-alpine area of Bavaria, a generally dispersed development is predominant with just a few bigger agglomerations and Munich as the federal capital with about 1.5 million inhabitants. Whereas Austria's territorial development follows the valleys form, which results in linear con-urbanizations with Innsbruck as the federal capital of Tirol with around 130.000 inhabitants and Salzburg with around 150.000 inhabitants.

- Munich

Salzburg

Rosenheim

Innsbruck

Landshut

1

2

3

4

5
- River

River basins

National borders

Continuous urban areas

Discontinuous urban areas

Population

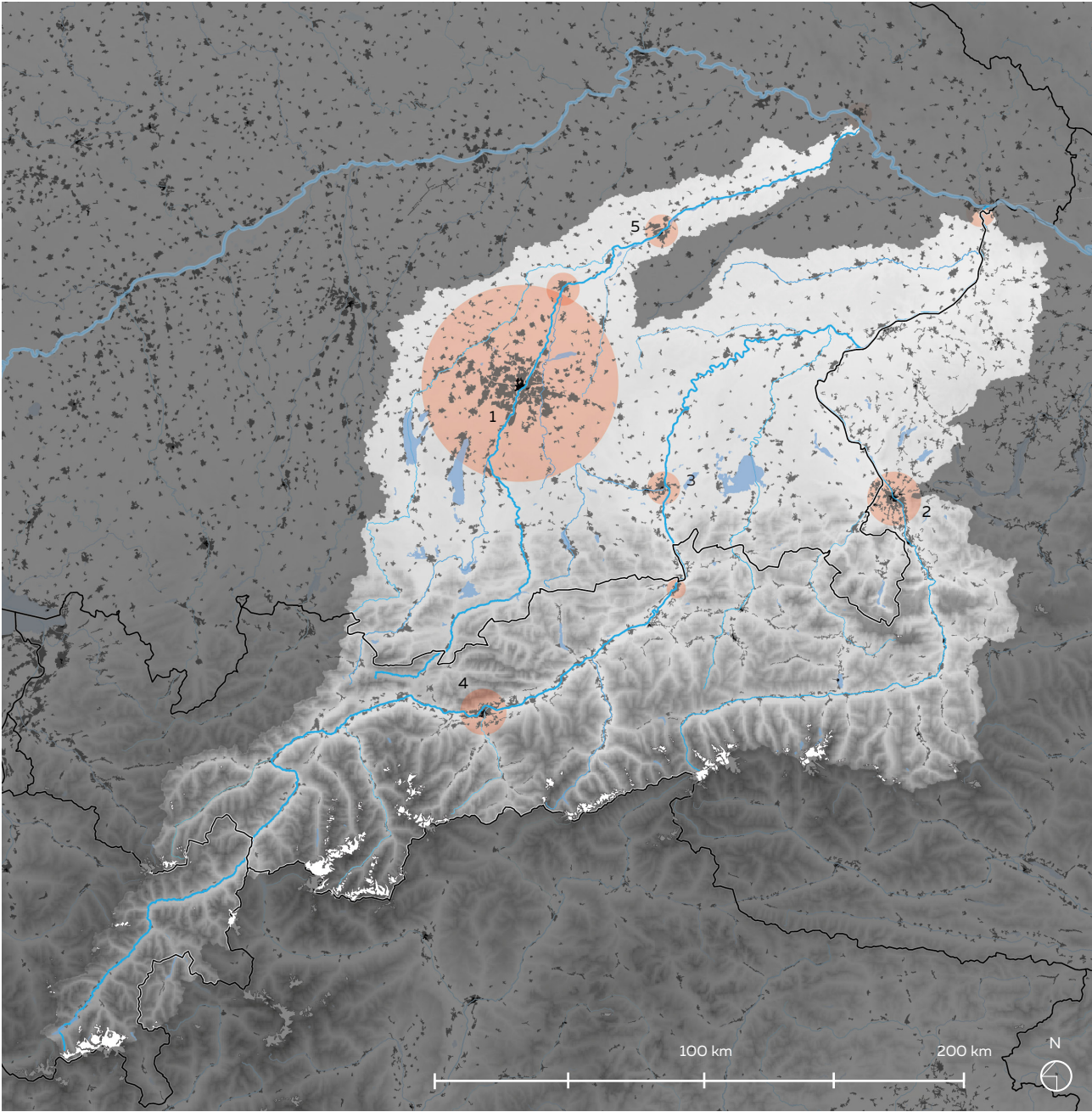


Figure 69: Urban structure of case study area
Source: Author

Rail infrastructure & connectivity

Main cross-border rail infrastructure between pre- and inner-alpine areas is located between Garmisch Partenkirchen - Innsbruck (a), Rosenheim - Wörgl (b) and Munich - Salzburg (c). The two biggest transport corridors connecting south and north start in Austria Firstly, the so-called 'Brenner' from Innsbruck to Verona and secondly, the Tauern train from Schwarzach to Villach.

- Brenner route 1

Tauern route 2
- River

National borders

Urban areas

Railway

Main rail stations

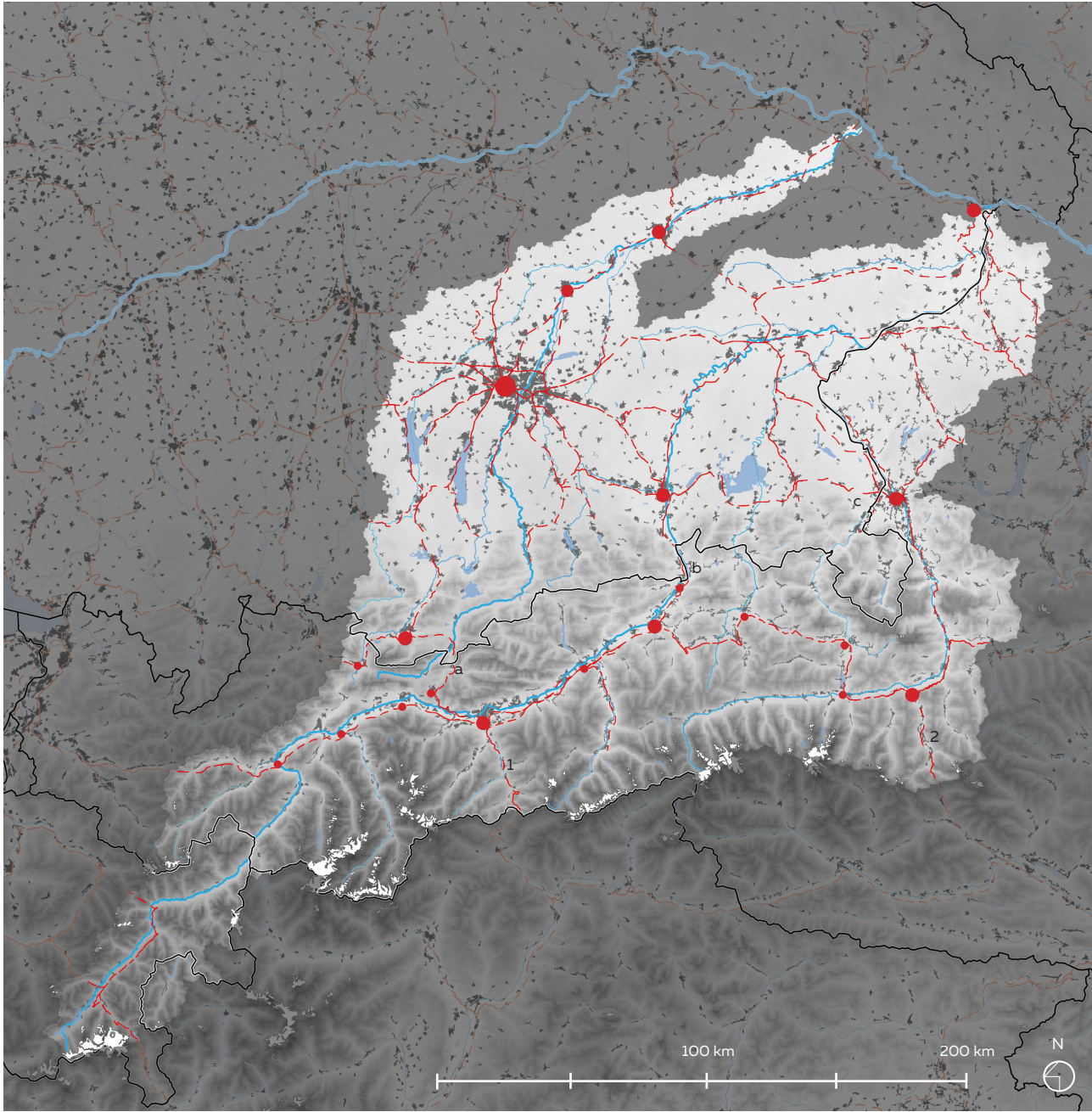


Figure 70: Rail infrastructure of case study area
Source: Author

Car infrastructure & connectivity

Similar to the train infrastructure, the main alpine cross corridors are Brenner and Tauern highway. The major connections between pre- and inner-alpine areas follow the same routes as the rail, but nevertheless, the amount of secondary connection is comparatively higher.

- A95 Highway 1

A93 Highway 2

Inntal highway (A12) 3

A8 Highway 4

Tauern highway (A10) 5
- Danube river

River basins

National borders

Urban areas

Highways

Roads

Exit ramp

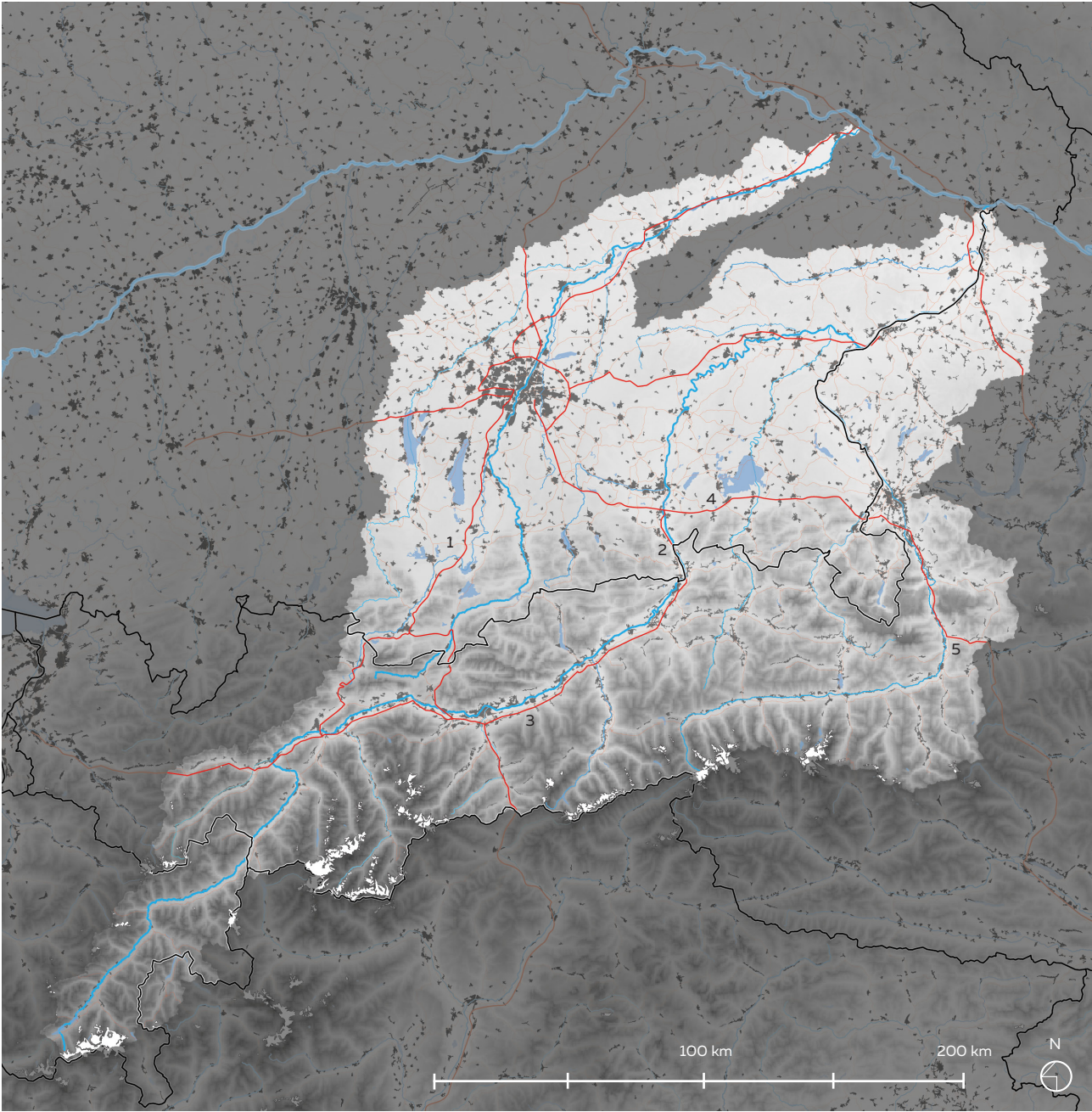


Figure 71: Car infrastructure of case study area
Source: Author

Landscape & land use

The main predominant landscape patterns found in the case study area are various kind of forests and grasslands. In the pre-alpine areas, mixed and broad-leaved forest exist, whereas in the inner Alps mixed forest is dominating. Rising up in height, the following pattern is natural grasslands and in pre-alpine areas pastures, so use dedicated to agriculture.

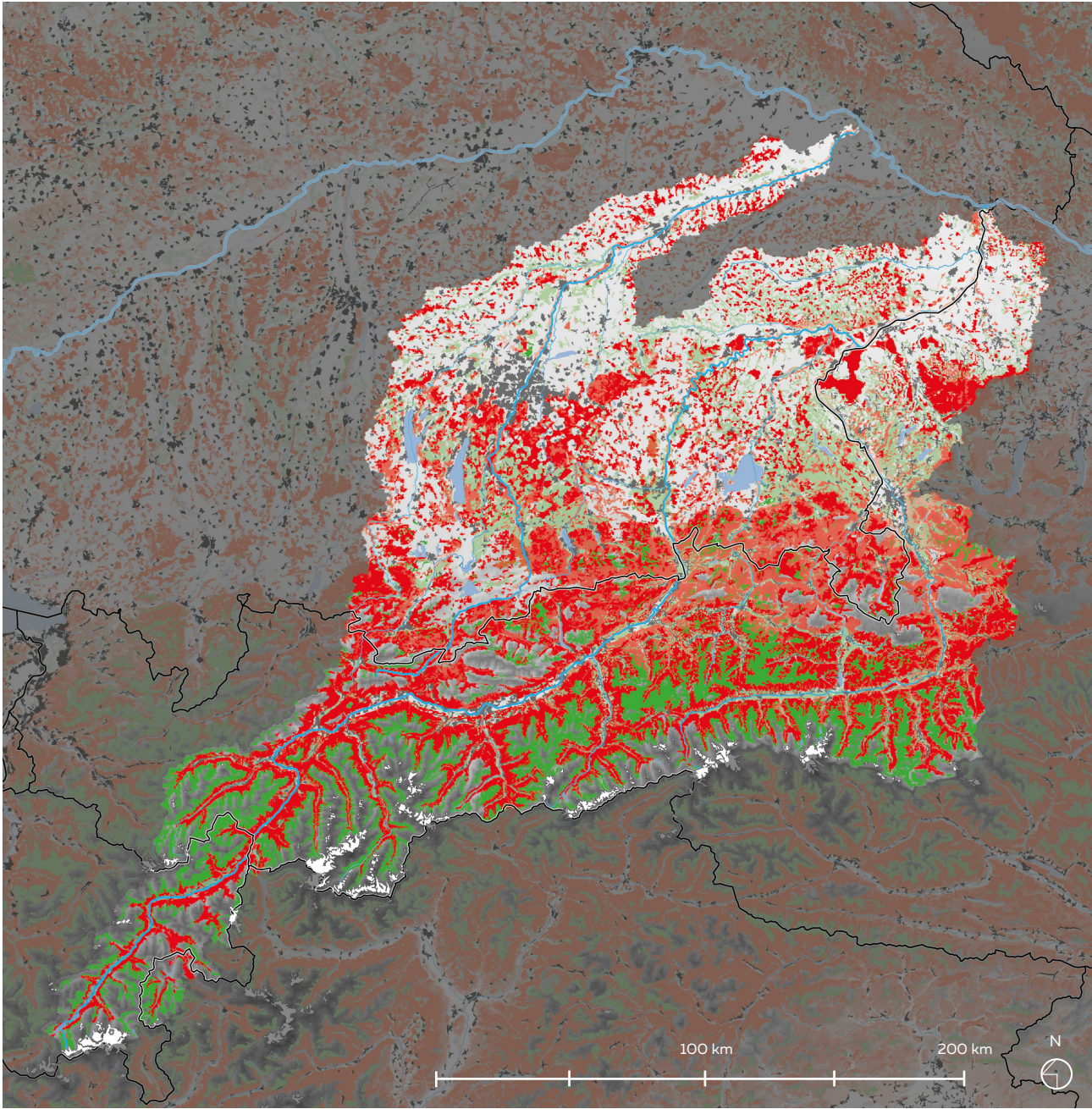
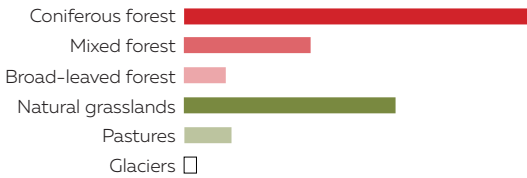


Figure 72: Landscape & land use of case study area
Source: COPERNICUS Corine Land Cover 2016

Protected areas

The protection of nature works through the EU with Natura 2000 areas, and through additionally nationally defined zones. In the case study perimeter main protected areas cover high mountain ranges, including glaciers, but at the same time various smaller parts of river courses of Isar, Inn, and the Danube and partly lakes.

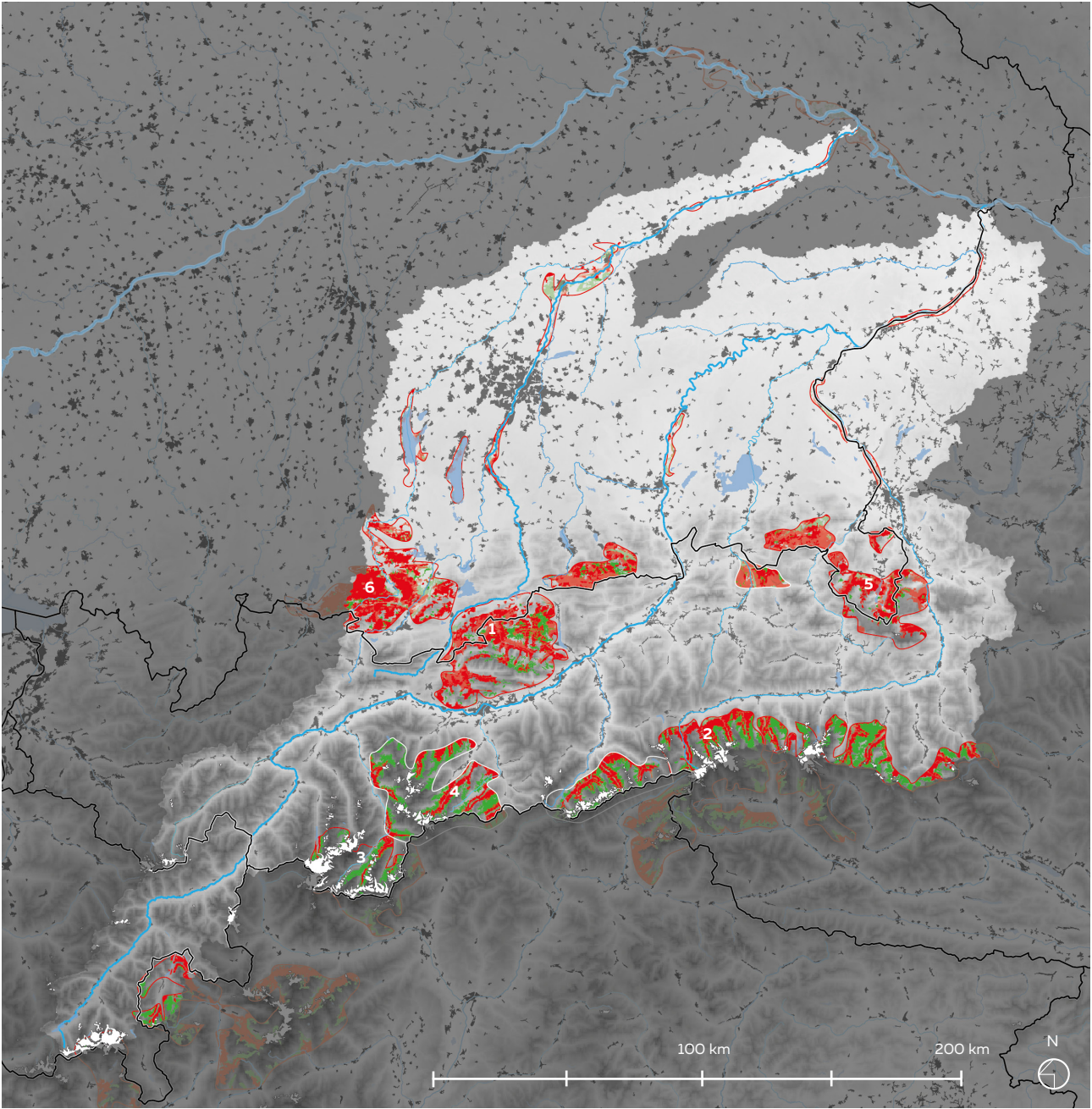


Figure 73: Protected areas of case study area
Source: COPERNICUS Corine Land Cover 2016

V.I.iii Introduction of analysis

This following chapter repeats the steps of analysis in the scale of the case study area in order to understand first the planning and spatial context, and secondly, to add a third component: time. This factor is essential when analyzing water balances, tourism, and hydroelectric power because their supply and demand vary strongly depending on the season and daytime. By considering all these elements, a strategy responding to seasonal imbalances can be developed.



Figure 74: Kauner Valley in summer
Source: www.wikipedia.com

V.II Understanding the planning context

V.II.i Planning frames

Administrative/Political frames

Political decisions are made within different perimeters. Thereby it is important to mention, that Austria, Germany, and Switzerland are federally organized countries, so administrative and political power is distributed within so-called 'Länder' or in the case of Switzerland, 'Kantons'. For the Inn and Isar watershed Bavaria on the German side, Graubünden in Switzerland, and Tirol, Salzburg and Upper Austria on the Austrian part are within the scope. The next scale of political power are the communes ('Regierungsbezirke'). In Bavaria, this contains Upper and Lower Bavaria, in Tirol Landeck, Imst, Innsbrucker Land, Schwaz, Kitzbühel, and Kufstein, in Salzburg Pinzgau, Pongau, Tennengau, Flachgau and Salzburg, and in Upper Austria Braunau, Ried and Schärding, so in the Austrian part a total of 15 districts. In Switzerland, this contains the regions Lower Engadin/Münster Valley. In the next scale, Germany distinguishes between districts ('Landkreise'), a union of various municipalities, whereas Austria's and Switzerland's next scope are the municipalities itself.

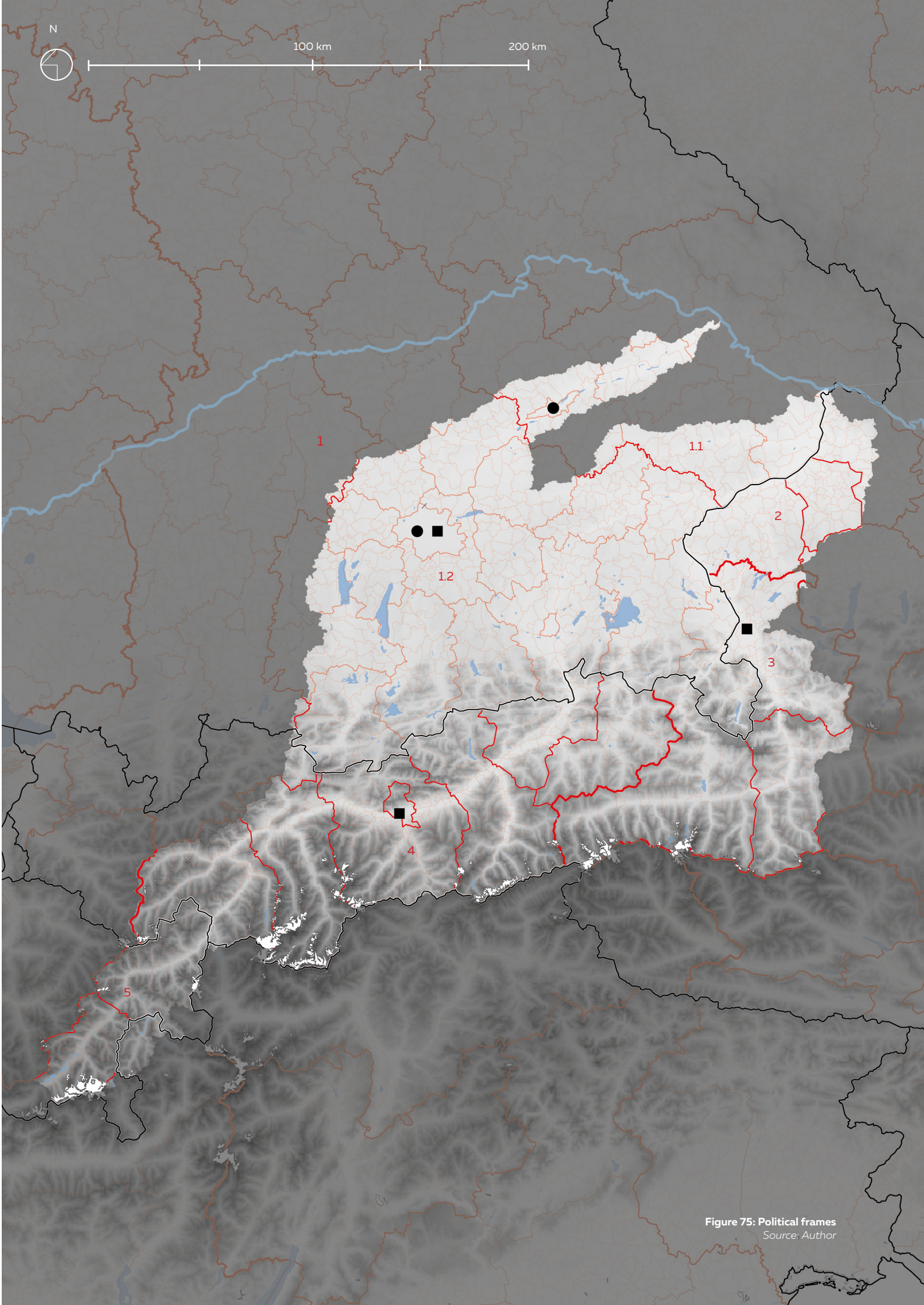
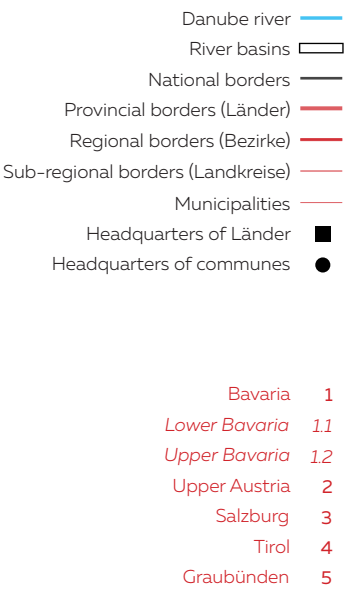


Figure 75: Political frames
Source: Author

Spatial planning frames

For the project region, spatial planning in the EU scale works through the Interreg project between Austria and Bavaria, and the macro-regional strategy of the Alpine region. Their instruments are to stimulate cooperation and also facilitate funding for projects. In the next level, the national scale, territorial governance operates mainly with mission statements ('Leitbilder') in Germany, territorial development concepts ('Raumentwicklungskonzepte') in Austria and guiding principles for land use planning in Switzerland. Moreover, sectoral planning concerning transport, electricity, and water takes place in that perimeter.

In the provincial level, Germany and Austria work with development programmes ('Landesentwicklungsprogramm'), and the Swizz Cantons with strategic regional plans. The German province Bavaria divides its territories in 18 planning associations responsible for the elaboration of regional development programmes for landscape and territories. Austria's provinces divide their territories as well in various planning units, which are unions of several municipalities. Thereby it becomes clear, that the planning size for development differs strongly between both countries. Switzerland divides its territories into 129 planning regions, and its competence lies in tackling and coordinating cross-communal tasks (OECDlibrary, 2018).

Next, in Germany exists a sub-regional planning level, the communes. Their instruments are regional, landscape and green structure plans and the setting of land use guidelines (OECDlibrary, 2017). The Bavarian local levels power is limited to the development of land-use plans, but current trends show that territorial planning is aiming for decentralization towards local (ESPON, 2018b). In turn, Austrian municipalities hold considerable responsibilities for strategic spatial planning within their territories as well as for the preparation of land-use plans. However, according to the recent ESPON Study 'COMPASS – Comparative Analysis of Territorial Governance and Spatial Planning Systems in Europe' spatial planning is moving towards centralization on a sub-national level. In Switzerland, municipalities are central actors in land-use policies, as they prepare binding land-use plans.

- Danube river
- River basins
- National borders
- Provincial planning borders (Länder)
- Regional planning association
- Sub-regional borders (Landkreise)
- Municipalities
- Institutions of provinces
- Institutions of communes

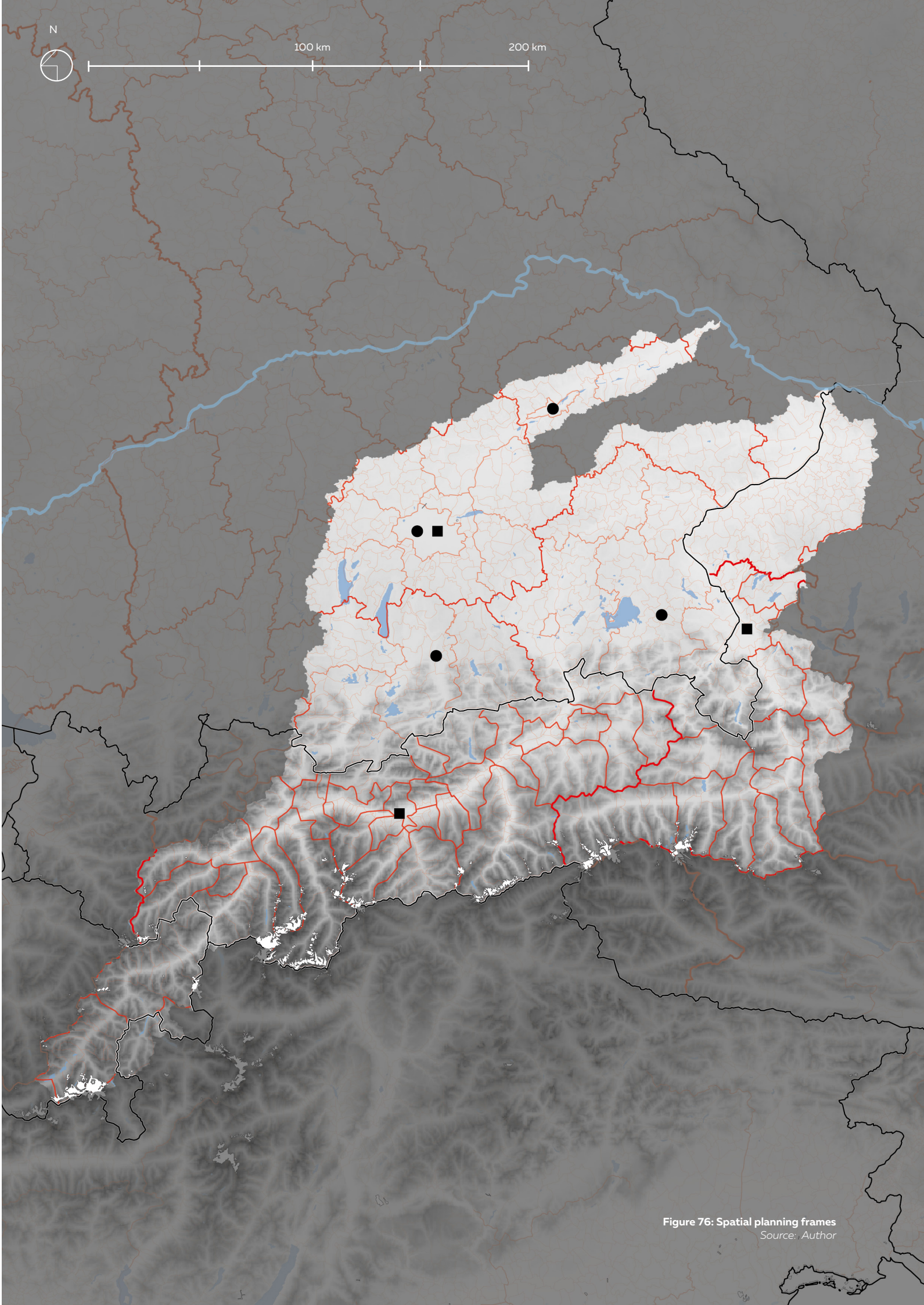


Figure 76: Spatial planning frames
Source: Author

Water planning frames

The cross-border area of the Inn and Isar watershed is organized in different levels of governance (Figure 79). The highest perimeter, the Danube river basin, is represented in the ICPDR (International Commission for protection of the Danube River) aiming for an integrated water management plan, and the macro-regional strategy for the Danube region (EU-SDR).

However, the main water planning frame is defined through the EU Water Framework Directive (WFD) of 2000. It proposes an integrated river basin management and wants to achieve a good status of all water bodies. The WFD is transposed in the national law of Austria and Germany, the federal water act. The instrument both countries use is water management plans organized in three periods of implementation. In Germany, this tool is elaborated on a regional level, the so-called ‘Länder’ and implemented by 14 different sub-regional planning areas. In turn, Austria proposed a national water management plan and divides thereby into 8 different planning areas. During the elaboration of the water management tools, both countries cooperated with each other in order to achieve coherence and consensus. Besides that, a permanent water commission exists between Austria and Germany based on the ‘Regensburger Vertrag’ of 1987.

In the non-EU-member, Switzerland, water governance is divided into three levels: National, cantons and municipal. So it is oriented around political rather than physical catchment boundaries. Thereby the national government is responsible for the definition of legal frameworks, the cantons for the regulation of water resources and the municipalities for the provision of water services. However, there is a trend occurring towards a more holistic approach to water management, that is following natural perimeters, e.g. river basins.

Decisions related to hydropower plants are made by federal and regional institutions depending on the power capacity or river course. In the case of Germany, the competent authority remains within the regional borders in case its spatial effects do not exceed a certain size. In Austria the regions are responsible in case the capacity does not exceed 500 KW. If the facility generates more, the province becomes the authority. In Switzerland the confederation is responsible for international rivers, the cantons or municipalities for inland rivers and in any case, installations bigger than 3MW need to be submitted to an EIA (Environmental Investigation Agency). In a bigger frame, the WFD often restricts further exploitation of hydropower due to its effects on the river, whereas European, national and regional energy concept plans aim for an extensive exploration of renewable energy sources, including hydroelectric power.

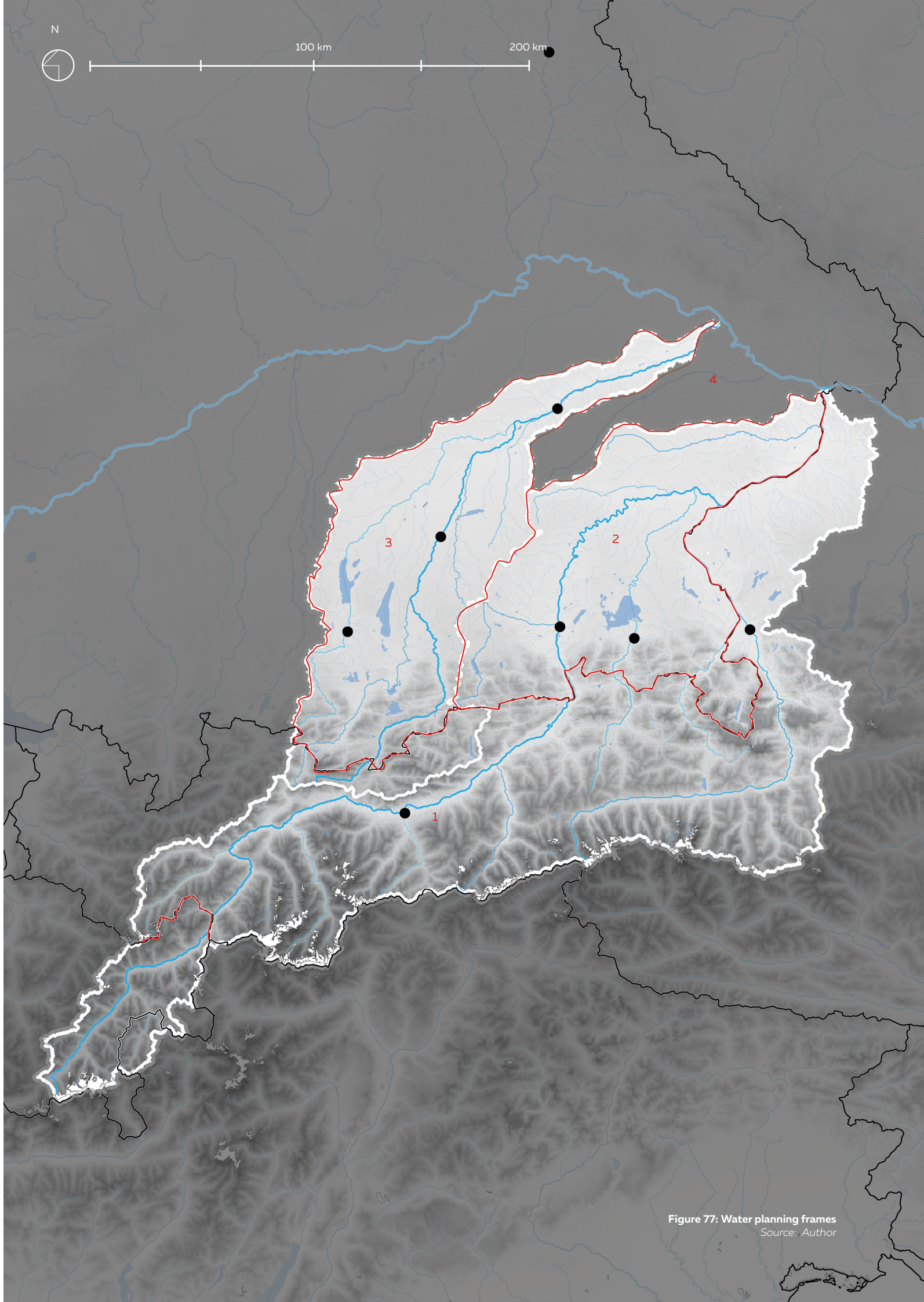
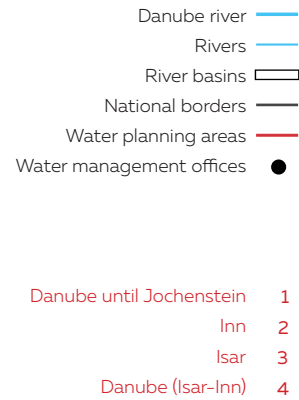


Figure 77: Water planning frames
Source: Author

Tourism planning frames

In the two federal countries, Austria and Germany's tourism are organized mainly in the provincial and communal level. Bavaria works since 2010 with a tourism policy concept, which is implemented and further developed in four different planning associations (Oberbayern - München, Ostbayern, Franken, Allgäu- Bayerisches Schwaben). Their role is to promote marketing, create mission statements and to subdivide their area into various tourism regions. Additionally, a spatial zoning plan ('Alpenplan') for the Bavarian alpine areas tackles tourism issues already since 1972.

In the case of Austria, every province has its own law regarding tourism, and also their own way of subdividing its sub-regions. They are public bodies and their responsibilities are strategic planning, marketing and making the region more attractive infrastructure wise. For instance, Tirol's tourism law defines the division of the entire territory into 34 tourism regions. In turn, Salzburg and Upper Austria still work with few inter-municipal planning co-operations, but independent municipalities. However, the current trend is leading towards an increase of merging tourism regions in these areas due to economic marketing reasons.

In Switzerland exist several regional and local tourism organisations, and additionally, so called destination management organisations, which are exclusively responsible for marketing. In the case study perimeter just destination management organisations are predominant (Engadin Scuol Samnaun, Engadin St. Moritz).

In the European scale, the Interreg projects Alpine Space and Bavaria - Austria focus also on tourism related issues and facilitate funding for projects.



Figure 78: Logos of Tourism regions for marketing reasons
Source: Author

- Danube river
- River basins
- National borders
- Provincial borders ('Länder')
- Tourism associations
- Tourism regions
- Municipalities

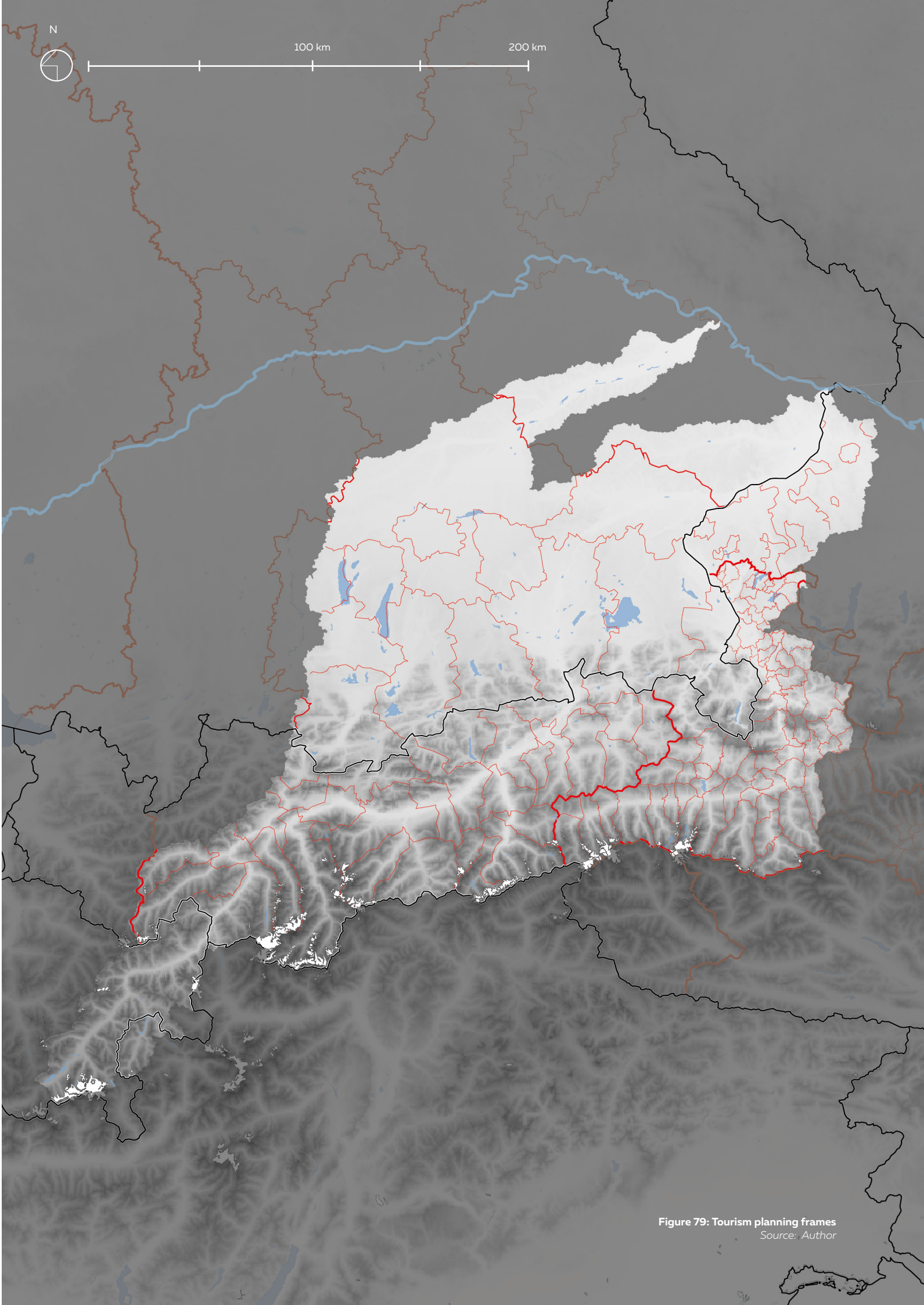


Figure 79: Tourism planning frames
Source: Author

V.II.ii Existing cooperation

Cross-border cooperation

In the case study area, various territorial co-operations pre-exist. However, their priorities and planning instruments differ strongly. Cross-border cooperation can generally refer exclusively to soft planning instruments because they never possess a mandate. The Alpine Convention is an exception in this context. It is an international treaty formulated in various protocols concerning different topics, like e.g. tourism, energy, environmental protection, and spatial planning. It is legally binding for all member states, so a relatively hard instrument. Nonetheless, since 2017 they introduced a new instrument to facilitate the implementation of the aforementioned protocols, a multi-year work program. Thereby it gives several priorities, among others measures for climate change, the preservation of biodiversity, green economy, sustainable mobility and to execute a leading role in the EUSALP; and controls its progress with an actualized Roadmap every two years.

Another planning instrument is funding programs. The Alpine Space Program contains the entire inner alpine regions and partly pre-alpine areas. Therefore it supports exclusively projects, which expand over more than three countries. Additionally, they are actively involved with an observing role in EUSALP decisions and projects. Another funding program in the case study perimeter is Interreg Bavaria - Austria. It focuses especially on cross-border issues, so also on river-related topics, which is enforced through their main priority point 'Environment and resource efficiency'.

The latest planning instrument is European macro-regional strategies. According to the academic discourse, they are rather soft, since they work with the '3 NOs', and possess therefore a more political intention. EUSALP works with an Action plan, which can basically be translated into specific projects and is adding more and more connected to the funding of Alpine Space projects. EUSDR works according to the same concept but already established a 'Danube strategy point' for the cooperation between the European Commission and the local authorities. It seeks for the restoring and maintenance of the quality of waters and the management of environmental risks.

	Alpine Convention	Alpine Space Program	Interreg GER-AT	EUSALP	EUSDR
Objectives	<div>- preservation of biodiversity in the inner Alps</div> <div>- sustainable mobility</div>	<div>- ecological connectivity</div> <div>- multilevel and transnational governance</div>	<div>- preservation and efficiency of natural resources</div> <div>- cross-border issues</div>	<div>- preservation of natural resources</div> <div>- ecological connectivity</div> <div>- improving cooperation and coordination</div>	<div>- restoring of the quality of waters</div> <div>- improving cooperation and coordination</div>
Tools	<div>International treaty</div>	<div>Funding</div> <div>Project of min. 3 countries</div> <div>Project of max. 2 countries</div>		<div>Communication tool & strategy</div> <div>Action plan, action/steering groups,</div>	

Observing & Active role

Projects

Figure 80: Objectives and instruments of cross-border co-operations
Source: Author

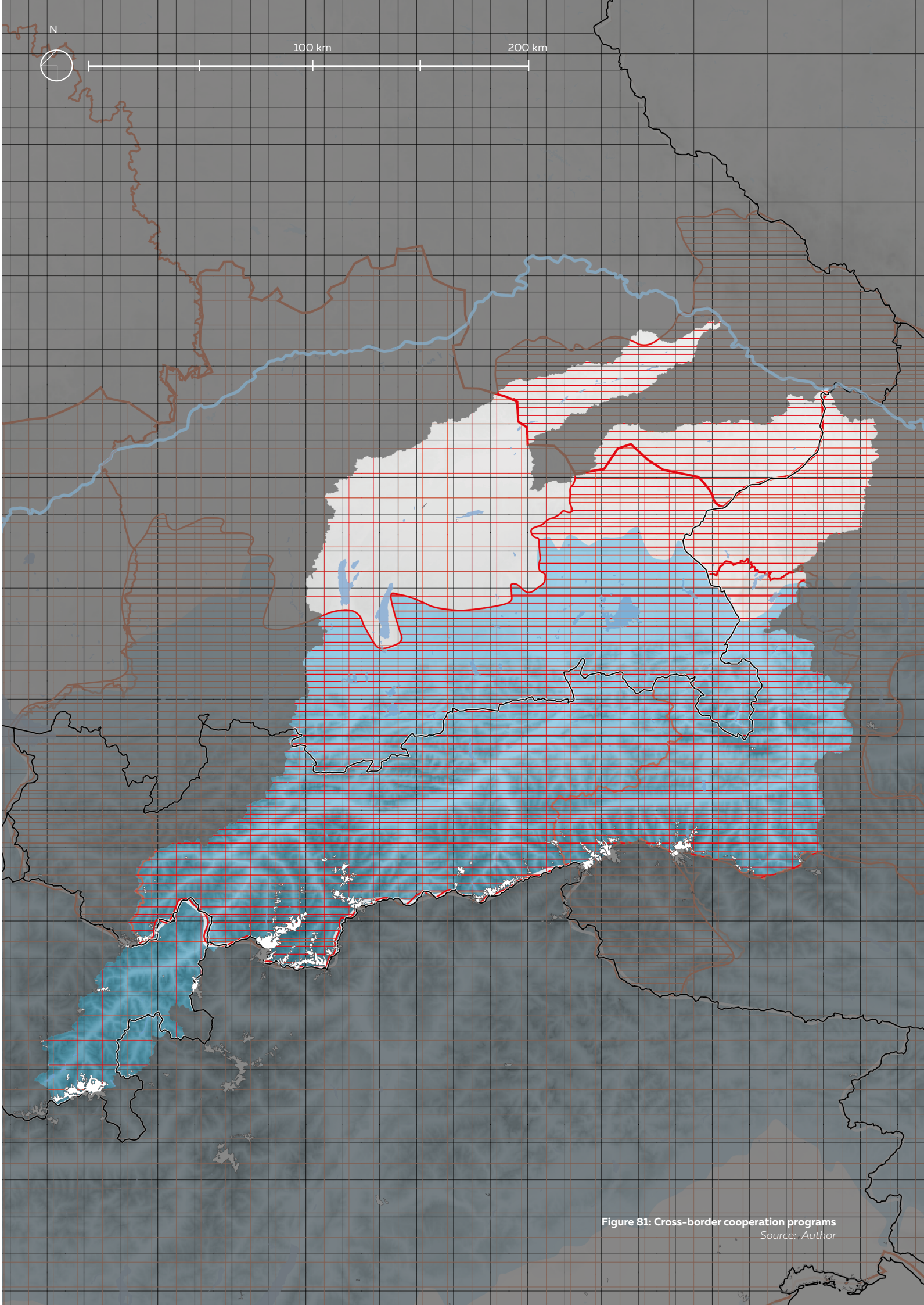


Figure 81: Cross-border cooperation programs
Source: Author

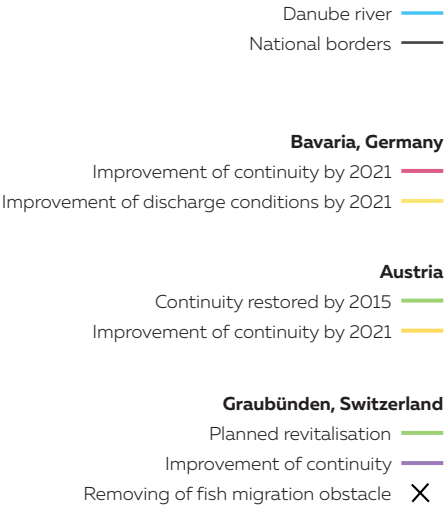
(Integrated) river management plans

As it is mentioned previously, the WFD of 2000 stimulated a process towards a more integral and holistic approach for waters management. In the case of Switzerland, the Federal Water Protection Act of 2011, requires the cantons to plan strategically for the revitalization of waters. However, current plans are still made within administrative national or regional borders and not elaborated with a cooperative approach, so e.g. considering the entire river basin as a perimeter. Figure 84 shows the water management plans elaborated by Bavaria and Austria for the period of 2016 - 2021, and the federal strategic plan of Graubünden until 2030. Their main goals are similar due to the WFD and the Federal Water Protection Act, but however, they lack coherence in its implementation.

The issue of cross-border rivers and its management is already a priority topic in EUSALP AG 7, because of the missing cooperation. Therefore, WWF proposed a project in cooperation with the University of Innsbruck and Verbund AG concerning the river Inn. It seeks to foment the cooperation between Bavaria and Austria and to allow an exchange of their taken and planned measures. Thereby the focus lies on the conservation of biodiversity and species for the first funding period. In case the project can continue, the same methodology will be applied for water economies, such as agriculture, hydropower, and tourism. However, this project is still waiting for approval by Interreg Bavaria-Austria in order to be able to start.

Best practice examples on a smaller scale already show that cooperation is most difficult, but still possible. For example, the so-called 'Isar plan' from 2000 to 2011 brought the water closer to Munich's inhabitants and counts nowadays with comparatively good water quality for urban waters. In turn, the Swiss canton Graubünden initiated a project for an integrated river basin management for the Inn. Finally, the Upper Engadine refused to participate and just communes of the lower Inn agreed to this plan.

In summary, currently, cross-border cooperation concerning river management plans is already in progress in the case study area. On the one hand through a new political dynamic by EUSALP, and on the other hand by smaller projects, as e.g. the 'river dialogue' allowing knowledge and practice exchange. However, the phenomenon of 'free riders' is occurring right now. So people and cities, who consume indirectly the river's good, as for example tourists and hydropower consumers, are not considered directly in waters management plans.



During the project 'Stream-Land' by the Austrian environmental association and several other partners **a possible cross-border cooperation with Bavaria was not considered**. The project worked with the small river Vils, which runs mainly through Austria and only for 15km in Bavaria. However, during the implementation difficulties occurred because development proposals in the neighbouring country were not enquired and vice versa.

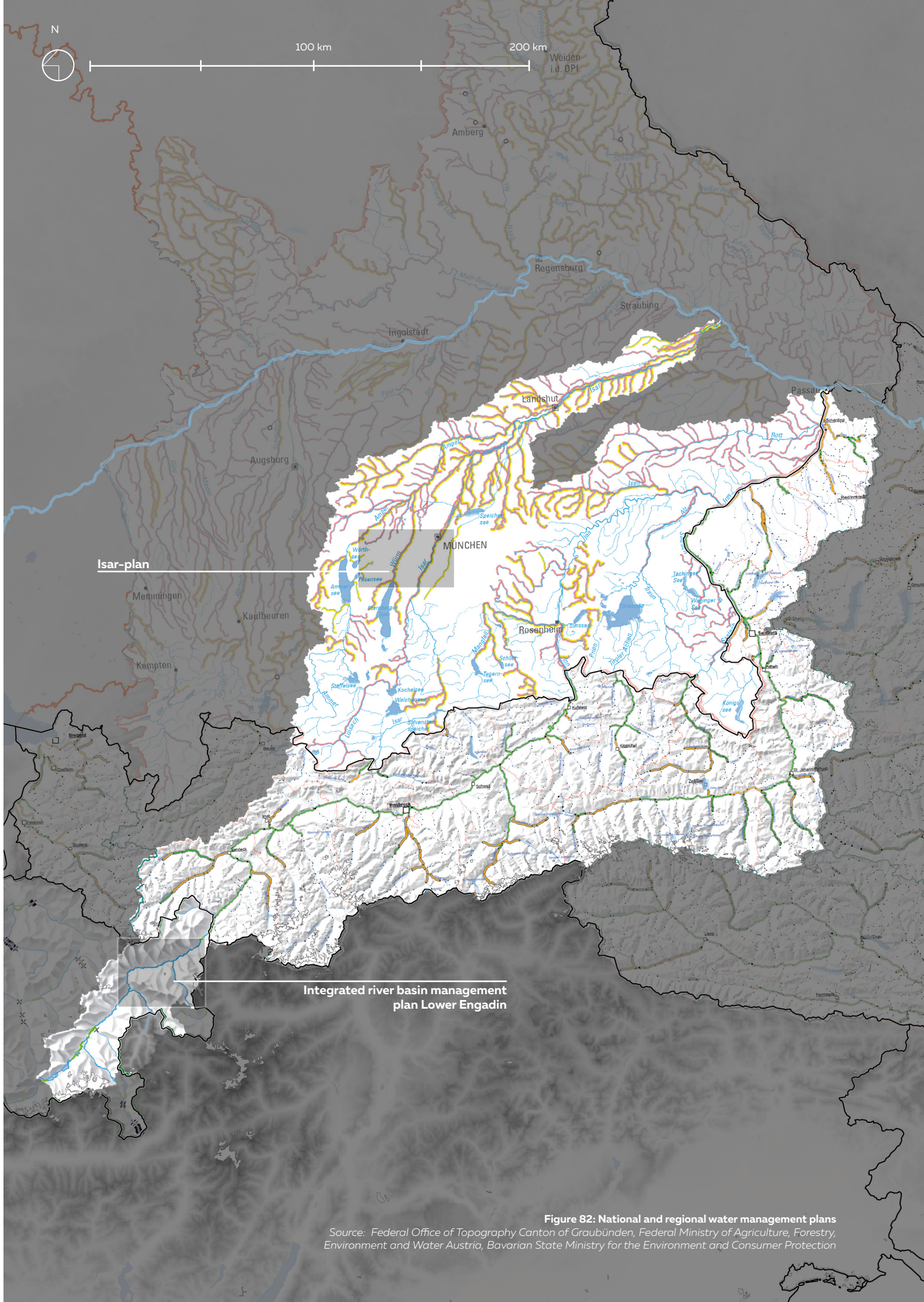


Figure 82: National and regional water management plans
Source: Federal Office of Topography Canton of Graubünden, Federal Ministry of Agriculture, Forestry, Environment and Water Austria, Bavarian State Ministry for the Environment and Consumer Protection

V.II.iii Conclusion

Based on the previous analysis it becomes clear, that in the regional and sub-regional level the planning perimeters differ strongly depending on the sector and country. The size of the planning areas in Austria is comparatively smaller than the ones located in Bavaria. Hence, the implementation of an integrated river management plan considering the interrelations of pre- and inner alpine areas is hampered by differing planning perimeters per sector and size. However, Austria and Germany are federally organized countries, which facilitates possible cooperation through the predominant regionalization and already distributed power (Figure 73).

Currently, hydropower generation and tourism are organized in a more sectoral way and not yet formalized in integral spatial plans. Accordingly, the already proposed water and river basin management plans consider various aspects but do not acknowledge the interrelation between pre- and inner-alpine areas through electricity and tourism and its effect on the river ecosystem. In summary, currently, there is a lack of horizontal integration.

The aforementioned issue is tackled by various cross-border and transnational cooperation programmes in different ways (EUSALP, Interreg Alpine Space programme, Alpine Convention, Interreg Bavaria – Austria, Alpenplan). However, the multitude of co-operation and approaches leads again to the phenomenon of institutional thickness and hampers thereby the effectiveness of possible results. Therefore, the soft planning framework of EUSALP with its coordinating approach can be used to allow new actor constellations for the elaboration of a pilot river basin management plan in a sub-macro region, in that instance, my case-study area.

	Spatial planning	
EU	Macro-regional strategies & Interreg Alpine Space / BAY-AT	
National	Spatial development concepts	Mission statements
Regional	Spatial concepts	Development programme & Alpine zoning plan
Sub-regional	Spatial concepts	Regional plans & Land use guidelines
Local	Spatial concepts & Land use plans	Land use plans
	Water	
EU	EU Water Framework Directive (2000)	
National	Waters management plan	
Regional		Waters management plans
Sub-regional		
Local		
	Tourism	
EU		
National		
Regional	Strategic plans & policies	Tourism policy concept
Sub-regional	Marketing strategies	Marketing strategies
Local		
	AUSTRIA	GERMANY

Figure 83: Scheme of main planning instruments in different sectors
Source: Author

V.III Understanding the territorial context

V.III.i Economy of water

Electricity through hydro power

Figure 84 shows clearly, that hydropower plants are already located along nearly all river courses in the case study area. However, most electricity is generated by pump storage and storage power plants situated in higher inner-alpine areas. Their power capacity and ability to store water exceed the effectiveness of run-off river plants needed in pre-alpine areas. Accordingly, areas of Bavaria within the case study scope show an installed hydropower capacity of 1.812 MW per year (Bayern Portal, 2016), whereas the Austrian part generates approximately 2.209 MW (TIWAG 2017, Verbund 2017) only with its big power plants and additionally 3.709 MW adding the smaller run-off river plants.

The operators of hydropower plants differ from country and region. The biggest Austrian supplier is 'Verbund AG' with power plants in all river courses, also partly in Germany, and secondly, 'TIWAG' as the responsible association in Tirol. In Bavaria, the main operator is 'E.ON' and various local providers like e.g. 'Isar-Amper Werke'.

Most electricity generated by hydropower enters the electricity grid and is, therefore, part of the trade exchange between countries. Currently, Germany is the main exporter of electricity (AT 17.711 GWh, CH: 17.500 GWh), followed by Austria (CH: 6.887 GWh, GER: 3.221 GWh) (Frauenhofer Institut, 2019). Main cross-border transmission lines are located between Garmisch-Partenkirchen and Innsbruck (1), Kempten and Imst (2) and thirdly, from Braunau towards the German border (3).

The average electricity consumption per capita in Austria with 7.207 kWh is slightly higher than in Germany and Switzerland, however bigger German urbanizations show the highest values in total. This can be explained partly due to the number of inhabitants, but also due to the location of industrial and business clusters. For example, Munich counts with use of 6.889.996 MWh per year because of its high population number, whereas Altötting consumes 4.691.935 MWh annually due to the location of the so-called 'Chemical Triangle' (Energieatlas Bayern, 2019). The values of electricity consumption per communes in Austria is generalized and based on the average national consumption per capita because more detailed data is not available.

TIWAG acts as a monopoly in Tirol. Next to its own hydro power plants, it also owns a multitude of subsidiary companies related to electricity, as e.g. Ökoenergie Tirol GmbH, Gemeinschaftskraftwerk Inn GmbH and TI-NETZ-Tiroler Netze GmbH. Moreover, TIWAG is buying smaller hydro power companies, and the remaining smaller independent suppliers need to sell their electricity to the TIWAG network.

VERBUND AG is indirectly the owner of the German part of the Inn, since the multitude of run-off river plants is all operated by subsidiary companies (VERBUND Innkraftwerke GmbH, Grenzkraftwerke GmbH). VERBUND AG bought 13 power plants from the German energy company E.ON in 2009, and 8 more in 2012. Bavaria renounced its right for reversion and in return VERBUND AG is now responsible for the implementation of the WFD.

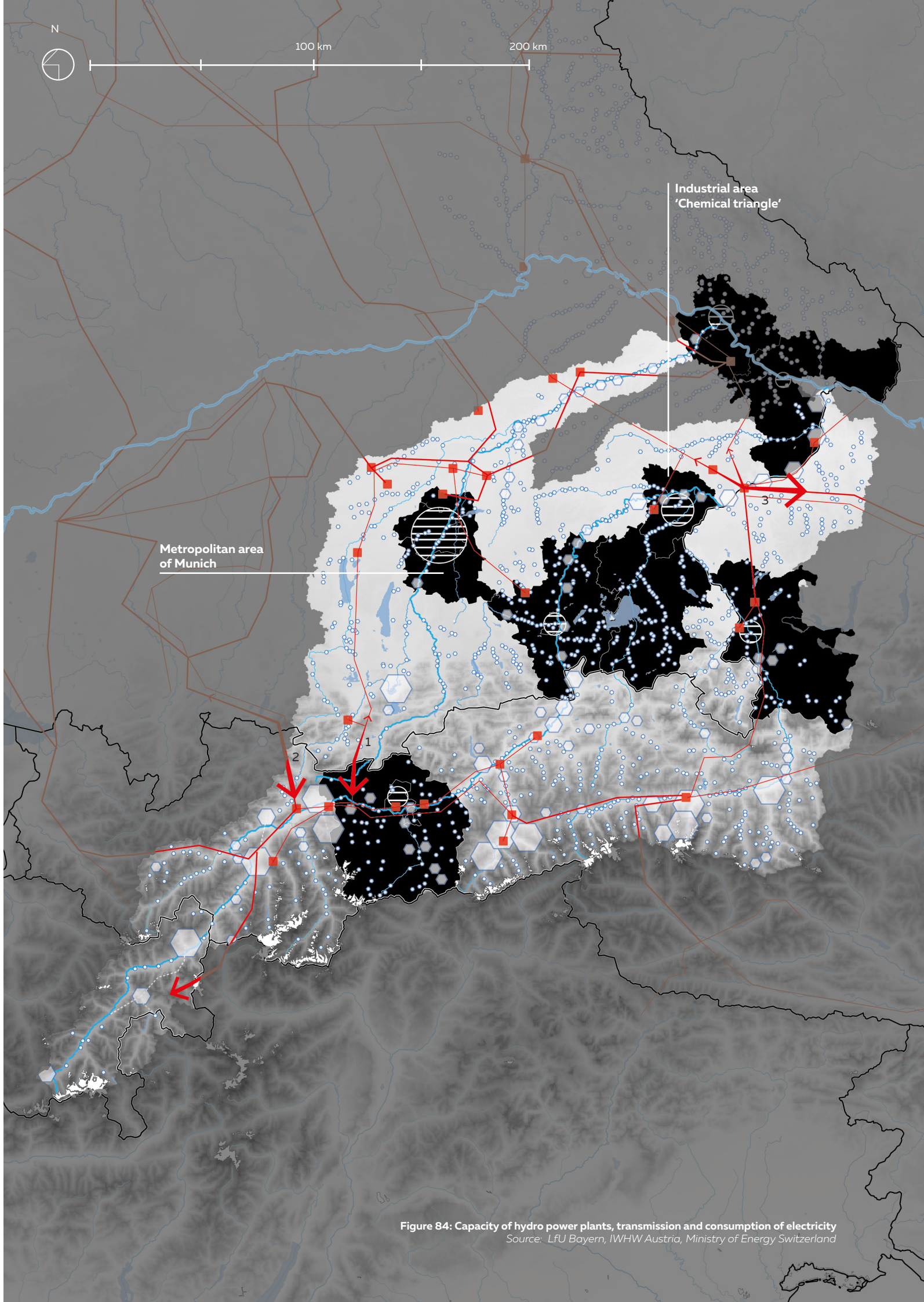
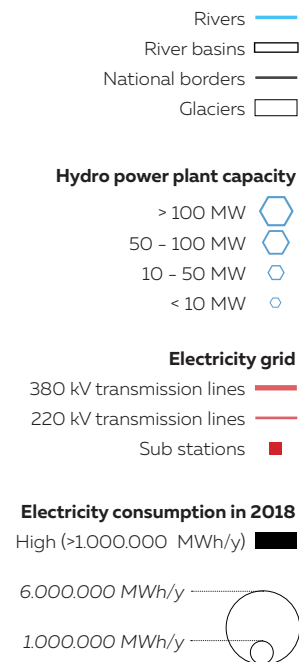


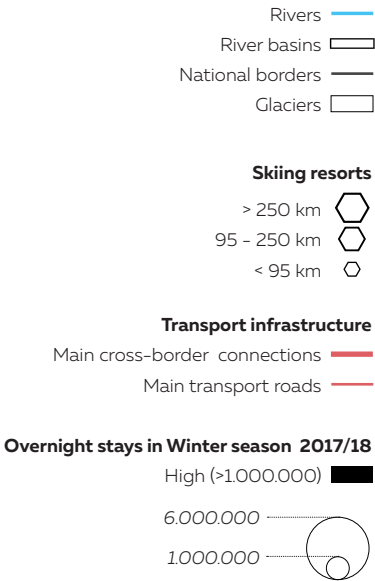
Figure 84: Capacity of hydro power plants, transmission and consumption of electricity
Source: LFU Bayern, IWHW Austria, Ministry of Energy Switzerland

Winter tourism

Small skiing resorts are predominant in the German part of the case study area, whereas in Austria exist also medium to bigger size. This can be explained through the morphology of the area. Depending on the height of the skiing resort, often the snow reliability and accordingly its dependency on artificial snowmaking can be defined. Considering current and future effects of climate change, especially ski resorts located in the Bavarian and lower Austrian Alps will not be profitable anymore. Moreover, a current trend shows, that more and smaller skiing areas merge together in order to survive economically.

According to the Austrian Federal Ministry of Sustainability and Tourism nearly half of the tourists, which spend nights in the Austrian skiing resorts within the case study area, come from Germany, and most of them from Bavaria. The main transport modality used is individual car transport, and therefore the connecting and mountain valley roads are overstrained during the winter season.

The tourism intensity is measured by the nights spent during the winter season. Nearly all communes in the Austrian Alps and just one commune in Germany, Garmisch Partenkirchen' show a relatively high value with more than 1,0 million overnight stays. The communes Landeck (1) and Pinzgau (2) count with around 6,5 million overnight stays for the Winter season 2017/18.



The province of Tirol is one of the few regions which uses exclusively 'pure' water for artificial snow making. Triggered by a petition of a ski resort in Seefeld, the **Tirolean parliament prohibited the use of aggregates** for artificial snow making from the 4th of October 2018 on.

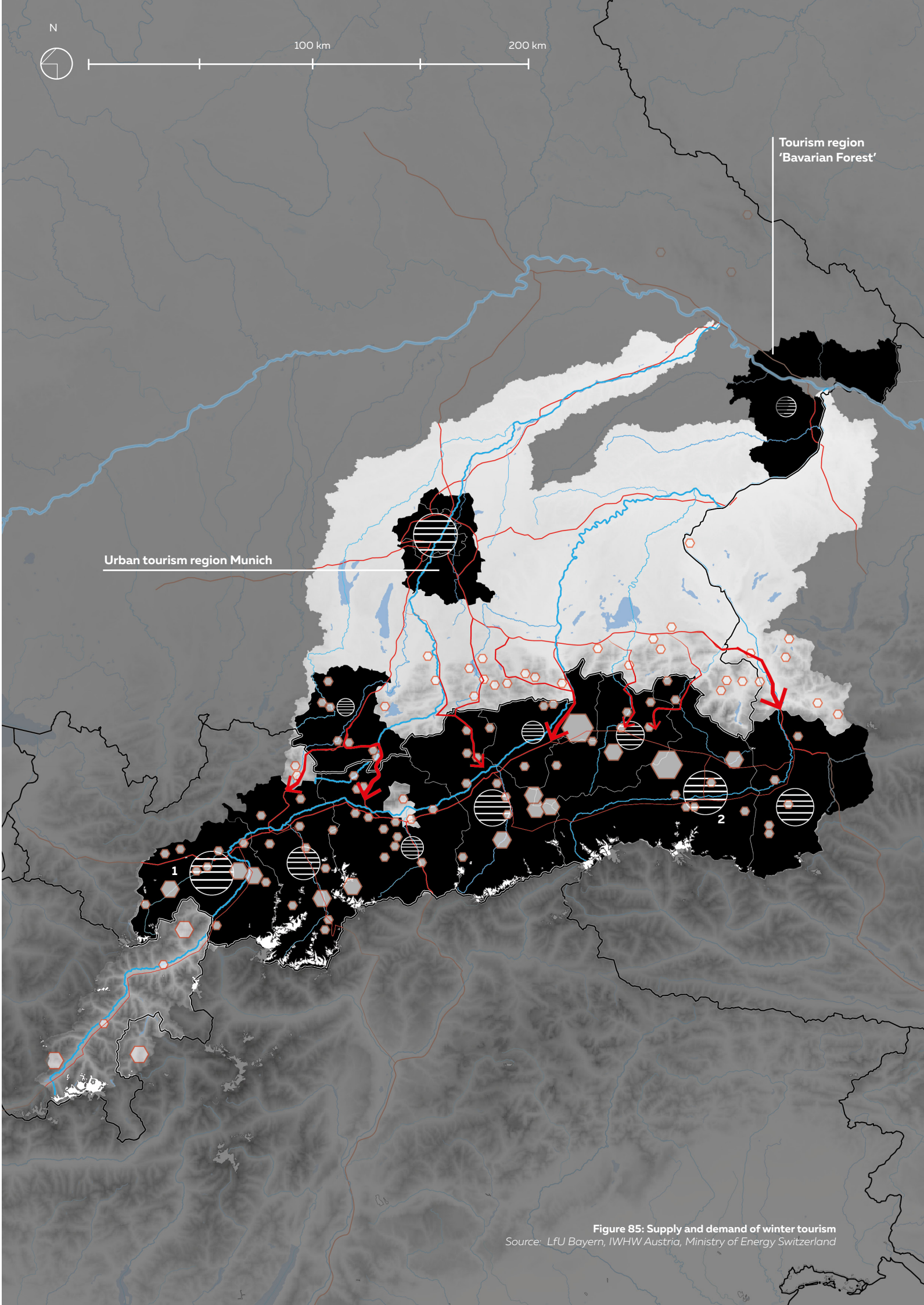


Figure 85: Supply and demand of winter tourism
Source: LfU Bayern, IWHW Austria, Ministry of Energy Switzerland

Electricity and water consumption pattern & its effects on the river ecosystem

Figure 86 refers to average national values of Austria since main winter tourism and hydropower generation takes place within this perimeter. It shows the relation between electricity and water consumption in the case study area and finally how this affects the river ecosystem.

The high yearly amount of fresh surface water in the Austrian context, 78,5 million m3, composites of ca. 75% precipitation, and 25% inflow. Around 35% of it evaporates in time and just 1,5 million m3 are extracted for anthropogenic uses. Drinking water is not included in this number, because it is mainly extracted from groundwater due to the high incidence of pores groundwater, and karst and crevice groundwater springs in the region (Österreichische Vereinigung für Gas-und Wasserfach, 2018; Umweltbundesamt AT, 2018).

Remaining fresh surface water is used to generate hydropower and afterward discharged again in the river course. Around 70% of all electricity consumed is generated by hydropower (Federal Ministry for Sustainability and Tourism, 2018). The high amount of hydropower plants already situated in the case study area lead to hydro morphological pressure and above all, to unnatural river flow regimes. Thereby especially the aquatic biodiversity is threatened, but also connected ecosystems and its habitats.

Moreover, water is extracted from various economic sectors. Normally it is released again after its use, but often in diminished quality. In the case of winter tourism, water is extracted mainly for the service sector. In the ski resorts, it is used for the operation of snowmaking, but also for gastronomy and accommodation.

Additionally to water, also electricity is needed for the operation of an economically feasible winter tourism season. The service sector is thereby after industry and private households the biggest consumer (E-control, 2018). However, ski resorts and their infrastructure consume relatively less electricity compared to hotels and gastronomy connected to tourism. The biggest conflict connected to this water and electricity flow is the delayed water release and the degradation of its quality. The infrastructure installed under- and overground threatens thereby again biodiversity in river courses and lakes, but also connected ecosystems.

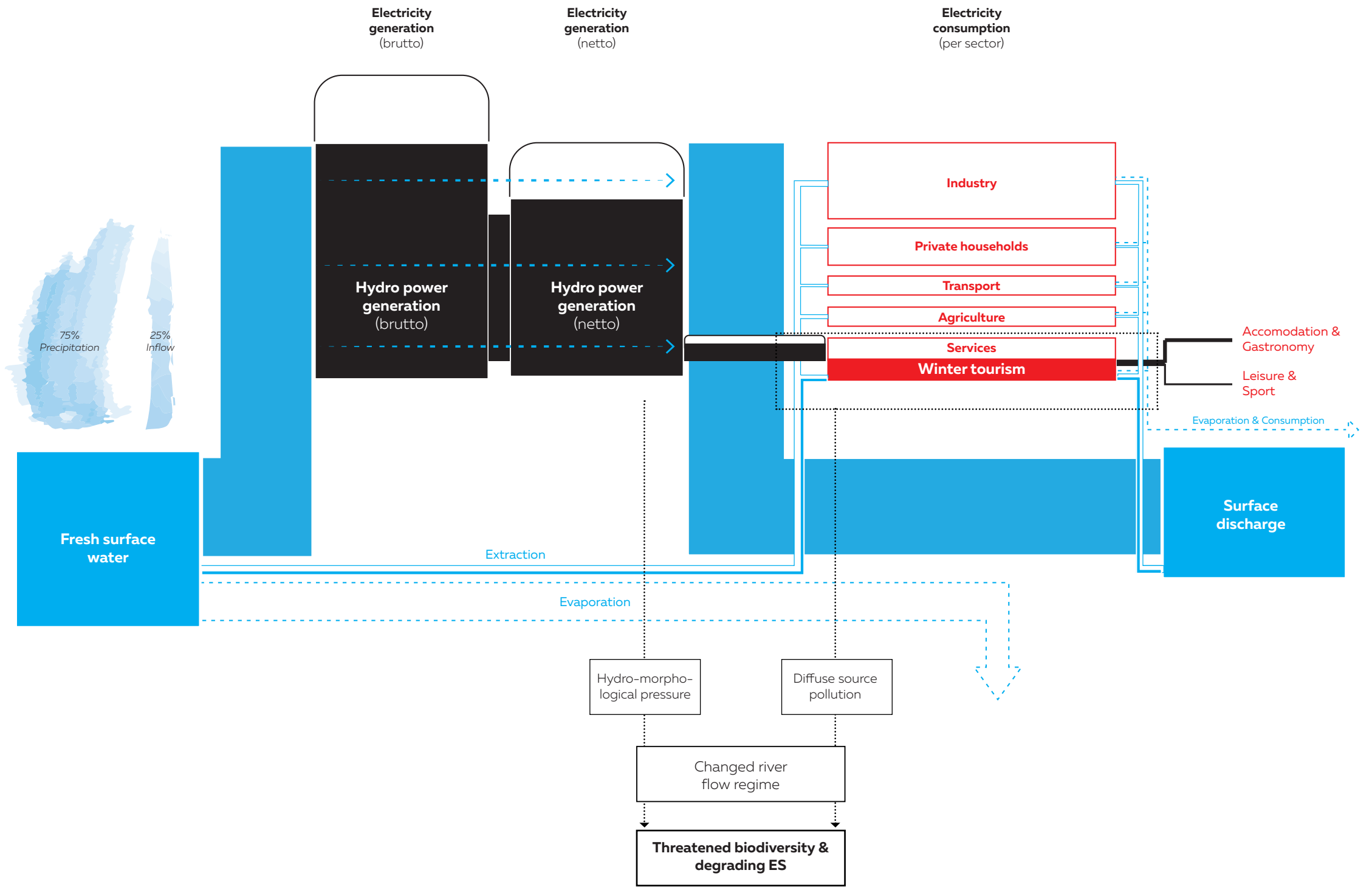


Figure 86: Water and electricity flow
Source: Federal Ministry for Sustainability and Tourism, 2018; E-control, 2018; ÖVGW Branchenbild Wasser 2018

V.III.ii The voice of nature

Status quo of river ecosystems

Figure 87 shows the ecological status of surface water bodies assessed according to the EU Water Framework Directive. For natural river streams biological, chemical and hydro-morphological quality components are considered and accordingly categorized in five levels: very good, good, moderate, unsatisfactory and bad; whereas for strongly transformed and artificial river streams it is declared as a potential and divided into only four categories: good, moderate, unsatisfactory and bad. The maps show exclusively bad and unsatisfactory parts of river courses. Switzerland is not an EU member and therefore the comparability of data is limited.

Comparing now the Inn and Isar river basins, differences can be found. The river Isar is hardly affected by hydro-morphological pressure through dams in its upstream areas. Diffuse source pollution caused by winter tourism is exclusively visible in the region of Garmisch Partenkirchen. Isar areas around Munich are incomparably good quality due to the Natura 2000 protected zones. However, downstream areas close to the Danube inflow present bad and unsatisfactory ecological water status. A reason, therefore, can be the multitude of run-off river plants and the industrial and urbanized context.

In turn, the upper Inn basin is exposed to hydro-morphological pressure due to the high amount of dams for the generation of hydroelectric energy. Secondly, the multitude of ski resorts affects the chemical status of river ecosystems by using aggregates for artificial snowmaking. Especially the Austrian part of the strongly transformed Inn and Salzach show a constantly bad potential to reach a better ecological status. Comparatively, the German part of the Inn possesses a better status even though a multitude of run-off river plants are situated in the river course. The border area of Inn and Salzach is a nearly constant Natura 2000 site and therefore in good ecological status. The same phenomenon applies to the Danube itself.

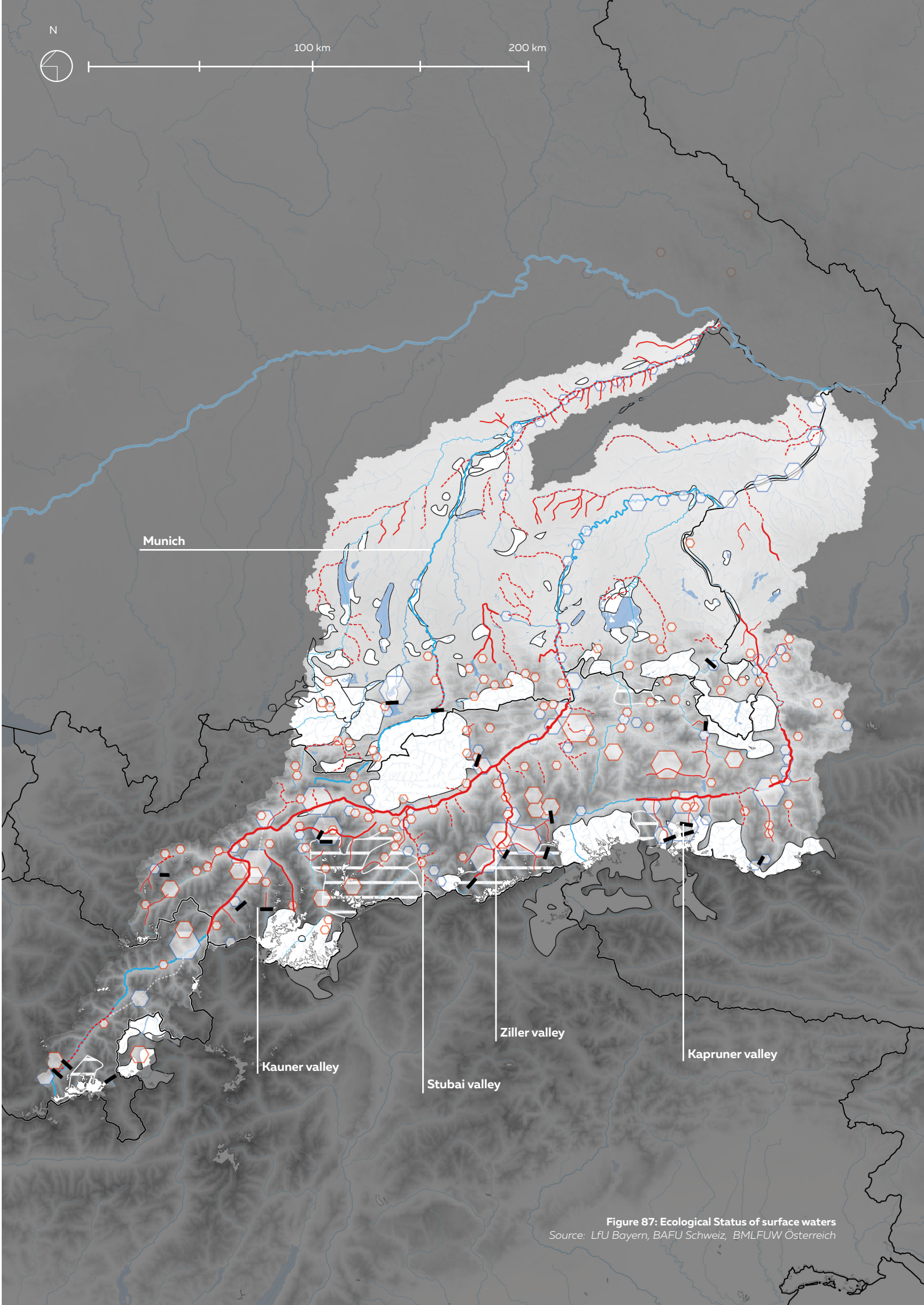
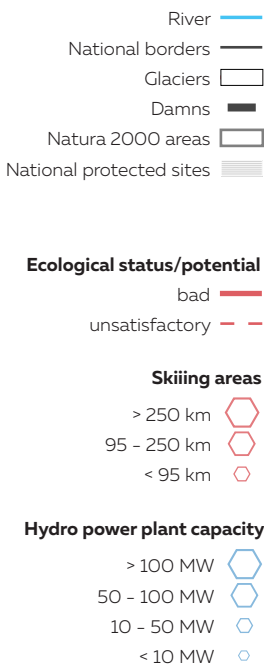


Figure 87: Ecological Status of surface waters
Source: LfU Bayern, BAFU Schweiz, BMLFUW Österreich

V.III.iii The voice of people

Economic role

The economic role of hydropower and tourism is analyzed in different scales: international, national and local. In a second step, it is identified where the added value and revenue goes to related to the aforementioned scales.

A general value for the entire inner Alps states, that around 10-12% of jobs are related to tourism, but however, this depends on every municipality. For example, in various municipalities in Tirol up 40% of its working population work in the tourism sector, whereas in the pre-alpine areas the average percentage is about 5-6%. Finally, local employment is created, but often employees are seasonal foreign people.

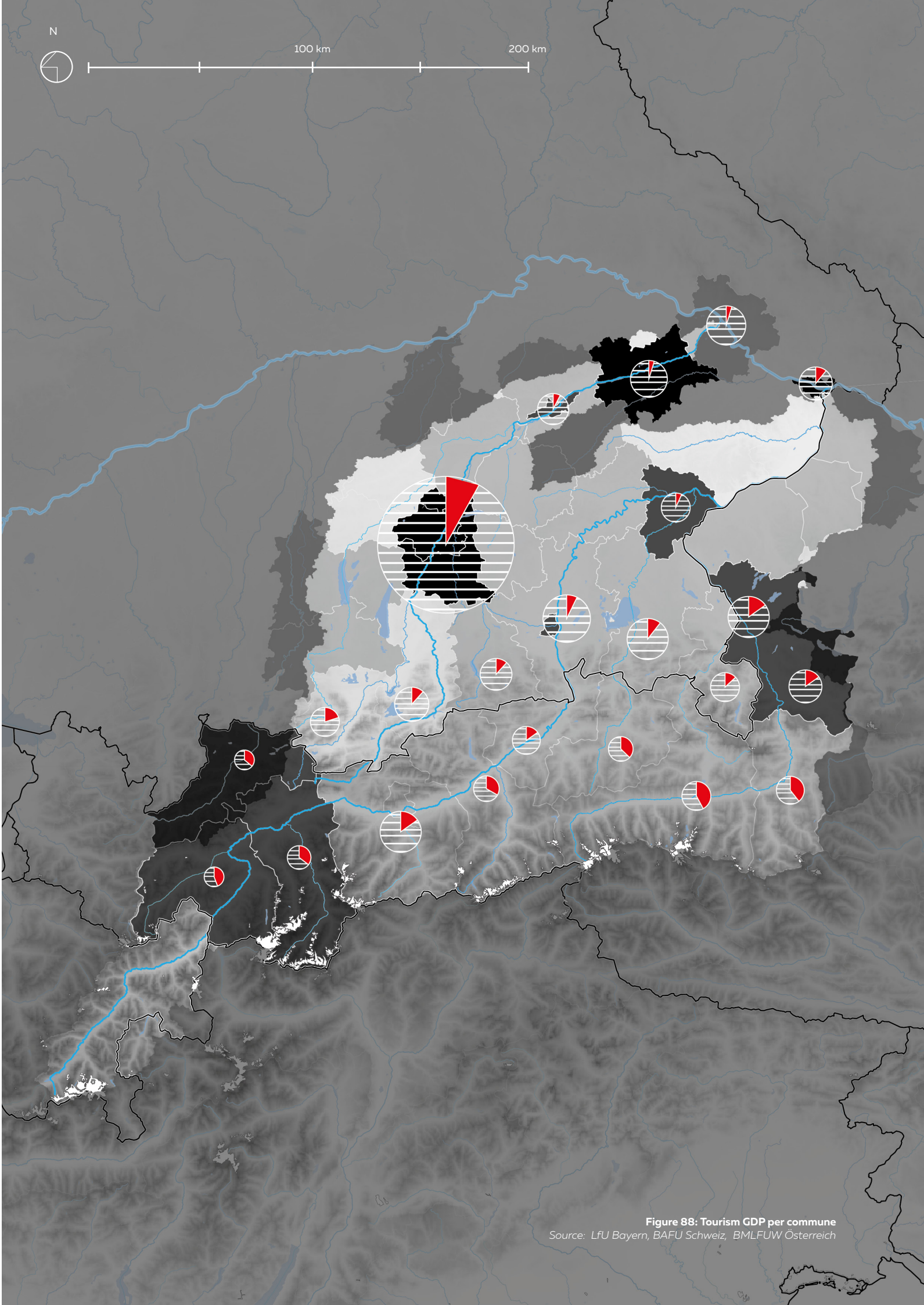
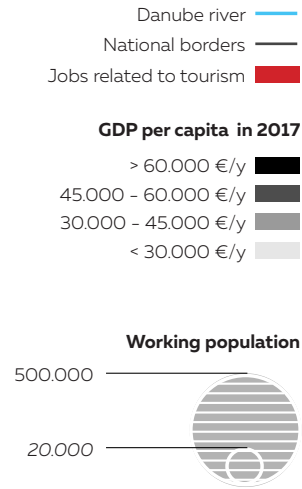


Figure 88: Tourism GDP per commune
Source: LfU Bayern, BAFU Schweiz, BMLFUW Österreich

ongoing social movements

The project wants to connect the comparatively small skiing areas of Kühltai and Hochoetz in order to guarantee a profitable future for the region. This means new funiculars, 38 ha slopes, artificial snow infrastructure, and a new reservoir. However, the local population does not agree with these plans, because it affects the natural high plateau 'Feldringer Böden', which is a popular destination for ski touring and summer hiking. Therefore the civil population started a petition for the protection of these areas.

Mayor of Oetz

Citizen of Oetz

Representative of 'Ötztal Tourismus'

Gerd Estermann, initiator of petition

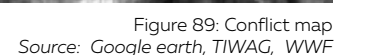
This project aims to increase the capacity for hydroelectric energy and implies the construction of two new power plants, a new reservoir in the Platzer valley, and new diversion tunnels. The effects on natural ecosystems led the people's voices to raise and generated a mobilization guided by various NGOs, such as WWF, Greenpeace and Global 2000. More than 20.000 signatures participated in this movement and therefore, the planning of this project is still ongoing and not sure to be approved.

Provincial government Tirol

Citizen of Tirol

Initiators of petition (WWF)

Representative of 'TIWAG'



V.IV Understanding the seasonal context

V.IV.i Effects of climate change

The effects of climate change in the case study area possess different dimensions depending on the location and the four seasons. Five different locations with a connected weather station and varying climatic conditions, so the territorial factor were analyzed. Thereby the air temperature and precipitation of the last 10 years were compared with the average of the last 30 years and future projected values in order to detect territorial-seasonal phenomenons with a need for adaptation.

A general increase in air temperature can be observed in all five locations during all seasons besides winter. In the most extreme case, 'Brenner', temperatures rose nearly 1 °C in spring, summer, and autumn since the last 10 years. In the lower locations temperature is supposed to rise up to 3,2 °C until the end of the 21st century, and in the higher up to 3,8 °C. A general precipitation increase is predominant in all locations besides the lower, pre-alpine 'München-Stadt'. Rising temperatures connected to precipitation loss in summer and autumn caused problems of drought and affected thereby agriculture and other water consumers. In all other locations in the inner Alps, the strongest precipitation increases take place in spring and summer, but above all, the higher location shows the most extreme changes up to 14mm average per month of difference.

In summary, the general effects of climate change in the case study area are changing precipitation patterns, rising temperatures, and more extreme climatic events. These changes affect seasonal run-off. Higher temperatures and changing precipitation patterns lead to a strong escalation in winter and can provoke flooding, whereas in the other seasons a general decrease is predominant. This can be explained by the reduced snow and glacier melt, which brings a higher drought risk, especially in summer with it.

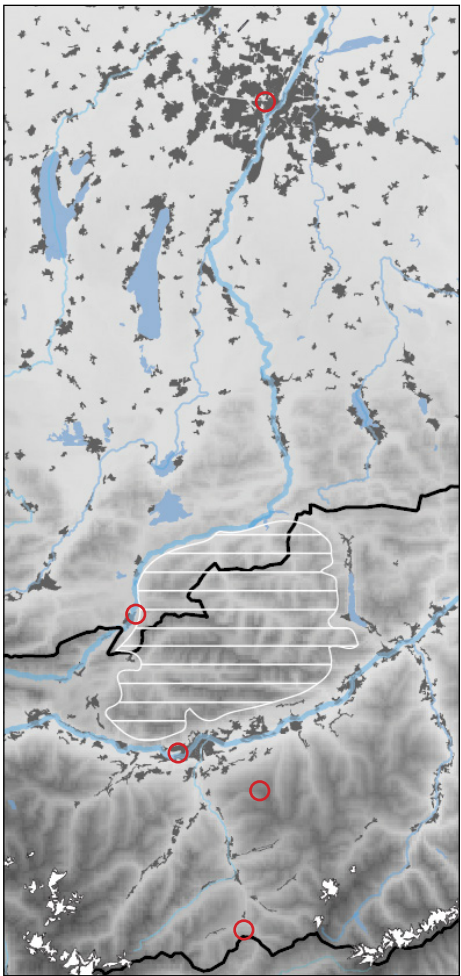


Figure 91: Location of weather stations
Source: Author

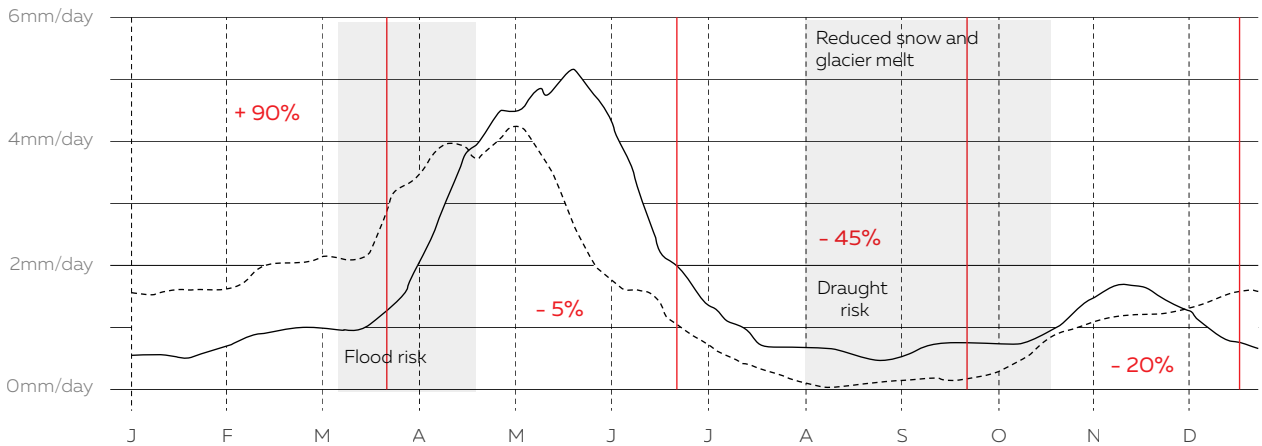


Figure 90: Shifts in seasonality of runoff in the Alps
Source: University of Ljubljana

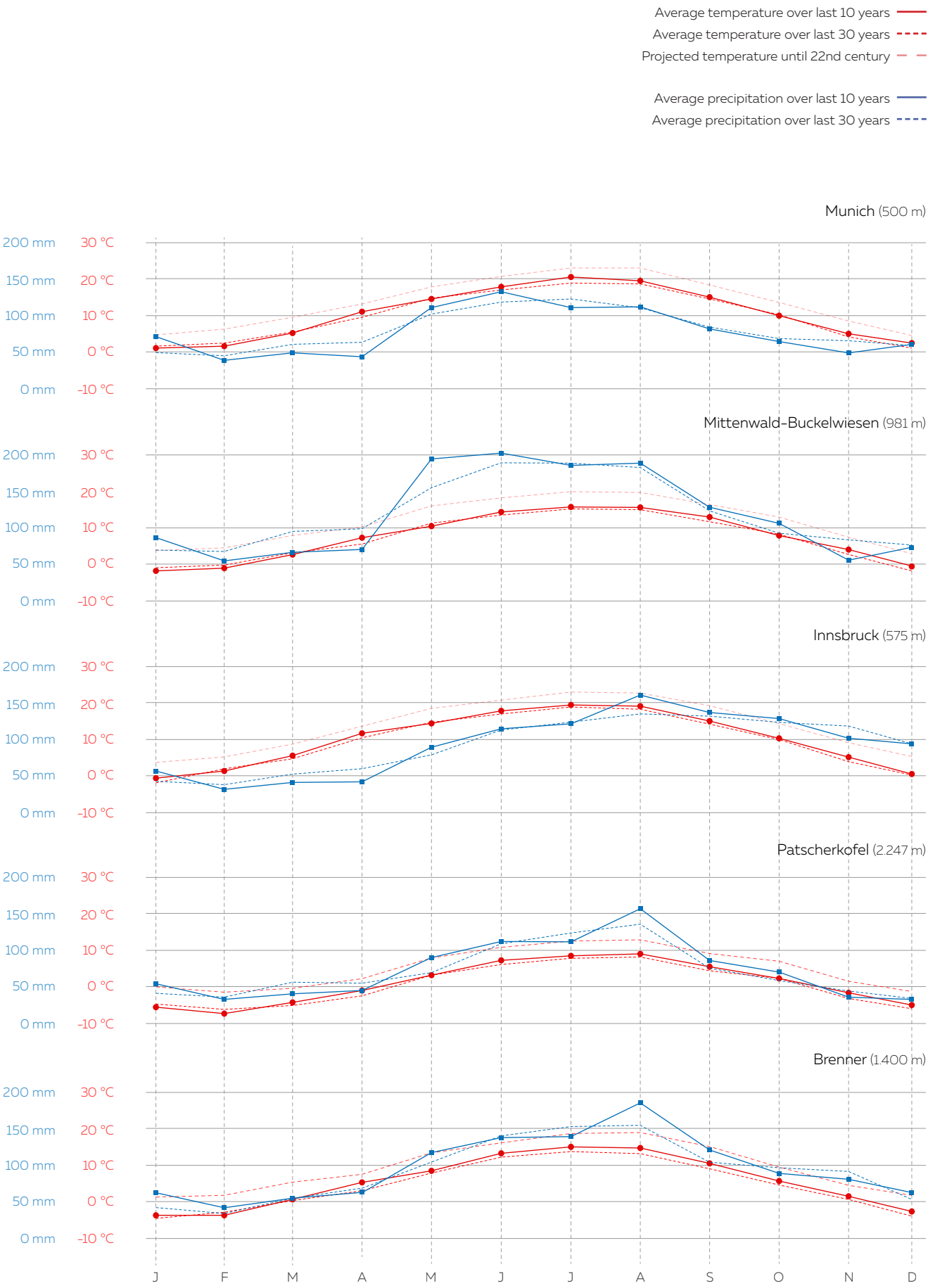


Figure 92: Climate diagrams
Source: Deutscher Wetterdienst, ZAMG

V.IV.ii Effects on hydro power

Before looking deeper into seasonal differences, it is important to elaborate more on the daily curve of electricity consumption (Figure 95). The long-term base load is generally defined by the lowest daily electricity consumption, so normally during nights and is covered by constantly running power plants, such as nuclear-, coal- and run-off river power plants. The middle base load corresponds to regular daily imbalances and is therefore generated by more flexible power plants, as e.g. run-off river, solar panels or wind turbines. Finally, the peak load describes moments of the highest daily consumption and depends on extremely flexible power generation, such as storage- and pumped-storage power plants (VSE, 2018). Thereby it becomes clear, that after finishing work, the population depends on electricity generation by (pumped-)storage power plants in the alpine regions.

This hypothesis is enhanced by the analysis of monthly supply, demand, and exchange of electricity (Figure 97). The trading balances show that Germany has a nearly constant positive result, whereas Austria depends strongly on electricity imports during the entire year. This leads to the assumption, that a big capacity of Austrian's sizable availability of (pumped-)storage power plants are currently used to provide the peak load in Bavaria, and simultaneously, a significant part of Austrians base load is covered by German nuclear- and coal-fired power plants. Considering ongoing policies towards renewable energies in the case study area, the current pattern needs to adapt.

Moreover, climate change effects influence the hydropower potential. Melting glaciers, changing precipitation patterns and more extreme climatic events lead to irregular electricity generation, positively or negatively. E.g. the dry period of 2018 decreased Bavarian's generation strongly.

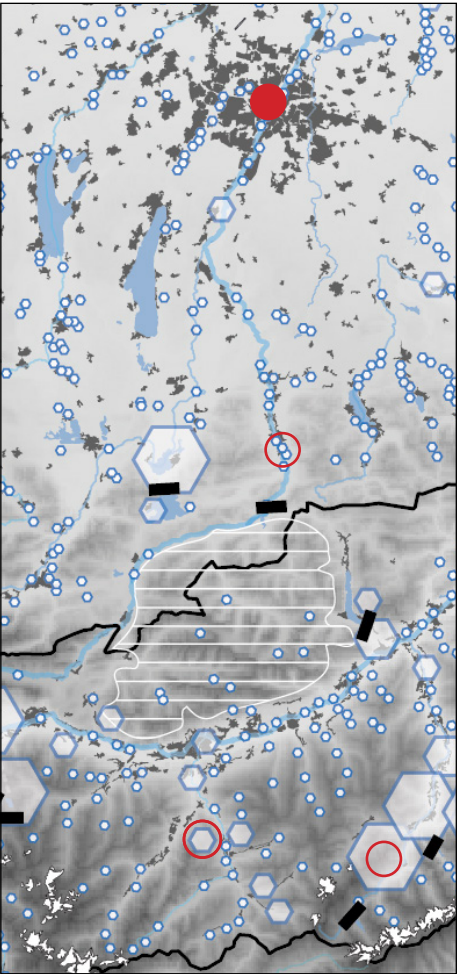


Figure 94: Location of hydro power plants
Source: Author

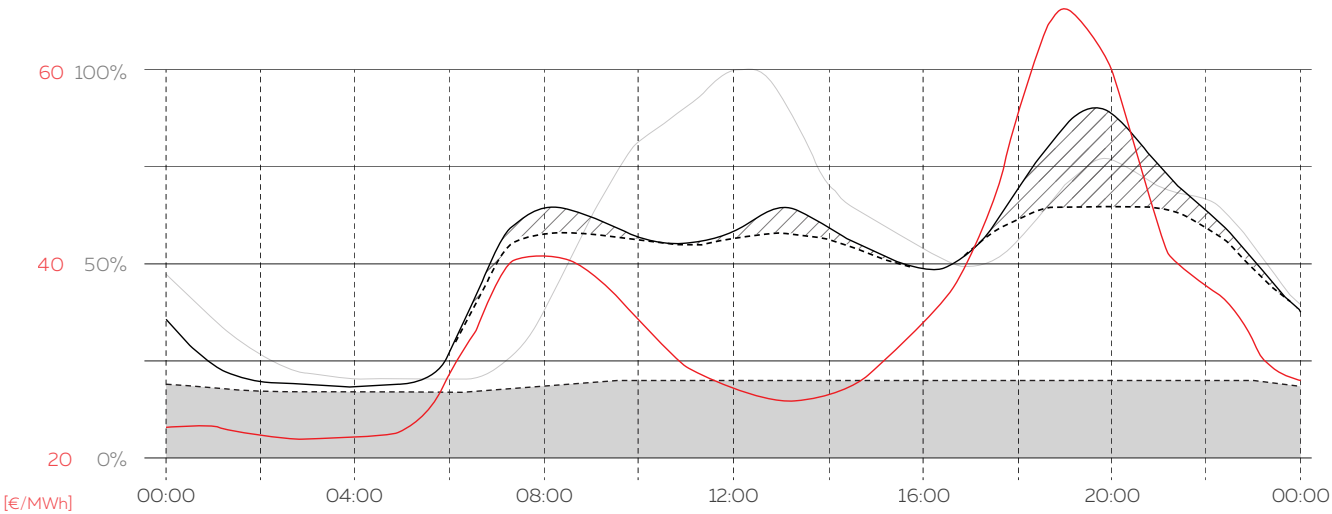


Figure 93: Schematic daily load pattern in spring and electricity prices
Source: Association of Swiss Electricity companies, 2018

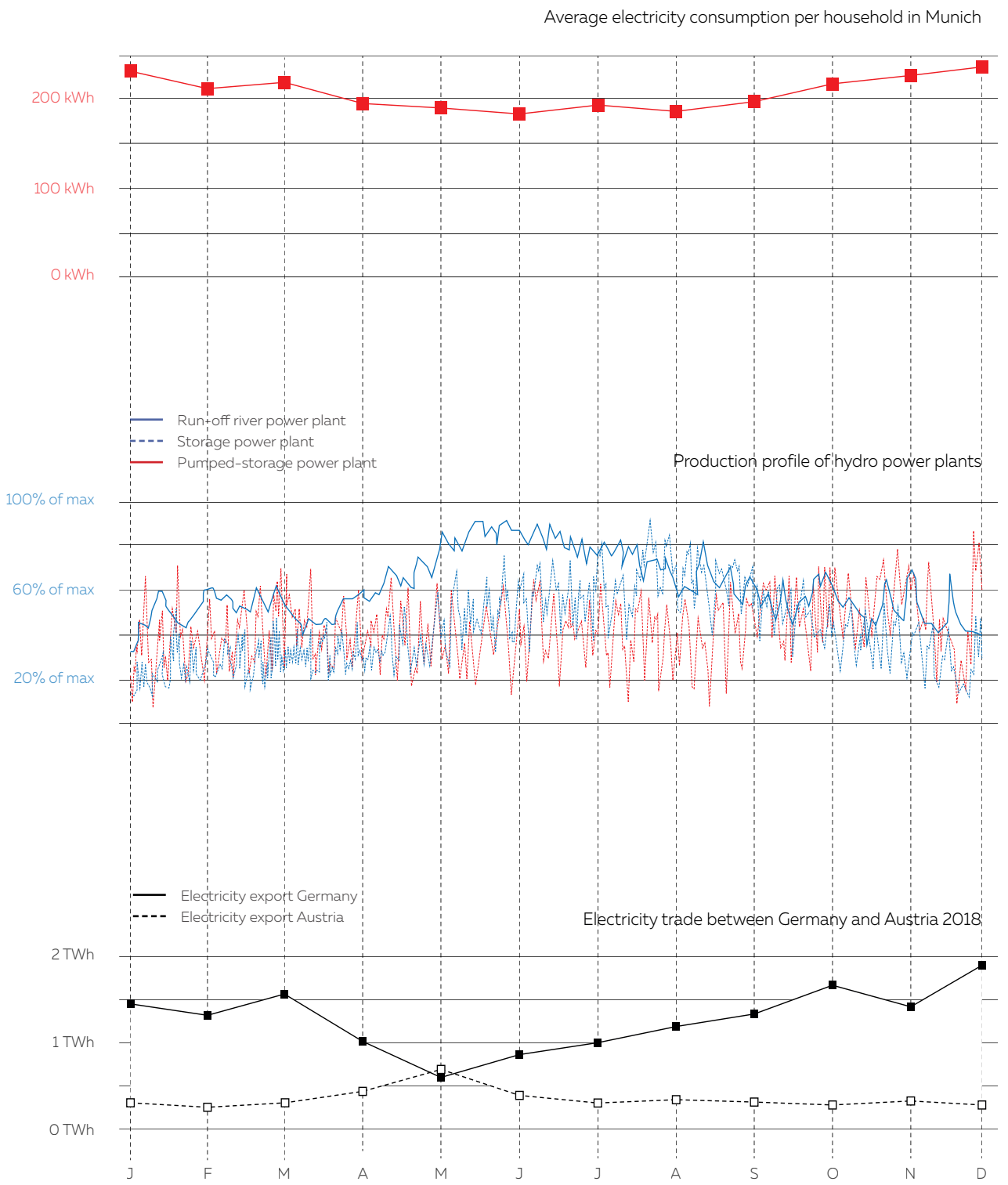


Figure 95: Diagrams about hydro power
Source: SWM Munich, Swiss Water Management Association 4/2016, Fraunhofer Institute

V.IV.iii Effects on (winter) tourism

Higher temperatures lead to a rising snowline and a delayed start of the winter tourism season. Furthermore, water availability is expected to decrease in autumn. By analyzing three different kinds of winter holiday destinations territorial and temporal characteristics become clear. The bigger and higher a ski resort lays, the earlier the winter season starts and the longer it lasts (Figure 100). Thereby snow reliability and cold enough temperatures play a key role.

Most ski resorts measure their profitability according to the '100-day' rule and aim to start their season as early as possible, usually by mid of November. But in the last years, it happened more frequent, that the official start had to be delayed. Furthermore, special importance is put on the Christmas, Winter, and Easter holiday business, since it is extremely lucrative for the resorts. However, considering climate change effects, snow reliability is often not given any more by that time, especially in lower areas. Therefore, the use of artificial snowmaking became a common measure to maintain a profitability business. Figure 98 shows that artificial snowmaking is intensively used in order to guarantee a punctual start of the season and a profitable Christmas and new years tourism.

By comparing different ski resorts it becomes clear, that also their seasonal focus differs strongly. In lower areas like Lenggries, already all-year-round tourism is predominant with a slight concentration in summer. In higher, middle-sized areas tourism exists all year round with a minor focus on winter. In turn, one of the most intensive destinations Sölden works with relatively low summer operations, but an extremely high focus on winter tourism. This means an unsustainable behavior of land use.

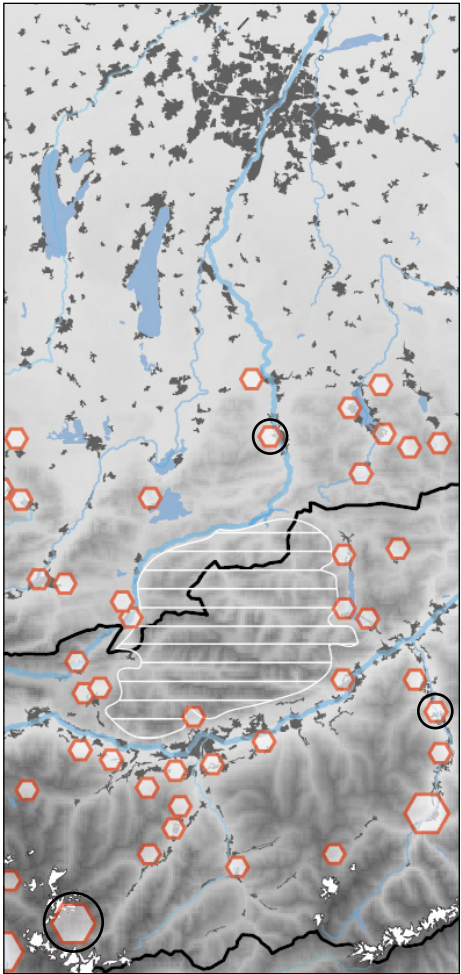


Figure 97: Location of skiing resorts
Source: Author

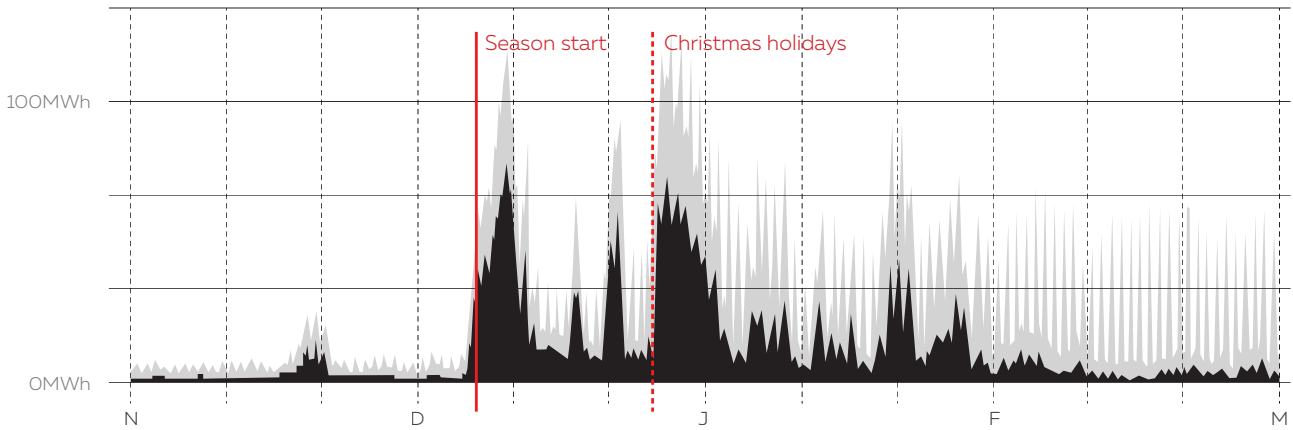


Figure 96: Electricity consumption pattern of artificial snow making and ski lifts in Salzburg 2015
Source: ÖIR GmbH, Austrian Power Grid AG

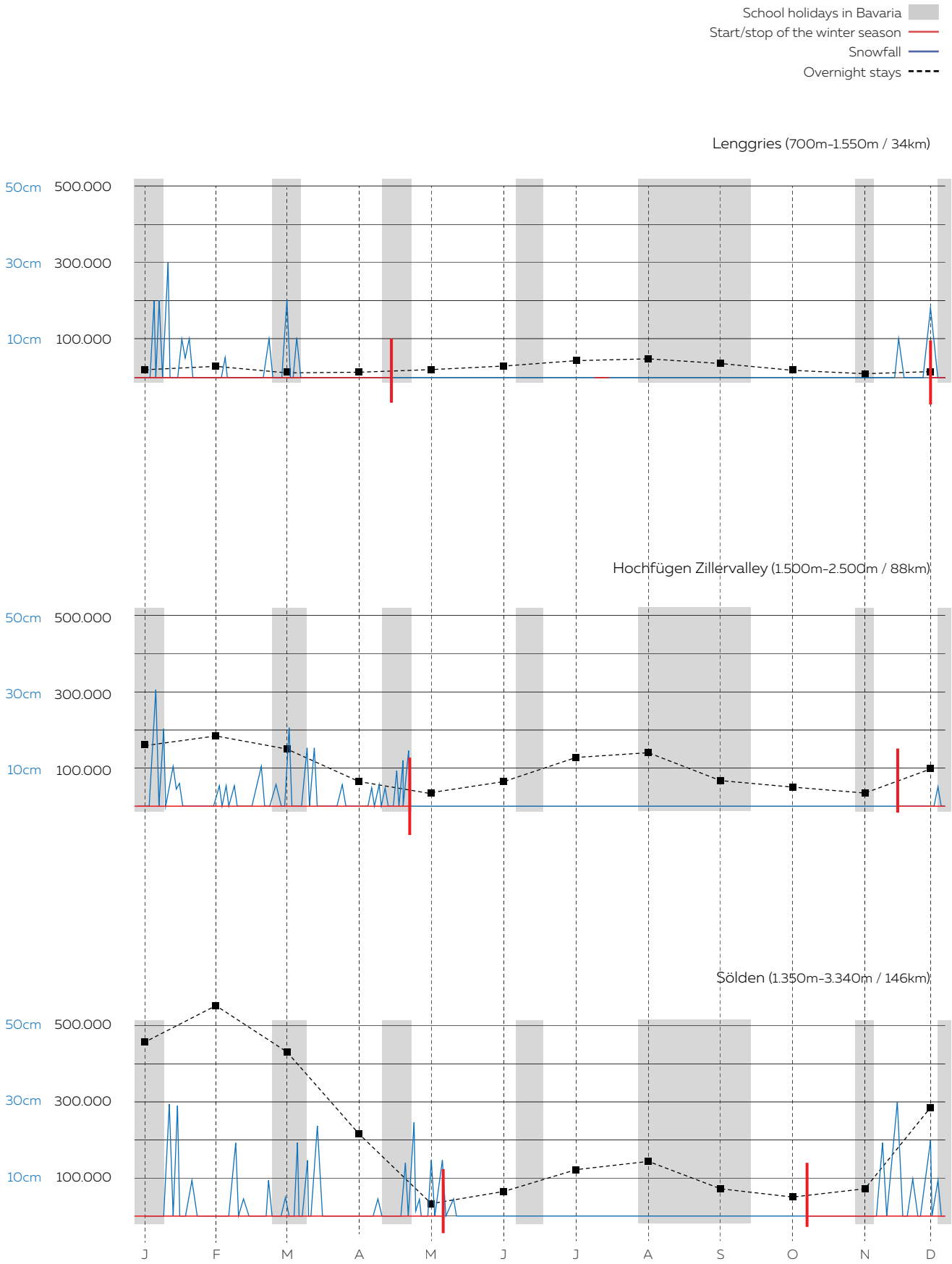


Figure 98: Overnight stays, snowfall and winter season duration of ski resorts 2017
Source: Office of the Tyrolean Provincial Government, Municipality of Lenggries

V.V Conclusion

A hybrid system

In summary, the previous analyzed systems of hydropower and (winter) tourism need to be understood as hybrids, so not as two separate entities of human and natural processes. As Maria Kaika puts it, '...nature is transformed by human labor and capital investment' (Kaika, 2012; p.31) and is therefore continuously per-formative and not static. In other words, current environmental change needs to be understood beyond biophysical processes, but consider also the socio-economical and political perspective and its externalities on the water system.

The degradation of local environments is often driven by forces that transcend the local level. Local land use and resource decisions are made by economic and political forces, that operate at the regional, national and global scale. Therefore, always winners and losers in environmental change and resource distribution exist. In the case study area this becomes especially clear by ongoing petitions in the alpine communes. The local community does not profit by decisions made regarding water resources in a regional, national or even transnational scale. In turn, they and other species experience ecological degradation in their habitat and this puts spatial justice in question.

From vision to strategy

The general spatial vision goals/objectives derive from the previously analyzed steps in the macro- and case study scale. They are based on the understanding of interrelations between pre- and inner alpine areas in terms of supply, demand, and externalities. As it is mentioned in the previous paragraph, the location of these three elements is often not the same and provoke the phenomenon of spatial injustice. Therefore, anthropogenic networks, as e.g. mobility and electricity exchange need to be transformed in a sustainable way. Secondly, natural interrelations through freshwater ecosystems must be prioritized, which implies the enhancement of regulating and supporting ecosystem service. Climate change is an external influence and contributes to per-formative environmental change. This asks for economic and environmental adaptation in especially vulnerable areas and seeks for alternative future development.

The framework for the spatial strategy is built upon the four yearly seasons in order to provide a feasible all year round perspective. Thereby the current and future changes and mismatches in water balance, tourism seasons, electricity generation and consumption can be tackled.

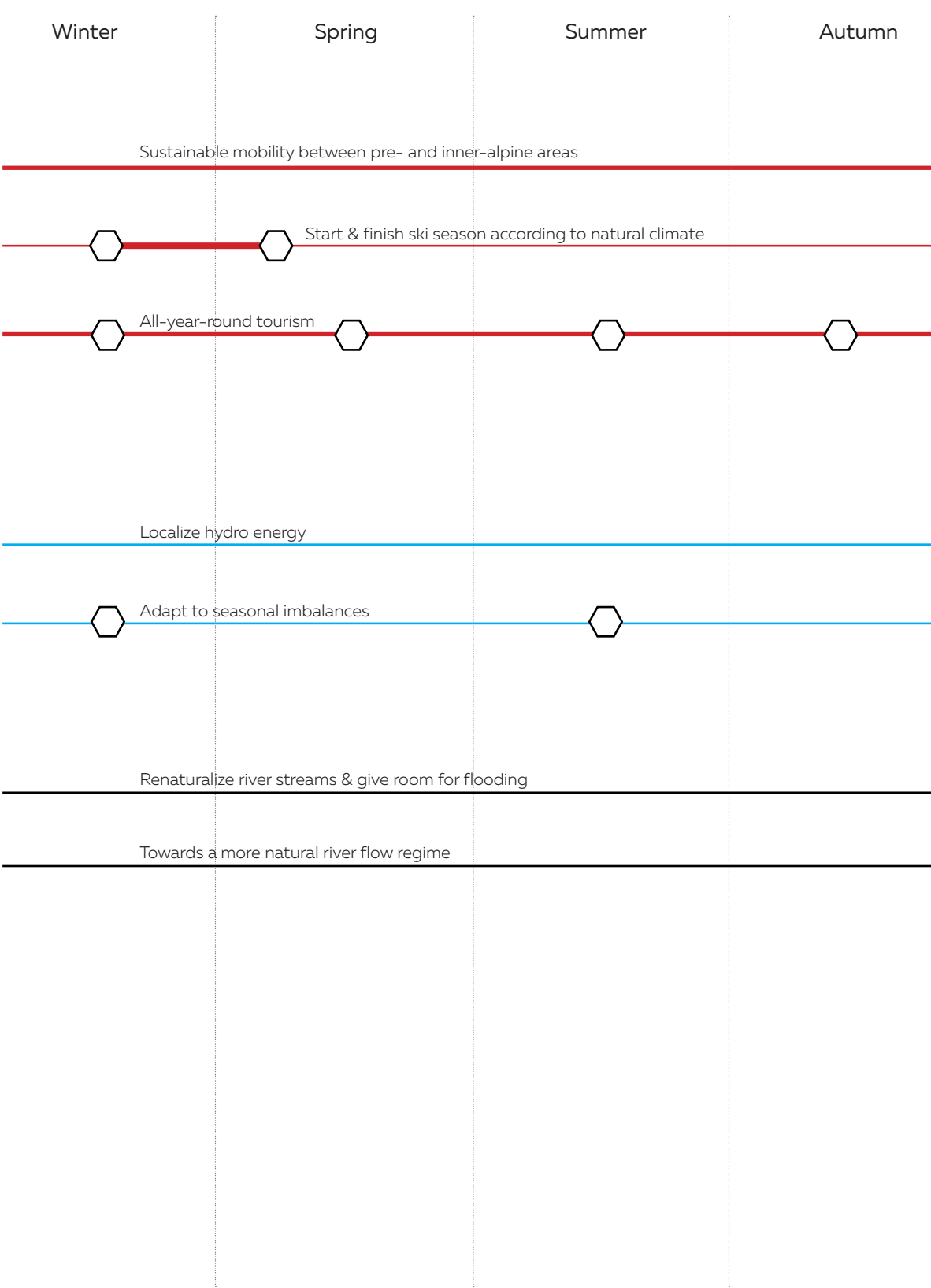
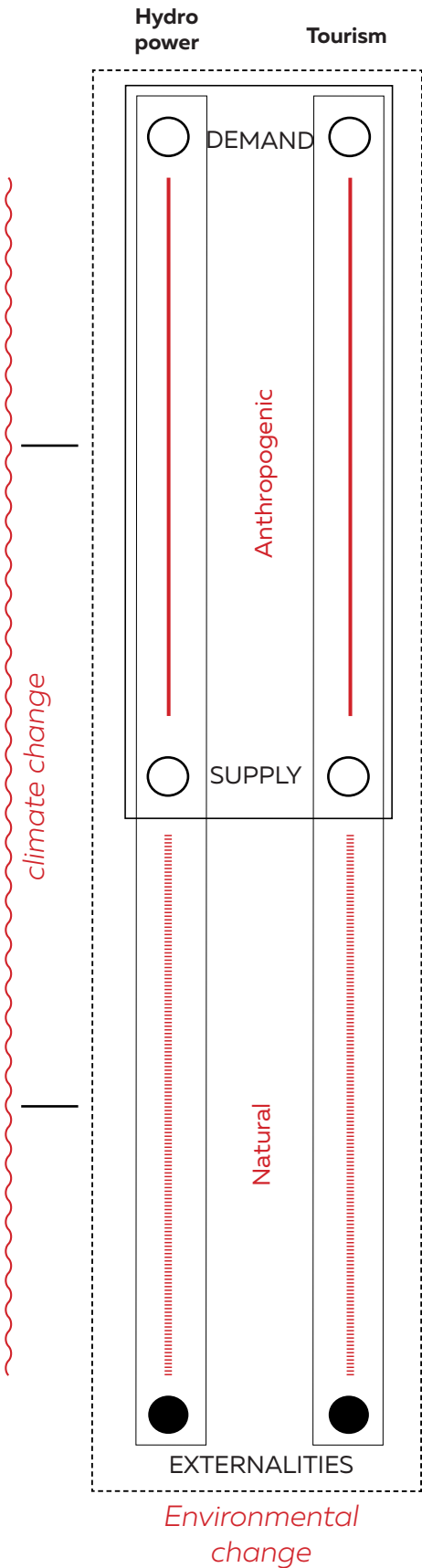




Figure 99: Melting artificial snow in Lermoos
Source: Author



VI. DEVELOPMENT STRATEGY

VI.I Introduction of a strategic framework

From objectives to actions

The strategy follows a climate-responsive approach and aims to improve freshwater ecosystems by intervening the supply and anthropogenic interrelations of tourism and hydropower. Through the use of a strategic framework based on seasonality and intensity (Figure 100), previously defined vision objectives can be translated into localized spatial actions.

The foundation is changing water flow patterns caused by climate change (figure 100) and accordingly, how tourism and hydro energy generation can adapt to that. In the first step, areas of intervention are classified by their seasonal distribution and intensity of tourism. Secondly, potentials for alternative electricity generation are analyzed under a seasonal approach. Finally, both aspects are overlapped and lead to strategic actions aiming for more sustainable water use.

Water run-off
Future run-off-pattern 
Current run-off-pattern 

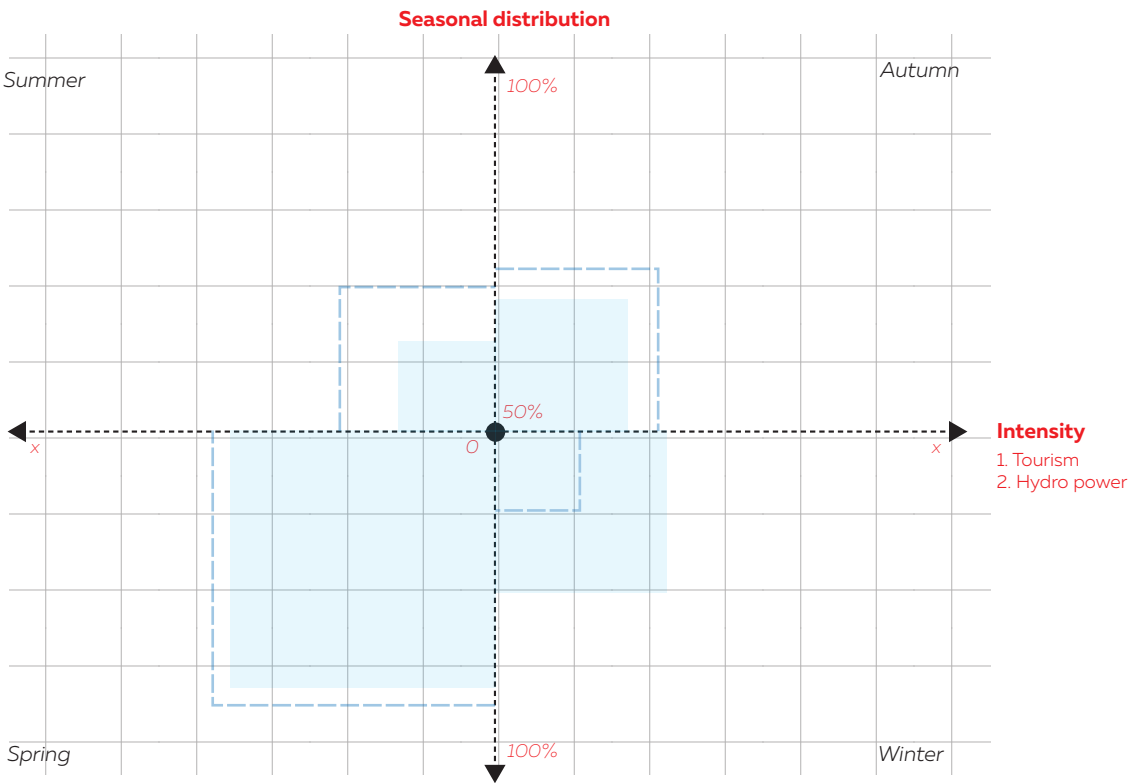
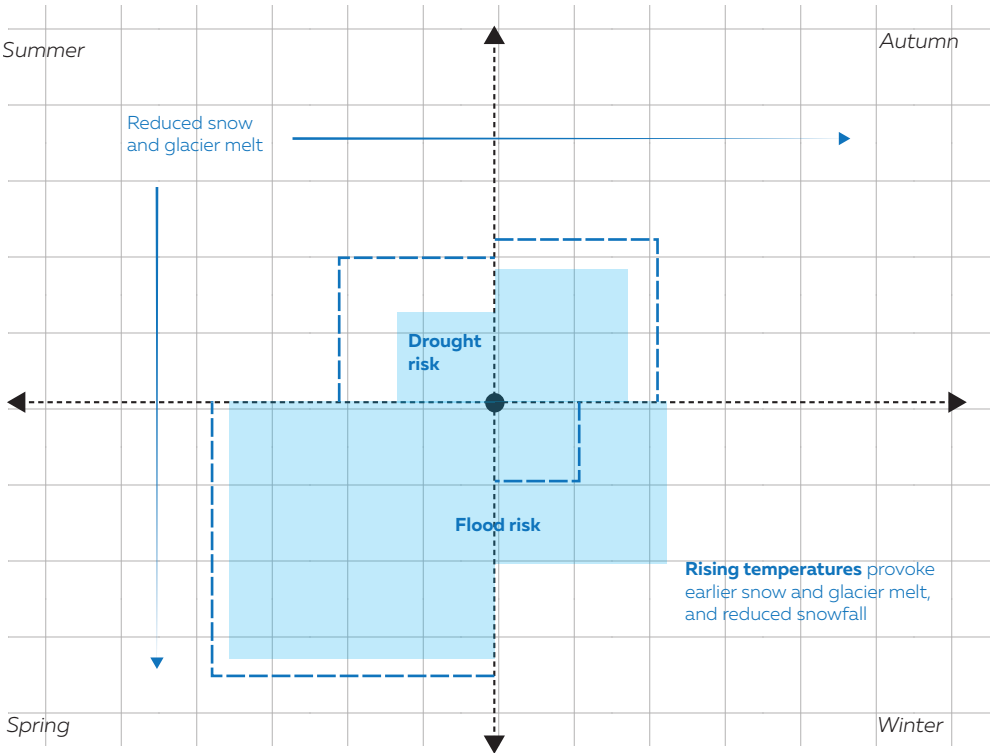


Figure 100: Strategic frameworks
Source: Author

Localization of seasonal tourism

Tourism intensity in the case study area is spread out through the territory depending on the season. In order to detect the most popular summer, winter and all-year-round destinations, overnight stays and seasonal distribution per municipality have been considered. Thereby it becomes clear, that regional capitals, but also some destinations in the mountains count with high tourism intensity all-year-round. However, a general shift from the north in summer towards the south in winter can be observed.

It becomes clear, that high intensive tourism destinations prevail especially during winter, i.e. tourist activities of some big areas take place more than 70% exclusively in this season. In turn, various smaller, on winter tourism focused areas, are shifting already towards an all-year-round based model, or are struggling to survive economically through the competition of big, polarising areas and climate change effects. Summer destinations show generally a more balanced seasonal pattern but still, count with high masses of tourism.

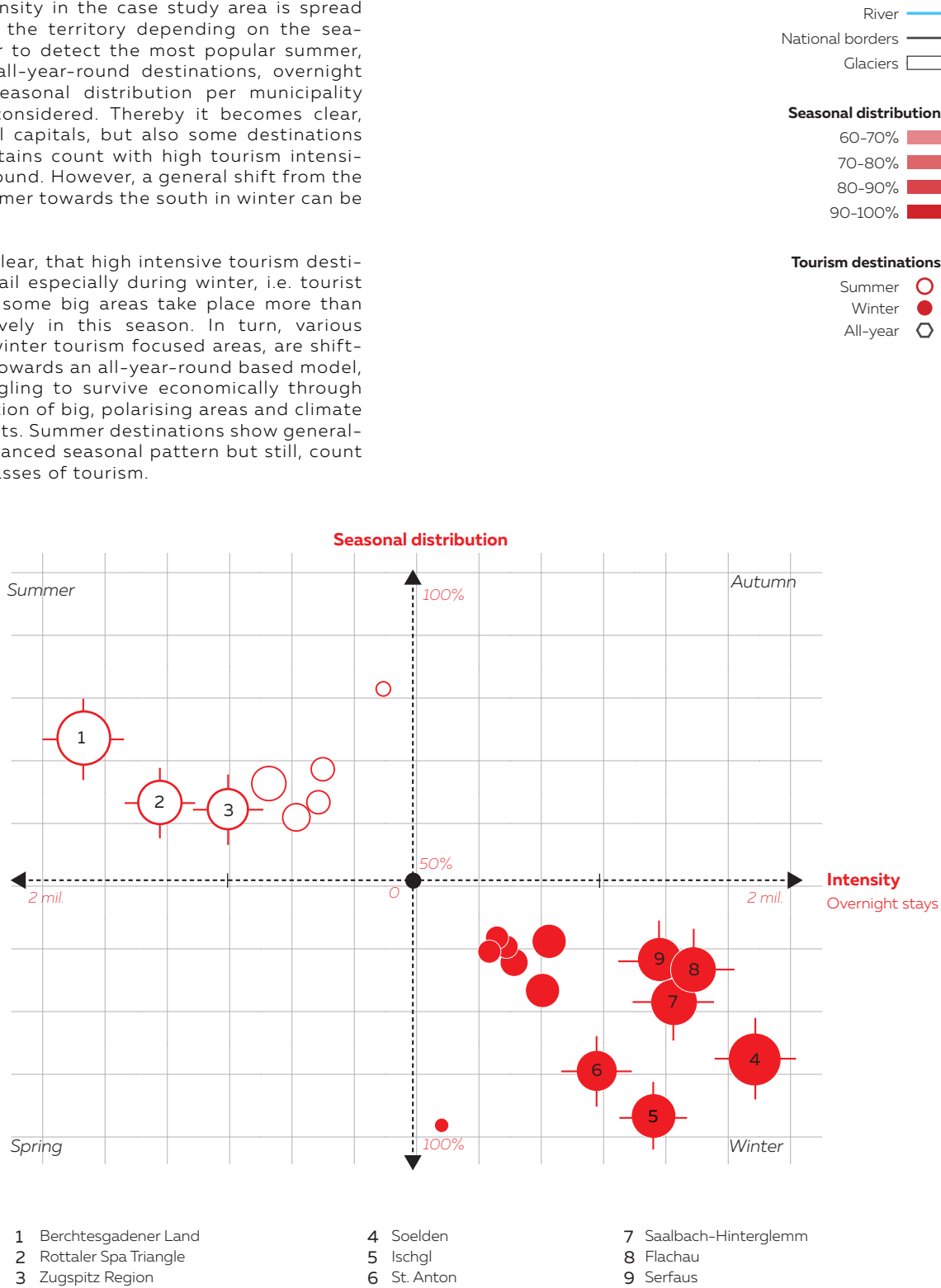


Figure 101: Seasonal tourism hot spots classified in framework
Source: Author

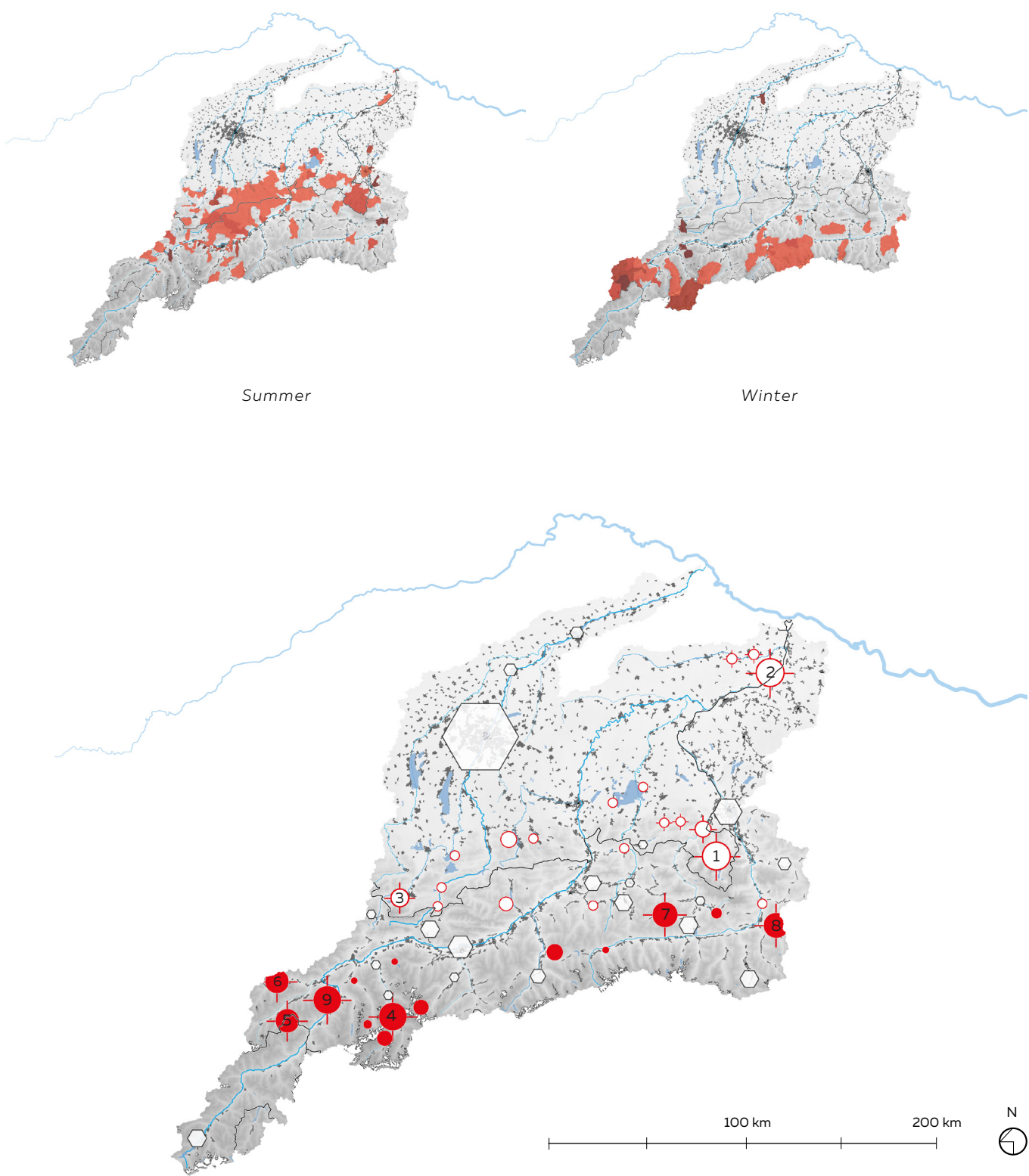


Figure 102: Classification of seasonal tourism hot spots
Source: Author

Potentials of seasonal electricity generation

Electricity demand is generally higher during winter, but electricity supply through hydropower is experiencing its peak in spring and summer. This can be explained through a stronger river run-off regime caused by melting snow and glaciers. That mismatch will be contested partly by climate change effects resulting in an increased run-off pattern in winter, but additionally with alternative, renewable energy sources. They give especially in Austria the opportunity to support the missing baseload energy. Currently, the hydropower capacity is already reaching its limits and influences additionally the river ecosystems in a negative way. Therefore alternative, renewable energy resources build the potential for the decentralization of energy generation and consumption and so a decrease in the electricity exchange between pre- and inner-alpine areas.

Especially solar power in high altitudes provides the potential to cover missing electricity generation during winter times but offers additionally baseload generation during the other seasons. In turn, bio-energy provides a lower, but steady electricity generation so support self-sufficiency, and eventually local revenue. Due to the decline of the projected electricity exchange, the role of energy storages becomes more relevant, in a daily and seasonal perspective.

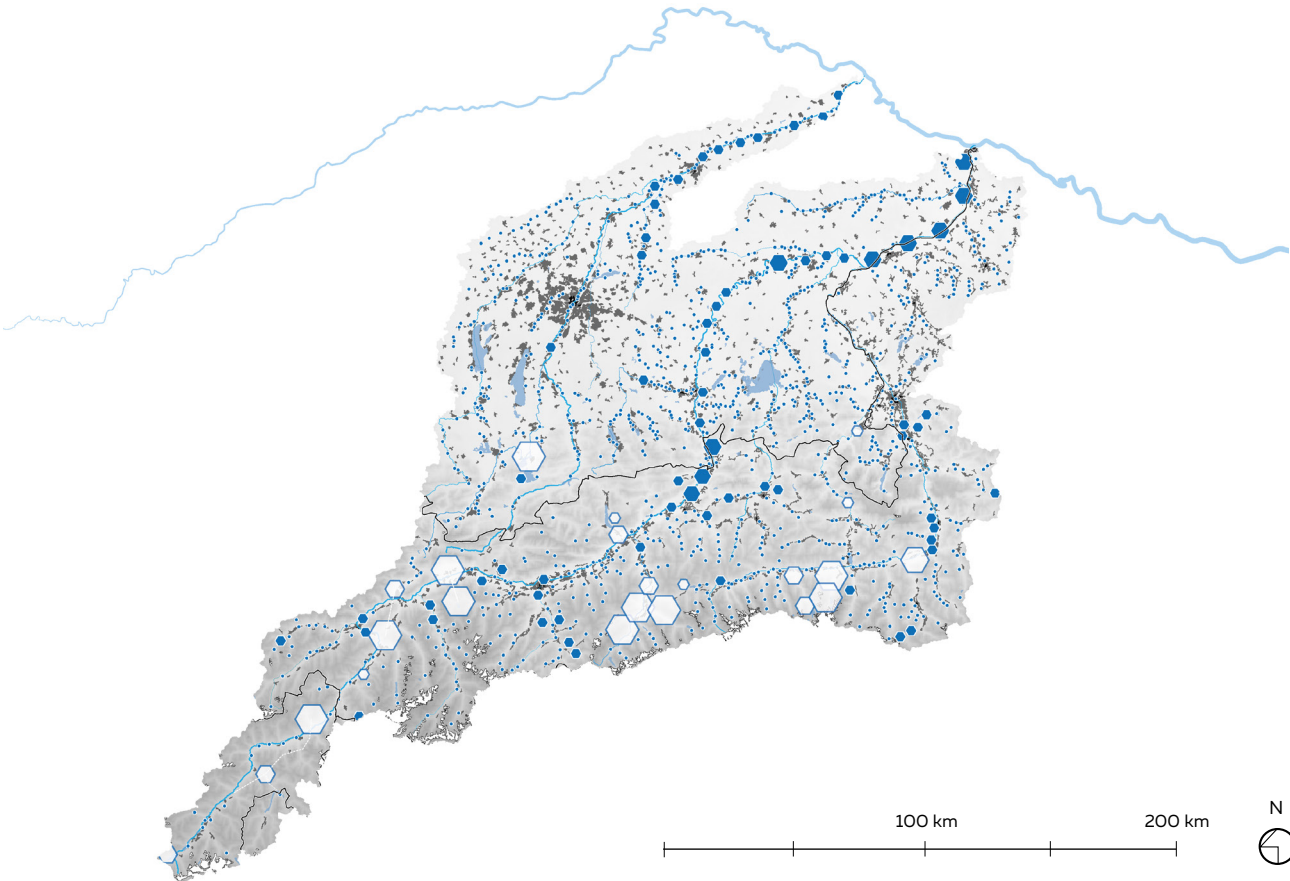


Figure 103: Hydropower plants in key area
Source: Author

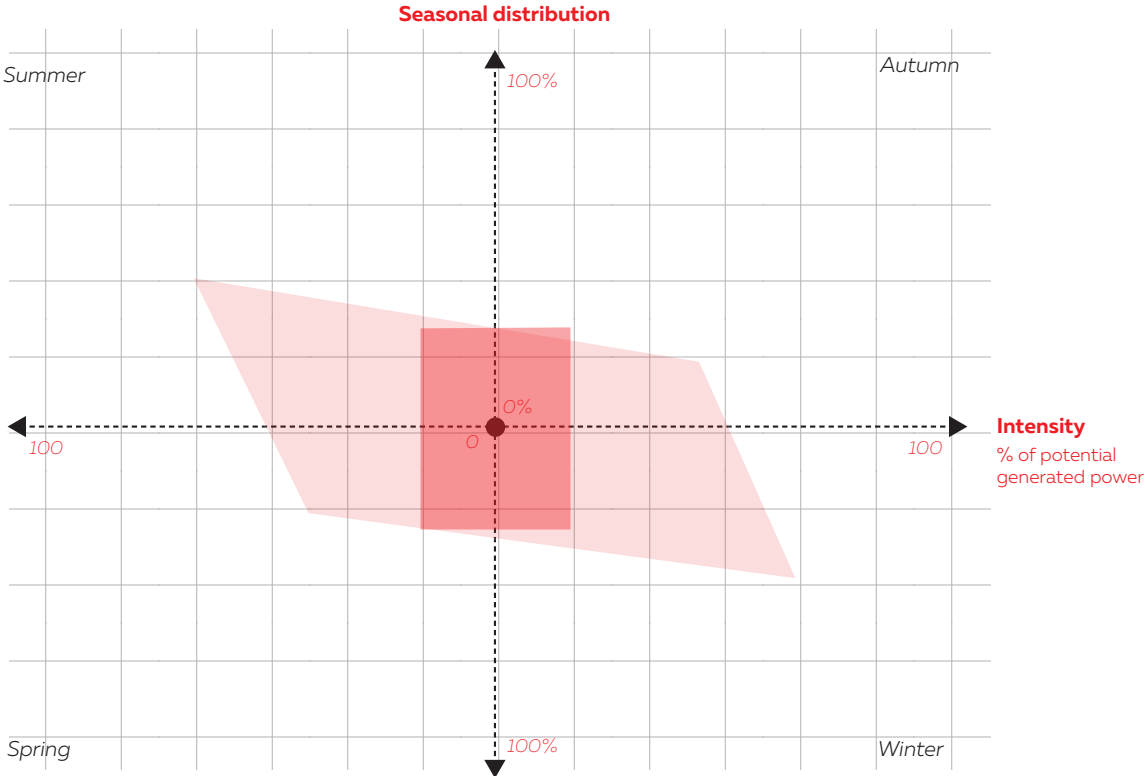
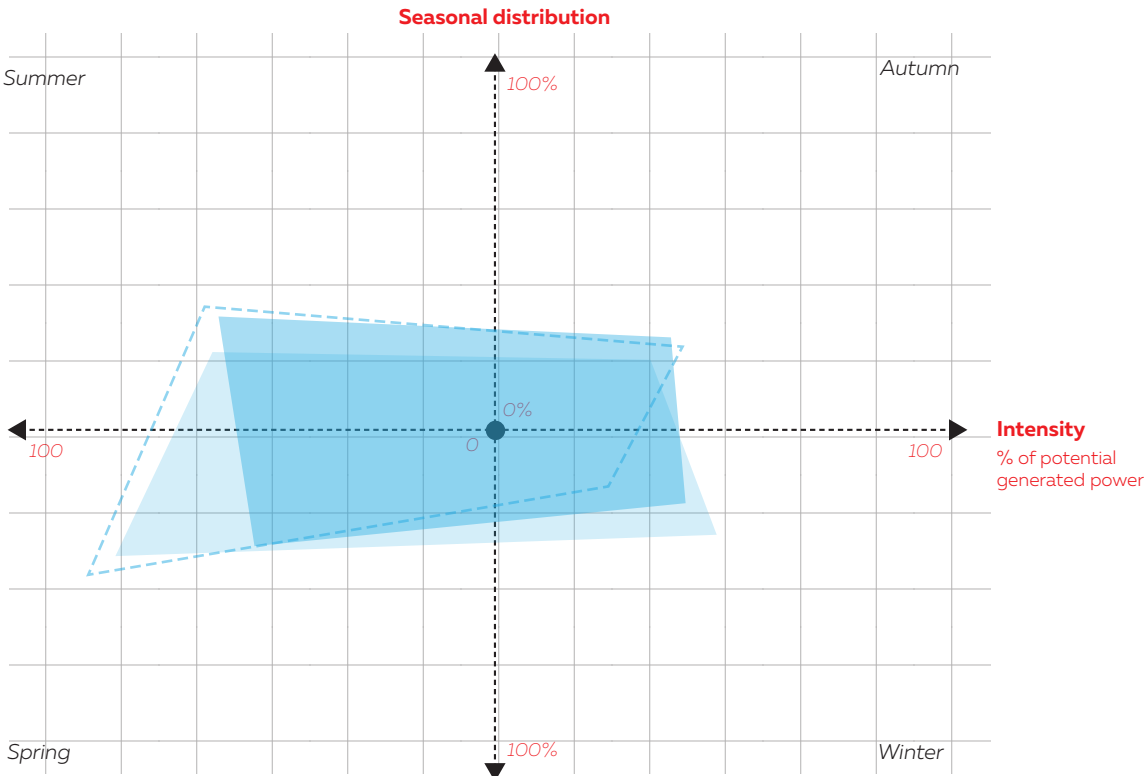
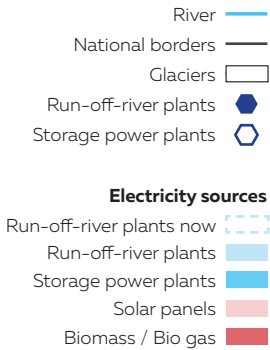


Figure 104: Seasonal performance of energy sources
Source: Author

Concreting strategic actions

As it is stated previously, the strategy follows a climate-responsive approach and aims to improve freshwater ecosystems by intervening the supply and anthropogenic interrelations of tourism and hydro-power. Concerning interrelations between pre- and inner-alpine areas, the strategy acknowledges the interdependency of tourism and aims to make current transport more sustainable. Secondly, the electricity exchange between Austria and Germany is reduced in order to achieve a more spatial just development. Concerning the supply, a more sustainable tourism and energy provision model is put forward to reach a socio-ecological development. Concrete strategic actions can be divided into three different fields:

1. Introduction of a pioneer network
Areas threatened by climate change effects and economic competition build an alliance and promote a more sustainable way of tourism and electricity generation. This approach gives opportunities for an alternative economic development for winter tourism focused areas. These destinations use the potentials of an intact river ecosystem to promote a new ecological-friendly way of tourism and elec-

tricity generation. This refers e.g. to starting and finishing the season according to natural climatic conditions, i.e. no use of artificial snowmaking, and the use of alternative energy sources. By applying a community-based model, local revenues can be generated in lower intensive seasons through the selling of surplus energy.

2. Policy recommendations for a sustainable water use
High intensive tourism will still take place in these areas, but they need to adapt to more sustainable water use in the future and be energy wise self-sufficient. This refers to the limitation of artificial snowmaking, possibilities of water and electricity storage and renaturalization approaches.

3. Sustainable mobility
This concept follows a collective and demand-responsive approach. The idea is to introduce a network of collaborative mobility exchange between intensive summer- and winter tourism regions located in the pre- and inner-alpine areas. High intensive, but also pioneer destinations are included in this network.

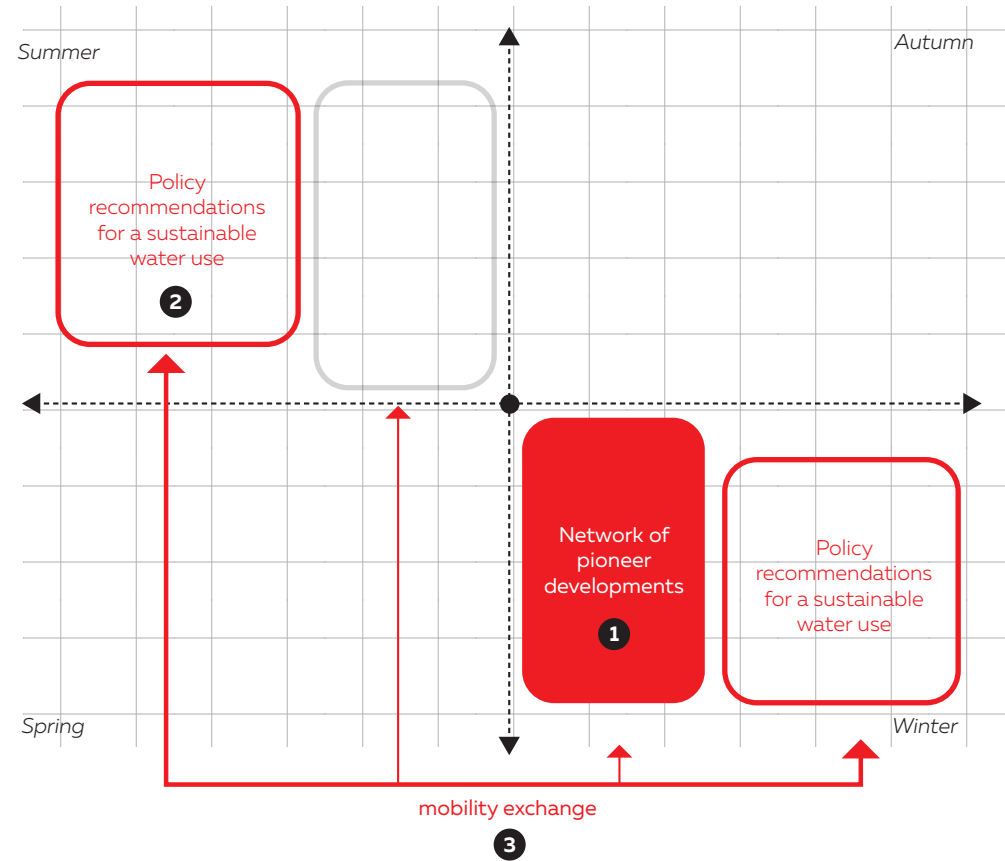


Figure 105: Key strategic actions
Source: Author

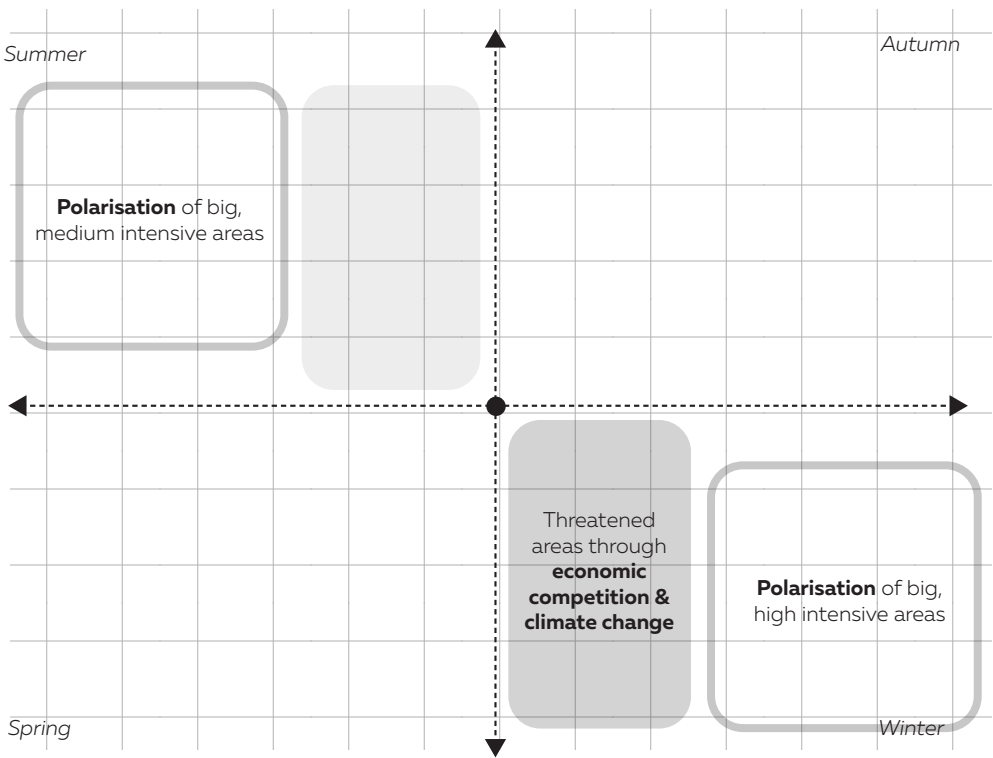


Figure 106: Conclusion from previous defined frameworks
Source: Author

VI.II General design principles

Renaturalization

The starting point is the renaturalization of river beds, and so the re-activation of regulating supportive and cultural ecosystem services. By providing a more natural river flow, services such as nutrient cycling, water purification, prevention of erosion, climate and air control can be triggered, but above all, a natural habitat for native species is given back. This, in turn, rises recreation and aesthetic values and transforms locations into an attractive tourism destination. Secondly, expected seasonal changes and imbalances are considered. By providing space for the river, more extreme climatic events can be prevented. This refers to space for flooding but at the same time a still attractive, dryer river bed during summer allowing new tourism activities such as kayaking or rafting.

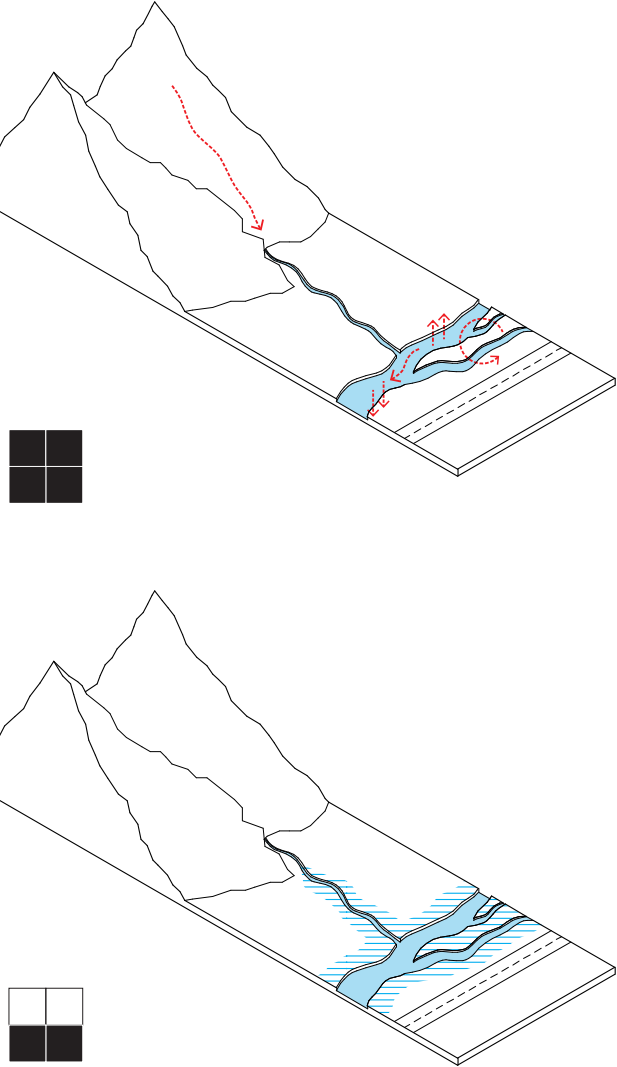


Figure 107: Design principles
Source: Author

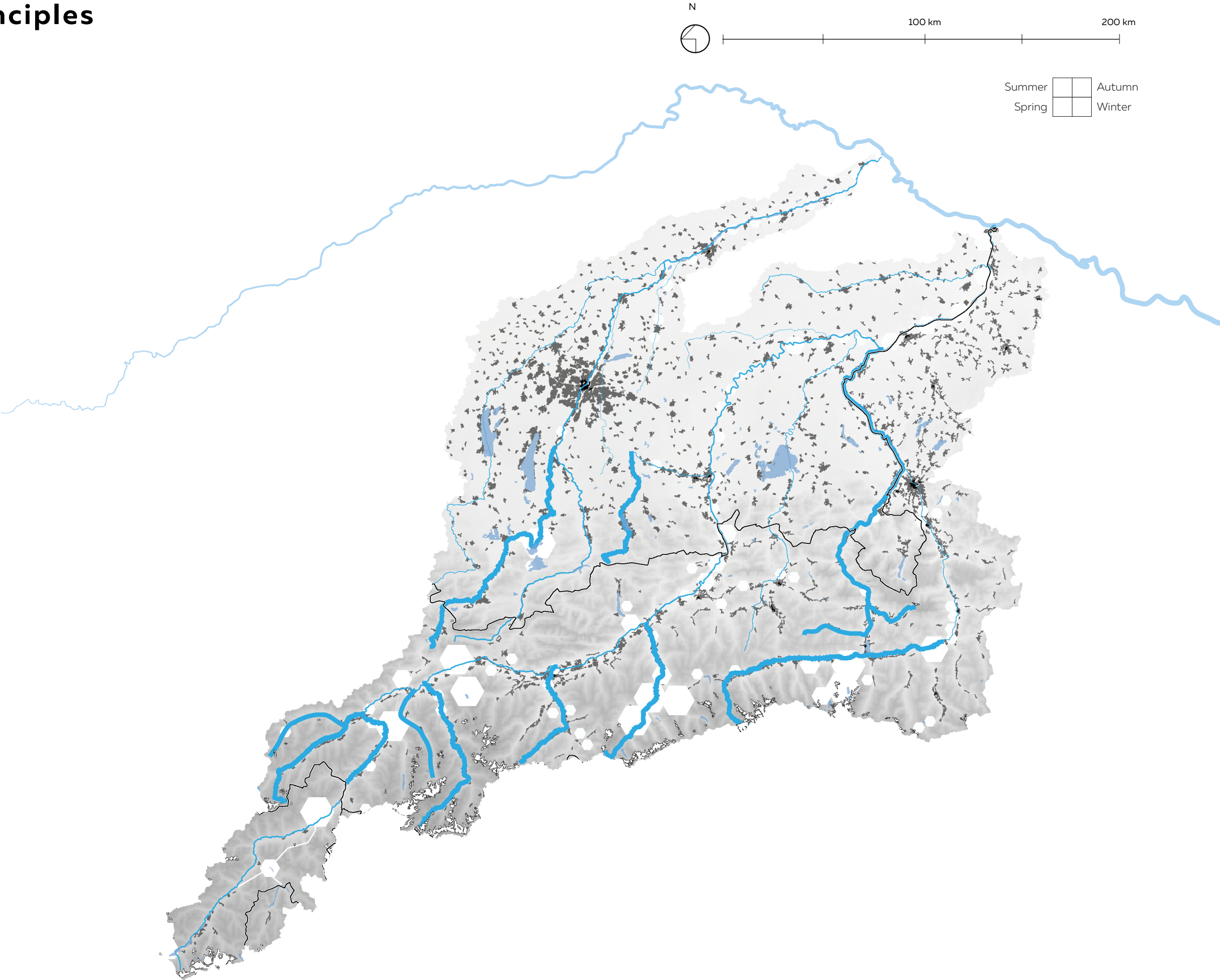


Figure 108: Rivers with potential for re-vitalization
Source: Author

VI.III Policy recommendations for a sustain- able water use

Use of existing infrastructures for alternative en- ergy generation

Considering the negative effects of hydropower, an exploration of alternative, renewable energy sources is proposed. Thereby especially solar panels play an important role due to its potential in higher altitudes. Reflecting snow and higher radiation allow even in Winter the generation of electricity. In order not to waste a random natural landscape for solar parks, the idea is to use big existing infrastructure. This refers firstly to the transmission network, and secondly to overground installations, as e.g. ski lifts and hydropower reservoirs. Floating solar panels or self-powered solar lifts build an innovative opportunity for integrated infrastructures.

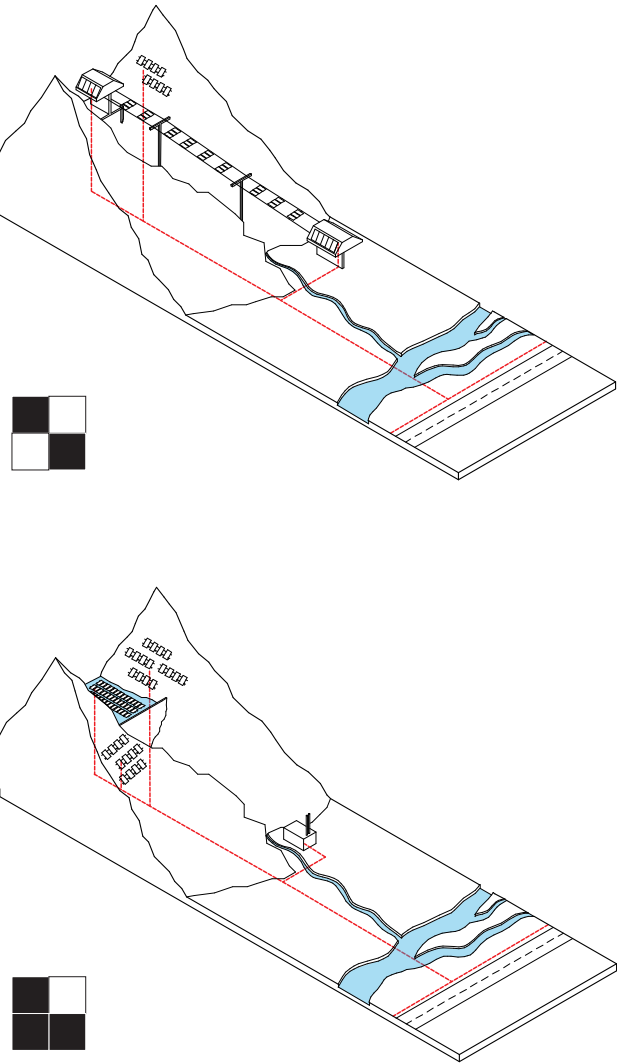


Figure 109: Design principles
Source: Author

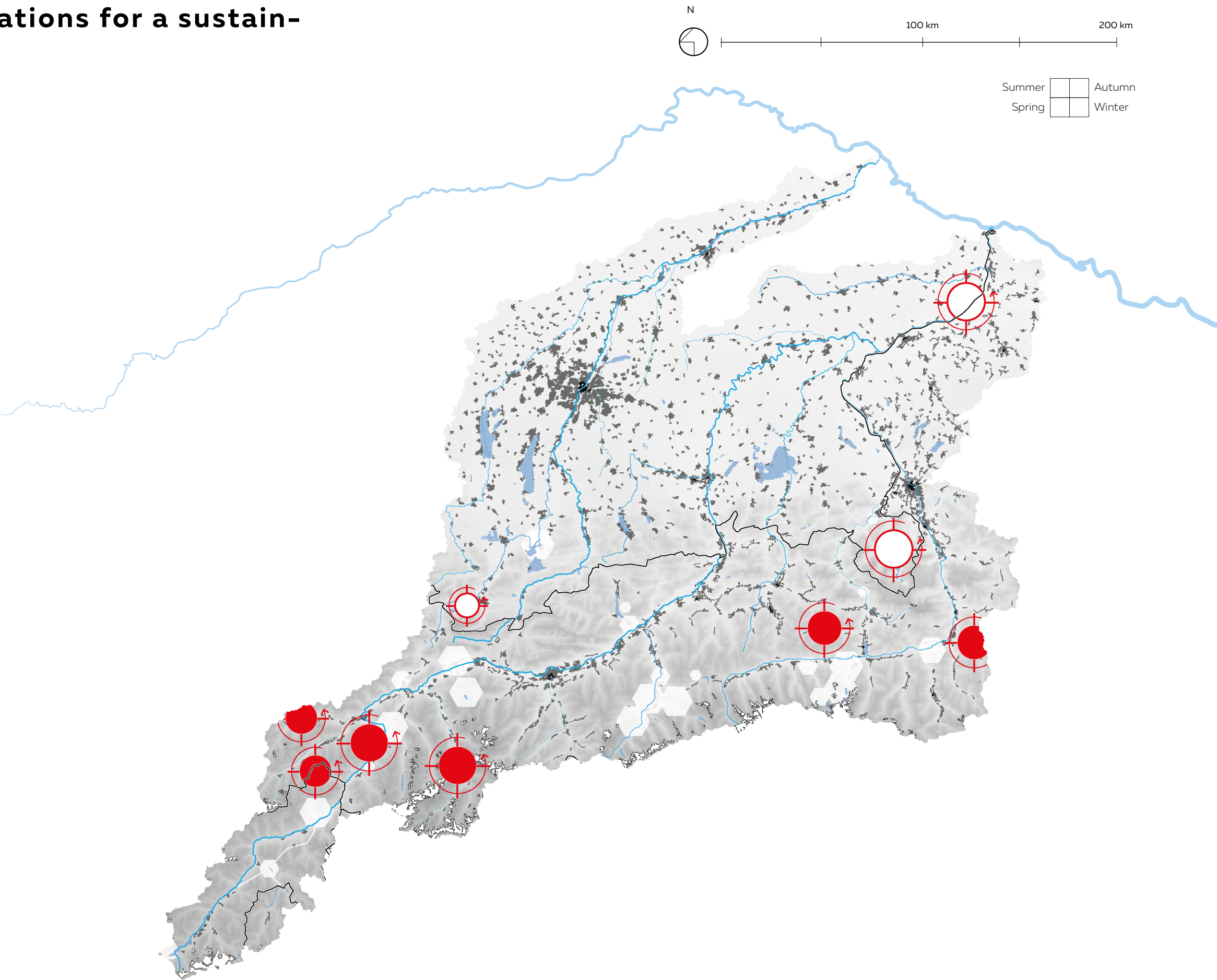


Figure 110: Rivers with potential for re-vitalization
Source: Author

VI.VI A network of pioneer developments

Defining a network

Figure 111 shows areas of opportunities. This refers to regions, which focus currently on winter tourism and face threats due to climate change and/or economic competition of the big skiing resorts. Areas affected by this phenomenon are e.g. Kühtai - Hochoetz, Hochzeiger - Pitztal, Ehrwald - Lermoos, and Zell am See - Kaprun. These areas can start an alternative development, i.e. a transition towards a more sustainable and socio-ecological resilient way of tourism contesting already ongoing trends/demand of the population.

This economic transition is enabled by forming a network with the aforementioned regions, and additionally with allied, but not directly connected resorts of the big destinations. An example for that is Wildkogel in the Zillertal Arena, and Dienten, Mühlbach, Maria Alm in Ski Amade. This allows the necessary promotion and economic viability of a new, soft way of tourism and gives an opportunity to be able to compete with the traditional alpine ski tourism.

The proposal seeks a climate responsive and resilient tourism offer in winter. Therefore, the operation of alpine ski tourism is often not viable due to insufficient natural snow days, and high lift operation costs. This refers especially to the current focus on an early 'punctual' opening, and a secured Christmas - new years holiday. Hence, the revenue of tourism activities will decrease mainly to accommodation and gastronomy, but new jobs and profit can be created through the exploration of alternative activities.

- 1 Ehrwald - Lermoos

2 Hochzeiger - Pitz valley

3 Kühtai - Hochoetz

4 Zell am See - Kaprun

5 Spieljoch (Hochfügen - Ziller valley)

6 Wildkogel (Zillertal Arena)

7 Dienten (Ski Amadé)

8 Flachauwinkl (Ski Amadé)

- River

National borders

Glaciers

Urban structure

- Tourism

Ski resorts associated to big areas

Small-medium independent skiing resorts

Association

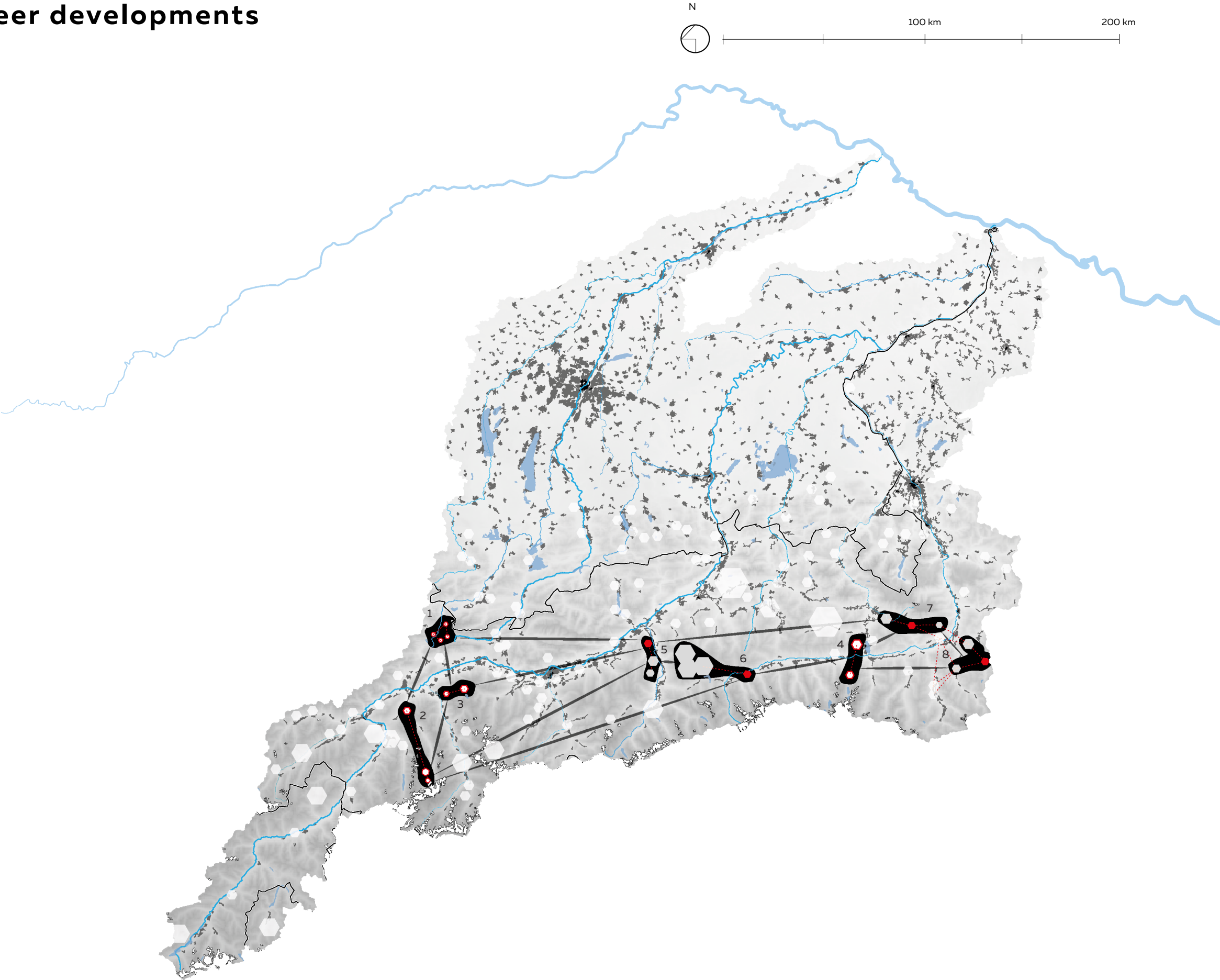


Figure 111: Possible areas for alternative economical development
Source: Author

A new tourism paradigm

A climate responsive tourism approach means the promotion of climate neutral activities and no artificial snowmaking. This refers to activities which can be enjoyed with or without snow, as e.g. biking, hiking and climbing. Moreover, a natural river bed and flow can promote white water activities such as kayaking and rafting. These more soft forms of tourism additionally do not depend directly on electricity or water and contribute thereby to a more socio-ecological resilient development.

Secondly, through the introduction of a sustainable mobility system, previous extensive spaces used for parking can be reused for new purposes, as e.g. bike parks, water storages, etc.

Summer

 Autumn
Spring

 Winter

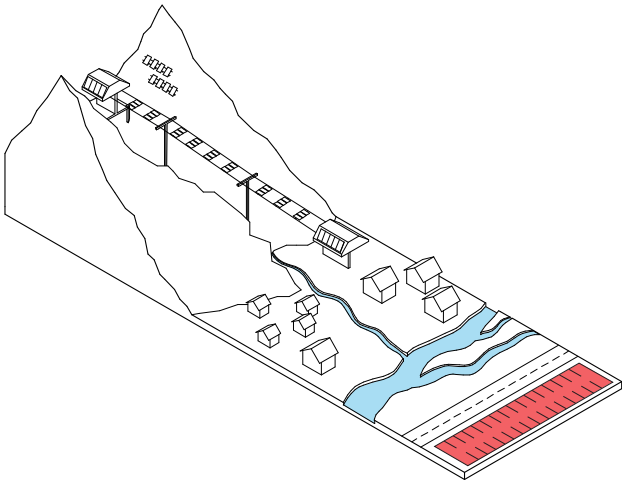
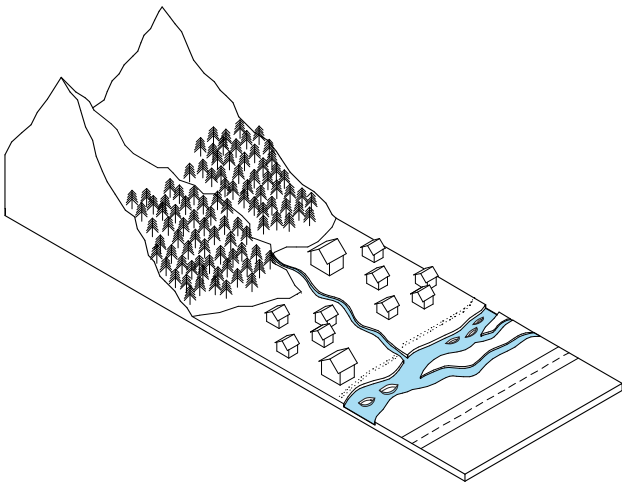
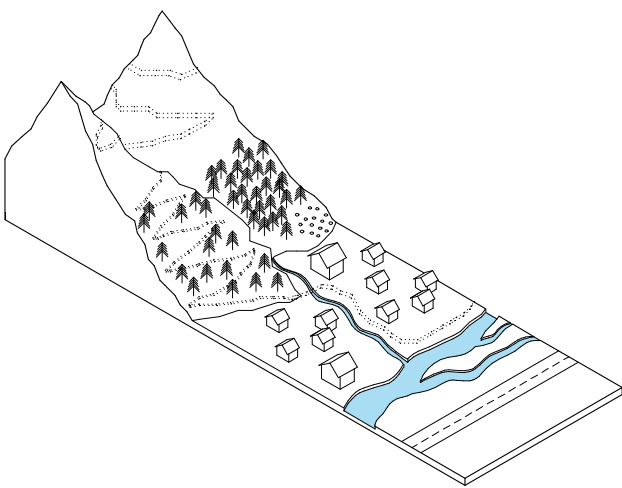


Figure 112: Design proposals for alternative economical development
Source: Author

Decentralization of energy

Pioneer destinations aim for energy self-sufficiency and even for a seasonal surplus generation. A combined heat and power plant based on biomass can provide stable baseload energy for the community. Therefore, partly forest and organic tourism waste can be used and transformed into heat and electricity.

Moreover, small hydropower plants form an opportunity to generate ecological-friendly electricity without disturbing the aquatic life and supporting additionally a natural river flow pattern.

Furthermore, the use of solar panels in higher altitudes and existing infrastructures allows to balance the current mismatch in winter, but also to generate a surplus during the lower season in summer.

Summer

 Autumn
Spring

 Winter

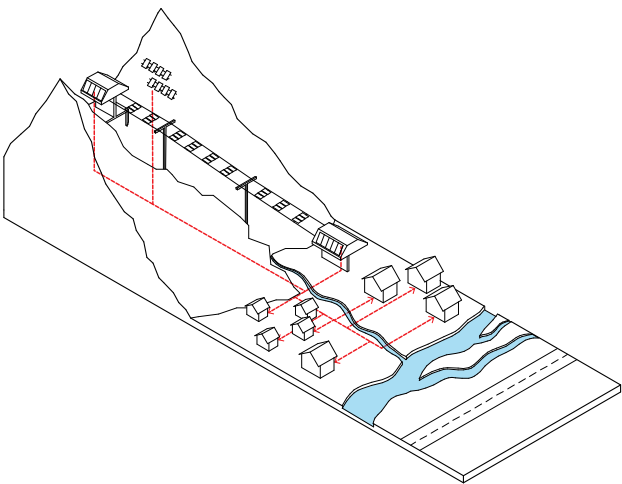
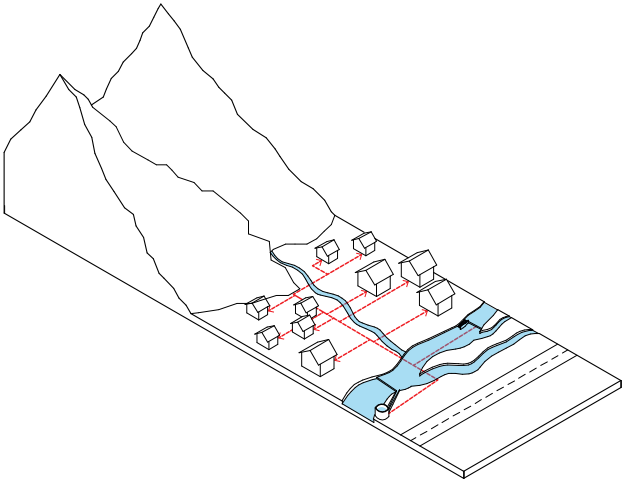
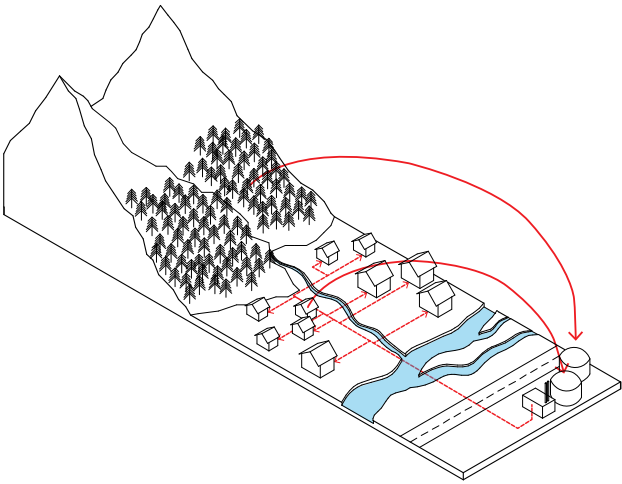


Figure 113: Design proposals for the decentralisation of energy
Source: Author

VI.V Sustainable mobility

Capacity of existing rail infrastructure

The main rail connection between pre-and inner alpine areas passes through Munich – Rosenheim – Kufstein – Innsbruck – Landeck and counts with a high frequency already. Therefore, its capacity is reaching its limits and the remaining potential of other routes become relevant. E.g. the connection between Rosenheim and Salzburg and further can be intensified in the future to enhance the use of train for tourism purposes.

A ring train connecting Rosenheim, Traunstein, Salzburg, Bischofshofen, Kitzbühel, and Wörgl allows the promotion of sustainable mobility between pre- and inner-alpine areas and thereby connect popular winter and summer tourism destinations.

This proposal coincidences with existing plans of expansion for the rail connection between Munich and Salzburg following a different route (Munich – Mühldorf am Inn – Freilassing – Salzburg). It is an integrated part of a relocation strategy for passenger and goods transport in the Rhine-Danube corridor (Deutsche Bahn, 2019). Next, to provide an additional sustainable high-speed connection from pre- to inner-alpine areas, it also relieves the overloaded train route between Munich and Rosenheim. The proposed ring line benefits from these plans due to better and more balanced connectivity. In addition, it can operate as an incentive for a faster planning and financing process and vice versa.

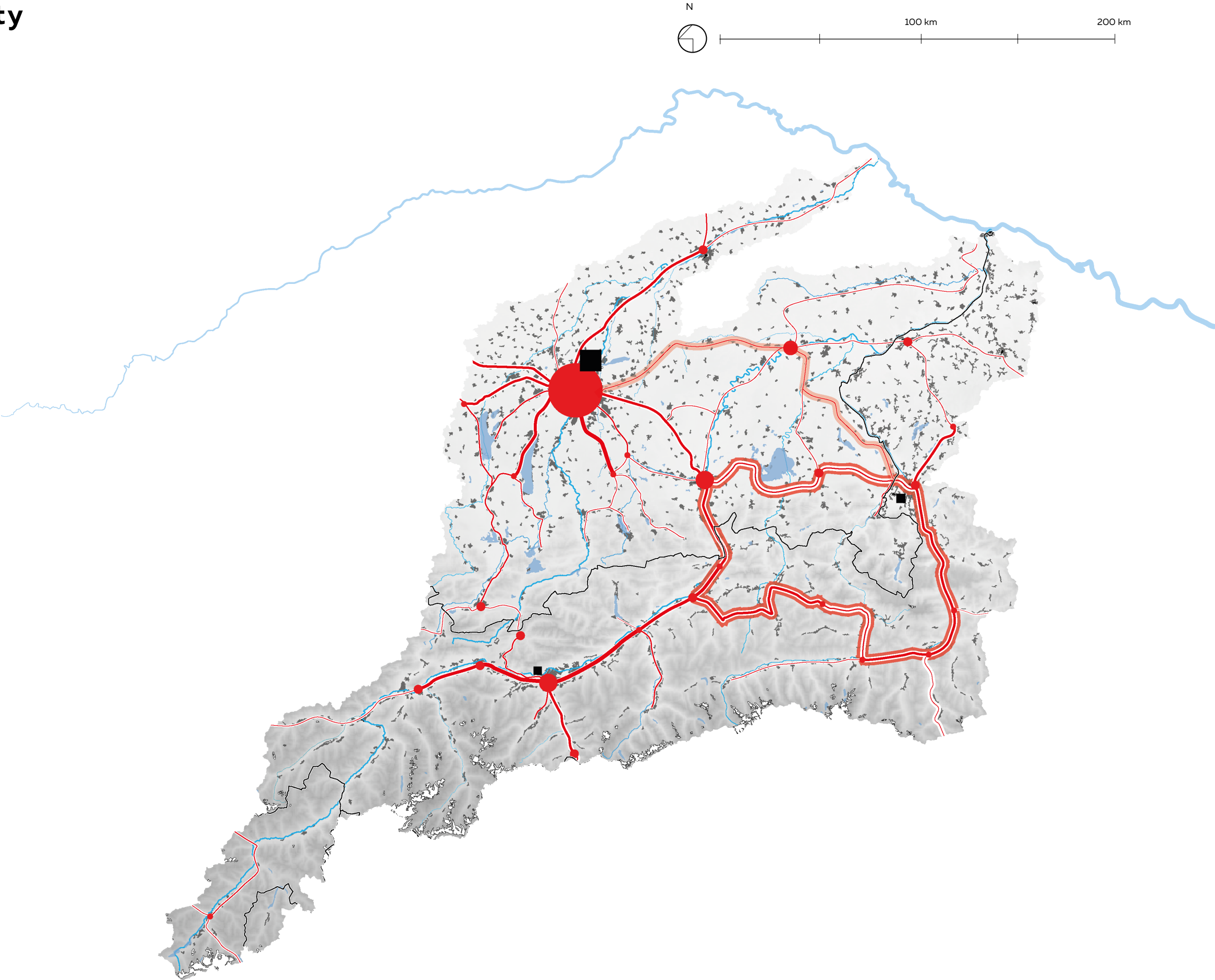
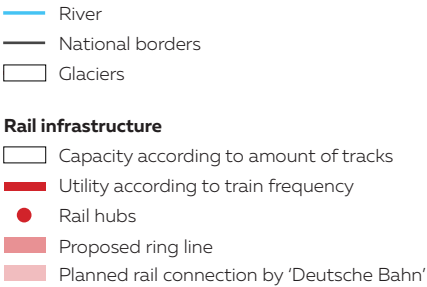


Figure 114: Capacity and utility of rail infrastructure
Source: Author

Localization of poorly connected areas

Tourist destinations, which show equal visitor numbers in summer and winter, can be classified in city and mountain tourism. They are generally located directly connected to a train stop and depending on the size, also with a sufficient local transportation system. In turn, smaller areas often struggle with the so-called 'last mile' problem for tourists, and an all year round transport for the local population.

The most popular summer destinations can be classified into four different types: City, health, lake and mountain tourism. They are generally located in the lower Alps and in the case of health tourism, even in the pre-alpine areas. Big destinations, such as the 'Rottaler Spa Triangle' and 'Berchtesgadener Land' do not count with a direct train connection, but exclusively with a local, often insufficient bus system.

Most popular winter tourism destinations are located in higher alpine areas, which are not connected directly to a train stop. Currently, transportation is provided by local bus systems, or special private bus companies during the ski season. However, the frequency and utility for tourists and the local population is often limited to one or two seasons and therefore not an attractive option.

Train frequency —
Poorly accessible areas ■

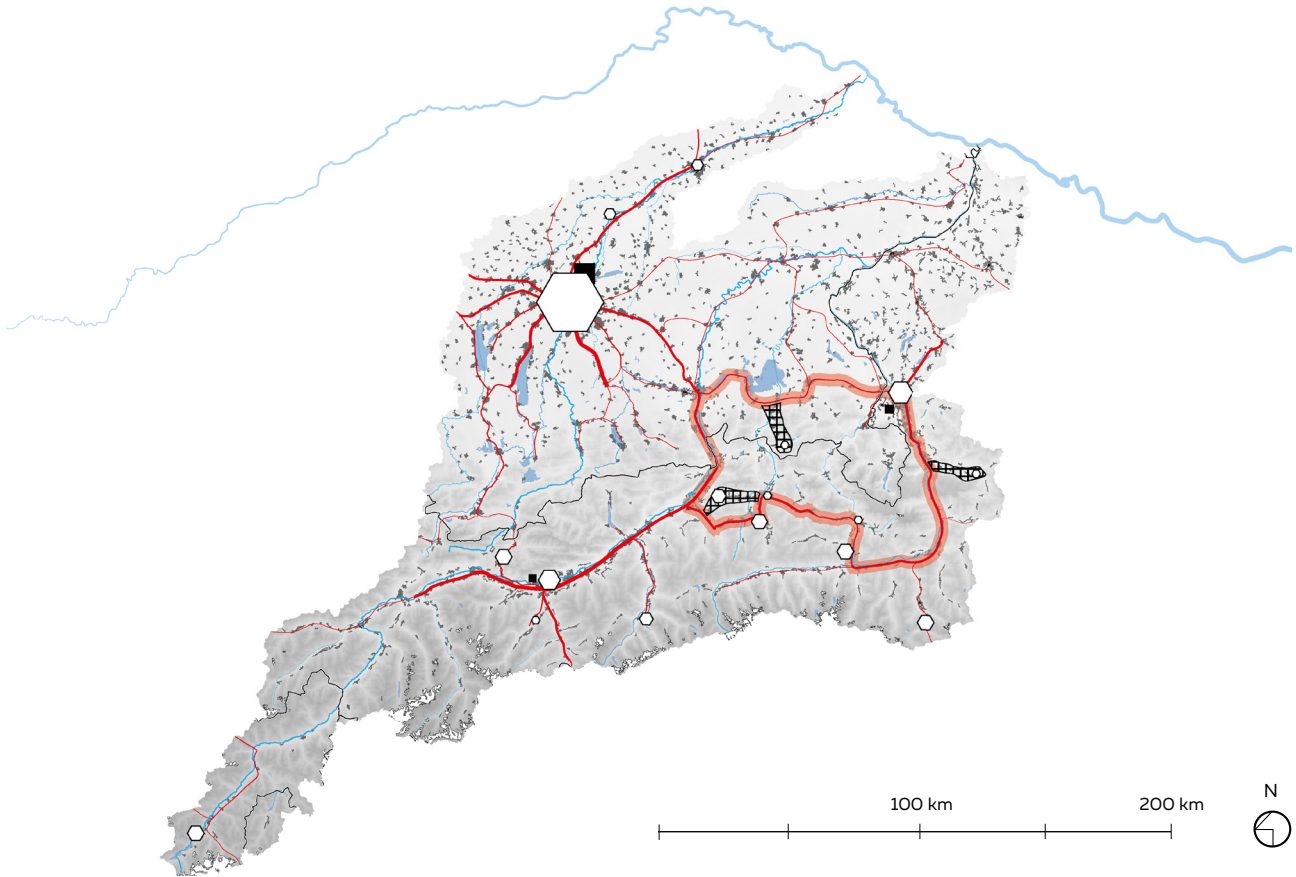


Figure 115: Poorly connected tourism areas all-year-round
Source: Author

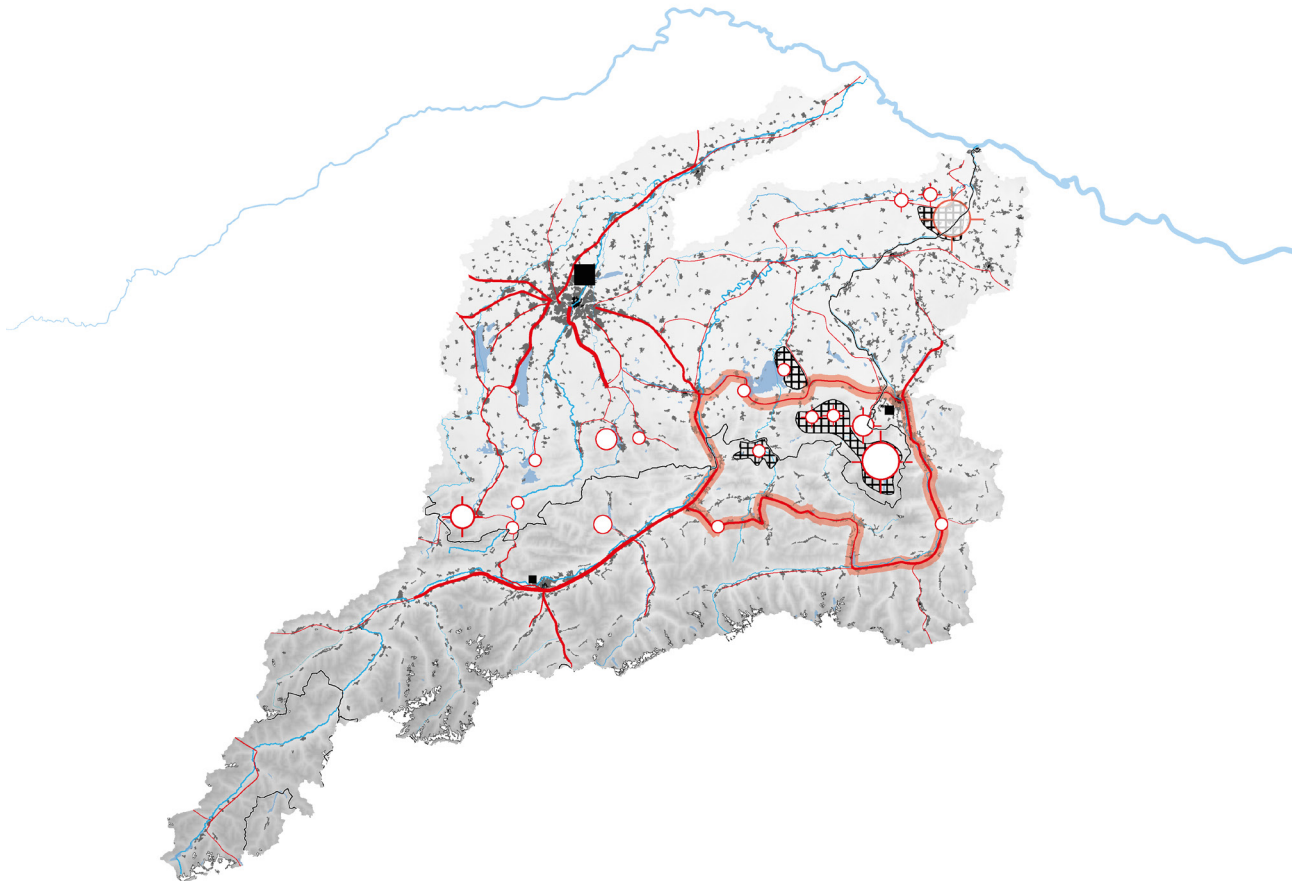


Figure 117: Poorly connected tourism areas in summer
Source: Author

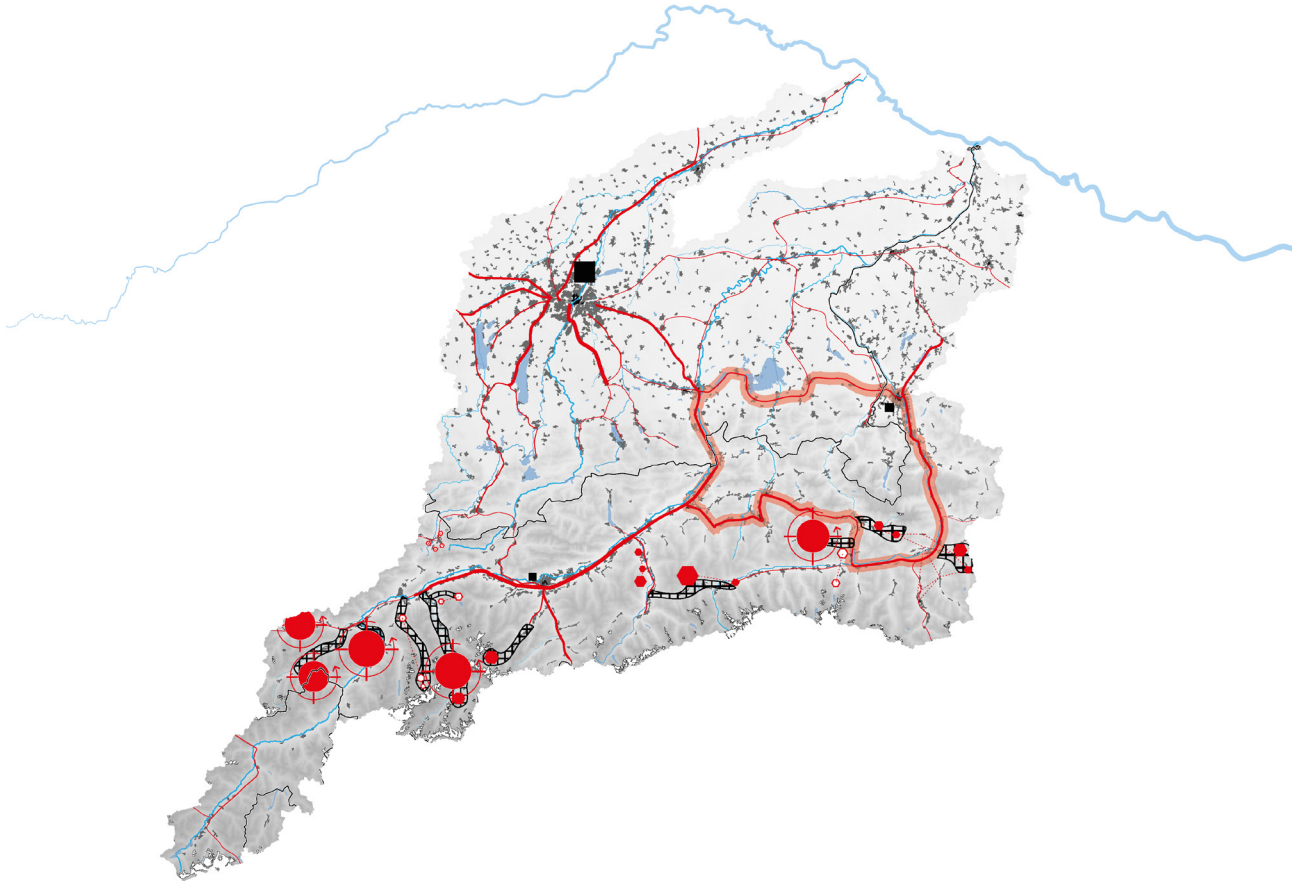


Figure 116: Poorly connected tourism areas in winter
Source: Author

Towards a demand responsive transport

Firstly, it is important to repeat the aforementioned, so to use the remaining capacity of the existing infrastructure. Hence, the option of getting to the final tourist destination by train becomes more attractive and flexible. This affects the region Rosenheim – Salzburg – Wörgl, and all destinations located in between.

However, many destinations face the so-called 'last mile' problem. They are still not directly reachable by train or do not count with a sufficient all-year-round local transportation system. Therefore, I propose a transition towards a seasonal demand responsive transport with a special emphasis on collectivity. By forming co-operations between summer and winter-intensive tourism regions, the needed critical mass for feasibility and profitability can be reached. Thereby the buses can be used all-year-round, just in other locations depending on season and demand. The introduction of new hubs connected to the existing infrastructure is essential.

The role of the smaller, all-year-round, but high intensive tourism regions possess a special role in this proposal. Since their amount of inhabitants is low, but the number of tourists visiting in summer and winter comparatively high, a demand responsive transport would allow new opportunities. They can act as a certain buffer in the established co-operation between summer- and winter-intensive regions and thereby provide public transport also for the local population.

Consequently, the mobility stock can be exchanged via the new introduced ring train in order to put forward a more sustainable system.

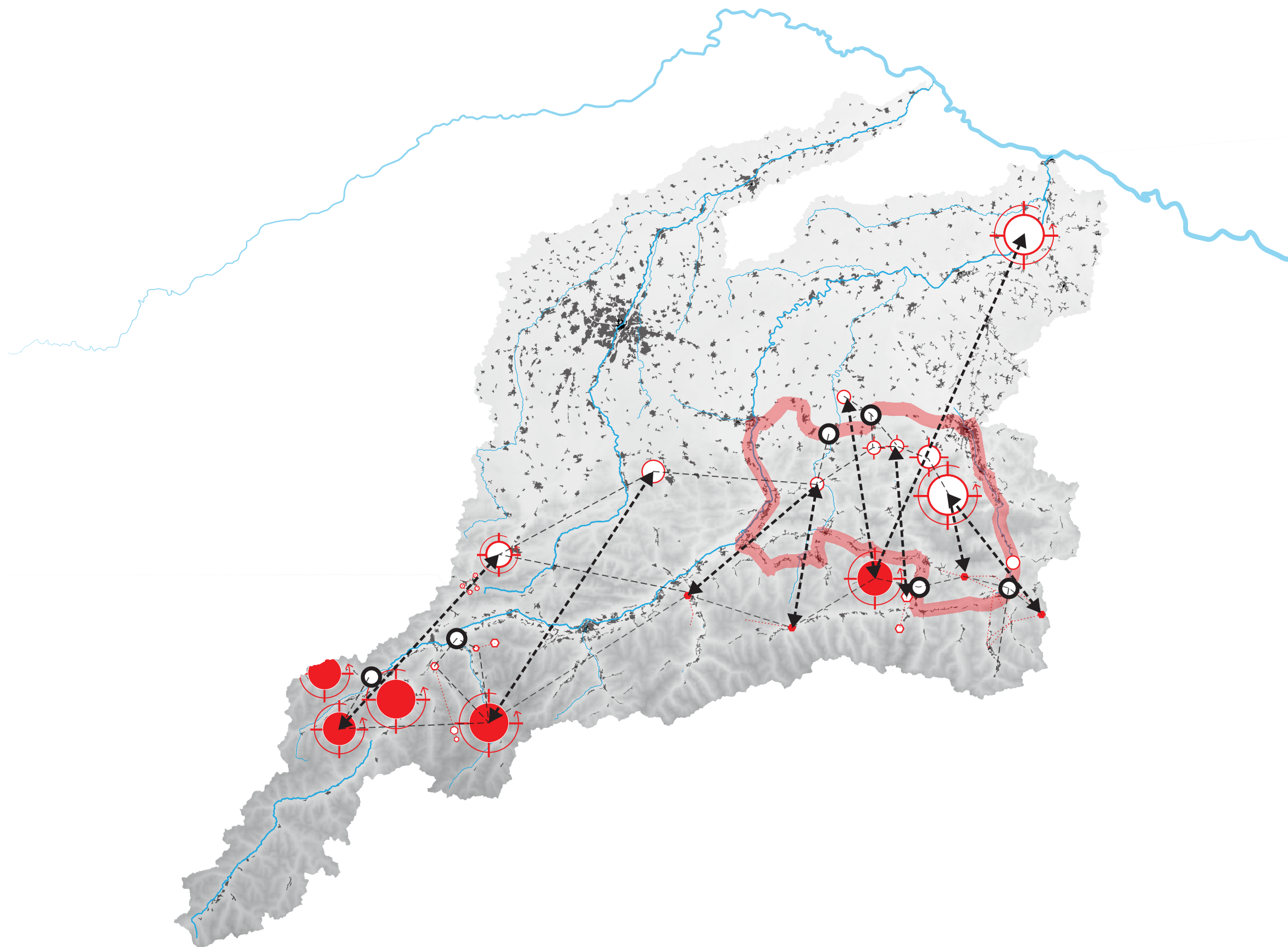
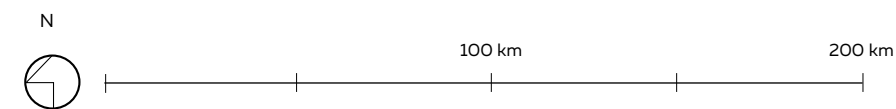
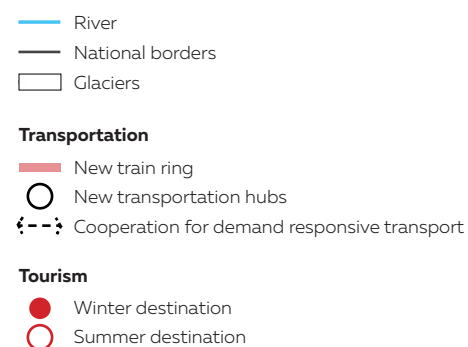


Figure 118: Towards a seasonal demand responsive transport system
Source: Author

Existing initiatives

Currently, various pilot projects already exist, but the regional perspective is still missing. E.g. the 'samo card' (Figure 119) of Werfenweng provides free shuttle service from the train station, but also e-cars and other vehicles on site. Another example is the test project 'digibus' in the surrounding areas of Salzburg (Figure 120). Collective automated mobility has been tested in order to tackle the 'last mile' problem in rural areas.

Therefore, this project puts forward the idea of automated electric minibusses in order to promote collectivity and flexibility in terms of mobility exchange between regions or even countries. This implies the cross-border cooperation between various tourism associations, the ministries of transportation of Bavaria and Austria, and between private and public.

Seasonal mobility distribution

High intensive summer tourism regions can exchange parts of their collective mobility stock with winter intensive regions (Figure 121). Thereby the needed critical mass can be achieved to maintain an economically feasible system. A demand responsive transport allows especially in remote areas the replacement of inefficient bus systems. In summary, the main idea is to provide 'elastic' transport for tourists, but also for locals. This refers to the margin of the entire year, but especially to low season periods (May and October/November). Main hubs for this system can be connected to existing railway stations in order to promote the use of sustainable transport.

Daily pattern

Considering now the daily demand for transport, various user groups can be identified. Main collective local groups are pupils and the working population, which daily pattern is consisting throughout the entire year. Peaks of demand take place in the morning, after lunch and in the evening. In turn, the demand for the elderly population is more flexible and individually organized. The behavior of tourists is more similar to that and depends on the kind of activity. In summary, one vehicle can serve different user groups during the day, depending on the season (Figure 122).



Figure 119: Samo Card of Werfenweng
Source: www.werfenweng.eu



Figure 120: Digibus in Salzburg
Source: www.digibus.at/

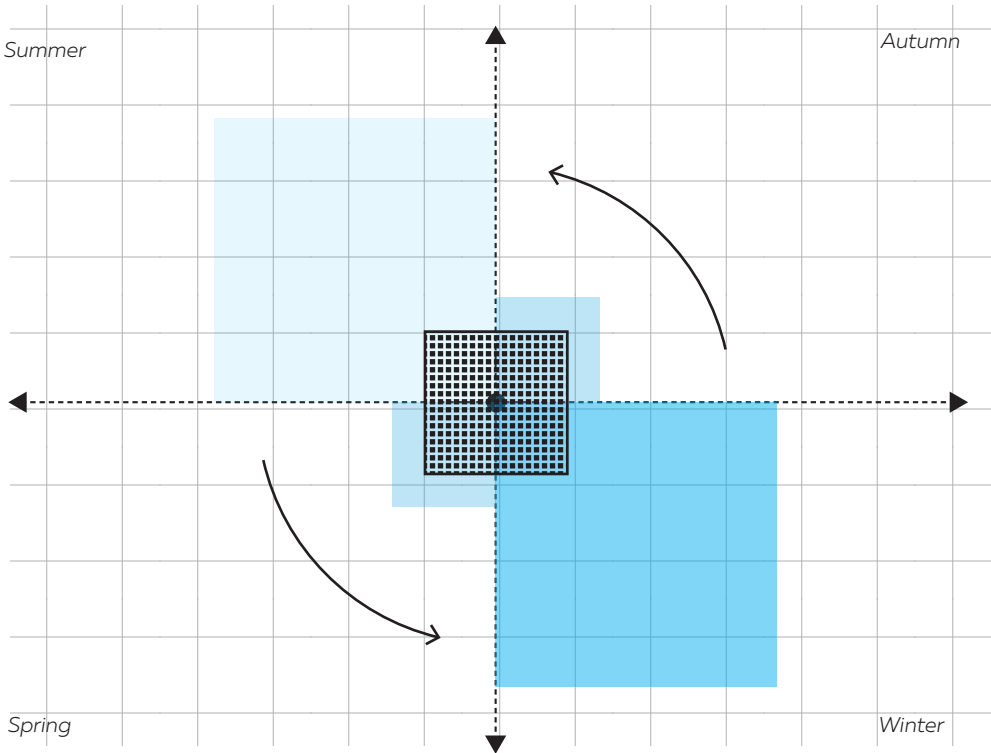


Figure 121: Seasonal exchange of vehicle stock
Source: Author

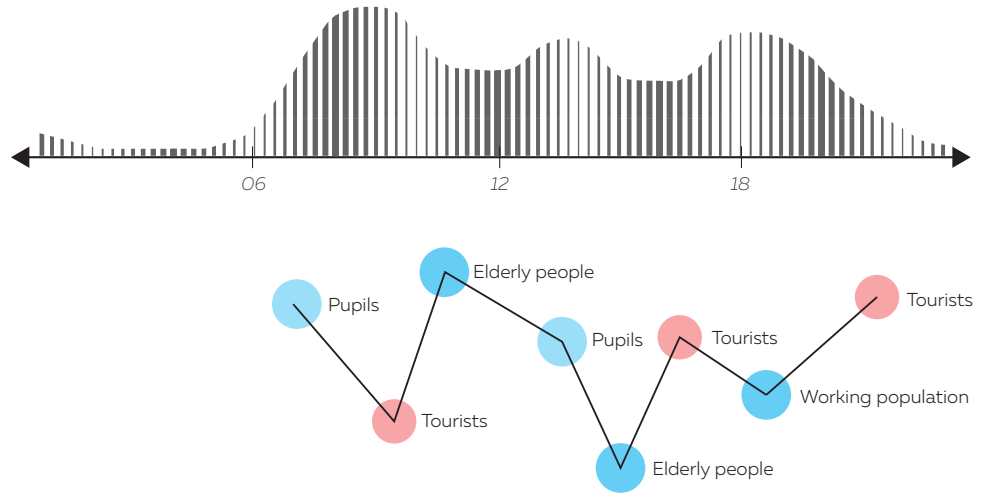


Figure 122: Possible daily route of vehicle
Source: Author

VI.VI Conclusion

The aforementioned actions divided in the strategic framework can be translated into several overlapping networks: big tourism areas aiming for self-sufficiency, a pioneer network forwarding a new relation between human and nature, and mobility exchange between summer and winter destinations. Finally, this leads to positive effects on the river ecosystem crystallized in renaturalization processes. Hence, it can be stated that a more natural river flow and sustainable water use is the starting point and ultimate aim at the same time.

Next, reflecting on a before and after scenario focussing on territorial interrelations and related supply chains. Pre- and inner-alpine areas are connected through electricity exchange, seasonal traffic flows caused by tourism, and river ecosystems. Currently, intensive electricity exchange takes place between Bavaria and Austria mainly induced to the capacities of base and peak load electricity generation. Traffic flows related to tourism reach back

mostly to personal car infrastructure. This behavior can be explained due to insufficient local transport system at the destinations, which makes the getting there by train less attractive.

Hence, the future scenario proposes a change towards more sustainable interrelations with a positive effect on the river ecosystem. The electricity exchange is reduced by implementing alternative energy sources next to hydro-power in the inner-alpine areas, which leads to self-sufficiency and less need for baseload electricity from Germany. Concerning the interrelation of transport, a new ring line is introduced to stimulate the use of train mobility for tourism purposes. This ring connects directly to a demand responsive transport system, which can be exchanged between summer- and winter destinations and improves by that the local accessibility. Finally, the river ecosystem is improved by these changes, and above all, by the introduction of a new supply system, the pioneer network.

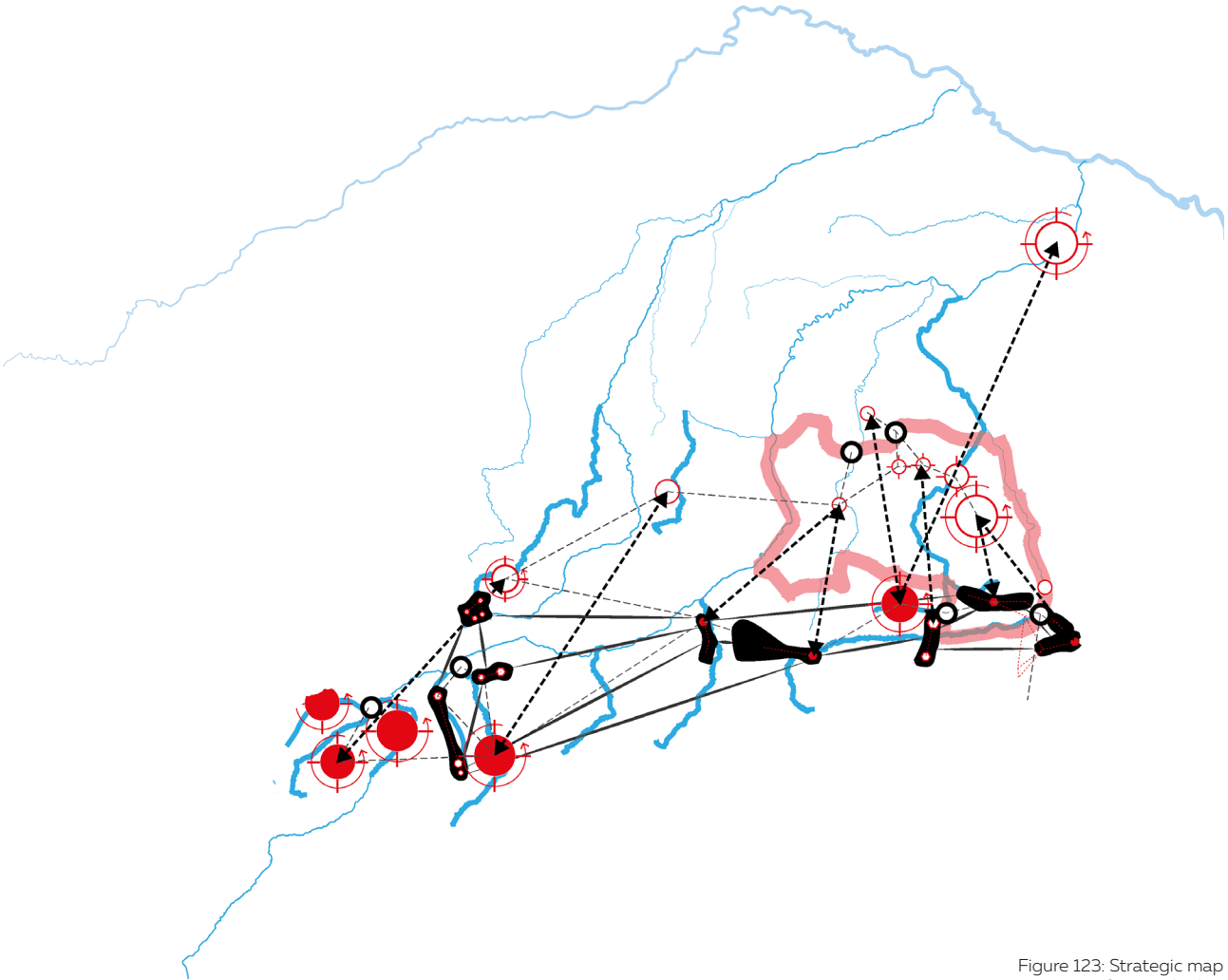


Figure 123: Strategic map
Source: Author

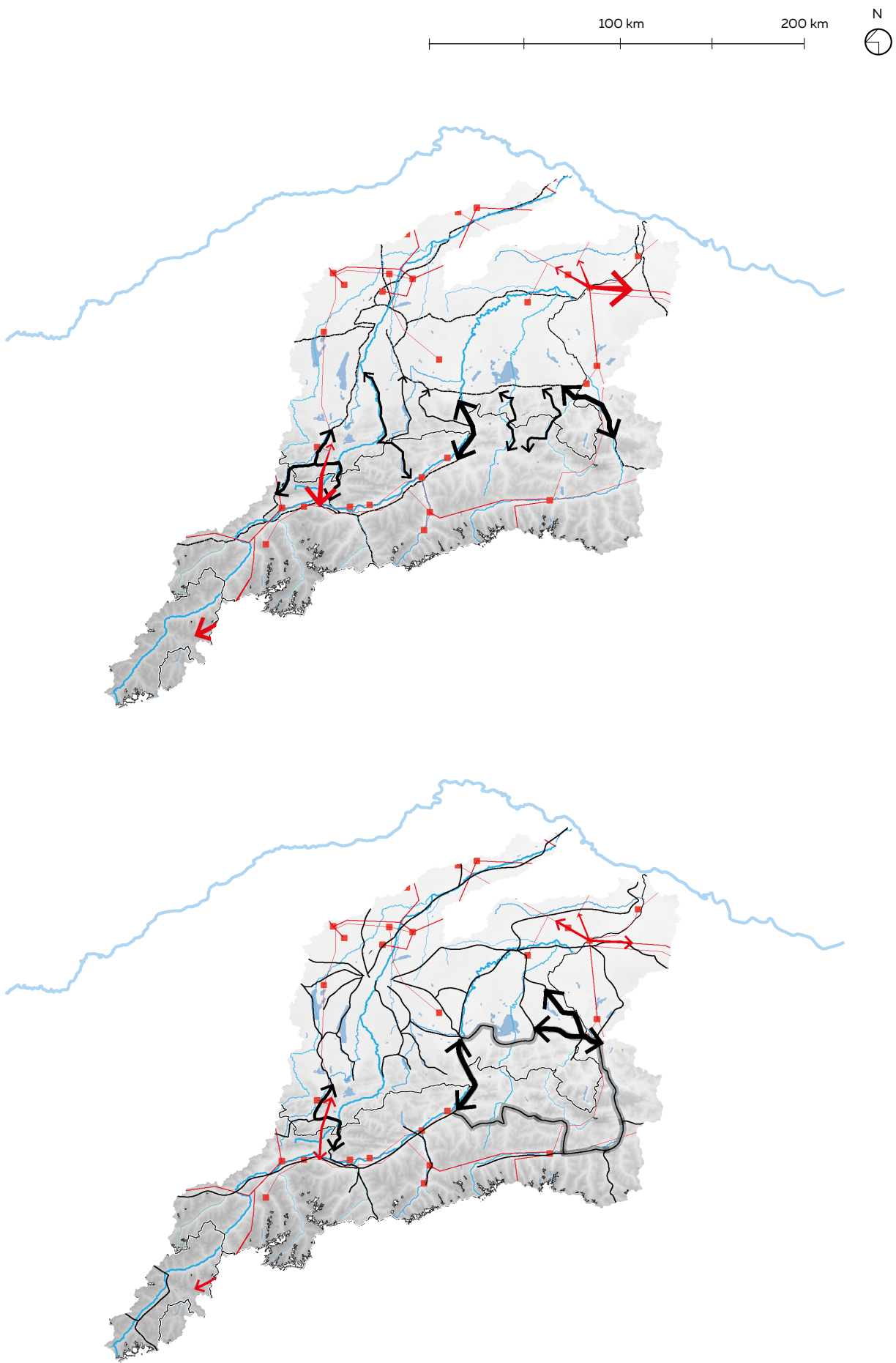


Figure 124: Before and after of territorial interrelations
Source: Author

VI.VII Stakeholder

EUROPEAN	NATIONAL	PROVINCIAL	REGIONAL	LOCAL
<div><div></div><div>EUSALP <i>Power:</i> Stimulation of cooperation and political discourse <i>Interest:</i> Cross-border cooperation, preservation of natural resources</div></div> <div><div></div><div>Interreg BY-AT <i>Power:</i> Funding of cross-border projects <i>Interest:</i> Cross-border cooperation, preservation of natural resources, sustainable mobility</div></div> <div><div></div><div>Alpine Convention <i>Power:</i> International treaty <i>Interest:</i> Preservation of biodiversity in inner-Alps</div></div> <div><div></div><div>WWF <i>Power:</i> Support and initiate government independent projects <i>Interest:</i> Preservation of natural resources, cross-sectoral and cross-border cooperation</div></div>	<div><div></div><div>Ministry for Sustainability and Tourism <i>Power:</i> Hydro power and Tourism policies, Spatial development concepts, Water management plan <i>Interest:</i> Cross-sectoral sustainable development</div></div> <div><div></div><div>Österreichische Bundesbahnen (Öbb) <i>Power:</i> Operation and financing of train infrastructure <i>Interest:</i> Improving of national network, financial viability</div></div> <div><div></div><div>VERBUND AG <i>Power:</i> Transmission and generation of electricity <i>Interest:</i> Increasing of electricity generation and scope, profitability</div></div>	<div><div></div><div>Provincial parliaments <i>Power:</i> Tourism policy concepts, Spatial concepts and development programs <i>Interest:</i> Economic growth, stability</div></div> <div><div></div><div>TIWAG AG <i>Power:</i> Transmission and generation of electricity <i>Interest:</i> Increasing of electricity generation and scope, profit</div></div> <div><div></div><div>TIROL Werbung GmbH, SalzburgerLand Tourismus GmbH, Oberösterreich Tourismus GmbH <i>Power:</i> Marketing <i>Interest:</i> Increasing tourism activity in region, economic growth</div></div>	<div><div></div><div>Planning Associations <i>Power:</i> Regional development plans for landscape and territories <i>Interest:</i> Improve regional development</div></div> <div><div></div><div>Public transport operators <i>Power:</i> Define bus routes <i>Interest:</i> Economic feasibility</div></div> <div><div></div><div>Tourism associations <i>Power:</i> Marketing, strategic plans, infrastructural activation <i>Interest:</i> Profit, sustainable development</div></div> <div><div></div><div>Ski-area associations <i>Power:</i> Market regulation, supply power <i>Interest:</i> Profit</div></div>	<div><div></div><div>Municipalities <i>Power:</i> Spatial concepts, land use plans <i>Interest:</i> Improve local development</div></div> <div><div></div><div>Civic society <i>Power:</i> Consumer power, participation <i>Interest:</i> Protection from climate change effects, spatial justice, local job opportunities</div></div>
<div><div><div><div>Spatial planning</div><div><div>Water</div><div>Energy</div><div>Tourism</div></div></div><p>This part shows relevant stakeholders involved in the proposed strategy. It includes actors from different fields, such as water, energy and tourism, and finally from the cross sectoral discipline of spatial planning. A multi-scalar approach in connection with a distinction in public, private and civic allows to categorize stakeholders according to their level and function. Further, actors are differentiated in a German and Austrian context from the national scale on in order to detect possible cross-border cooperation.</p></div></div>	<div><div></div><div>Ministry for transport and digital infrastructure <i>Power:</i> Co-financing of train infrastructure expansions <i>Interest:</i> Improving (inter)national train network</div></div> <div><div></div><div>Ministry for environment, protection and nuclear security <i>Power:</i> Tourism guidelines, definition of natural protection zones <i>Interest:</i> Protection of natural environment</div></div> <div><div></div><div>Ministry for energy and economy <i>Power:</i> Regulations and financing for energy transition <i>Interest:</i> Foster renewable energy sources, economic growth</div></div> <div><div></div><div>Deutsche Bahn AG <i>Power:</i> Operation and financing of train infrastructure <i>Interest:</i> Improving of national network, financial viability</div></div> <div><div></div><div>E.ON <i>Power:</i> Transmission and generation of electricity <i>Interest:</i> Increasing of electricity generation and scope, profitability</div></div>	<div><div></div><div>Ministry for environment and consumer protection <i>Power:</i> Water management plans <i>Interest:</i> Protection of natural environment</div></div> <div><div></div><div>Ministry for economy, development and energy <i>Power:</i> Regulations and funds concerning tourism and energy transition, strategic tourism plans <i>Interest:</i> Economic growth</div></div> <div><div></div><div>Ministry for housing, building and transport <i>Power:</i> Co-financing of train infrastructure expansions <i>Interest:</i> Improve regional and local connectivity</div></div>	<div><div></div><div>Planning Associations <i>Power:</i> Regional development plans for landscape and territories <i>Interest:</i> Improve regional development</div></div> <div><div></div><div>Landkreise <i>Power:</i> Defining regulations and zoning plans <i>Interest:</i> Improve regional development</div></div> <div><div></div><div>Public transport operators <i>Power:</i> Define bus routes <i>Interest:</i> Economic feasibility</div></div> <div><div></div><div>Tourism associations <i>Power:</i> Marketing <i>Interest:</i> Profit, sustainable development</div></div>	<div><div></div><div>Municipalities <i>Power:</i> Land use plans <i>Interest:</i> Improve local development</div></div> <div><div></div><div>Civic society <i>Power:</i> Consumer power, participation <i>Interest:</i> Protection from climate change effects, attractive offer of alpine tourism</div></div>

Public

Public/Private

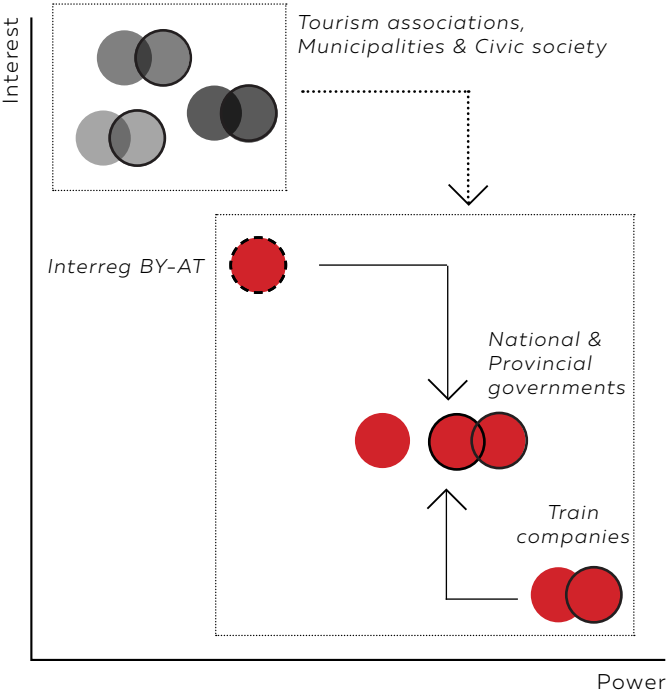
Private

Civic Society

Power-interest: Sustainable mobility

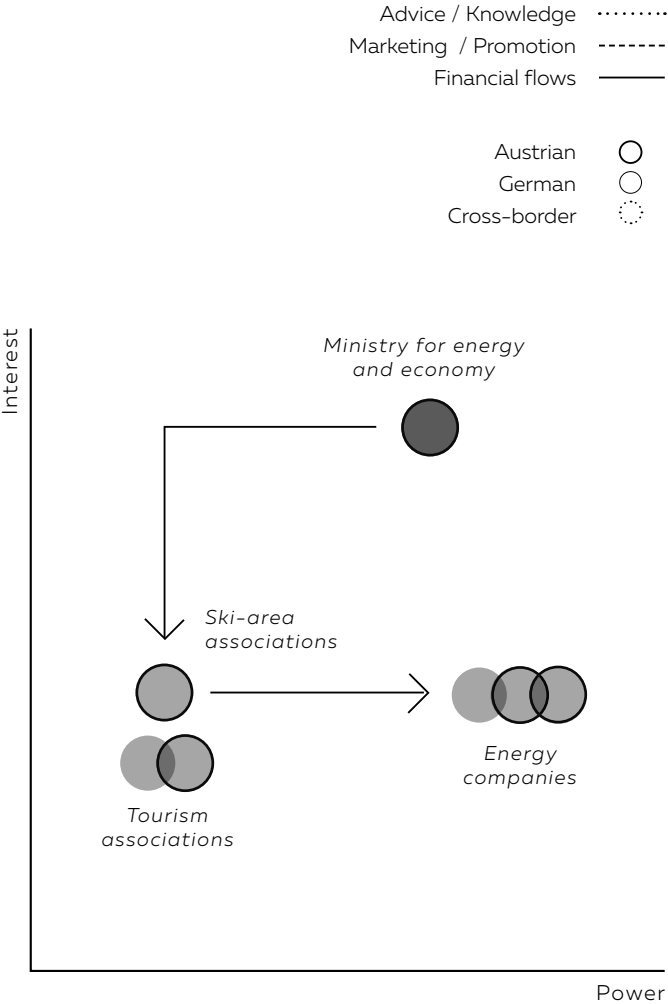
For the proposed ring line cross-border cooperation in a national and provincial scale is necessary. This refers especially to the financing of a comparatively expensive investment. Therefore, a co-financing of official train companies, national and provincial governments and the Interreg BY-AT is proposed. Introduced by the municipal transport financing law (Gemeindeverkehrsfinanzierungsgesetz, Schieneninfrastrukturfinanzierungsgesetz), it is a common practice that national and provincial government release supportive funding for regionally relevant infrastructure projects.

Actors who possess the highest interest, but little power, are tourism associations, civil society, and municipalities. Hence, integration in the planning process is essential.

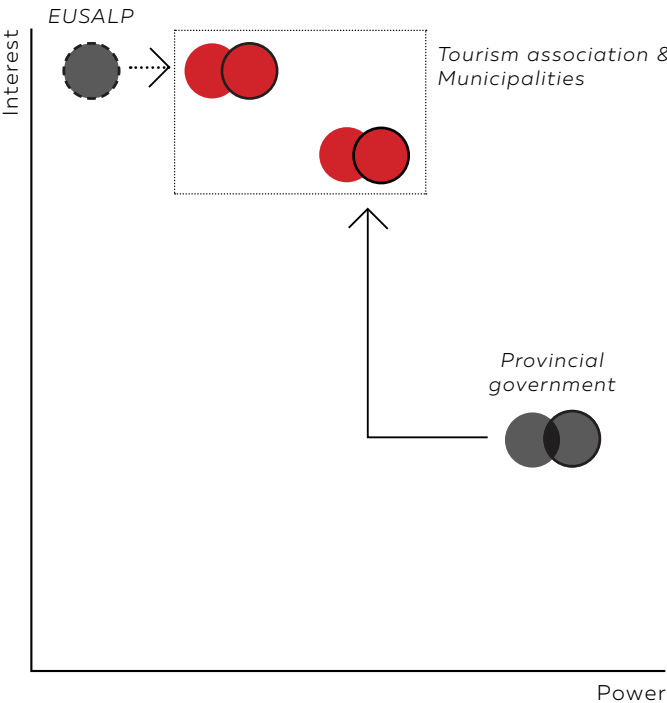


Power-interest: Big areas

Big skiing resorts need to reach energy self-sufficiency and existing (pumped) storage power plants must add renewable resources. This implies incentives given by the Ministry for Energy and Economy and finally the implementation by big energy players, (Verbund AG, E.ON, TIWAG). Big ski resorts can receive subsidies to install additional energy sources in their territory. The tourism associations possess a cooperative function in order to develop a wider perspective for the region.



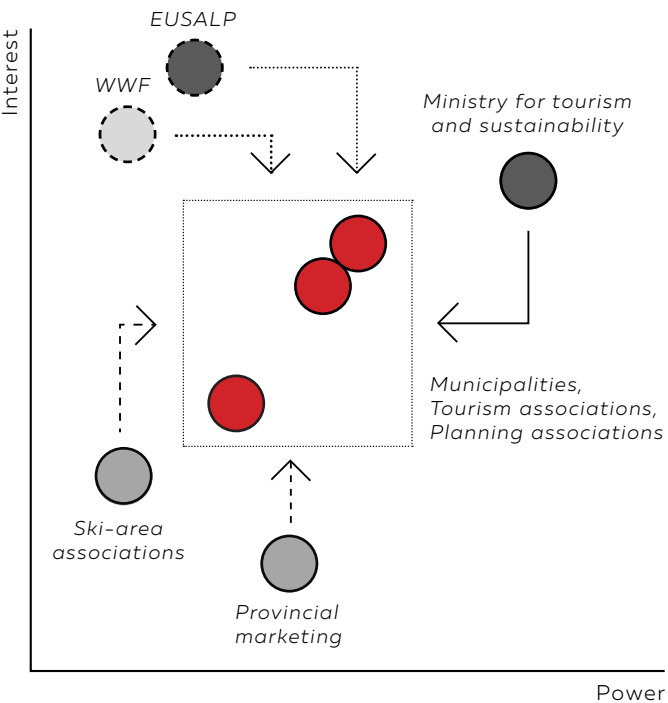
Cross-border cooperation is needed again in the case of mobility exchange between tourism destinations. However, it is based in a rather local and regional level. Compared to the previous project, users can also be investors. This implies, on the one hand, the cooperation of German and Austrian tourism associations representing the tourist, and on the other hand municipalities representing locals. With additional subsidies from the provincial government, a feasible mobility stock can be acquired and maintained under a cooperative approach of locations and user groups.



Power-interest: Pioneer network

All investments needed to implement the new pioneer network are comparatively small but depend on good marketing in order to be economically feasible. Therefore, cooperation with ski-area associations and provincial marketing companies is essential. In addition, EUSALP and WWF can act as a facilitator by promoting it as a pilot project and subsequently, attract funds.

Main investor and the user is a cooperation of municipalities, planning and tourism associations. The decentralization of energy, the introduction of a new tourism paradigm and connected river re-naturalizations can be additionally promoted and financed by the Ministry for sustainability and tourism.



VI.VIII Roadmap

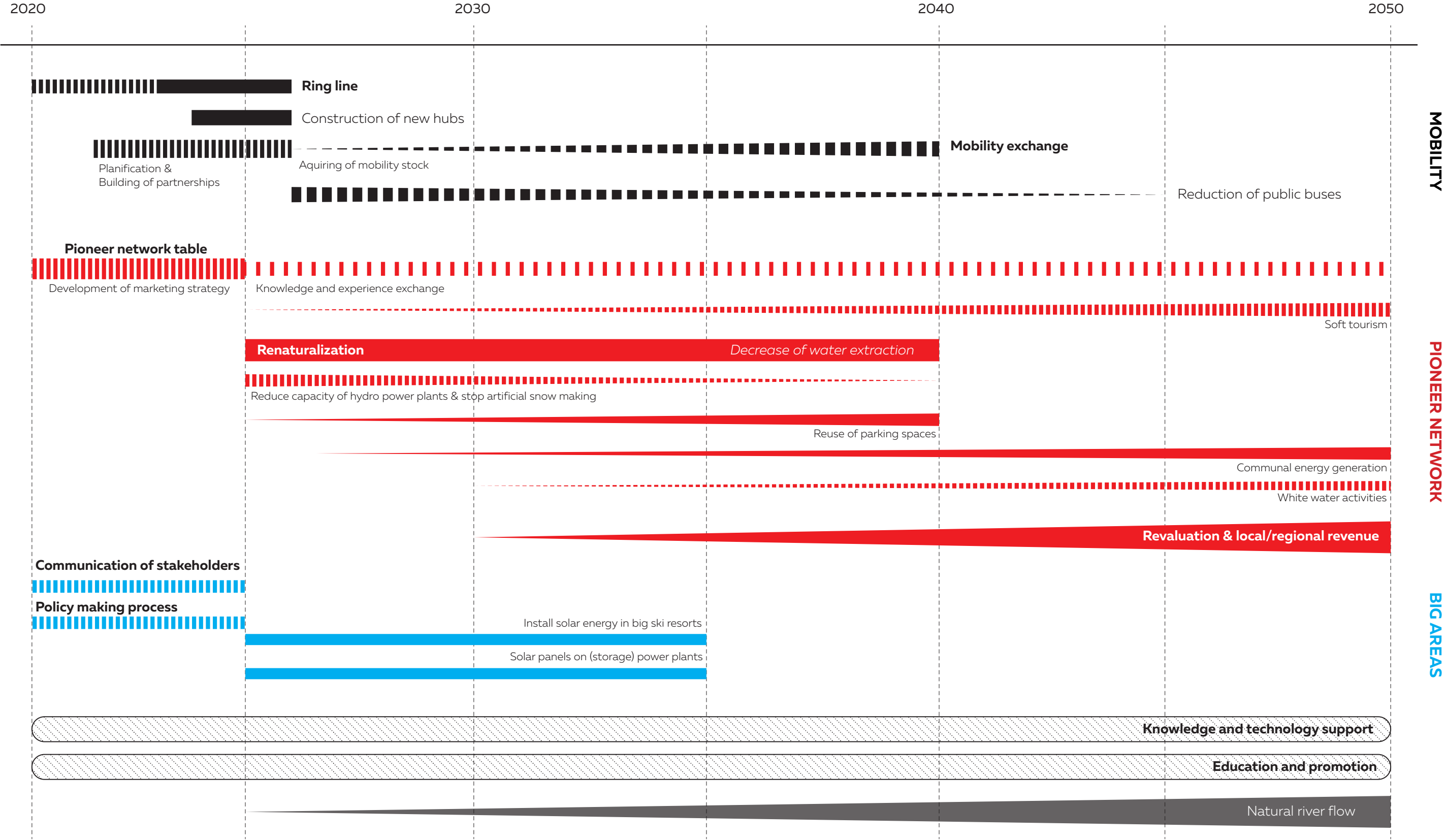


Figure 125: Roadmap of spatial strategy
Source: Author



Figure 126: Torrent 'Dientenbach' in Dienten
Source: Author

VII. KEY PROJECT

VII.I Hochkönig - Introduction of a region

The key project is located in the Austrian province of Salzburg. It is named and united through the mountain chain 'Hochkönig' and part of two communes: Zell am See (Pinzgau) and St. Johann im Pongau (Pongau). Currently, all ski activities in the region sum up to 120 km of ski runs, which are united through the skiing association 'Ski Amadé'. This cooperation allows access to all of their 25 tourist destinations with one single ticket. Besides, nearly all locations in Hochkönig are directly connected with lifts in ski runs to attract more tourists and compete with other big areas. In total, use of ca. 500 snow cannons allow covering 95% of all ski runs to be snowed in artificially. However, the more isolated 'Hochkeil' relies 100% on natural snow and is therefore a forerunner in terms of sustainability.

Currently, all locations are connected by local buses with low-frequency all-year-round and additional tourism shuttle services during the high seasons. This leads to the preference for personal car trans-

port. Due to its locations between train stations in Saalfelden in the West and Bischofshofen in the East, the introduction of a demand-responsive transport system is reasonable. Both locations can act as hubs and provide more flexible and collective mobility for tourists and locals. Considering now the projected rise of the frequency of the ring train, it gives the choice for tourists to reach the destination without a personal car. The steady local population amounts up to 4.500 inhabitants, but e.g. during the more intensive winter season, they count with around 600.000 overnight stays. Hence, the exchange with parts of their mobility stock during summer with Berchtesgaden allows to reach the critical mass and so the economic feasibility.

Compared to other big skiing areas, Hochkönig is located relatively low, i.e. ski runs are placed between 800 and 1.900m. Therefore, an adaptation towards a climate responsive development in terms of tourism and energy provides new opportunities.

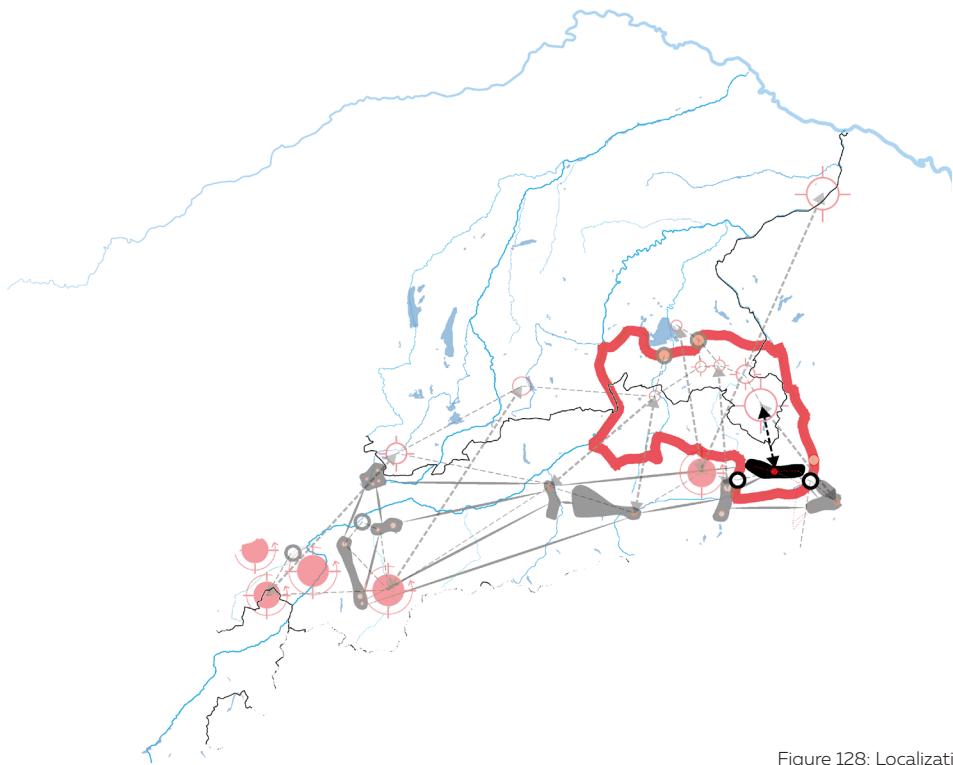


Figure 128: Localization of key project region
Source: Author

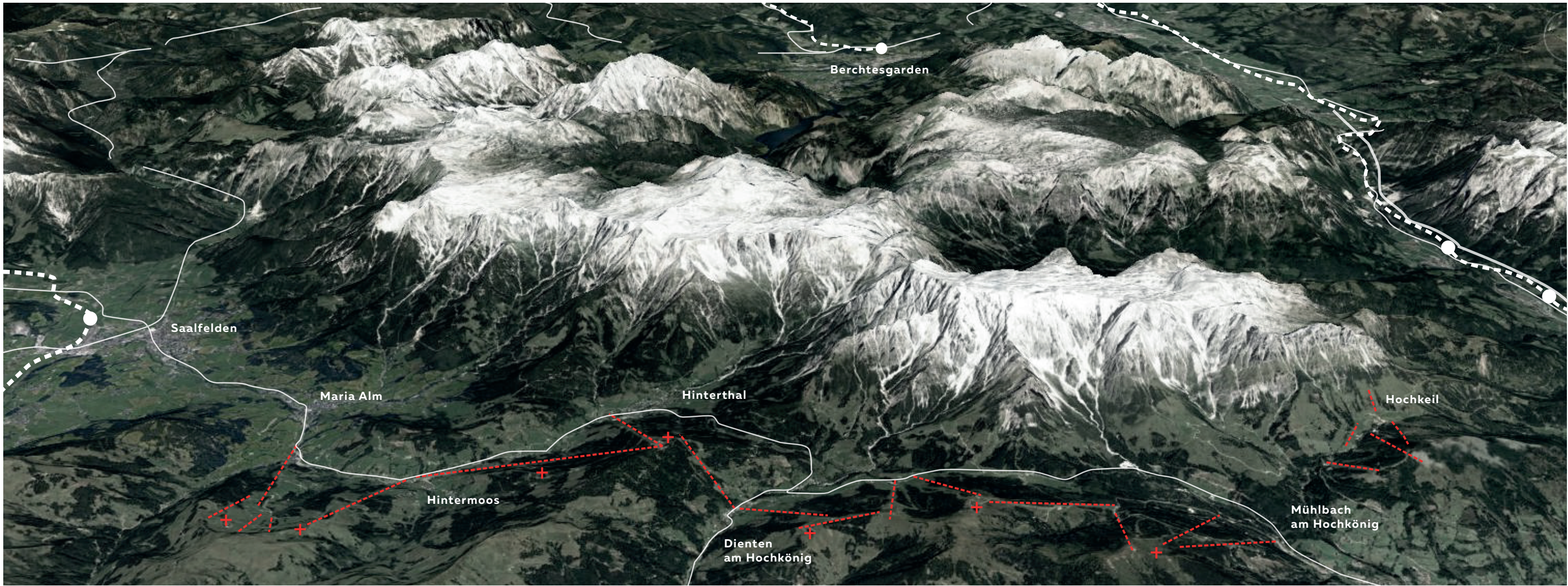


Figure 127: Introduction of the key project region
Source: Google earth

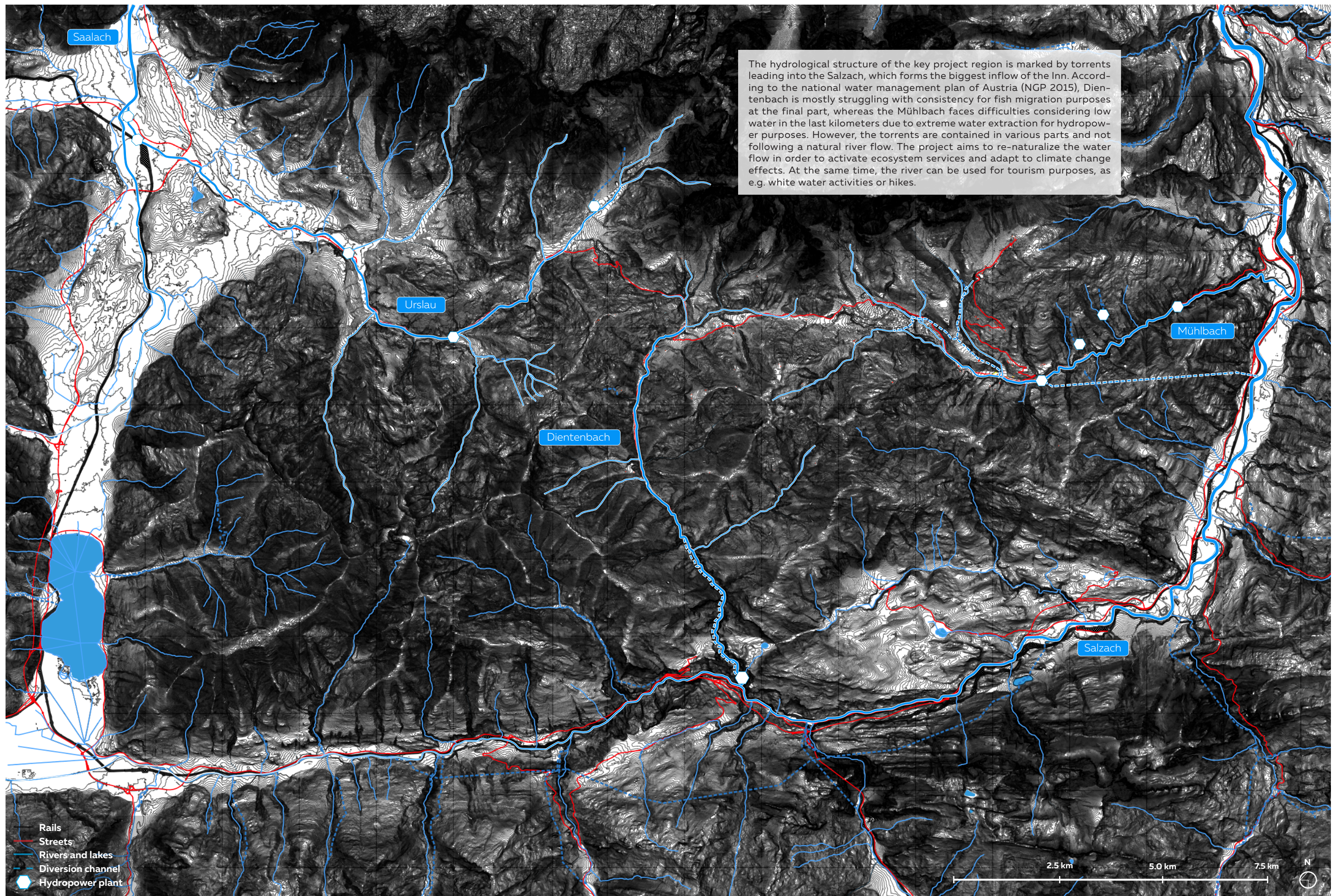


Figure 129: Hydrological structure of key area
Source: Author

The dynamic of alpine torrents

Alpine torrents are above-ground waters with at least occasional large channel inclination, fast and strongly changing runoff pattern and temporarily high solids handling. In order to understand the dynamic of torrents better, they can be divided into three different parts: the collection area in the upper mountains, where water, eroded soil and stone shingle gathers, followed by the main drainage channel, where the water and sediments flow comparatively fast, and finally, the alluvial fan, where main sedimentation and bed-load is accumulated. (Figure 133)

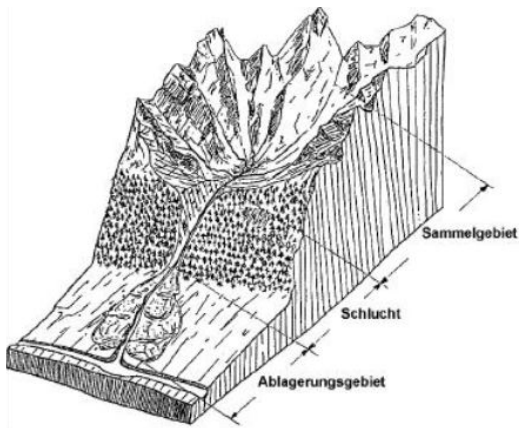


Figure 133: Scheme of alpine torrents
Source: Hübl et al. 2003, p. 10

The combination of fast changing runoff pattern and material carriage generates various risks for the surrounding environment. Especially in the alluvial fan accumulated driftwood, stones and bed-load can lead to massive mud-flows, and thereby affect the settlements (Figure 130). Whereas in the main drainage canal particularly the high velocity provokes erosion of the river bed and bank.

Therefore, human settlements sought for protection of mud flows and flooding through engineering based approaches. The main aim of all traversal structures is to prevent erosion, lift the river bed, reduce the slope, and to break the momentum. Common techniques are various barrier structures to hold back driftwood, stones and sedimentation (Figure 131). Besides, drop structures provide an opportunity to reduce erosion and operate as a protection of the riverbed (Figure 132).

However, the price of all these taken measures is high. Upstream fish migration is hampered by traversal structures, but also artificial consolidation of the river bed destroys the habitat of native species, which are used to gravel and stony plains. In addition, the extraction of water for hydropower generation leads to a relatively low water level, which does not allow a natural living space for flora and fauna anymore. This issue is especially visible for the torrent Mühlbach in the lower part.



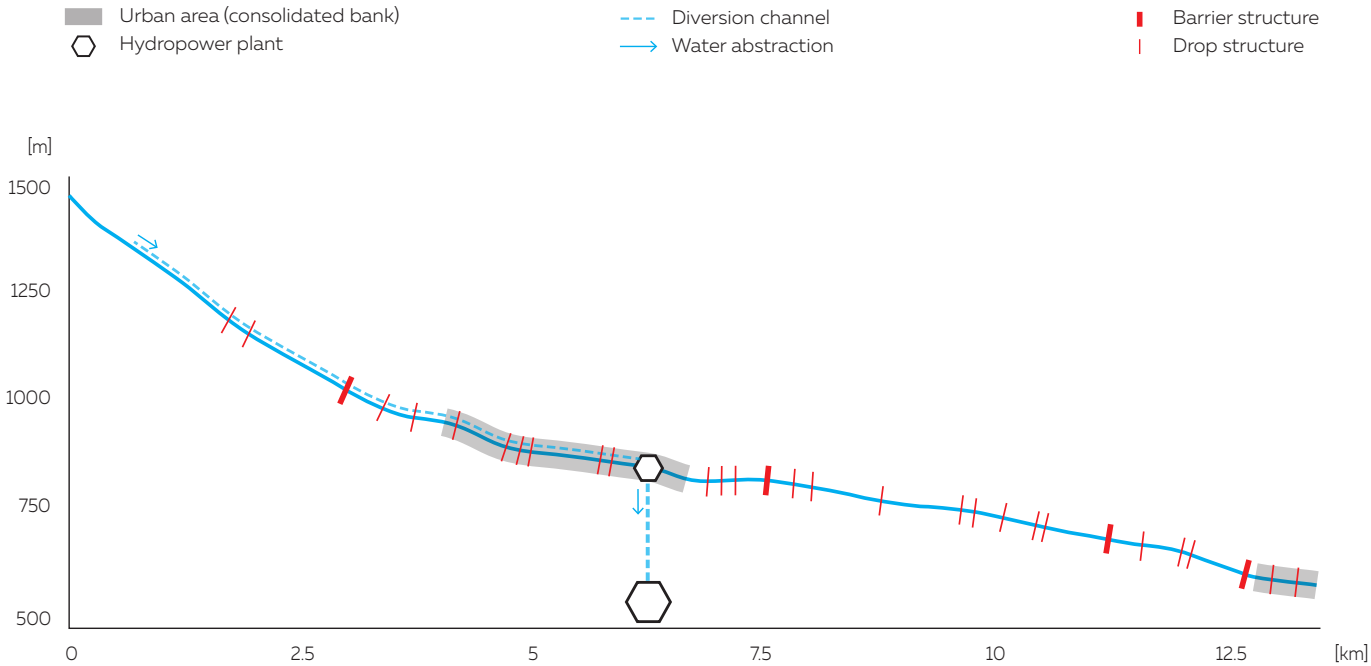
Figure 130: Mud flow in Bondo, Switzerland 2017
Source: www.suedostschweiz.ch



Figure 131: Barrier structure in the torrent 'Leoganger Ache'
Source: Author

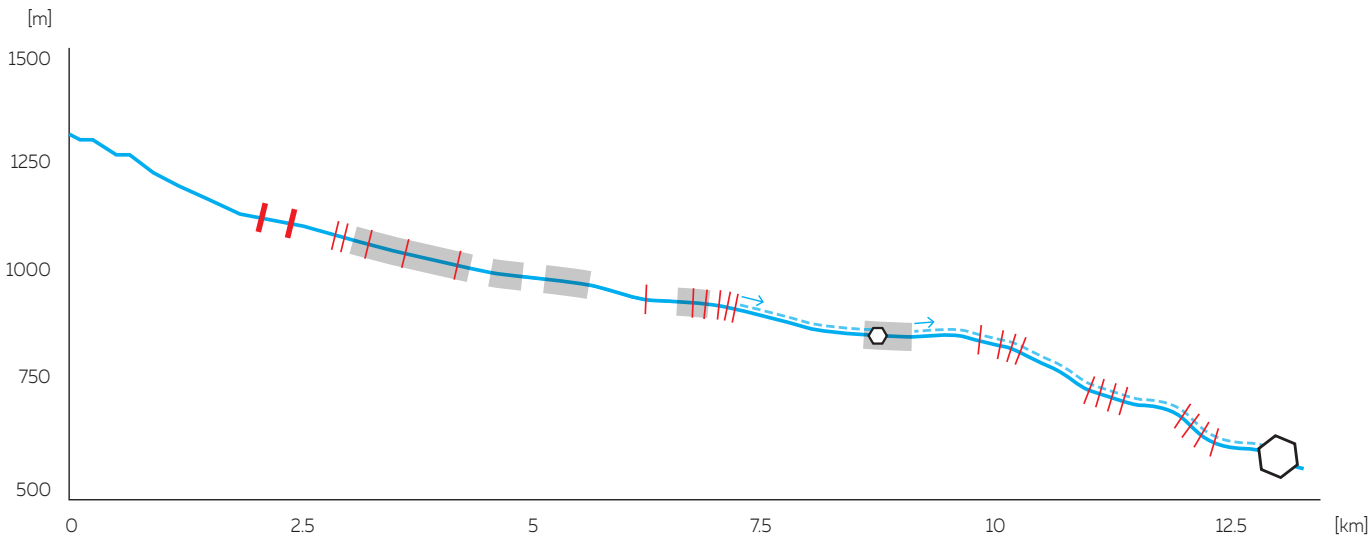


Figure 132: Drop structure in torrent
Source: www.biberberti.at



Profile Mühlbach

Catchment area: 32.3 km²
Average depth: 0,7 m (0,5 m - 1,4 m)



Profile Dientenbach

Catchment area: 53.4 km²
Average depth: 0,3 m (0,1 m - 1,0 m)

Figure 134: Profiles of torrents Dientenbach and Mühlbach
Source: Wasserbuch Salzburg 2018, SAGIS

Regional cooperation and strategy

Figure 118 shows clearly, that Saalfelden and Bischofshofen possess a regional supply function with a relatively high population and lower tourism intensity. In turn, Maria Alm, Dienten and Mühlbach focus on seasonal tourism and show a low amount of steady inhabitants. This can be explained due to their less accessible location, which transforms them automatically into less attractive residential areas.

By proposing a new demand-responsive mobility system especially these areas can be made more accessible, and so more attractive for future develop-

ment. The main route follows the current bus stops, but the system allows detours according to demand and responds thereby to the rural context.

Comparing now the development of all municipalities it becomes clear, that especially Dienten and Mühlbach are facing difficulties. Falling numbers in tourism during winter, stagnating population growth and climate change effects ask for a new development model. Hence, all strategic interventions are located in these structurally weaker areas. In turn, Maria Alm shows growing numbers in both seasons, but especially in winter with around 10%.

The proximity to Saalfelden and a broad activity offer attract tourists.

Starting point is the transition towards a climate-responsive development with a special emphasis on changing water flow patterns due to climate change. This refers to re-naturalization interventions and a winter season without artificial snowmaking, but the offer of alternative activities for the region. By bringing back a natural water flow and connected freshwater ecosystem services, the locations will be more attractive for tourism, too. Another step is the implementation of alternative energy sources in a

community-based model to generate employment and revenue for the local population. This opens up a new development and supply function for the region.

That implies the cooperation between the municipality of Dienten and Mühlbach for tourism specific developments, but also the tourism association 'Ski Amadé'. In the case of the re-naturalizations of torrents, all municipalities and users of each stream need to cooperate. The mobility concept entails the cooperation of the entire Hochkönig region and the summer partner location, Berchtesgaden.

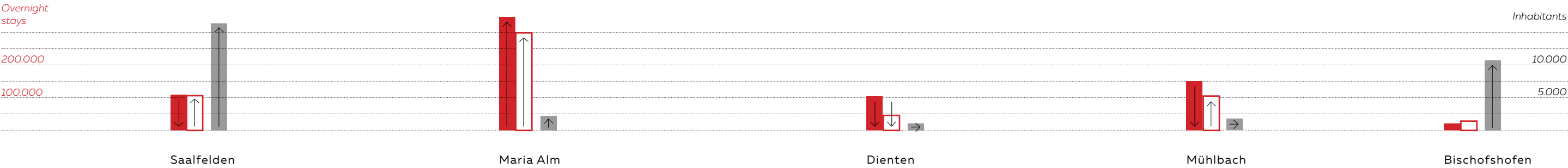


Figure 136: Population and overnight stays 2018 per municipality
Source: www.salzburg.gv.at

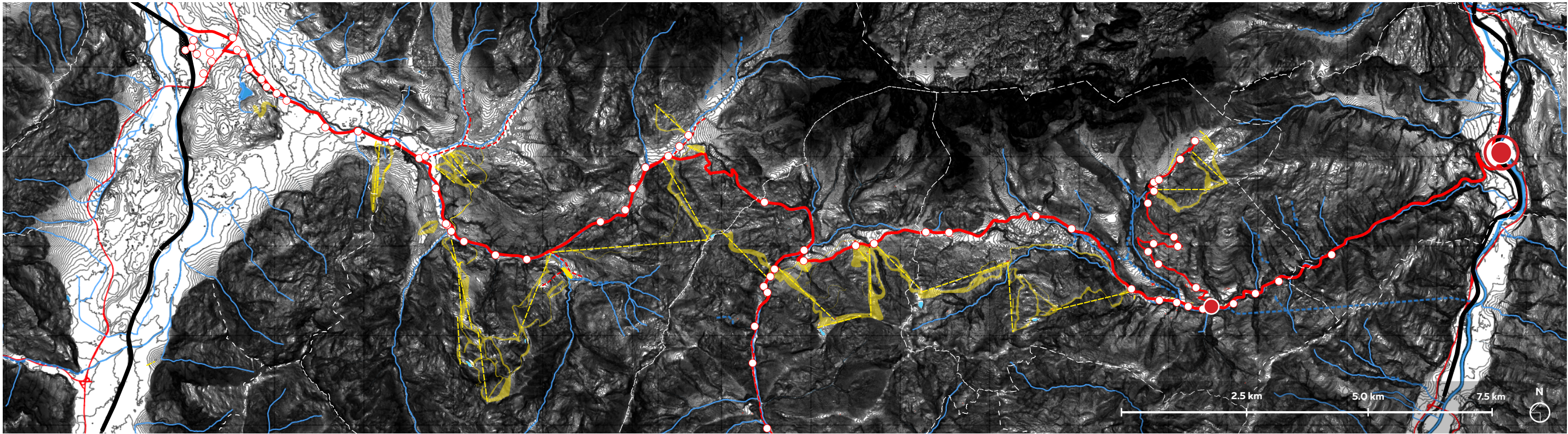


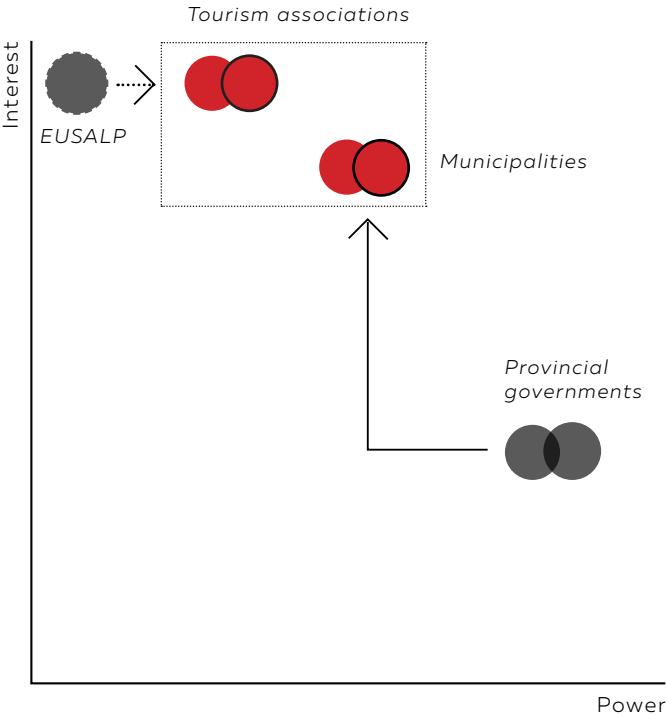
Figure 135: Demand-responsive mobility in the Hochkönig region
Source: Author

VII.II Important actors

Stakeholders - sustainable mobility

The planning and implementation process for a demand-responsive transport system requires the direct cooperation of tourism associations and municipalities. In the case of the region 'Hochkönig' the Austrian municipalities Dienten, Mühlbach, Maria Alm need to cooperate with the German municipalities Ramsau and Schönau, and the Austrian tourism association 'Hochkönig' with the German association 'Berchtesgadener Land'. These actors are the main investors, planners and users. Additional financing can be acceded by the provincial government of Salzburg. Previous subsidies used for local bus systems can be inverted in this project. Eventually existing local bus operators can be integrated in the development of a demand-responsive transport system.

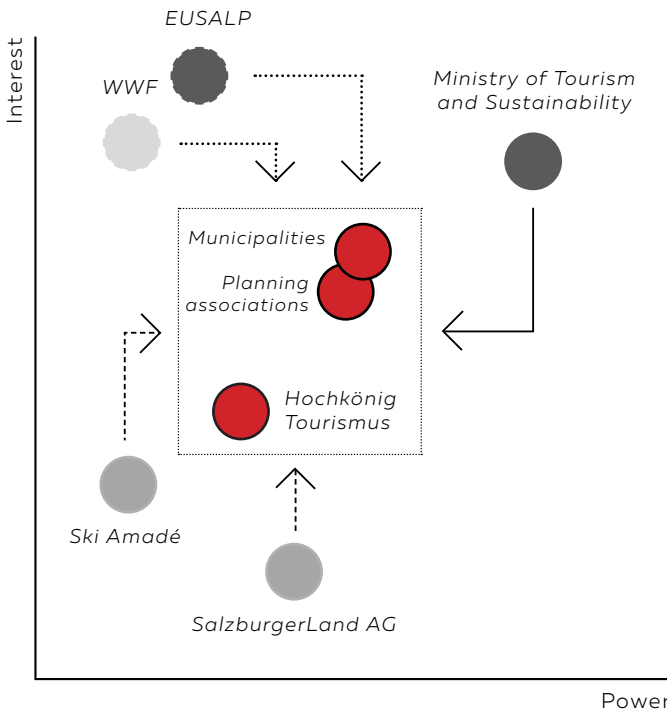
The role of EUSALP is to promote it as a pilot project for cross-border cooperation, give advice and take up the idea in further discussions and implementations.



Stakeholders - pioneer network

The planning and implementation of the pioneer network in Dienten and Mühlbach implies the co-operation between municipalities, tourism and planning associations. They act as main investors, planners and users of this project. Marketing support derives from the regional skiing association Ski Amadé, the provincial tourism association 'SalzburgerLand AG'. Additional funding and promotion can be acceded from the Ministry of Tourism and Sustainability.

In addition, EUSALP and WWF can act as advisors and facilitator by promoting it as a pilot project and subsequently, attract funds.



- Advice / Knowledge
- Marketing / Promotion
- Financial flows
- Austrian
- German
- Cross-border
- Public
- Public/Private
- Private
- Civic Society

EUSALP <i>Power:</i> Stimulation of cooperation and political discourse <i>Interest:</i> Cross-border cooperation, preservation of natural resources		EUROPEAN
WWF <i>Power:</i> Support and initiate government independent projects <i>Interest:</i> Preservation of natural resources, cross-sectoral and cross-border cooperation		
Ministry for sustainability and tourism <i>Power:</i> Hydro power and Tourism policies, Water management plan <i>Interest:</i> Cross-sectoral sustainable development		NATIONAL
Verbund AG <i>Power:</i> Hydro power and Tourism policies, Water management plan <i>Interest:</i> Cross-sectoral sustainable development		
Provincial government of Salzburg <i>Power:</i> Tourism policy concepts, Spatial concepts and development programs <i>Interest:</i> Economic growth, stability		PROVINCIAL
Salzburger Land AG <i>Power:</i> Marketing <i>Interest:</i> Increase tourism activity in province	Ski Amadé <i>Power:</i> Market regulation, supply power <i>Interest:</i> Profit	
Planning Association of Unter Pinzgau <i>Power:</i> Regional development plans for landscape and territories <i>Interest:</i> Improve regional development	Planning Associations of Unter-Salzach-Pongau <i>Power:</i> Regional development plans for landscape and territories <i>Interest:</i> Improve regional development	REGIONAL
Postbus <i>Power:</i> Define bus routes <i>Interest:</i> Economic feasibility		
Tourism association 'Hochkönig' <i>Power:</i> Marketing, strategic plans, infrastructural activation <i>Interest:</i> Profit, sustainable development	Tourism association 'Berchtesgadener Land' <i>Power:</i> Marketing, strategic plans, infrastructural activation <i>Interest:</i> Profit, sustainable development	LOCAL
Municipality of Dienten <i>Power:</i> Spatial concepts, land use plans <i>Interest:</i> Improve local development	Municipality of Mühlbach <i>Power:</i> Spatial concepts, land use plans <i>Interest:</i> Improve local development	

VII.III Strategic interventions

Overview strategic interventions

Various design principles are applied in the key project region, but above all prevails the concept of re-naturalizing the river flow. This allows the pioneer area to be adaptable for climate change effects such as floods and dry periods, and at the same time provides freshwater ecosystem services for locals and tourism. Project number 1, 2 and 3 deal with development opportunities of alternative energy sources for the local community, whereas project 5 and 6 tackle the promotion of a new paradigm paradise. Project 4 is located in an urban context and applies directly the principle of revitalisation by reusing parking spaces.

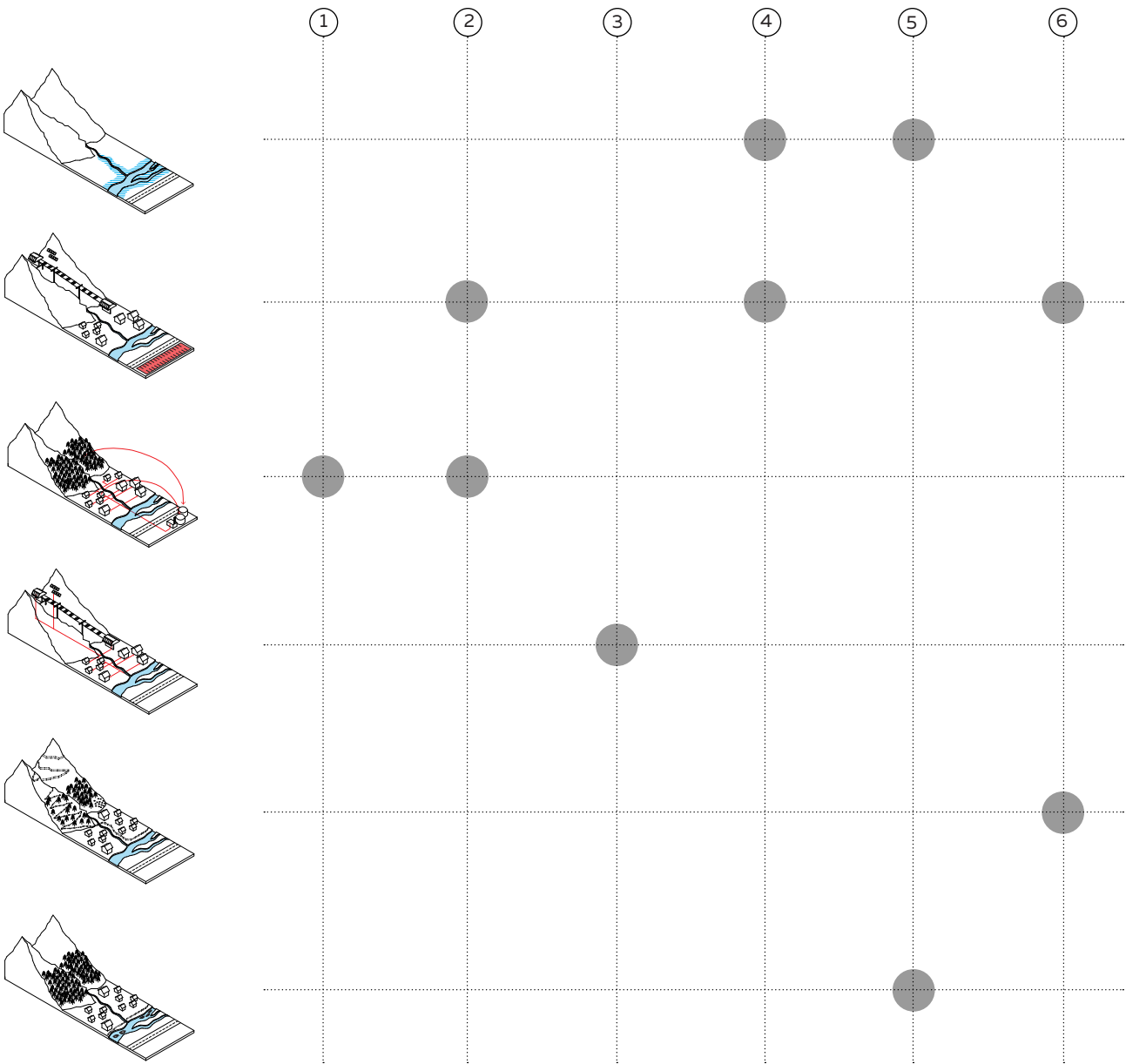


Figure 137: Applied design principles, Source: Author

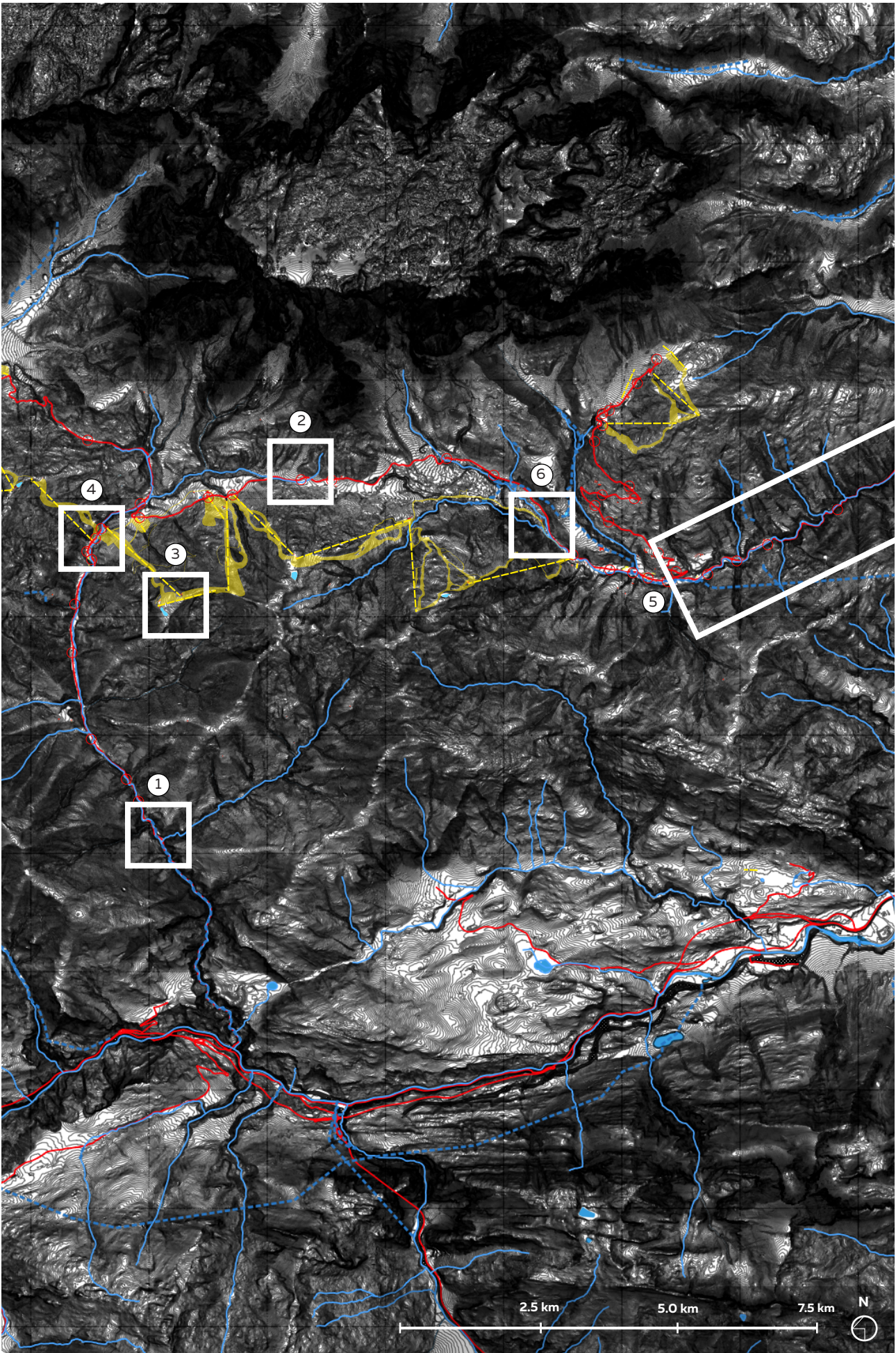


Figure 138: Location of key interventions, Source: Author

Intervention 1: Wood gasification plant

This project aims to use the local resource wood to produce electricity and heat for the community via a wood gasification plant. The power plant is located next to the existing sawmill 'Feroli' and a connected small diversion hydro power plant. Hence, existing infrastructure can be used for electricity and resource transport. Moreover, wood waste from the sawmill can be directly used and additionally increase the efficiency due to heat recovery. This creates a regional value chain and during surplus generation, revenue for the community.

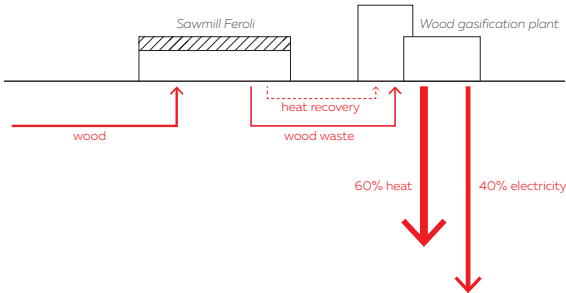


Figure 139: System of wood gasification plant
Source: Author

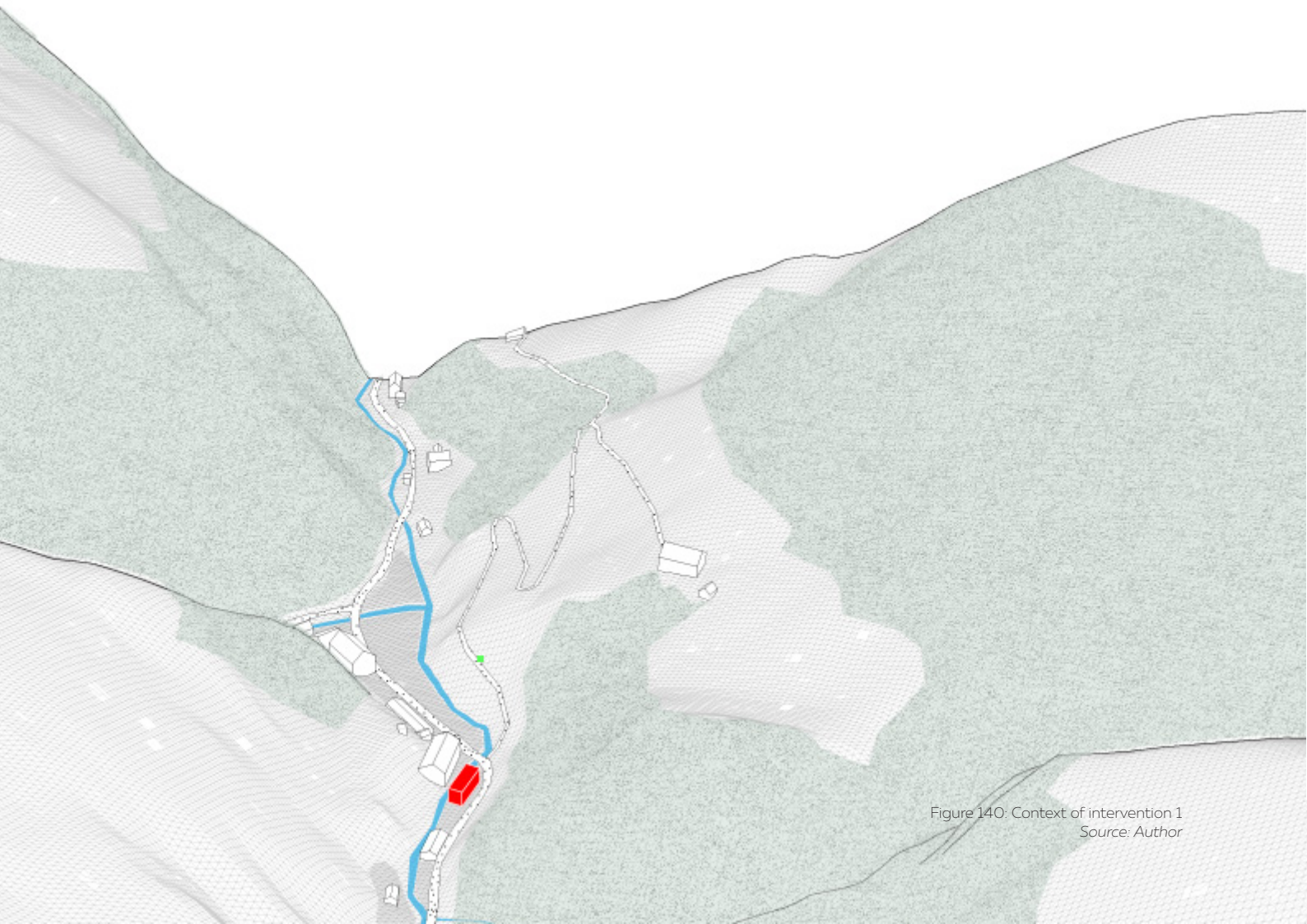


Figure 140: Context of intervention 1
Source: Author



Figure 141: Impression of intervention 1
Source: Author

Intervention 2: Bio-digester for tourism waste

This intervention proposes a bio-digester for the community of Mühlbach and Dientenbach. It works with the utilization of organic tourism waste of the region. Supply of organic waste varies during seasons, i.e. in winter and summer intensive tourism generates more than in low seasons. Therefore, energy supply can meet demand and in case of a surplus generation, even revenue for the community. The bio-digester is located at a previous parking area, which will not be necessary anymore due to the introduction of a collective demand driven transport system.

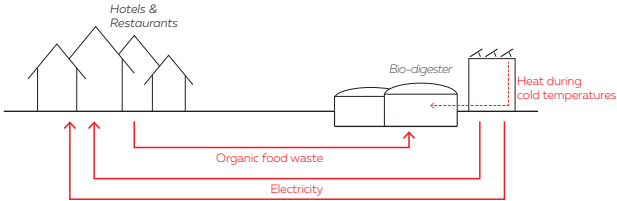


Figure 142: System of Bio-digester
Source: Author

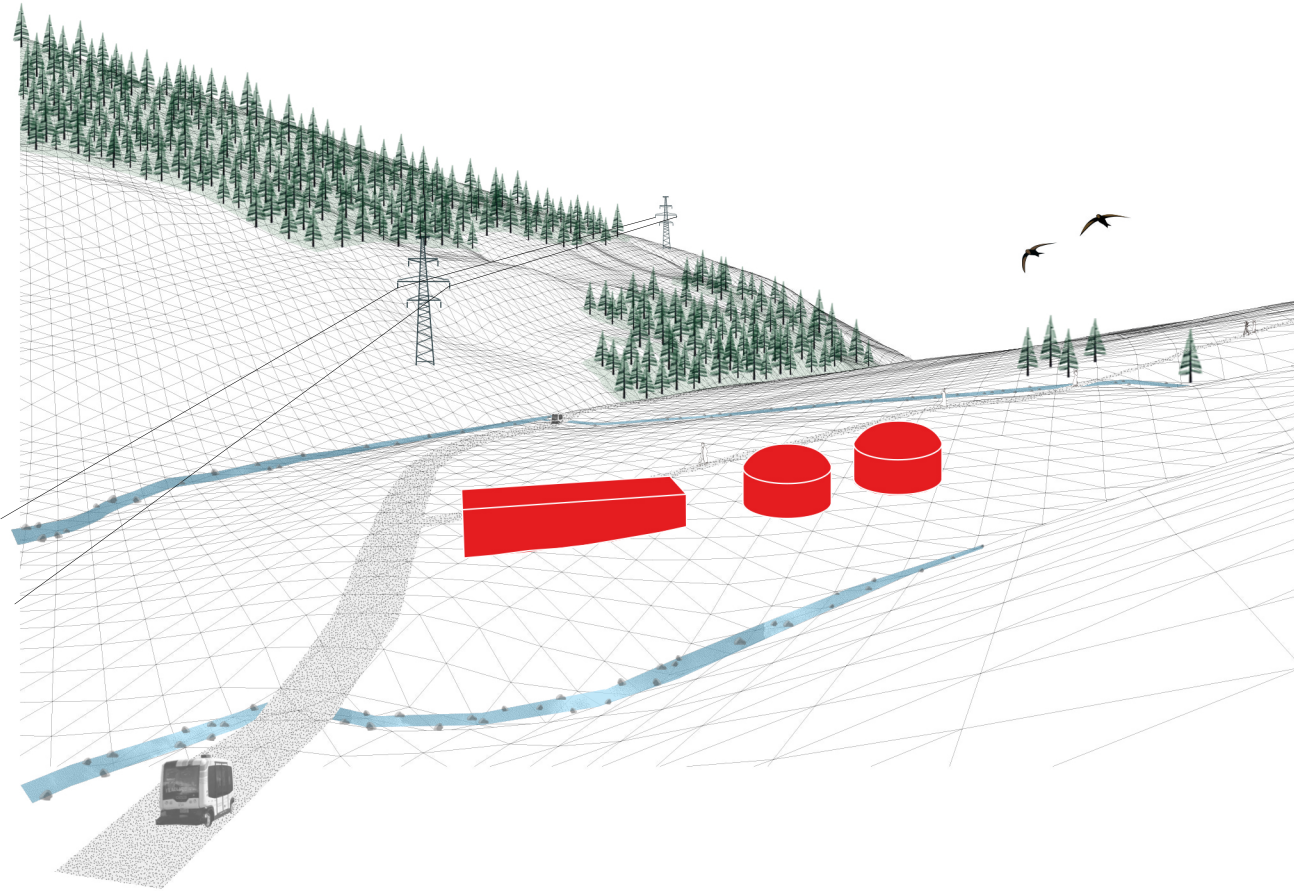


Figure 144: Impression of intervention 2
Source: Author

Intervention 3: Solar-powered ski area

This intervention proposes the use of solar power in high altitudes on existing infrastructures. This includes water reservoirs currently used for artificial snow-making and buildings connected to alpine ski tourism. The generated electricity can be used for local consumption including ski operations and households of Mühlbach and Dienten. In case of a surplus production, electricity can be sold to the general grid and thereby generate revenue for the community.

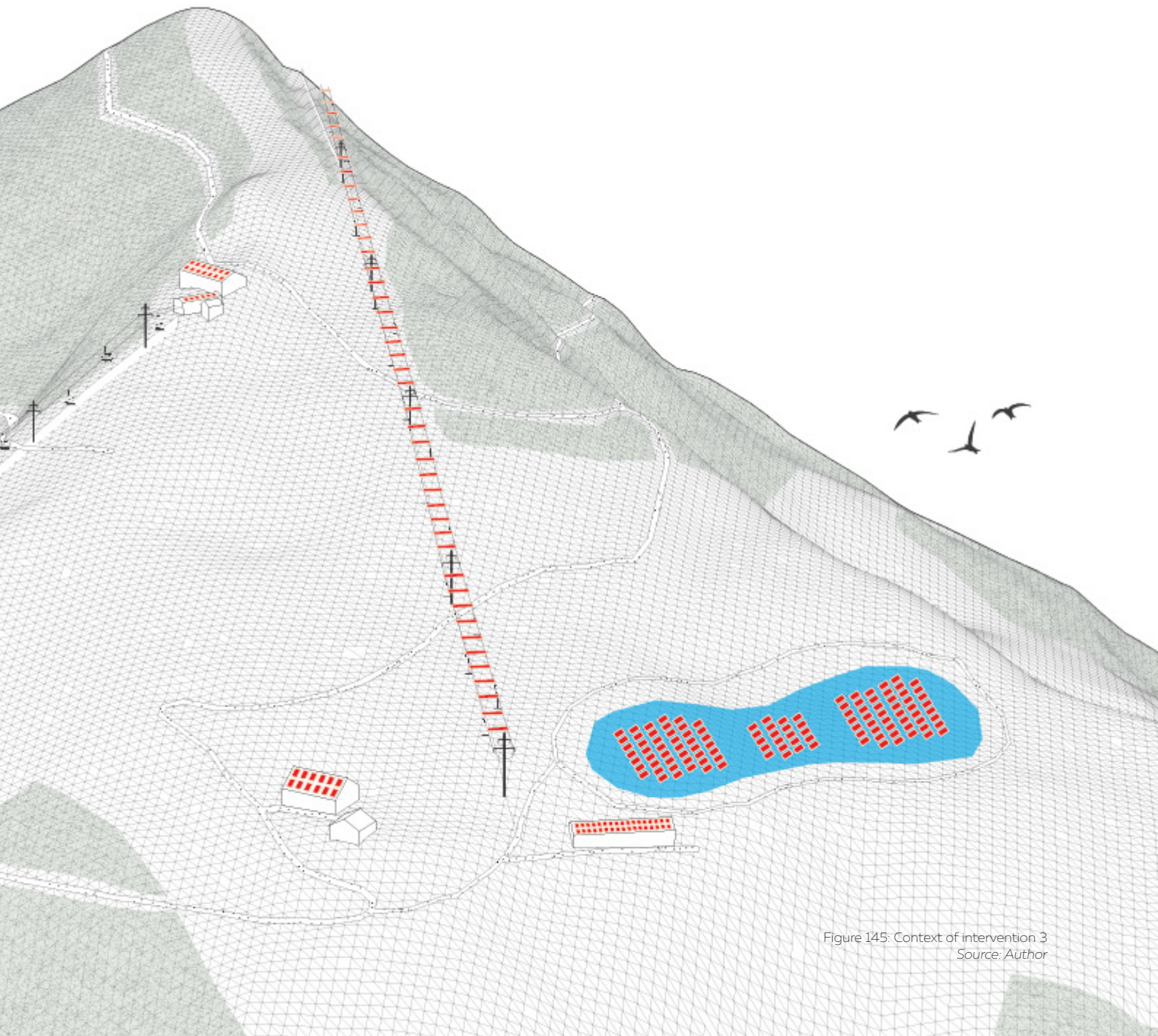


Figure 145: Context of intervention 3
Source: Author

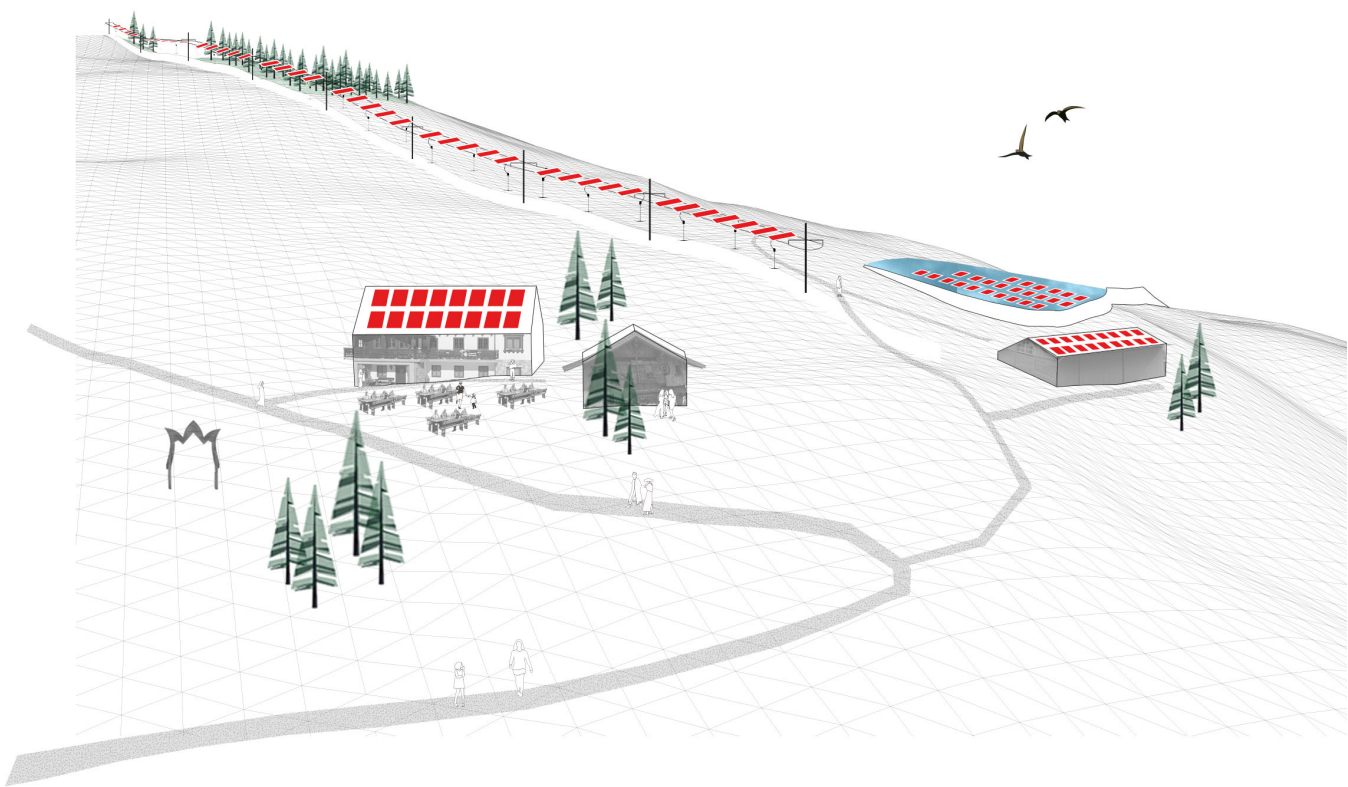


Figure 146: Impression of intervention 3
Source: Author

Intervention 4: Room for the river

This intervention reuses parking area for a re-naturalization process of the torrent Dientenbach and create simultaneously a new green village centre. Currently, it is contained throughout the entire village by stone walls and thereby decreases given capacity of ecosystem services. By giving space back to the torrent, additionally a water retention area is provided, which will be used in case of heavy rainfalls. During regular run off, the previous parking spaces can be used a new green centre of the village due to its location next to important amenities, such as the supermarket, bank, charging station and restaurants.



Figure 147: Context of intervention 4
Source: Author

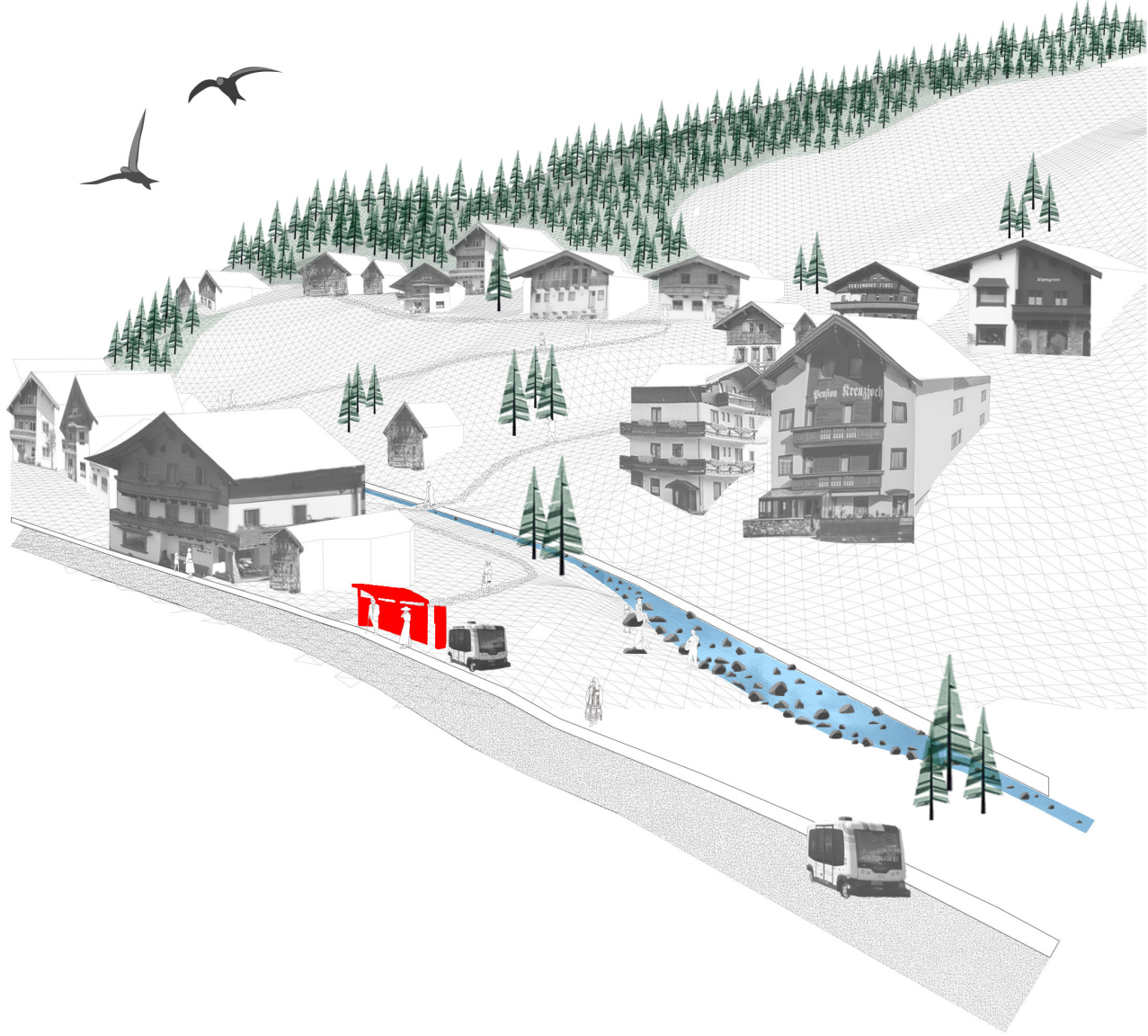


Figure 148: Impression of intervention 4
Source: Author

Intervention 5: White water activities

This project tackles the problem of residual water in the torrent Mühlbach and connects it with a new tourism activity. Currently, the final part of Mühlbach is facing problems due to intensive water extraction for the generation of hydro power. Therefore, this project proposes to reduce the capacity of Arthurwerk and provide instead a natural river flow. This brings back a natural habitat for aquatic species, and at the same time opens up to use the increased river run-off in winter and spring for white water activities, as e.g. kayaking or rafting. During seasons with a lower tourism activity and river run-off, the river bed provides regulating and supportive ecosystem services for the environment.

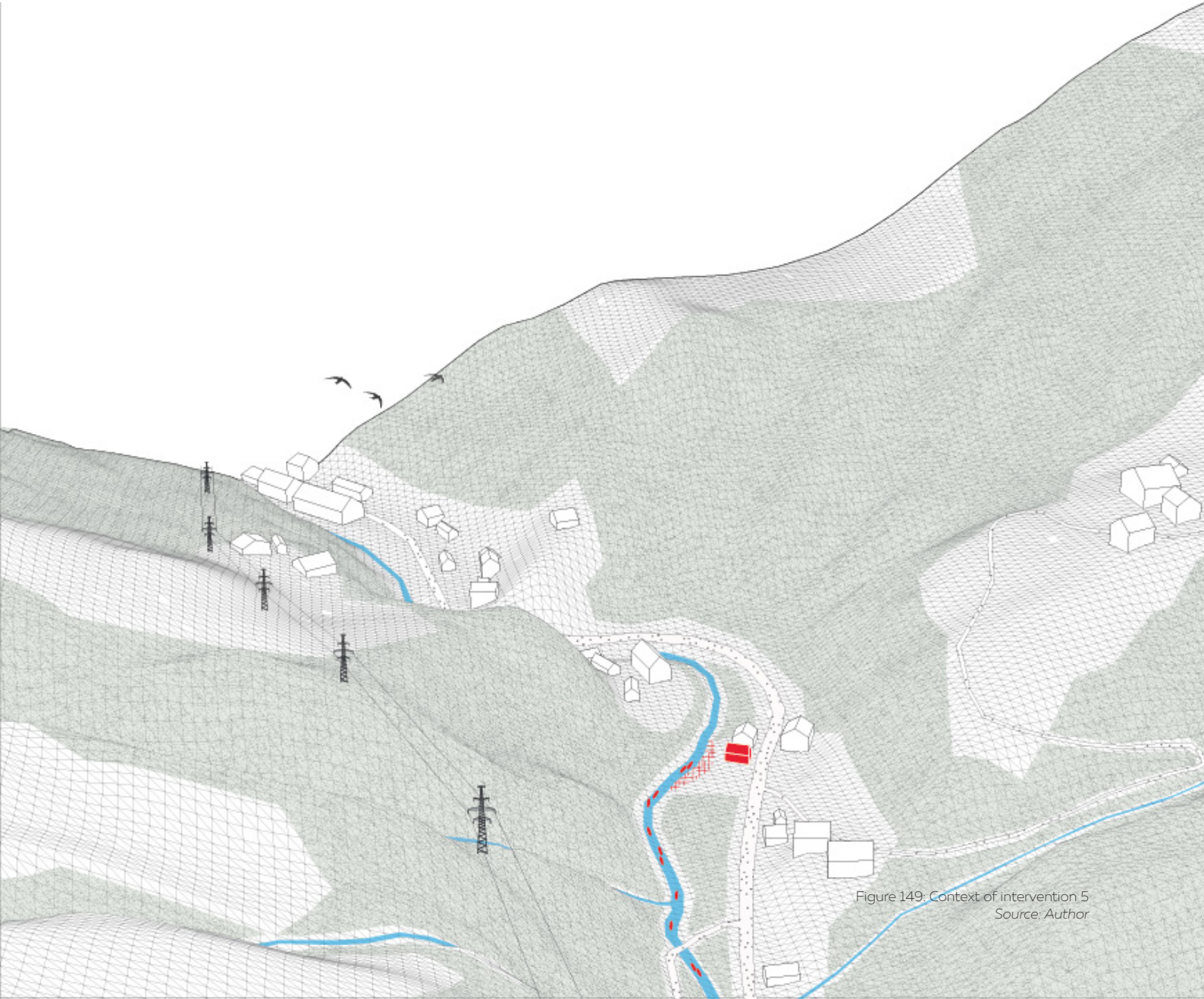


Figure 149: Context of intervention 5
Source: Author

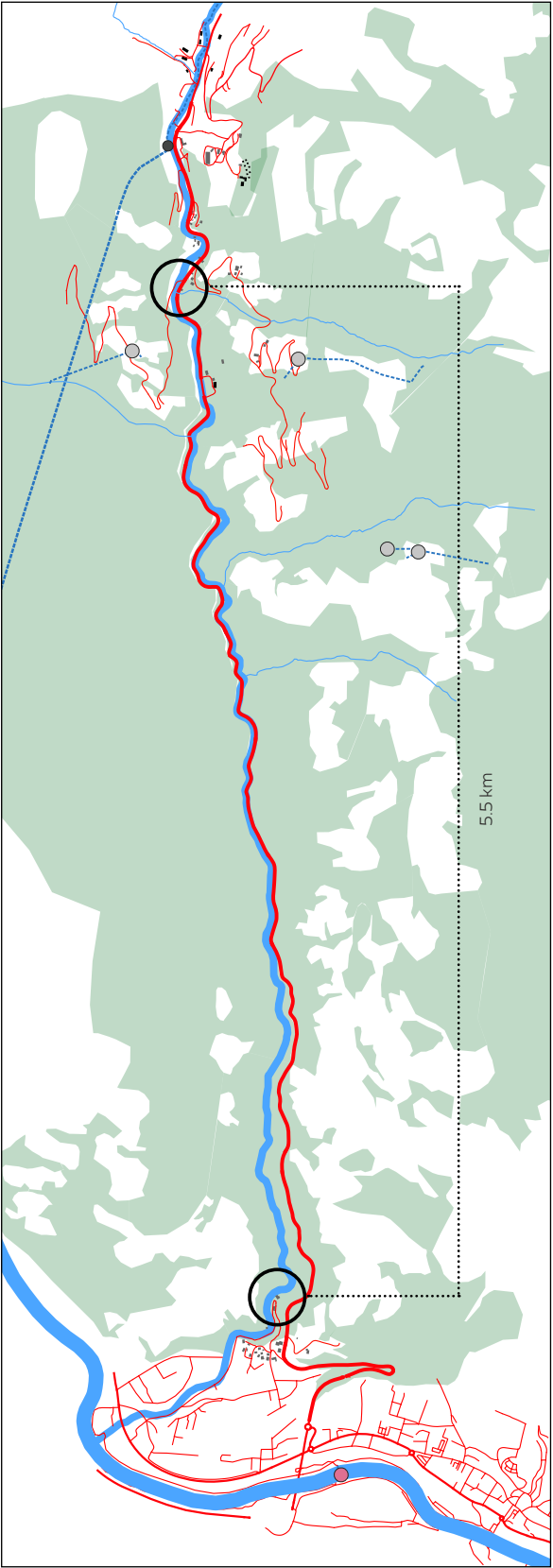


Figure 150: Location of starting and ending point
Source: Author

The starting and ending point are chosen according to their accessibility. Furthermore, they provide an opportunity to develop tourism amenities, as e.g. restaurants or hotels and a water retention area in case of extreme rainfalls. The ending point located on the border of Bischofshofen shows a relatively wide river bed, which allows an attractive ending

of tours. After the ending point of the white water route a small run-off river plant is proposed in order to compensate the lost electricity generation by Arthurwerk. This action is an incentive for the often long-lasting and unattractive re-naturalization processes.



Figure 151: Context of intervention 5
Source: Author

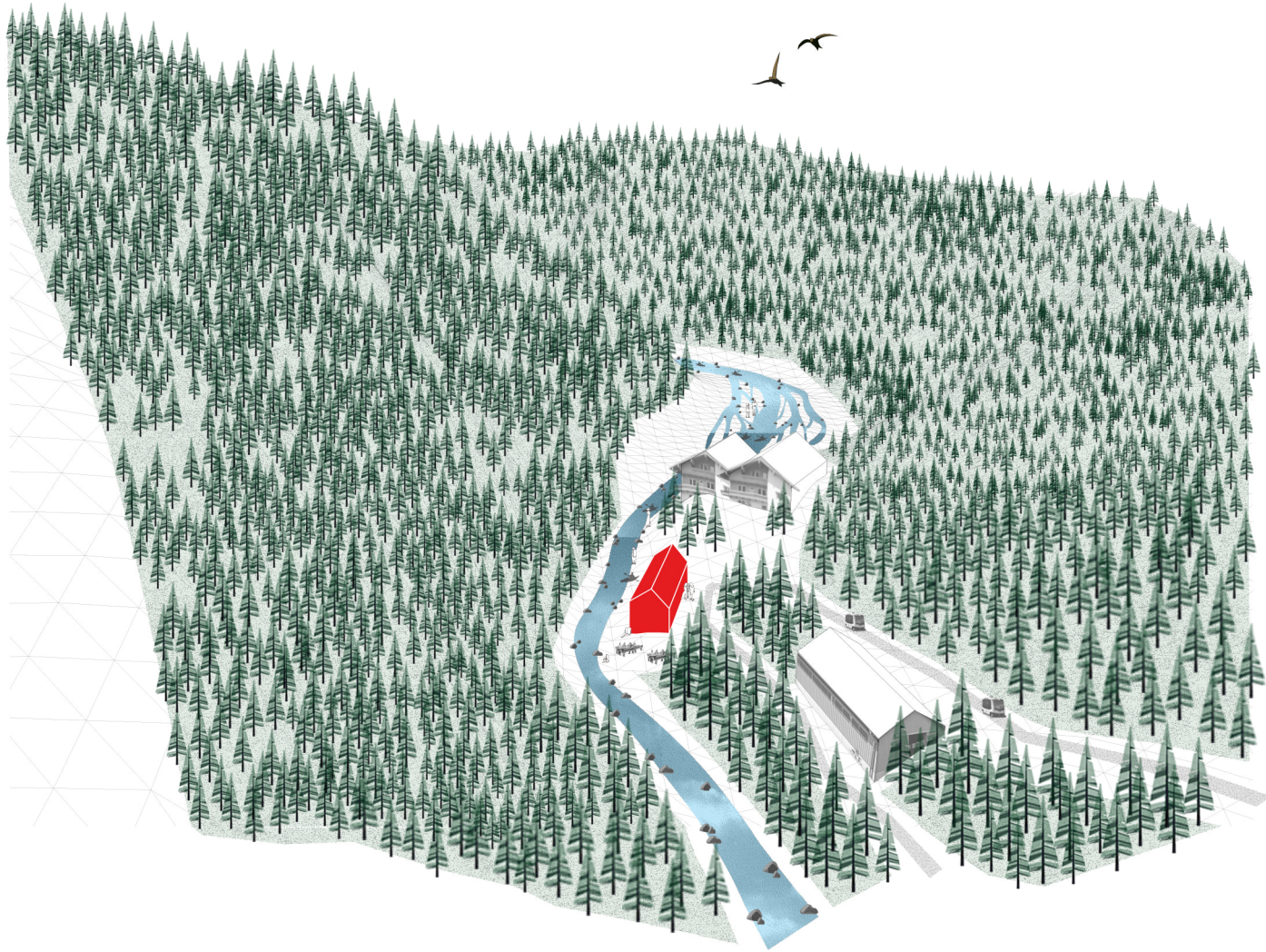


Figure 152: Impression of intervention 5
Source: Author

Intervention 6: A new centre for soft tourism

This intervention puts forward an approach of soft tourism. By proposing adventure paths along torrents and forests, an alternative to alpine ski tourism is provided. Due to the increasing water run off in winter it will be an attractive activity also during cold months. Hikes, guided tours, mountain-bike and ski-touring routes can be provided along the torrents Fellerbach and Trockenbach and thereby supply an attractive surrounding. In addition, a nature house at the crossing point of both torrents informs about the predominant flora and fauna, offers tours and hires outdoor equipment for aforementioned activities.



Figure 153: Context of intervention 6
Source: Author

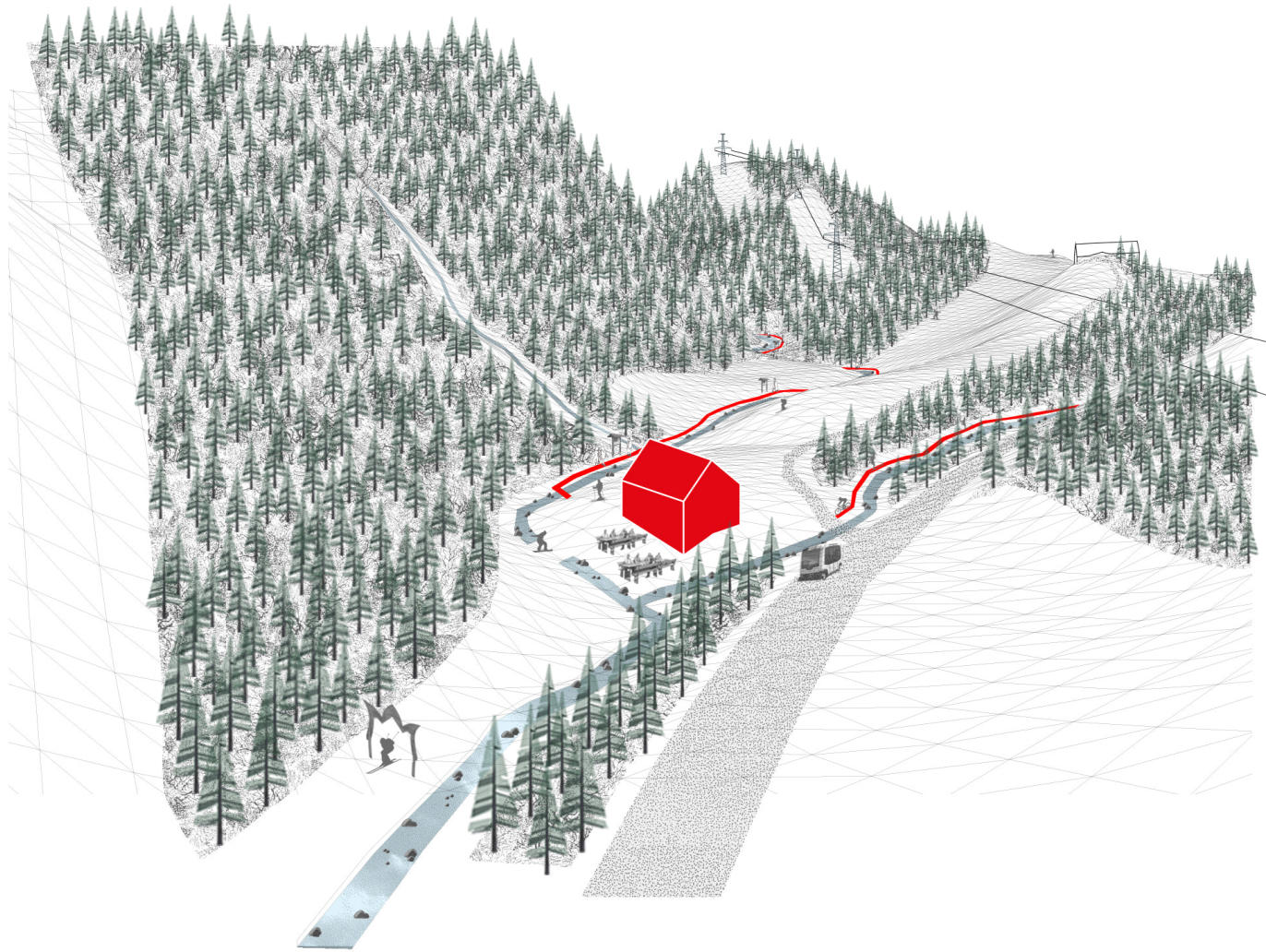


Figure 154: Impression of intervention 6
Source: Author



Figure 155: Covered snow cannon in Lermoos
Source: Author

VIII. CONCLUSION & REFLECTION

VIII.I Conclusion

The status quo of the Alpine region is characterized by overexploitation of water-intensive economies. Especially hydropower generation and ski tourism are spread out extensively over the region and thereby influence the river ecosystem in up- and downstream areas. Consequently, the cultural landscape is almost completely covered with over- and underground infrastructure. This extreme socio-technical system is leading to an increasingly alienated relation between human and nature, resulting in negative externalities for the river ecosystem and human wellbeing. Additionally, effects of climate change are leading to an overall decreased availability of freshwater, but also a seasonal changing run-off pattern. This conflict of interest between water-intensive economies and the river ecosystem itself asks for an adaptive development paradigm considering the interrelations between pre- and inner alpine areas. Thereby, the European strategy for the alpine region (EUSALP) established the starting point of my graduation process as it matched my personal fascination for the region itself and boosted my interest in regional strategies. With a focus on aforementioned water-related issues, this graduation thesis aimed to detect the potentials of EUSALP to develop a more socio-ecological resilient relationship between pre-alpine areas and its surrounding agglomeration belt.

Sub-RQ1: What is the added value of a macro-regional strategy in the Alpine region?

The first step during my research was to understand in a qualitative and quantitative way the added value of a macro-regional strategy in the alpine region. Firstly, it has been concluded that the acknowledgement of the relation between pre and inner alpine areas within EUSALP forms a main aspect since it has not been considered previously in spatial planning. Besides, an integral governance approach is put forward, i.e. multi-level governance and cooperation between thematic EUSALP action groups. This allows to tackle problems in constantly changing planning areas, so called soft spaces, and above all, to tackle the existing institutional thickness. With its coordinating function, existing national, regional and cross-border programmes can be aligned and lead to new actor constellations. However, EUSALP is still facing certain obstacles, such as a lack of legitimacy, the missing involvement of the civic society, a strong focus on economic growth and internal communication issues. As Boglarka Finyesi Kiss, leader of a EUSALP Action Group, stated in our conversation, that EUSALP still needs time to find its own identity, making it difficult to predict its future development. Conclusively, I see the biggest potential in perceiving EUSALP as an environmental soft space with a special focus on climate change effects in mountain regions, since they are affected stronger, especially in their water household, as surrounding regions. These outcomes can be found in a more detailed way in the theory paper located in the appendix (p.224).

Sub-RQ2: What are the interrelations between inner-alpine areas and the surrounding agglomeration belt?

Followed by that, a multi-scalar systematic and spatial analysis about the interrelations of pre and inner alpine areas allowed me to refine the problem statement, but also to define first guidelines for vision and strategy. In the macro scale it became clear, that pre and inner alpine areas are directly connected through hydropower generation, winter tourism and above all, the freshwater ecosystem. This includes also spatially indirect connected networks like transport infrastructure and electricity exchange. After analysing the case study scale, the understanding of interrelations can be extended in terms of supply, demand, and externalities. However, the location of these three elements is often not the same and provoke the phenomenon of spatial injustice. Pre- and inner-alpine areas are connected through electricity exchange, seasonal traffic flows caused by tourism, and river ecosystems. Currently, intensive electricity exchange takes place between Bavaria and Austria mainly induced to the capacities of base and peak load electricity generation. Traffic flows related to tourism reach back mostly to personal car infrastructure. This behaviour can be explained due to insufficient local transport system at the destinations, which makes the getting there by train less attractive.

Sub-RQ3: To what extent can the Alpine region adapt to the pressure of climate change and current development of water-intensive economies?

This question has been answered in the macro, meso and miso scale, and forms the base for a vision and a spatial strategy. In the macro-scale the outcome was limited to a vision based on guidelines resulting of the theoretical approach of socio-ecological resilience, i.e. the adaptation of anthropogenic systems affected by expected and unexpected changes, the ESPON ‘Alps 2050’ workshop and a spatial analysis defining the most vulnerable areas. Thus, anthropogenic networks, as e.g. mobility and electricity exchange need to be transformed in a sustainable way. Secondly, natural interrelations through freshwater ecosystems must be prioritized, which implies the enhancement of regulating and supporting ecosystem service. Climate change is an external influence and contributes to per-formative environmental change. This asks for economic and environmental adaptation in especially vulnerable areas and seeks for alternative future development. Applying now these guidelines in the case study scale, the electricity exchange is reduced by implementing alternative energy sources next to hydro-power in the inner-alpine areas, which leads to self-sufficiency and less need for baseload electricity from Germany. Concerning the interrelation of transport, a new ring line is introduced to stimulate the use of train mobility for tourism purposes. This ring connects directly to a demand responsive transport system, which can be exchanged between summer- and winter destinations and improves by that the local accessibility. Finally, the river ecosystem is improved by these changes, and above all, by the introduction of a new supply system, the pioneer network. This network is elaborated in a key including strategic design interventions. Thereby the decentralisation of electricity is translated in the introduction of new sources as e.g. organic waste, wood residuals and solar power. Possible locations and changes for a new, climate-responsive tourism paradigm result in a new centre for soft tourism, and the implementation of white water activities. Moreover, basic design principles like the reuse of parking spaces and river revitalisation processes are applied throughout the entire interventions.

Sub-RQ4: To what extent can a macro-regional strategy be spatialized in a regional and local scale?

By answering the last sub-research question all previous findings are reflected on Sub-RQ1. In other words, defining the role of EUSALP in spatial planning and design. As it is proposed in the future vision for the Alps, EUSALP can be used to develop an environmental soft space. Therefore, flexible planning spaces considering the inter-relation between pre- and inner-alpine areas for water-related issues can evolve and change in time, as e.g. networks of pioneers and mobility exchange. EUSALP takes the role as a facilitator for cross-border cooperation and in addition, to push forward the po-

litical discourse of water-related issues. Hence, the involvement of Action Group 2 (Economic development), 4 (Mobility), 6 (Resources) and 9 (Energy) is essential. They can act as advisors, attract funding and provide knowledge for the development of the aforementioned networks.

RQ: What are the potentials of a macro-regional strategy to develop a more socio-ecological resilient relationship between inner- and pre-alpine areas for future water use?

Finally, the previous steps guided my graduation thesis to develop a spatial strategy in a sub-macro region and thereby respond to the main research question. Generally a macro-regional strategy allows to have a common vision for the scope of pre and inner alpine areas, and therefore guidelines can shape the political discourse for water-related issues in all seven involved countries. This can trigger additionally cross-border cooperation, and so tackle the currently not considered interrelation between pre and inner alpine areas. In the scale of the main outcome, a development strategy in a case-study region the role of EUSALP acts as a facilitator and direct advisor for the implementation of a pioneer network and the exchange of a seasonal mobility stock. The locations of supply can be introduced to a new tourism paradigm and the concept of decentralization of energy. In terms of river revitalisation processes EUSALP can stimulate the political discourse and put forward a more interdisciplinary approach of actors constellations and planning, i.e. to connect spatial planning more with the sectors of water and tourism.

VIII.II Transferability

The proposed strategy can be applied in other regions in the Alpine territory. However, it depends on the type of strategic action and the context until what extend they can be implemented. This refers to the so-called place-sensitive approach, which seeks for a context-aware, and non-universal solution.

In the case of big scale infrastructure for hydro-power generation and mass tourism areas, the proposed design interventions can be transformed into a cross-border policy for all alpine states. Consequently, a step towards energy decentralisation is brought closer. The introduced concept of sustainable mobility depends mostly on the context, since existing rail infrastructure and available funding depend highly on the area of intervention. In turn, the idea of seasonal mobility exchange can be promoted in the entire region according to predominant summer- and winter destinations due to the comparatively lower investment costs. Moreover, the pioneer network can be expanded in clusters throughout the entire Alps. Thereby the context is specifically relevant to provide a context-based and feasible development alternative. This refers to the decentralisation of energy and a new tourism paradigm in a inter communal-based level. In the case study area the promotion of a pioneer region was facilitated due to the federal organized structure of Austria and Germany, but e.g. in France or Slovenia the implementation can be hampered due to their more centralized organisation.

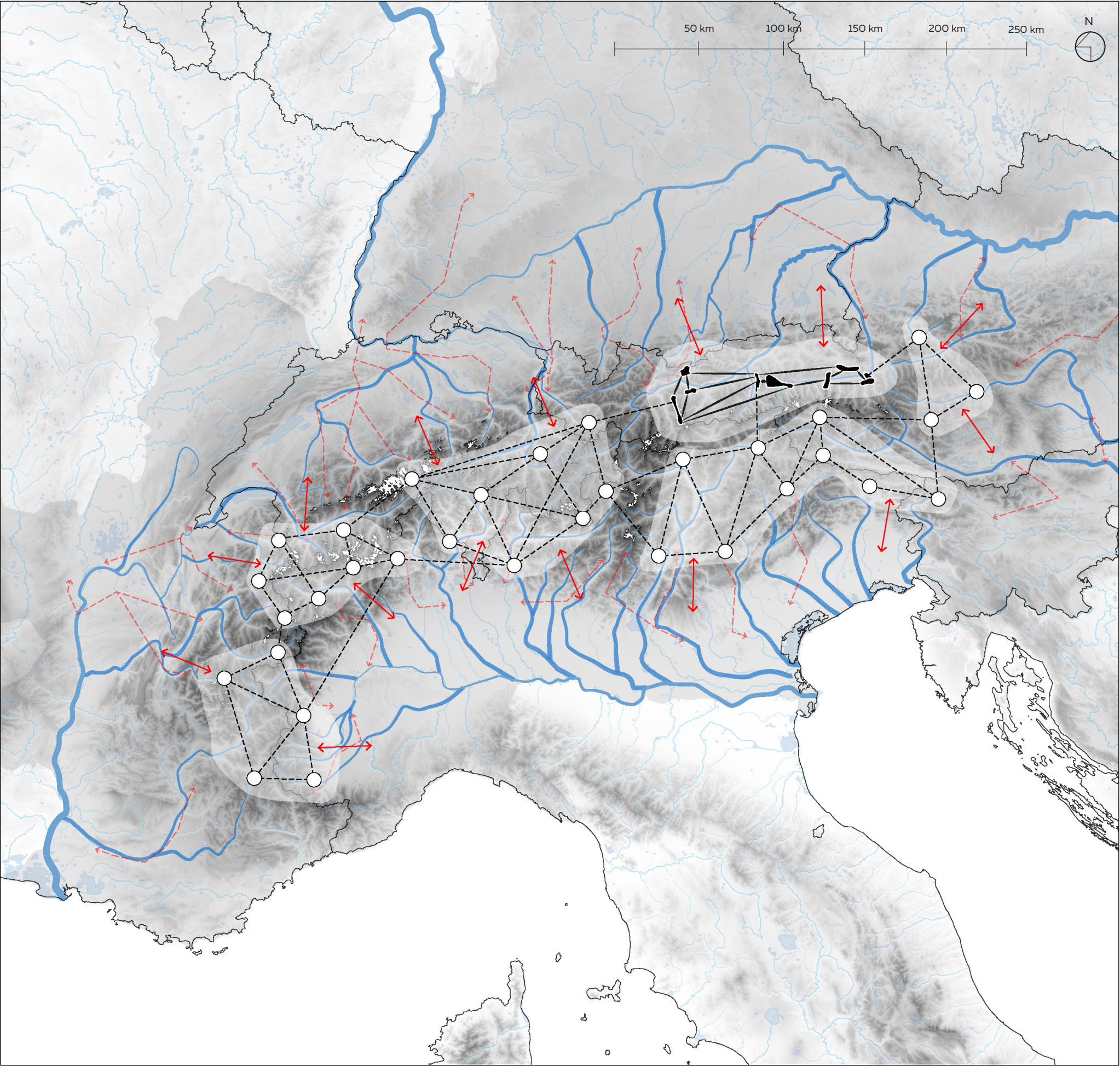
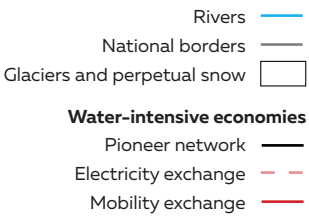


Figure 156: Reflection and transferability to other regions and scales
Source: Author

VIII.III Personal reflection

This thesis aimed to discover to what extent a macro-regional strategy can be used to develop a more socio-ecological resilient relationship between pre- and inner alpine areas with a special emphasis on freshwater ecosystems. The reflection addressees the main points during my learning process, research limitations, and the scientific relevance.

The role of macro-regional planning

Over the course of my graduation project, my understanding of the meaning of macro-regional planning has constantly been evolving. This learning process based on a literature review in the beginning, which was complemented by visiting various conferences as well as interviews with people directly involved in the development of the alpine region. By contrasting academic and written reference with practical, on-site happenings, I was able to detect current implementation and communication gaps.

Another important aspect of my graduation research was to grasp the meaning of planning, strategy, and design in different scales. While research and planning happen on a macro scale, implementation and design take place in a meso and a micro level, influencing and complementing each other. Thereby community cooperation on a local scale increasingly gains importance in an excessively planned context that is additionally confronted with institutional thickness. My research results represent exactly this conclusion: Instead of proposing a typical river basin management plan including all relevant sectors and stakeholders, a inter communal-based alternative development model has been designed. This bottom-up initiative is based on a long-term perspective, promoting a new relation between human and nature, especially water, and thereby implying a shift from a socio-technical towards a more socio-ecological system.

Socio-technical or socio-ecological systems?

The shift towards a more socio-ecological system that my graduation project proposes was additionally triggered by climate change. In order to position the philosophy of my project more clearly, I would like to refer to the diagram of Clive Hamilton (Figure 157). The current paradigm of a socio-technical system is coinciding clearly with scenario two, where geoengineering tools such as big storage power plants, river regulations, and artificial snowmaking are promoted. My proposal on the other hand engages with scenario four, the ‘Anthropocentrism 2.0 / Eco pragmatism’, as it acknowledges the power of nature, and at the same time the power of humans to coop with it. This addresses the effects of climate change and how we can design with nature in order to coexist under changing environmental conditions. In this respect, my graduation project promotes an reversing and repairing strategy , suggesting river revitalization processes, the reuse of resources, and an ending of artificial snowmaking.

The ultimate aim is to take forward ongoing sustainability trends and use them to stimulate a new relation between human and nature in the alpine context.

Another important research point in the course of my graduation project was the shaping of my personal understanding of nature. Based on theory in the field of political ecology, I perceive nature as a continuously performative system transformed by human labour and capital investment (Kaika, 2012, p.31). This implies that nature and human are not two separate structures, but an interconnected and interdependent one. Hence, environmental changes can be interpreted beyond biophysical processes. Additionally, the socio-economic and political perspective and their externalities on the freshwater system can also be considered. The general theory of social-ecological resilience stands in close relation to this definition, as it also approves the perception of human and nature as one holistic structure instead of two independent ones.

This process of understanding and defining my own perception of nature, and the relation between human and nature, has been essential for the development of my research results. Looking back, it was really time-consuming and often not in direct relation to spatial matters and the subject of Urbanism. However, I now perceive it as an important personal learning process, which creates a valuable base for my future career Therefore I am grateful that the studio of complex cities and my mentor constellations allowed me to explore and deepen my knowledge in this field before applying it to my strategy and developing my graduation project design.

Limitations

One of the key challenges faced during the development of my design strategy was the lack of a direct transdisciplinary cooperation between water management and economy, and the related absence of specialist knowledge in this interdisciplinary field. It needs to be acknowledged, that the developed design is limited in its feasibility and implementability. In order to enhance the feasibility and implementability of the design in this rather complex geographical area, a more in-depth knowledge of hydraulic processes and climatic conditions would be required. Furthermore, a more profound exploration of economic models, dynamics, and powers would have allowed to develop a more feasible economic proposal. This brings me to the general definition and at the same time the main challenge of our profession as urbanists: We are coordinators of several disciplines with the ultimate purpose to find a common solution or compromise. Consequently, the single disciplinary research approach for a comparatively multidisciplinary issue should be considered as a major limitation of my graduation research project. Therefore, the outcome of my research is locally based in order to account for a more multidisciplinary participation.

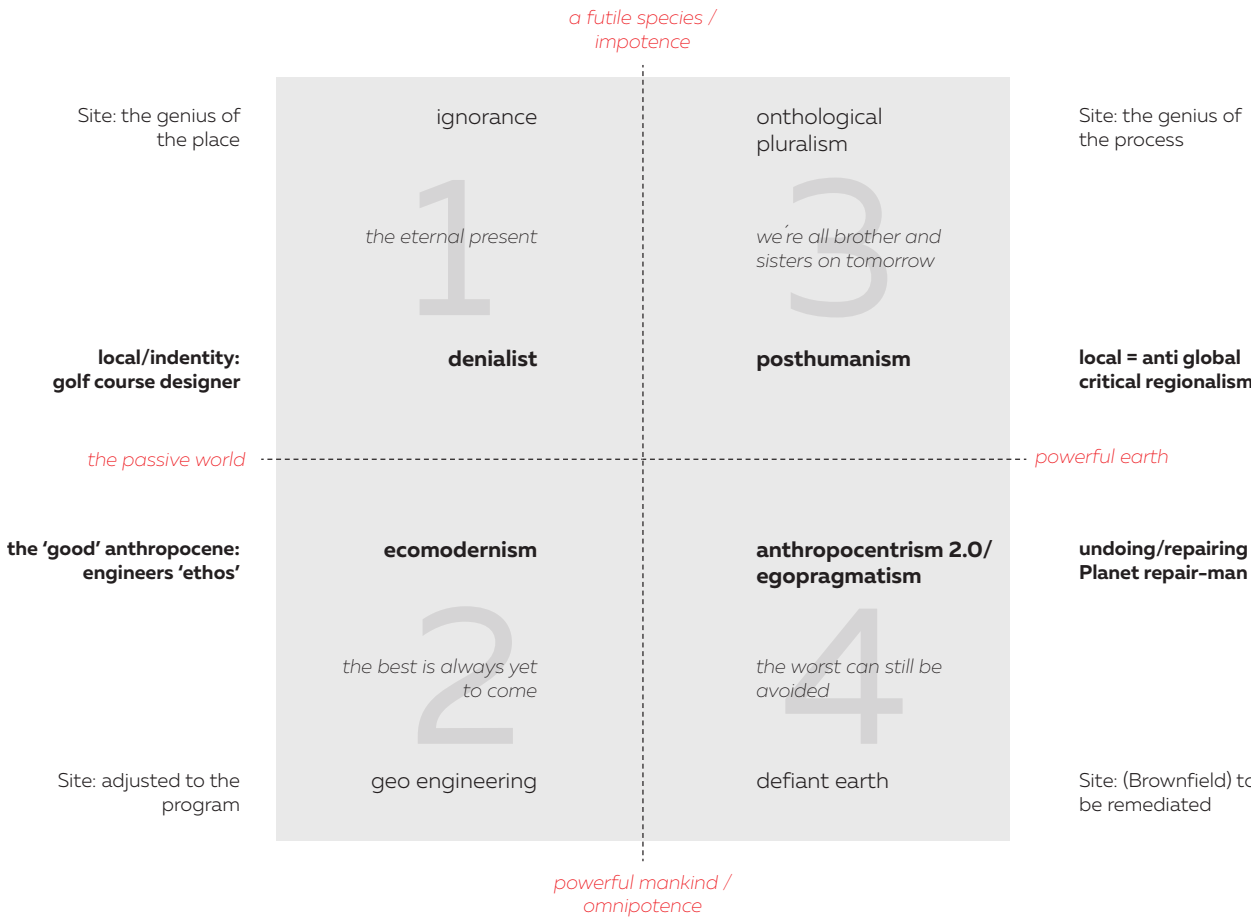


Figure 157: Diagram extracted from 'Defiant Earth', 2018
Source: Clive Hamilton

The second key challenge during my research concerns the macro scale and the available time frame. By deciding on a relatively big region as research scope, the outcome of the spatial strategy is rather broad than detailed, which also derives from the limited time available for detailed exploration. Consequently, the analysis focuses exclusively on the most relevant issues, as the expected outcome of a spatial strategy in a sub-macro regional scale could have otherwise not been reached. However, the challenge of translating a macro-regional strategy to the alpine region was known from the beginning and overcoming this challenge creates the main objective of my research. Therefore, the missing level of detail in combination with a more interdisciplinary approach could be taken as an opportunity and starting point for further research concerning the implementation of a macro-regional strategy.

Scientific relevance

A main part of my research has been to decode and understand the EUSALP and translate it to a strategy that emphasizes the relation between pre- and inner- alpine areas. Both of these areas are part of the macro-regional strategy but have not yet been considered from a relational perspective. The process of translating EUSALP into a spatial strategy has been challenging in many ways as the macro-regional scale is meant to trigger a political discourse and the term 'space' does rarely appear on their agenda. After perceiving EUSALP more as a stimulating platform for territorial cooperation, the spatial implementation level could be broken down to a smaller scale. This forms the main knowledge contribution of my graduation thesis.



Figure 158: River bed changes in Ellmau
Source: Author

IX.
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Figure 159: Hotel next to Ötztal train station
Source: Author

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APPENDIX

VI.I Theory paper

The added value of a macro-regional strategy in the Alpine region

Exploring opportunities and threats of soft space governance

AR3Uo022 Theory of Urbanism
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Abstract

The Alps, known for its diverse natural capital, is a territory shared by seven different countries: Austria, France, Germany, Italy, Liechtenstein, Slovenia and Switzerland. Besides distinct national planning contexts, a multitude of cross-border and transnational cooperation programmes pre-exist already in the region. The resulting institutional thickness of cooperation programmes and national governance is challenging, since they are targeting different objectives, sometimes overlap and overall, demand a strong coordination. The European Union, member states and Alpine regions acknowledged this challenge and developed in 2015 a macro-regional strategy. Since the macro-regional strategy of the Alpine region is moving from the planning to the implementation phase, questions are now emerging about its future development and execution. Current conflicts and tensions appear between state territoriality and European integration, between private and public interests, between selective and integral approaches, and ultimately between cooperation and competition. These issues are analysed in the paper. This paper assesses the potential added value of EUSALP in playing a coordinating and re-organisational role, acknowledging the interrelation between inner and pre-alpine areas and finally the capability of acting as an environmental, rather than an economic soft space. This paper explains first the pre-given context of institutional thickness in the Alpine region, followed by a chapter of terminology defining the concepts of soft spaces and European macro-regions, and finally discusses extensively the present and future added value of a macro-regional strategy for the Alpine region (EUSALP) through different fields of tension.

Key words: European macro-regional strategies, EUSALP, soft spaces, European integration, transnational cooperation

1. Introduction: Institutional thickness in the Alpine region

The Alps is a territory with diverse natural capital, but at the same time divided through administrative borders of seven countries. Since some of these countries are organized politically more federal or unitary, the governance of common challenges is hampered, especially in the areas of environment and mobility. Because of that, a multitude of cooperation programmes was established as well by national states and civic society, as by the European Union, which resulted finally in the phenomenon of institutional thickness. The main problem is, that these transnational cooperation programmes focus on different perimeters and aim for distinct objectives. Whereas the Alpine Convention for example is an international treaty addressing the inner-alpine area and targeting mainly natural protection, the Alpine Space programme is an Interreg project region, which acknowledges functional relationships to pre-alpine areas and promotes therefore also economic integration within the surrounding agglomeration belt. Besides addressing different main objectives, also their organizational structure is not the same, which impedes possible cooperation. Therefore, a different approach, the macro-regional strategy for the Alpine region (EUSALP) was developed in 2015. Especially Alpine regions pushed this new approach, since their influence in decision making was limited previously by the power of states in the Alpine Convention (Balsinger, 2016). It is designed as a ‘soft space’ and supposed to align existing cooperation programmes and funding in different scales (Sielker, 2017). Recently EUSALP is moving to the implementation phase and rises a lot of questions about its future development. The main question answered in this paper is the exploration of the added value of EUSALP. This paper explains first the concepts of soft spaces and European macro-regions, followed by an extensive evaluation of the added value of a macro-regional strategy in the Alpine region and closes finally with a conclusion.

2. Terminology: Soft spaces and European macro-regions

In order to start a comprehensive discussion about the added value of a macro-regional strategy in the Alpine region, a clear definition of ‘soft spaces’ and European macro-regions is necessary. Previous spatial planning in the Alps took place exclusively within formal administrative borders of nations and regions. The so called ‘hard spaces’ based on a statutory planning process working within static contained spaces were challenged by emerging externalities of globalisation: functional interrelations caused by a mobile, liquid and multiple world (Allmendinger et al., 2015). A possible response to this phenomenon is the creation of new ‘hard spaces’, but with different actor constellations within distinct borders. However, also these spatial constructs often do not counter the current dynamic

life we are living in and therefore so called ‘soft spaces’ emerged. According to Allmendinger and Haughton, ‘...planning increasingly has to work with and through new scales of governance and makes thereby use of fuzzy boundaries’ (Allmendinger et al., 2007). The relationality of socio-spatial relations are one of the main reasons for the introduction of soft spaces in practice. They define soft spaces as ‘...new multi-area sub-regions for strategy making and policy delivery, evident at various scales of regeneration, planning, and other domains, breaking away from the rigidities associated with the formal scales of statutory plan-making’ (Allmendinger et al., 2009). Nevertheless, this does not mean they are purely relational spaces, but a hybrid of territorial and relational spaces (Stead, 2011). Soft spaces are a tool to address mismatches between administrative and functional areas and can thereby create new platforms to tackle specific issues (Sielker, 2017). So the relationship between soft and hard spaces is supposed to be symbiotic and based on co-existence.

Especially in the European spatial planning context, the concept of soft spaces is experiencing an increasing popularity in the last decade. There are different scales and types, but in the European context cross-border co-operations, sub-regions and the most recent construct, macro-regional strategies (MRS) are examples of this paradigm shift. According to the official definition by the European commission ‘...a macro-regional strategy is an integrated framework endorsed by the European Council, which may be supported by the European Structural and Investment Funds among others, to address common challenges faced by a defined geographical area relating to Member states and third countries located in the same geographical area which thereby benefit from strengthened cooperation contributing to achievement of economic, social and territorial cohesion’ (European Commission, 2013). To put it in other words, a macro-regional strategy refers to a strategy tackling common challenges and opportunities in a geographical area including territories from a number of different countries or regions and aiming thereby for cohesion. A special condition and also a characteristic of macro-regional strategies, are the so called 3 NO’s, so no new institution, funding and legislation. Its aim is to use existing institutional structures and funding in a comprehensive, coordinated and cross-sectoral way and thereby enhance European integration and territorial cohesion (Gänzle et al., 2016). Regarding the development and process of macro-regions, Franziska Sielker states that they lead to new soft borders, which not necessarily develop towards own institutionalised entities with formal territorial mandates, but nevertheless, imply the rescaling of networks, policy rationales and instruments (Sielker, 2017). As it is explained before, the macro-regional strategy being a soft space is a stimulating platform of direct communication and therefore embedded in the hard spaces of institutionalised co-operations, legal states and regions. However, it is a new, exploratory approach of gov-

ernance and raises therefore questions about its future development and execution. The following chapter explores and evaluated the added value of the macro-regional strategy for the Alpine region.

3. Added value of a macro-regional strategy in the Alpine region

3.1 Between state territoriality and European integration

The first part evaluates the added value of a macro-regional strategy for the Alpine region focussing on political intentions and capacities. The Alpine region shows already a long history of cooperation, but nevertheless, decisions are generally still made within national and regional borders. The so called ‘state territoriality’ (Faludi, 2014) hampers the legitimacy of transnational or interregional cooperation (Debarbieux, 2013). This shows clearly the sensitivity of MRS to existing ‘hard settings’ and political games (Allmendinger et al., 2015). Repeating the aforementioned, MRS is aiming for European integration, but a possible co-operation between different states and regions depends strongly of the predominant political decision-system. Whereas regional spatial planning is empowered in Germany, Austria and Switzerland through more federal governance and in the case of Italy through autonomous regions in the Alpine area, Slovenia and France work according to a more centralized principle, which hampers possible regional development (Balsinger, 2016). Another important variable for a possible added value of a macro-regional strategy is the interest and willingness of regions for European integration. As Figure 1 shows, in some parts of the Alpine macro-region the shares for votes for parties (strongly) opposed (more than 30%) to European Integration was significant between 2013 and 2018. Andrés Rodríguez-Pose explains this reaction of the ‘places that don’t matter’ through the ongoing centralized economic development in the ‘places that do matter’ as for example London and Paris in the European context (Rodríguez-Pose, 2018). However, these obstacles of cooperation are currently addressed in macro-regional strategies with the so called ‘place-based approach’. This means that instead of a ‘spatially-blind approach’, the geographical context is considered as important for development policy making and thereby acknowledging the social, cultural and institutional character of every place. The logic of a ‘place-based approach’ lays in the balance between exogenous policy action and endogenous changes, so general conditions are defined by external elites and specific targets and design projects by local groups (Barca et al., 2012). A stimulated interaction between these two groups is necessary in order to overcome previous ‘one-size-fits-all’ development approaches. Another phenomenon is alpine populism. For example, a party in the northern Italian regions (LEGA Nord) uses the MRS for their election campaign. While aiming towards more independence from their national state and more autonomy as a region,

their interest in European integration is relatively low (Balsinger, 2016).

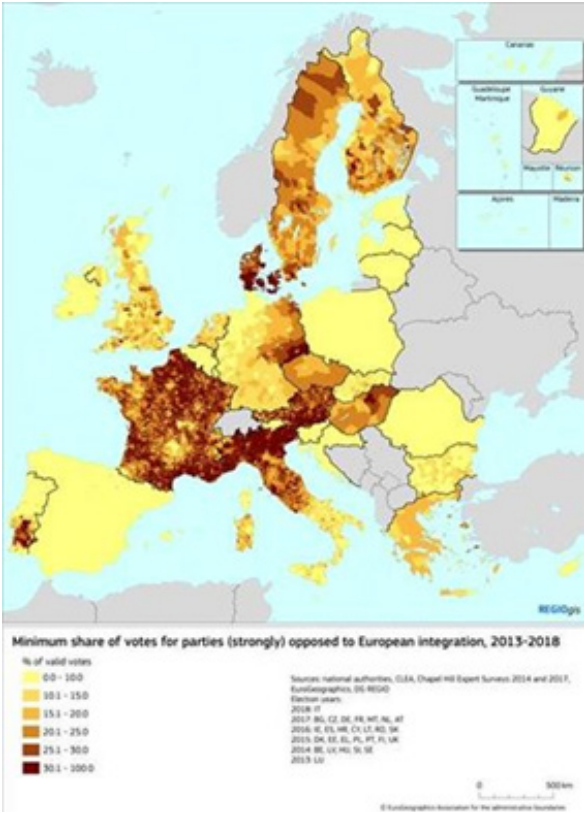


Figure 1. Minimum share of votes for parties (strongly) opposed to European Integration, 2013-2018

In order to conclude, the concept of the MRS as a soft space needs to be reflected on again. As it is explained in the previous chapter, soft spaces work within existing hard spaces. Therefore, in the Alpine region the context is really thick: 7 countries and 48 regions. The capacity of every planning unit depends highly on the national political model and their willingness to work within a bigger European picture. The aim of the MRS for the Alpine region is to provide a platform for a more direct communication with less bureaucracy leading towards a rapid implementation in the future. However, legitimacy for decision making and willingness to cooperate in a European context are not necessarily given in the future.

3.2 Between private and public

The shift from a statutory planning process within formal borders towards a new soft space, the MRS for the Alpine region, allows new actor constellations. According to Phil Allmendinger, neoliberal restructuring in soft spaces provokes an often market-led and towards economic growth orientated land use planning and gives thereby a stronger voice to private actors (Allmendinger et al., 2015). In the

case of the MRS for the Alpine region this is partly visible, since its objectives are situated content wise within the framework of Europe2020 (Gänzle et al., 2016). ‘Economic Growth and innovation’ is one of the four main pillars in the strategy and aims for the integration of the inner-alpine region in the European economic network. However, many voices articulate doubts especially about this objective. For example, Werner Bätzing, professor of Cultural Geography, states, that the integration of metropolises of the outer alpine range can lead to negative externalities in the inner mountain regions (Bätzing, 2014). The Alps was a specific living and economic space in the European context, but through the integration of pre-alpine metropolises in its economic scope, they are endangered to reduce themselves to a supplementary function for the surrounding agglomeration belt (Bätzing, 2003). As a result, their economy could exist limited to mono-functional activities such as tourism, water and energy, which is already an accelerating trend nowadays. The potential of electricity production through hydropower plants is being exploited until its limits, ski-resorts are getting bigger and increase their infrastructure for the production of artificial snow, and finally the tourist flux is growing steadily.

The previous paragraph shows, that the MRS for the Alpine region raises some doubts in economic terms. Through the empowerment of private actors, which support this mono-functional development, a sustainable future for the relationship between inner- and outer-alpine areas is endangered. However, in environmental and mobility terms the involvement of private actors appears more meaningful. Current transport for permanent inhabitants, but also for tourists, is still heavily based on individual car traffic, which affects the natural environment. The MRS can be used to develop a new and less polluting mobility concept and therefore the involvement of private actors is necessary. The same counts for the protection of the natural environment. Ecosystems are complex and cover big cross-border cutting areas and therefore actors from inner- and outer-areas, but also from private and public need to come together.

In summary, the MRS for the Alpine region provides a new opportunity to address interrelations between inner- and pre-alpine areas. This brings a clear added value of the MRS, but at the same time the focus on economic growth can threaten especially inner-alpine regions in time.

3.3 Between selective and integral

One of the promised features of a MRS in the Alpine region is a multi-level governance, which entails automatically the involvement of civic society, but at the same time public actors from different levels of governance. According to the officially proposed government structure of the EUSALP, the civic society is directly involved through a so called ‘stakeholder platform’, which is connected to the Executive board responsible for coordination (European Commission, 2016). However, critiques commented during the EU weeks of cities and re-

gions 2018 focused on the missing involvement of the civic society. Current involvement of actors is selective, and thereby resulting positively especially for public and partly for private stakeholders. The most important NGO, and also representative of the civic society, CIPRA, is an active member in just three action groups, mobility, green infrastructure and resources, and takes an observing role in some other groups (EUSALP EU Strategy for the Alpine Region, 2018).

Besides that, the involvement of civic society is relatively low and not clearly developed.

A similar dichotomy between selective and integral happens for the policy fields of EUSALP. Current trends show, that policy-making in the EU, national and regional level is aiming towards a more integral approach (Allmendinger et al., 2015), but at the same time the phenomenon of an institutionalization process of sectoral policy in a regional level can be observed (Chilla et al., 2018). An example for this are river basin management plans, as it was established in 2015 for the Po river after extreme drought periods. EUSALP could take a new role and provide more integral responses, but the current organisation structure appears still partly sectoral.

In the case of the MRS for the Alpine region priority areas were selected and represented in four different policy fields: Economic growth and innovation (1), mobility and connectivity (2), environment and energy (3), and finally a cross-sectoral field, governance (4) (European Commission, 2016). Nine thematic action groups in the implementation level are supposed to communicate frequently in order to achieve an integral result. However, this demands a structured organisation of implementation and a solid communication strategy.

Finally, it can be stated, that in theory the MRS for the Alpine region is following an inclusive and integral model, as it is exemplified in multi-level governance and the cooperation between action groups. The main added value of these stimulating approaches is the increase and re-organisation of cooperation between existing actors and policies (Gänzle et al., 2016). However, the implementation of these concepts is still not satisfying for some stakeholders. In order to overcome these patterns of ‘winners and losers’, especially the involvement of the civic society needs improvement (Allmendinger et al., 2015).

3.4 Between competition and cooperation

As it is explained in the introduction of this paper, currently the Alpine region is characterized by the phenomenon of institutional thickness. Several soft and hard spaces co-exist within or next to each other. The existing soft spaces compete with each other for EU funding, public awareness and institutional recognition (Allmendinger et al., 2015) and that is why the EUSALP stands out with its focus on cooperation and alignment of existing programmes. However, the alignment process is not easy. The current situation of a ‘...congested and confused landscape of functions, capacities and responsibilities’ (Allmendinger et al., 2015) can provoke mutu-

al mistrust between co-operations. In the case of the EUSALP future funding is based mainly on the Alpine Space programme, but also mainstream, national and regional funds (Balsinger, 2016). So in order to make an implementation viable, an alignment of the aforementioned funding sources to the MRS is necessary. Therefore, and also to promote cooperation, recent discussions considered the merging of the Alpine Space programme with EUSALP as a promising option in the future (Chilla et al., 2018). Besides the funding, also the power of legitimacy should be approached in a co-operative, instead of a competitive way. Existing soft spaces in the Alpine region do not count with a valid institution, but the Alpine Convention and constitutional regions do. By using the power of legitimacy, especially of the Alpine Convention, the implementation of EUSALP can be facilitated. However, the cooperation between transnational soft spaces, Alpine Space programme and EUSALP, and the Alpine Convention is not easy to guarantee, because their scope focuses on different perimeters and so partly on distinct objectives. Whereas the Alpine Convention addresses exclusively inner-alpine areas, EUSALP and Alpine Space programme include also surrounding metropolitan areas in the pre-alpine region. Nevertheless, all existing cooperation programmes agreed on the defined perimeter of EUSALP, which nowadays is a strong added value (Balsinger, 2016). Acknowledging this perimeter as an inter-relational territory gives the opportunity to tackle challenges and opportunities between the inner- and pre-alpine areas, which has not been addressed clearly before (Chilla et al., 2018). However, currently this relationship is still under discussion, because some inner-alpine actors fear the ‘power’ of the mass of the surrounding metropolitan areas (Bätzing, 2014). This implies further work for the promotion of cooperation between the mountain core and pre-alpine areas. To summarize, the tension between cooperation and competition takes places in two different scales: between existing cooperation programmes, soft and hard, and between the inner- and pre-alpine areas. The added value of EUSALP lays in its focus on alignment of existing programmes, so for its coordinating role, and secondly, in acknowledging the relationship between mountainous regions and surrounding metropolitan areas. Acknowledging this inter-relationship allows new actor constellations and the development of new strategies. However, this alignment process is not easy and demands a well-organized communication strategy.

3.5 Uncertain future of EUSALP

The future development of EUSALP is uncertain and cannot be foreseen. According to Tobias Chilla soft spaces can die, stay or harden in time (Chilla et al, 2018). However, it can be stated, that there is no hardening process visible for now. Comparing it to the Danube Strategy (EUSDR), which established the Danube Strategy Point and the Danube Contact point as institutions, the EUSALP is not showing similar attempts so far (Chilla et al., 2018). In

a long-term perspective there could appear some kind of institution for the MRS of the Alpine region, but mainly for administrative reasons. There is also a chance that EUSALP will lead to reterritorialization and rescaling processes in the future, but these long-term effects are hard to anticipate (Sielker, 2017).

4. Conclusion

In the previous chapter the added value of a macro-regional strategy for the Alpine region was explored through different patterns of tension. Nevertheless, the different subtopics led to similar conclusions. As it is mentioned already in the introduction, the Alpine region is experiencing externalities of a context of institutional thickness. Therefore, the most significant added value of EUSALP lays in its coordinating and re-organisational role. Previous transnational programmes, hard and soft spaces, are supposed to be aligned within the macro-regional strategy in order to bring coherence to existing funds and policies. This alignment process also gives the opportunity for new actor constellations between existing and new stakeholders and comes along with a more direct way of communication, which is supposed to result in less bureaucracy and a rapid implementation. However, the base of the aforementioned benefits of transnational cooperation is threatened by current nationalist movements enhancing ‘state territoriality’. This can affect the willingness to cooperate in a bigger European context and foment a lack of legitimacy for decision-making within EUSALP. Secondly, EUSALP addresses the political gap of interrelations between inner-and outer-alpine regions and this constitutes an important added value of the strategy. Acknowledging relations between mountainous and surrounding metropolitan areas allows a new approach of understanding and results again in new actor constellations and strategies. Nevertheless, especially the focus of EUSALP on economic growth led to some resistance in the past. Inner-alpine areas fear the power of surrounding metropolises and the possibility of being reduced to a supplementary function. The EUSALP can be understood as an environmental soft space. Instead of putting the focus on economic concerns, the central point should be the natural environment considering current and future climate change effects in mountain regions. This paradigm shift in driving forces for future spatial planning provides a big potential for EUSALP to develop towards a progressive strategy for the Alpine region.

All things considered, the future of EUSALP is not predictable and its impacts are hard to assess. The experimental way of governance can develop in different ways depending on various external factors. If this soft space will stay, disappear or harden in time is difficult to anticipate, but considering its early phase and current stage, it can be stated that a hardening process is not probable for now.

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IV.II Interviews

The following semi-structured interviews have been conducted via Skype or telephone with the approval of all interview partners to record, transcribe and publish them afterwards. The interviews were held and transcribed in German, but afterwards additionally translated into English. The following people have been interviewed during February and March 2019:

- 1. Tobias Chilla**
Professor and Academic Researcher, University of Erlangen, Alps2050 project
- 2. Katharina Köhne**
Alpine Space Contact Point, Federal Ministry of Environment and Consumer protection
- 3. Boglarka Fenyvesi-Kiss**
Leader of EUSALP AG3, Representative of Trento
- 4. Christian Wandi**
Hotel Operator, Board member of the tourism association of the Olympic region Seefeld
- 5. Elias Walser**
Director of the tourism association of the Olympic region Seefeld, Strategic development of the region
- 6. Angelika Abderhalden**
Member of WWF Switzerland and ‘Pro Tierra Engadina’, Collaborator in SPARE-Project
- 7. Elisabeth Sötz**
Member of WWF Österreich, Expert on Alpine Policy and the river Inn

1. Tobias Chilla [28.02.2019]
Professor and Academic Researcher, University of Erlangen, Alps2050 project

Deutsch // German

GW: Das Projekt ‘Alps 2050’ ist in dem Kontext von drei großen Kooperation eingebettet: Das Alpenraumprogramm, EUSALP und der Alpenkonvention. Was ist ihrer Meinung nach der Mehrwert der EUSALP?

TC: Dazu muss man sagen, dass das ‚Alps 2050‘ Projekt diese Kooperationsformen nicht direkt analysiert, sondern sich eher auf den Raum fokussiert. Es war auch nicht Aufgabenstellung des ‚Alps 2050‘ Projekts den Mehrwert der EUSALP zu erforschen. Allerdings kann ich ihnen diese Frage aus einer eher persönlichen Sichtweise beantworten. Ich denke, dass der macro-regionale Ansatz ein sehr guter ist, um darauf Entwicklungen zu erarbeiten. Der regionale Ring um die morphologischen Alpen herum, wo sowohl hochalpine, metropolitane, sowie Zwischenbereiche vorhanden sind. Diese Gebiete haben gemeinsame Herausforderungen, sowie es das makroregionale Programm auch bezeichnet, und macht daher auch als Perimeter Sinn. Das Alpine Space Programm hat nahezu den gleichen Perimeter als EUSALP, ist jedoch meiner Meinung nicht so gut dafür geeignet wirklich politische Dynamik auszulösen, sondern es ist eher ein Förderprogramm, bei der auf der unteren Verwaltungsebene was passiert. Und in sofern ist EUSALP etwas neues, was es noch gebraucht hat. Es ist quasi eine Plattform, die eine politische Strategie ermöglicht. Ich würde allerdings nicht sagen, dass bisher eine besonders starke politische Strategie existiert, aber die Idee und das Potential dahinter besteht auch weiterhin.

GW: EUSALP wird im akademischen Diskurs oftmals als ‚soft space‘ bezeichnet. Wie können soft planning Instrumente eingesetzt werden und wo sehen sie ihr größtes Potential im Alpenraum?

TC: Zunächst einmal muss man sagen, dass es auf der transnationalen Ebene überhaupt kein ‚hard planning‘ geben kann, weil wir dort kein Mandat haben. Insofern wenn Planung vorhanden ist, dann nur softe, das ist quasi alternativlos. EUSALP wird jedoch ausschließlich von dem akademischem Diskurs als ‚soft space‘ bezeichnet, d.h. in offiziellen EUSALP Dokumenten wurde das nach meinem Wissen bisher nicht so formuliert. Man kann sich überlegen, was der nächste Schritt ist. Man kann sich das ganze Repertoire zu ‚soft planning‘ vorstellen und das fängt bei grenzüberschreitenden Abkommen an. Dort geht es vor allem um eine intensivere Raumintegration über Grenzen hinweg, um z.B. die ‚Services of Public Interest‘ besser aufeinander abzustimmen, oder mit strategischen Dokumenten eine gemeinsame Verkehrspolitik dahinbringt. Dazu gehören natürlich auch Strategiemassnahmen, wie man mit

den gemeinsamen Herausforderungen umgehen kann, wie z.B. Wasserversorgung. Das Repertoire ist allerdings genau so groß wie auf der nationalen und regionalen Ebene. Ich würde dazu momentan jedoch eher kritisch sagen, dass die Alpenpolitik doch in Teilen kaum entfaltet ist. Das Vokabular Raum kommt in den meisten Aktivitäten kaum vor. Z.b. bei den Action Groups der EUSALP ist es nur ein Unterthema bei manchen Gruppen, was letztendlich zu dem selben Dilemma wie bei der Alpenkonvention führt: Der Raum wird als Unterkategorie von irgendetwas anderen gesehen. Soweit ich mich jetzt erinnern kann, ist eines der wenigen räumlichen Themen der Alpenkonvention der Bodenschutz. Eigentlich sagt man ja, dass gerade in der grenzüberschreitenden, transnationalen und europäischen Ebene Planung immer koordinativ sein sollte und das ist es im Moment aus meiner Sicht leider nicht.

GW: Wie könnte die eher politische makroregionale Strategie in kleineren Maßstäben implementiert werden?

TC: Es gibt ja einen Action Plan der EUSALP, und dessen Punkte kann man theoretisch einfach herunterbrechen, was auch teilweise vor Ort passiert. Dazu möchte ich gerne ein Beispiel geben. Wir waren letztes Jahr an einem ARPAF Projekt beteiligt, bei welchem es um die Organisation von nachhaltigeren Formen von grenzüberschreitenden Pendlerströmen geht. Dort haben wir zwölf Fallstudien analysiert und waren deshalb auch in den letzten 10 Tagen an den Grenzregionen unterwegs. Dies ist eine ganz konkrete grenzüberschreitende Region, wo man Probleme mit den Grenzpendlern hat und sich mit Strategiewerkshops weitere Massnahmen ausdenkt. Die transnationale Sicht hilft bei diesen Prozessen. Das ist jetzt nicht nur eine Kufsteiner Geschichte, sondern eher eine transnationale Herausforderung, die viele Grenzländer in dieser eher sehr verbundenen und verwundbaren Alpenraum konfrontieren. Dies war jetzt nur ein Beispiel, um zu zeigen, dass es eigentlich ganz gut umgesetzt werden kann, allerdings würde ich auch sagen, dass es auch nicht das Hauptziel ist auf die lokale Ebene heruntergehen. Ich würde die Latte nicht zu hoch legen wollen. Meiner Meinung nach sind Makroregionen nicht etwas, das sich an die Zivilbevölkerung richtet, sondern es ist tatsächlich ein Instrument der territorialen Zusammenarbeit, was auch hochkomplex ist. Für mich wäre daher eine Makroregion nicht erst dann erfolgreich, wenn es jeder aus der Zivilgesellschaft kennen würde.

GW: Wenn man die erwarteten Effekte des Klimawandels auf den Alpenraum berücksichtigt, wie sehen sie die Zukunft des Wintertourismus?

TC: Der Wintertourismus ist ja schon seit etlichen Jahren im Umbruch, d.h. es gibt Skigebiete, die geschlossen haben, weil Tage- und Betriebszeit nicht mehr erreicht werden können, und andere Gebiete, die technologische Massnahmen ergreifen, um Unsicherheiten auszugleichen. Die Dynamik läuft ja schon, und die wird auch weitergehen.

GW: *Der neue Slogan der EUSALP basiert auf der sogenannten ‚Green Economy‘. Sehen sie darin Potential?*

TC: Da muss man sich erst mal fragen, was die Green Economy überhaupt ist. Meiner Meinung nach ist es ein sehr breites Konzept. Es gibt viele Publikationen dazu, manche verstehen es unter dem Konzept des Post-Wachstums, andere die es eher als eine an Naturressourcen orientierte Wirtschaft verstehen. Der größte gemeinsame Nenner ist wahrscheinlich die Ökologisierung der Wirtschaft insgesamt und da kann eigentlich keiner was dagegen haben. Zugleich ist dieses Konzept nach meiner Lesart so breit, und zu Teilen auch diffus, dass es mir schwer fällt was konkretes damit anzufangen. Für Präsidenschaften ist es allerdings gar kein schlechtes Konzept, da es eine Debatte in den Gang bringen kann wie sich denn die Wirtschaft in der Zukunft entwickeln soll.

GW: *Ihr Paper ‚Interrelational space? The spatial logic of the macro-regional strategy for the Alps and its potentials‘ fokussiert sich vor allem auf die Beziehung zwischen dem Vor- und innerem Alpenland, unter anderem auch auf Ökosystemleistungen des Po Flusseinzugsbereiches. Wie könnte die Kooperation zwischen Vor- und inneren Alpenland für Flusseinzugsbereiche an den Grenzgebieten verbessert werden? Wo sehen Sie die größten Probleme und Potentiale?*

TC: Die Fallstudie hat leider mehr Thomas Streifenender geleitet, aber ich versuche die Frage trotzdem ein bisschen zu beantworten. Diese Frage kann man eigentlich auf einer Ebene bearbeiten, wie man sie für viele andere Beziehung zwischen vor- und inneren Alpenraum thematisiert. Man hat einfach bei gewissen Dingen beträchtliche Konflikte, quasi zugespitzte Stadt-Land Konflikte. Das inspirierende bei der Fallstudie in der Po-ebene war eben, dass es keinen rechtlichen Rahmen für solch eine Krisensituation gab und dies musste dann hektisch herbeigeführt werden ausgelöst durch eine Notsituation. Die Notsituation war, dass tatsächlich eine gesamte Ernte vertocknete. Vor dem Hintergrund dieser Erfahrung hat man sich an den Tisch gesetzt und ein gemeinsames Regelwerk entwickelt, um sich in zukünftigen Kriesen darauf verlassen zu können. Dieses Regelwerk ist zu Teilen sehr technisch, d.h. ich kann es ad hoc auch nicht genau wiedergeben, aber es geht darum, wann Wasser abgelassen werden muss, in welchen Mengen und welche Kooperationsmechanismen in Gang gesetzt werden können. Die makroregionale Perspektive finde ich dadurch interessant, dass wir diese Wasserproblematik nicht nur in der Po-ebene haben, sondern rund um die Alpen. An dem Punkt haben wir auch die Trinkwasserversorgung in München angesprochen, wo es auch schon größere Konflikte gab. Wenn man den Gedanken der europäischen Regionalpolitik ernst nimmt, dass man voneinander auch lernen kann durch Austausch, wäre es eine vielversprechende Aufgabe, wenn die EUSALP sich mit den eher linearen Gewässerbeziehungen ausein-

andersetzt. Dadurch könnten Prozesse angestoßen werden, bei welchem es um Vereinbarungen zu Krisensituation geht.

GW: *Wie könnte die EUSALP dabei helfen?*

TC: Es gelten ja die 3 NO's in der Makroregion, insofern kann sie jetzt eher nicht viel anderes machen, als Dinge ansprechen, in den Action Groups in die Agenda zu setzen und dadurch politische Prozesse anregen. Wir sehen aber natürlich auch, dass es der EUSALP teilweise schon gelungen ist kleinere Gelder verfügbar zu machen. Wie z.B. das ARPAP-Projekt, wo zuerst thematische Dinge passieren. Außerdem gibt es eine zunehmende Anzahl von Alpine Space Projekten, die mit der EUSALP verknüpft sind, und damit auch Zugang zu Finanzierung haben. Auf mittlere oder lange Frist wird es einfach interessant zu sehen sein, ob dieser EUSALP-Prozess politischer wird oder nicht.

GW: *Vielen Dank für das Interview und Ihre Zeit.*

English / English

GW: *The project 'Alps 2050' is embedded in the context of three major collaborations: The Alpine Space Program, EUSALP and the Alpine Convention. What do you think is the added value of the EUSALP?*

TC: One has to say that the 'Alps 2050' project does not directly analyse these forms of cooperation, but rather focuses on space. It was not the task of the Alps 2050 project to explore the added value of EUSALP. However, I can answer that question from a more personal point of view. I think the macro-regional approach is a very good one to work on. The regional ring around the morphological Alps, where there are both high alpine, metropolitan and intermediate areas. These areas have common challenges, as the macro-regional program also calls them, and therefore makes sense as perimeters as well. The Alpine Space program has almost the same perimeter as EUSALP, but in my opinion it is not so well suited to really trigger political momentum, but it is more of a funding program where something happens at the lower administrative level. And in that sense, EUSALP is something new, which was still needed. It is a kind of platform that makes a political strategy possible. However, I would not say that so far a particularly strong political strategy exists, but the idea and the potential behind it continue to exist.

GW: *EUSALP is often referred to as 'soft space' in the academic discourse. How can soft planning instruments be used and where do you see their greatest potential in the Alpine region?*

TC: First of all, it has to be said that there is no hard planning in the transnational level because we

don't possess a mandate there. If planning is available, then only soft, there is basically no alternative. However, EUSALP is referred to solely by the academic discourse as a 'soft space'. According to my knowledge in official EUSALP documents it has not been formulated so far. You can think now about the next step. You can imagine the entire repertoire of 'soft planning' and that starts with cross-border agreements. Above all, there is a more intensive integration of space across borders, e.g. to better coordinate public interest, or to adopt a common transport policy through strategic documents. Of course, this also includes strategy measures on how to deal with the common challenges, such as water supply. However, the repertoire is just as big as at the national and regional level. At the moment, however, I would say rather critically that in parts the Alpine policy is hardly developed. The term 'space' hardly occurs in most documents. For example, in the EUSALP Action Groups, it is only an under-topic for some groups, which ultimately leads to the same dilemma as the Alpine Convention: space is seen as a subcategory of anything else. As far as I can remember now, one of the few spatial themes of the Alpine Convention is soil protection. Actually, it is said, that especially in the cross-border, transnational and European level planning should always be coordinative and it is currently not in my point of view, unfortunately.

GW: *How could the rather political macro-regional strategy be implemented in a smaller scale?*

TC: There is an Action Plan of the EUSALP, and its points can be theoretically simply being executed, what also happens partially on the ground. I would like to give you an example. Last year we were involved in a ARPAP project about the organization of more sustainable forms of transnational commuter flows. There we analysed twelve case studies and were therefore also on the border regions during the last 10 days. This is a very conspicuous cross-border region, where you have problems with the cross-border commuters and devise further measures with strategy workshops. The transnational view helps with these processes. This is not just a Kufstein story, but rather a transnational challenge confronting many border countries in this rather interconnected and vulnerable Alpine region. This was just an example to show that it can actually be implemented quite well, but I would also say that it is not the main objective to go down to the local level. In my opinion, macro-regions are not something that is aimed towards the civilian population, but in fact they are an instrument of territorial cooperation, which is also highly complex. For me, therefore, a macro-region would not be successful until everyone from civil society knew it.

GW: *Taking into account the expected effects of climate change on the Alpine region, how do you see the future of winter tourism?*

TC: Winter tourism has been in upheaval for several years, i. E. there are ski resorts that have closed be-

cause they can no longer fulfil the days and times of operation and other areas that take technological measures to counterbalance uncertainties. The momentum is already running, and it will continue.

GW: *The new EUSALP slogan is based on the so-called 'Green Economy'. Do you see any potential here?*

TC: First you have to ask yourself what the Green Economy is. In my opinion it is a very broad concept. There are many publications on this, some understand it as a post-growth concept, others as a natural resource oriented economy. The biggest common denominator is probably the greening of the economy as a whole, and no one can actually disagree with that. At the same time, according to my reading, this concept is so broad, and to some extent diffuse, that it is difficult for me to do anything concrete about it. However, it is not a bad concept for presidencies, as it can start a debate on how the economy should develop in the future.

GW: *Your Paper, Interrelational space? The spatial logic of the macro-regional strategy for the Alps and its potentials' focuses primarily on the relationship between the pre- and the inner Alpine region, including the ecosystem services of the Po river catchment area. How could the cooperation between the pre- and inner Alpine region for river catchment areas at the border areas be improved? Where do you see the biggest problems and potentials?*

TC: The case study was unfortunately led more by Christian Streifenender, but I will still try to answer the question. This question can actually be dealt with on a level that is thematized for many other relationships between pre- and inner Alpine space. You just have a lot of conflicts in certain things, so to speak, city-town conflicts. The inspiring thing about the case study in the Po-area was that there was no legal framework for such a crisis situation and this had to be provoked by an emergency situation. The emergency situation was that actually a whole crop was lost. Against the background of this experience, they have sat down at the table and developed a common set of rules in order to be able to rely on them in future crises. This policy is in parts very technical. I can't accurately reproduce it on an ad hoc basis, but it is about when water needs to be drained, in what quantities and what cooperation mechanisms can be set used. I find the macro-regional perspective interesting, because we have this water problem not only in the Po Valley, but around the entire Alps. At this point, we also addressed the drinking water supply in Munich, because there were also already major conflicts. If you take the idea of European regional policy seriously, so that you can also learn from each other through exchange, it would be a very interesting task for EUSALP to deal with the rather linear relations between waters. As a result, processes could be initiated that deal with agreements on a crisis situation.

GW: How could EUSALP help in this process?

TC: The 3 NO's are valid in the macro-region, and that's why so far they can't do much more than address things and put them in the agenda of the Action Groups. Thereby political processes could be stimulated. Of course, we also see that the EUSALP has partially succeeded in making smaller funds available such as the AlpGov project. In addition, there is an increasing number of Alpine Space projects linked to the EUSALP, giving them access to funding. In the medium or long term, it will be interesting to see if this EUSALP process will become more political or not.

GW: Thank you for the interview and your time.

2. Katharina Köhne [28.02.2019]

Alpine Space Contact Point, Federal Ministry of Environment and Consumer protection

Deutsch // German

GW: In unserem letzten Telefonat erwähnten sie, dass die Rolle des Alpenraumprogramms hauptsächlich Fördergelder sind. Erfüllt das Alpenraumprogramm neben Fördergeldern auch andere Funktionen? Und können sie dies anhand vom AlpGov Projekt erläutern?

KK: Neben der Zuteilung von Fördermitteln agiert das Alpenraumprogramm als sogenannter Observer (Beobachter) im Executive Board der EUSALP. Im Rahmen des von der EUSALP durchgeführten Projektes AlpGov, stellt das Alpenraumprogramm EFRE-Mittel zur Verfügung und steht für das Projekt als Ansprechpartner bei technischen Fragen zur Projektimplementierung und -finanzierung zur Verfügung. Die Durchführung und Implementierung des Projekts AlpGov erfolgt durch die Action Groups Leader der EUSALP.

GW: Seit 2015 gibt es die macro-regionale Strategie für den Alpenraum. Ich besuchte einige Konferenzen, und manche Teilnehmer sagten aus, dass die Rollen und dafür die Kommunikation zwischen Alpine Space, EUSALP und der Alpenkonvention oftmals nicht klar definiert ist. Wie funktioniert die Kommunikation derzeit mit EUSALP? Und wie könnte sie ihrer Meinung nach verbessert werden?

KK: Bei den Action Groups (AGs) und den Förderschwerpunkten des Programms (sog. priorities) gibt es Überschneidungen – so ist jeder AG ein thematisch spezialisierter project officer (Mitarbeiter) des Joint Secretariats zugeordnet. Dieser project officer kann als Observer an den Sitzungen der Action Groups teilnehmen. Umgekehrt fungieren die EUSALP Action Groups als Observer bei unterschiedlichen, thematisch passenden ASP Projekten. Somit können die AGs von den Projekten profitieren, da diese Beiträge zur Umsetzung des Arbeitsprogramms der AGs liefern. Gleichzeitig profitieren die ASP Projekte von einer stärkeren Sichtbarkeit auf politischer Ebene und in der Öffentlichkeit.

GW: Wie denken sie, wird sich das Alpenraumprogramm und EUSALP in der Zukunft entwickeln?

KK: Darauf kann ich momentan keine verlässliche Antwort geben. Derzeit und in den kommenden Wochen und Monaten laufen die Planungen für die zukünftige Gestaltung der nächsten Förderperiode (2021–2027) und der Makroregionalen Strategien.

GW: Vielen Dank für das Interview.

English // Englisch

GW: In our last phone call you mentioned that the role of the Alpine Space Program is mainly funding. Does the Alpine Space Program fulfill other functions besides that? And can you explain this on the basis of the AlpGov project?

KK: In addition to the allocation of subsidies, the Alpine Space Program acts as an Observer in the Executive Board of the EUSALP. Within the EUSALP project AlpGov, the Alpine Space Program provides ERDF funding and is available for the project as a point of contact for technical questions regarding project implementation and financing. The implementation of the AlpGov project is carried out by the Action Group Leaders of EUSALP.

GW: Since 2015, exists the macro-regional strategy for the Alpine region. I attended several conferences, and some participants said that the roles and communication between Alpine Space, EUSALP and the Alpine Convention are often not clearly defined. How does communication with EUSALP currently work? And how do you think could it be improved?

KK: There are overlaps in the Action Groups (AGs) and the priorities of the program – each AG is assigned a thematically specialized project officer (staff) of the Joint Secretariat. This project officer can participate as Observer in the sessions of the Action Groups. Conversely, the EUSALP Action Groups act as observers for different, thematically matching ASP projects. Thus, the AGs can benefit from the projects, as they contribute to the implementation of the work program of AGs. At the same time, the ASP projects benefit from increased visibility at the political and public level.

GW: How do you think the Alpine Space Program and EUSALP will develop in the future?

KK: At the moment I can not give a reliable answer. Currently and in the coming weeks and months, plans are underway for the future design of the next funding period (2021–2027) and macro-regional strategies.

GW: Thank you for the interview.

3. Boglarka Fenyvesi-Kiss [07.03.2019]
Leader of EUSALP AG3, Representative of Triento

Deutsch // German

GW: In der letzten E-mail erwähnten sie, dass die Action Group 3 stark mit dem ASP Projekt Dualplus zusammenarbeitet, aber auch mit den ARPAF Projekten AlpJobs und Transalp. Können sie detaillierter erläutern, wie die Zusammenarbeit in diesen zwei Fällen funktioniert?

BFK: Ist es von Anfang an vorgesehen worden, dass die EUSALP AGs Kontakt mit den verschiedenen Projekten haben. Wir haben einen Aktionsplan für jede AG und diese sind auch mit gewissen Aktivitäten zusammengeknüpft, die in Projekten stattfinden. Die ersten für uns interessanten Projekte waren natürlich Alpine Space Projekte. Am Anfang lief das so, dass die Kollegen verschiedene Alpine Space-Projekte vorgestellt haben und wenn es thematisch eine Verbidung gab, begann man eine Zusammenarbeit. Darauffolgend kam es auch vor, dass wir Projekte initiiert haben, d.h. dass wir als AG Leader und Member die Themen vorgeschlagen haben. Ein Beispiel dafür ist das Dualplus Projekt. Wir haben das Thema duale Ausbildung vorgeschlagen und die Projektpartner eines alten Projekts, PlurAlps, miteinbezogen und darauf die Planung vorbereitet. Wir, als AG stehen dahinter, sind allerdings nicht die Hauptdarsteller. Es ist in der Application Form auch niedergeschrieben, dass es eine gewisse Zusammenarbeit zwischen AG 3 und Dualplus geben wird, z.B. organisieren wir zusammen eine Konferenz in Trient diesen Oktober dazu. Diese gemeinsame Aktivität ist ein Teil der Zusammenarbeit, aber wir haben z.B. auch die Autonome Provinz Trient als Partner unseres Projektes, d.h. die Inhalte werden zusammen mit ihnen erarbeitet. Nun zu den ARPAF-Projekten: Dies ist ein Europäischer Fond in der Höhe von 2,0 Millionen Euro, der hauptsächlich für kleinere und kürzere Projekte im Alpenraum verwendet wird, oftmals nur Vorbereitungsprojekte oder eine geringere Partneranzahl. Allerdings hat man sich darauf geeignet, dass dieser Fond hauptsächlich an Projekte mit Partnern aus den EUSALP AGs gerichtet ist, für den Fall, dass interessante und relevante Projekte eingereicht werden. Natürlich sind diese Projekte eher von kleineren Maßstab, oder eben Vorbereitungsprojekte für ein größeres AG Projekt. Dabei wird besonders viel Wert auf die Zusammenarbeit von AGs gelegt. Wir wurden z.B. gefragt, eine Partnerschaft mit einer anderen AG zu starten, um ein gemeinsames Vorbereitungsprojekt einzureichen. Insgesamt wurden sieben Projekte von dem ARPAF Fond genehmigt, wobei drei davon etwas mit der AG 3 zu tun haben, wie z.B. Transalp und AlpJobs. Die AG 3 ist an Kompetenzen interessiert, und kann deshalb relativ leicht mit anderen AGs in Verbindung gesetzt werden, da dies immer wichtig ist bei einer Weiterentwicklung der Wirtschaft.

GW: Sie erwähnten, dass sie mit anderen AGs zusammenarbeiten.Wie funktioniert die Zusammenarbeit generell? Und was könnte ihrer Meinung nach verbessert werden?

BFK: In den neun AGs sind die Leader seit 2016 die gleichen geblieben. Wir haben ein gemeinsames Projekt, AlpGov, indem wir eine strukturierte Zusammenarbeit ausüben. Man könnte sagen, dass dieses Projekt we unser Sparschwein ist, wovon wir das Geld nehmen, um die Aktivitäten von den verschiedenen AGs zu koordinieren und zu finanzieren. Da wir das Projekt zusammen gestalten, müssen wir natürlich auch zusammen arbeiten. Dies wurde auch in einer Form institutionalisiert. Wir nennen uns BOAGL (Board of Action Group leaders) und haben jährlich drei bis vier Besprechungen. Bis vor der ARPAF war die Zusammenarbeit ausschließlich für organisatorische Angelegenheiten, d.h. die Abwicklung von dem AlpGov Projekt oder was generell benötigt wird für die Präsidentschaften der EUSALP. ARPAF hat uns gezwungen nachzudenken, was Möglichkeiten weiterer Zusammenarbeit wären und wir sind uns auch bewusst, dass dieser Schritt notwendig war. Es gibt natürlich AG mit Themen, die für alle anderen wichtig sind, und es gibt andere, die nicht so verbunden sind. Wir planen ein AlpGov 2 für das nächste Jahr, bei welchem ein Workpackage entwickelt wird mit Themen, die für alle AGs wichtig sind, wie z.B. Kompetenzen, Arbeitsmarkt, etc. Wichtig dabei ist, dass wir in der Zukunft zusammen Projekte vorbereiten können. Außerdem haben wir bereits damit angefangen, als AGs zusammen Aktivitäten zu organisieren, wie z.B. das Smart Villages Event im Mai im Valle d'Aosta mit AG 3, 4, 5 und 9. Nun zu dem Punkt, was verbessert werden könnte. Das größte Problem ist, dass wir zu wenig Zeit haben und daher fällt die Zusammenarbeit oftmals schwer. Die Zeit hängt allerdings nicht von uns ab und daher ist es schwierig diesen Punkt zu verbessern, allerdings könnte man durch strategisches Denken an der Kooperation arbeiten. Dabei könnte auch eine externe Unterstützung hilfreich sein, wie z.B. ein Mediator oder Facilitator.

GW: Wie funktioniert die Zusammenarbeit mit anderen Kooperationen, wie dem Alpine Space Programm, der Alpenkonvention oder Interreg Projekten? Und was könnte ihrer Meinung nach verbessert werden?

BFK: Mit dem Alpine Space Programm organisieren wir verschiedene Aktivitäten zusammen, wie z.B. das ‚Meet&Match‘ Forum, um neue Projekte vorzubereiten. Dort wurden die AG Leader eingeladen und ihnen die Projekte für eine zukünftige Zusammenarbeit vorgestellt. Außerdem gibt es bereits laufende Projekte, bei denen EUSALP und das Alpine Space Programm involviert sind, und dort besteht natürlich eine intensive Zusammenarbeit. Das Verhältnis zwischen dem Alpine Space Programm und EUSALP ist allerdings noch nicht ganz klar definiert, aber es ist auch nicht unsere Aufgabe dies zu entscheiden und deshalb halten wir uns aus dieser Diskussion heraus. Nun zur Alpenkonvention: Die AG 6 wird z.B.

von der Alpenkonvention geleitet, von Wolfgang Mayrhofer, und durch diese Präsenz in dem EUSALP Kontext, haben wir eine gute Zusammenarbeit mit ihnen. Zusätzlich besteht auch noch reger Austausch zwischen den Gruppen der EUSALP und den Gruppen der Alpenkonvention. Momentan besteht keine direkte Zusammenarbeit der EUSALP mit Interreg Projekten, allerdings werden sie oftmals als Referenzprojekte für gute Beispiele verwendet.

GW: Nun zur letzten Frage. Wie sehen sie denn die Zukunft der EUSALP?

BFK: Generell glaube ich, dass die EUSALP noch Zeit braucht, um ihre eigene Identität zu finden, d.h. es gibt vor allem Schwachstellen bei der Kommunikation zwischen dem General Assembly und den BOAGL. Das ist die Aufgabe für dieses und nächstes Jahr. Über die Zukunft der EUSALP können wir meiner Meinung nach erst in zwei Jahren sprechen, da die ersten fünf Jahre hauptsächlich Vorbereitungszeit sind. Bei anderen Strategien sagen die Mitglieder, dass diese Phase erst nach 10 Jahren abgeschlossen ist. Deshalb wird die EUSALP erst mal weitermachen wie bisher, allerdings gibt es einige Punkte die mehr in den Vordergrund rücken, wie z.B. eine intensivere Auseinandersetzung mit den Stakeholdern. Ein anderes Problem der EUSALP ist momentan das Engagement einiger Regionen, d.h. es gibt sehr aktive Region, wie z.B. Trentino, die nahezu in jeder AG vertreten sind, aber auf der anderen Seite gibt es sehr zurückhaltende, wie z.B. einige schweizer Kantone, Liechtenstein und teilweise Slovenien. Generell muss man beim Engagement einiger Regionen ab und zu ein bisschen nachhelfen, und das ist natürlich ein Risikofaktor. Das Executive Board ist dafür verantwortlich, die eher passiven Regionen nach Anmerkung der AG Leaders zu stimulieren und motivieren.

GW: Vielen Dank für ihre Zeit und das sehr interessante Interview.

English// Englisch

GW: In the last e-mail, you mentioned that Action Group 3 works closely with the ASP project Dualplus, but also with the ARPAF projects AlpJobs and Transalp. Can you explain in more detail how the collaboration works in these two cases?

BFK: It has been planned from the outset that the EUSALP AGs will have contact with the various projects. We have an action plan for each AG and these are also linked to certain activities that take place in its projects. The first interesting projects for us were, of course, Alpine Space projects. In the beginning, it was the case that the colleagues presented different Alpine Space projects and, if there was a thematic connection, they started working together. Subsequently, it also happened that we

initiated projects, i. E. that we as AG Leader and Member have suggested the topics. An example of this is the Dualplus project. We proposed dual education and involved the project partners of an old project, PlurAlps, and prepared the planning for it. We, as AG stand behind it, but are not the main actors. It is also written down in the Application Form that there will be some cooperation between AG 3 and Dualplus, e.g. we'll organize a conference together in Trento this October. This joint activity is part of the collaboration, but we have e.g. also the Autonomous Province of Trento as a partner of our project, so i. E. the content is developed together with them. Now coming to the ARPAF projects: this is a European fund of 2.0 million Euros, which is mainly used for smaller and shorter projects in the Alpine region, often only preparatory projects or a smaller number of partners. However, it has been appropriate for this fund to focus mainly on projects with partners from the EUSALP AGs in case interesting and relevant projects are submitted. Of course, these projects are more of a smaller scale or just preparation projects for a larger AG project. Particular emphasis is placed on the cooperation of AGs. We were e.g. asked to start a partnership with another AG to submit a joint preparation project. In total, seven projects were approved by the ARPAF Fund, three of which have something to do with AG 3, such as Transalp and Alp Jobs. AG 3 is interested in competences and can, therefore, be connected relatively easily with other AGs, as this issue is always important in the further development of the economy.

GW: You mentioned that you work with other AGs. How does the collaboration work in general? And what do you think could be improved?

BFK: In the nine AGs, the leaders have remained the same since 2016. We have a joint project, AlpGov, with structured cooperation. One could say that this project is our piggy bank, from which we take the money to coordinate and finance the activities of the different AGs. Of course, since we are designing the project together, we also have to work together. This was also institutionalized in a form. We call ourselves BOAGL (Board of Action Group Leaders) and have three to four meetings a year. Until the ARPAF, the collaboration was exclusively for organizational matters, i. the handling of the AlpGov project or what is generally needed for the Presidencies of the EUSALP. ARPAF has forced us to think about what possibilities for further cooperation could be and we are also aware that this step was necessary. Of course, there are AG with issues that are important to everyone else, and there are others who are not so connected. We are planning an AlpGov 2 project for the next year, in which a work package will be developed with topics that are important for all AGs, such as Skills, labour market, etc. It is important that we can prepare projects together in the future. In addition, we have already started to organize activities together as AGs, such as the Smart Villages event in May in the Valle d'Aosta with AG 3, 4, 5 and 9. Now to the issues, which could be

improved. The biggest problem is that we do not have enough time and therefore the cooperation is often difficult. However, time does not depend on us and therefore it is difficult to improve on this point, but one could work on cooperation through strategic thinking. External support could also be helpful, such as a mediator or facilitator.

GW: How does the cooperation with other co-operations work, such as the Alpine Space Program, the Alpine Convention or Interreg projects? And what do you think could be improved?

BFK: With the Alpine Space Program we organize various activities together, such as the 'Meet & Match' forum to prepare new projects. The AG Leaders were invited and presented the projects for timely cooperation. There are also ongoing projects involving EUSALP and the Alpine Space program, and of course, there is intense cooperation. However, the relationship between the Alpine Space Program and EUSALP is not yet clearly defined, but it is not our job to decide it, so we stay out of this discussion. Now to the Alpine Convention: The AG 6 is e.g. guided by the Alpine Convention, by Wolfgang Mayrhofer, and through this presence in the EUSALP context, we have good cooperation with them. In addition, there is still a lively exchange between the EUSALP AGs and the Alpine Convention groups. There is currently no direct cooperation between EUSALP and Interreg projects, but they are often used as reference projects for good examples.

GW: Now to the last question. How do you see the future of EUSALP?

BFK: In general, I believe that the EUSALP still needs time to find its own identity, but above all, there are weaknesses in communication between the General Assembly and the BOAGL. That's the main job for this and next year. In my opinion, we cannot talk about the future of the EUSALP for another two years because the first five years are mainly preparation time. For other strategies, members say that this phase is completed only after 10 years. Therefore, the EUSALP will continue as before, but there are some points which will get more in the foreground, such as more integration of the stakeholders. Another problem of EUSALP is currently the involvement of some regions. There are the very active regions, such as Trentino, which are represented in almost every AG, but on the other hand, there are very conservative ones, like e.g. some Swiss cantons, Liechtenstein and partly Slovenia. In general, you have to help a little bit with the involvement of some regions, and of course, that's a risk factor. The Executive Board is responsible for stimulating and motivating the more passive regions according to AG Leaders.

GW: Thank you for your time and the very interesting interview.

4. Christian Wandl [28.02.2019]

Hotel Operator & Pioneer in sustainable tourism, Board member of the tourism association of the Olympic region Seefeld

Deutsch // German

GW: Sie erwähnten, dass sie immer den Bezug zwischen Tourismusverband und Hotel trennen, da dort zwei unterschiedliche Philosophien dahinter stehen, daher möchte ich das Interview auch in zwei Teile teilen. Was sind die Kompetenzen des Tourismusverband und was kann er bewirken? Hat er Einfluss auf die Raumplanung?

CW: Generall hat der Tourismusverband keine direkten Kompetenzen und Einfluss, aber die Möglichkeit, Leitlinien bzw. Ideen vorzugeben. Wir sind ein Verein von touristischen Betrieben, wir können quasi mehr durch ‚Lobbying‘ bewirken, sind jedoch immer von der Regierung und den Bezirken abhängig. Raumplanung stand bis vor kurzem nicht auf der Agenda des Tourismusverbands. Vor ein paar Monaten jedoch gibt es die neue Herangehensweise den Urlaubsraum Seefeld auch als unseren lokalen Lebensraum zu betrachten und daher den Aspekt der Raumplanung miteinzubeziehen. In der Tourismusregion Seefeld haben wir den Vorteil, ein relativ großes Budget zu haben und daher teilweise ohne politischen Background etwas durchzusetzen. Aber wie ich es jedoch zuvor erwähnte, muss alles mit den Gemeinden und der Kommune abgestimmt werden. Zusammenfassend könnte man sagen, dass wir Hinweise geben können und diese Ideen durch finanzierte Projekte fördern.

GW: Sie erwähnten, dass seit letzten Jahr eine Tourismusstrategie für die Olympiaregion Seefeld existiert. Wie wird das Thema Klimawandel im Zusammenhang mit Wintertourismus behandelt? Wie steht der TvB zur künstlichen Beschneigung und Expandierung der Skigegebiete in der Zukunft?

CW: Zuerst muss man sagen, dass in unserer Region vergleichsweise wenig Alpintourismus vorherrscht, jedoch starke Langlaufaktivitäten. Dies kommt daher, dass unsere Region quasi 20 Jahre ‚verschlafen‘ hat. In den 70er Jahren war Seefeld eine der touristischsten Regionen und hatte mehr Übernachtungen als Ischgl. In den folgenden Jahren stagnierte der Tourismus und darauffolgend nahmen die Übernachtungen ab. Deshalb wurden auch keine Investitionen in den Alpintourismus betrieben, was in den meisten anderen Regionen passierte. Heutzutage könnte man sagen, dass wir davon profitieren, da unsere Landschaft und Berge unverbaut sind und die meisten Urlauber dies bevorzugen. Um zu der Frage zurückzukommen: Der Klimawandel hat hauptsächlich Investitionen in die Schneesicherheit bewirkt, da der Schnee, bzw. die Kälte später kommen. Während der Erarbeitung unserer Tourismusstrategie wurde aus wirtschaftlichen Gründen vorgeschlagen, intensive künstliche Beschneigung

für 50 km Langlaufloipen zu nutzen, um eine Saison, und damit auch Umsatz, vom 1. November an zu garantieren. Letztendlich hat sich der TvB dagegen entschieden und wir haben uns auf den Saisonstart ab Mitte November festgelegt. Dabei werden nur 10 km Langlaufloipen geöffnet und mit dem so genannten ‚Snow farming‘ fahrbar gemacht. Das bedeutet, dass der Schnee von der vorigen Saison mit Hackschnitzeln überdeckt und den Sommer über gelagert wird. Letztendlich müssen wir auch auf eine Form der künstlichen Beschneigung zurückgreifen, da wir nur mit natürlichen Schnee wirtschaftlich nicht überleben können, aber dieses System ist deutlich energieeffizienter. Der Alpintourismus unsere Regionen trägt sich hauptsächlich in zwei größeren Gebieten aus. Diese funktionieren natürlich mit vielen künstlichen Beschneigungsanlagen. Dazu muss man sagen, dass Tirol die einzige Region ist, die ‚reines‘ Wasser zur Beschneigung verwendet, also keine Zusätze um die Kühlungstemperatur zu senken und auch bei hohen Temperaturen die Maschinen zu benutzen. Nichtsdestotrotz muss man dazu sagen, dass es geschiede Meinung darüber gibt. Eines der Skigebiete unserer Region klagte vor kurzem ein, dass diese Zusätze auch in Tirol verwendet werden dürften, um die Schneegarantie und damit den ‚rechtzeitigen‘ Saisonstart zu garantieren. Nach angehenden Diskussionen wurde dagegen entschieden und sogar ein Gesetz gegen den Nutzen von Zusätzen festgelegt. Zusammenfassend kann man sagen, dass das größte Problem die immer weniger kälteren Nächte im November bzw. Dezember sind, und der damit verbundene erhöhte Stromverbrauch für die Beschneigungsanlagen. Daher haben wir in Tirol das Sprichwort: ‚Tirol benutzt mehr Strom nachts, als tagsüber‘. Wenn man die wirtschaftliche Rentabilität jetzt bei Seite legt und die Natur respektiert, sollte die Wintersaison erst Ende Dezember, bzw. Januar starten, wenn die Nächte kalt genug sind. Für die letzte Olympiade z.B. wurde eine Anlage für sehr viel Geld angeschafft, die nach Angaben in 6 Tagen das komplette Gebiet beschneien konnte. Am Ende hat es aber nicht funktioniert, da die Nächte nicht kalt genug waren. Die Gefahr dabei ist, dass zusätzliche Chemikalien notwendig sind, um die Temperatur herunterzukühlen. Dafür und für den direkten Verkauf von Schnee existieren verschiedene Anbieter, wie zum Beispiel SnoMax oder TexAlpin, die viel Energie verbrauchen, aber vor allem sehr teuer sind. Für das Skispringen in Oberhof werden auf solche Methoden zurückgegriffen.

GW: Die Isar entspringt in den Grenzen des Gebietes des Tourismusverbandes Seefeld. Wie stehen Sie, bzw der TvB zur Behandlung und Schutz von Flussökosystemen? Rbeiten Sie zusammen mit Bayern an diesem Thema?

CW: Generell besteht keine Zusammenarbeit zu diesem Thema, weder in Sachen Tourismus, noch zu Flussökosystemen. Was aber vor allem fehlt, ist das Bewusstsein Flussökosystem zu schützen. Hauptsächlich wird der Isarursprung zu Marketingzwecken genutzt. Sie entspringt im Karwendel-

naturschutzgebiet und war bis vor kurzem ein nahezu unangestastetes Gebiet, und wurde daher auch nicht zu touristischen Zwecken genutzt. Seit kurzem bieten wir auch Wanderungen im Karwendel an und verwenden es als eine touristische Alternative, um Flora und Fauna dort zu entdecken.

GW: Ein anderes Thema der Tourismusstrategie ist nachhaltige Mobilität. Wie glauben sie, können Touristen zu nachhaltigeren Transport motiviert werden? Und was sind aktuelle Ansätze, die im TvB diskutiert werden?

CW: Nachhaltige Mobilität ist mitunter eines der wichtigsten Themen des Tourismusverbandes Seefeld. Unser Vorteil ist, dass wir über einen direkten Bahnschluss verfügen und daher eine gute Verbindung zu München und Umgebung haben. Generell beobachten wir, dass deshalb immer weniger Leute mit dem Auto anreisen. Nichtsdestotrotz ist das größte Problem die Verbindung von der Haltestelle zum Zentrum, bzw. zu den Attraktivitäten. Unser öffentliches Bussystem ist relativ bescheiden und vor allem funktioniert es nicht das ganze Jahr über, sondern nur während den Hauptsaisonen. D.h. vier Monate während des Jahres fahren kaum Busse und dies erklärt auch, wieso Einheimische den öffentlichen Transport kaum wahrnehmen. Sie sind letztendlich auf das Auto angewiesen. Daher fließen nun ca. Zwei Drittel unseres verfügbaren Budgets in Mobilität. Die Hauptideen fokussieren sich auf einen intensiveren Transport, aber auch neue Alternativen wie Car sharing und autonomes Fahren. Allerdings fehlt in unserer Region die kritische Masse. Wir sind ca. 8000 Einwohner und teilweise bis zu 16.000 Touristen. Daher sind diese Alternativen kaum machbar. Eine andere Möglichkeit ist die existierende FlixBusverbindung in Seefeld. Das Problem ist dabei, dass die Haltestelle relativ weit vom Zentrum entfernt ist und das gleiche wie beim Zug passiert. Die letzten Meter von Station zur Unterkunft sind schwer mit den öffentlichen Verkehrsmitteln erreichbar.

GW: Unabhängig ihrer Mitgliedschaft im TvB Seefeld, sind Sie und ihr Hotelbetrieb ein Vordenker im Thema nachhaltiger Tourismus. In EU Projekten und Strategien wird oft von ‚sanften‘ und alljährlichen Tourismus als innovative Lösung gesprochen. Was ist ihre Haltung zu diesen Konzepten? Und haben sie andere Ideen?

CW: Generell kann man die Touristen in zwei Gruppen teilen. Zum einen gibt es viele Gäste, denen Nachhaltigkeit relativ egal ist und einfach nur unter perfekten Bedingungen skifahren und danach auf Apré Ski gehen wollen. Diese Gäste bevorzugen große Skigebiete wie z.B. Sölden. Dort zeigt sich eine eher extreme Entwicklung: Die Nächtigungszahlen steigen stetig, jedoch sind sie schon an ihrem Limit angelangt und nicht für diese Massen angelegt. Andererseits gibt es auch immer mehr Touristen, bei denen die Sehnsucht nach intakter Natur im Vordergrund steht. Diese Gäste kommen hauptsächlich aus dem urbanen Raum und legen Wert auf Nachhaltig-

keit. Ein Beispiel dafür ist der Karwendel Naturpark. Wie ich bereits zuvor erwähnte, wurde er bis vor 4-5 Jahren nicht touristisch genutzt und wird jetzt aber als neues, alternatives Potential wahrgenommen. Wir bauen derzeit z.B. ein ‚Naturparkhaus‘, welches über das Naturschutzgebiet informieren soll und dazu Naturführer für Wanderungen anbietet. Die Idee ist es zusammen mit der Natur und der Umgebung Geschäft zu machen, anstatt auf Kosten von ihr.

GW: Wie kann ein Hotelbetrieb, bzw. ein touristisches Unternehmen, ihrer Meinung nach einen Schritt zur Nachhaltigkeit bewirken?

CW: Da muss man sich zuerst die Frage stellen, wie man wirken will. Unser Hotel hat zum Beispiel das EHC-Siegel. Dies beschreibt Eco hotels die einen CO2 Ausstoß unter einem bestimmten Wert besitzen. Als wir darauf aufmerksam wurden, haben wir uns damit befasst, welche Ressourcen man eigentlich in einem Hotelbetrieb verbraucht. Wir haben sogar die Anzahl der Glühbirnen gezählt und sind am Ende auf 3.819 gekommen. Nach und nach haben wir die Anzahl reduziert und sie durch LEDs ersetzt. Am Ende haben wir einen CO2 Wert pro Übernachtung ausgerechnet und uns das Ziel gesetzt, diesen jedes Jahr um 10% zu reduzieren. Ein durchschnittliches Hotel verbraucht ca. 25kg, unser Betrieb benötigte 14,8 kg vor 9 Jahren und mittlerweile nur noch 9,6 kg. Der Wettbewerb mit anderen Eco-Hotels regt dieses Thema an und motiviert am Ende immer weiter zu reduzieren. Ein anderes Projekt, dass wir initiiert haben, ist ‚Lebensbäume‘. Wir pflanzen Bäume im Karwendel, um einen Lebensraum für die lokale Fauna zu garantieren. Ein anderes Projekt ist der sogenannte ‚Specht‘. Wir haben herausgefunden, dass die tägliche Zimmerreinigung ca. 4€ kostet (ohne Personal). Jeder Gast hat jetzt die Wahl diesen Specht an seine Zimmertür zu hängen und sich gegen die tägliche Zimmerreinigung zu entscheiden. Die gesparten 4€ werden dabei an das Projekt Lebensbäume gespendet.

GW: Sie erwähnten, dass sie ihr Hotel nur mit Strom eines kleinen Wasserkraftwerks in Tirol betrieben wird. Können sie die Geschichte und Umsetzung ein wenig mehr erläutern? Is es ein Normalfall, oder eher eine Ausnahme?

CW: Das ist eher eine Ausnahme. Unser Betrieb funktioniert mit 100% Ökostrom aus dem lokalen Unternehmen ‚Durchlaufwasserkraftwerke‘. Wir haben uns damals dafür entschieden, da der TIWAG Strom nicht sehr transparent ist. Man weiß nicht, ob es wirklich alles aus Wasserkraft kommt. Man sagt, dass Tirols Dauerstrom hauptsächlich aus billig importierten Atomstrom aus Deutschland stammt und der von den Wasserkraftwerken generierte Spitzenstrom nach München exportiert wird. D.h. wenn der Strombedarf in München hoch ist, wird er vor allem von den Pumpspeicherkraftwerken dorthin exportiert. Seit längerer Zeit plant TIWAG auch neue Pumpspeicherkraftwerke in Kühtai und im Kaunertal. Man muss dazu sagen, dass auch ‚Durchlaufwas-

serkraftwerke‘ vor kurzem von TIWAG aufgekauft wurde und deshalb suchen wir derzeit nach einem neuen regionalen Anbieter. Die meisten kleineren Betreiber verkaufen ihren Strom allerdings an das TIWAG Netz, daher ist es schwierig wirklich nachhaltige Betreiber zu finden, die kein ‚Green washing‘ betreiben.

GW: Kann man überhaupt unabhängig von TIWAG und dem öffentlichen Netz ein Wasserkraftwerk im kommunalen Level platzieren?

CW: Über die rechtliche Lage weiß ich nicht besonders viel, allerdings kann ich von zwei lokalen Projekten erzählen. Die Gemeinde Seefeld hat den Höhenunterschied von ca. 500m des Klärwerks genutzt und ein Kraftwerk installiert. Das gleiche passiert beim Trinkwasser. Allerdings wird dieser Strom darauf an TIWAG verkauft. Generell kann man sagen, dass früher viel mehr kleine, lokale Wasserkraftwerke existiert haben, aber sie darauffolgend von den großen Pumpspeicherkraftwerken überschattet wurde und heute wieder ihr Comeback erfahren.

GW: Zum Abschluss noch zwei Fragen, die dich mir während des Interviews gestellt haben. Wie wird der Tourismusverband finanziert? Und was sind neben dem Langlauf die hauptsächlichen touristischen Aktivitäten?

CW: Wir sind ein Verein, das heißt unsere Gelder kommen nicht von der Regierung. Jeder Gast zahlt einen gewissen Teil Ortstaxe und die touristischen Unternehmen geben Teil ihres Umsatzes an den Verein ab. Nun zu den alternativen touristischen Aktivitäten: Neben Langlauf ist vor allem Alpinski, Winterwandern beliebt. Der neueste Trend ist E-biken. Dies erlaubt es den Gästen Orte zu erreichen, die zuvor unentdeckt waren. Allerdings bringt das natürliche auch Probleme mit sich. Flora und Fauna dieser zuvor unberührten Orte sehen nun mehr und mehr Besucher.

GW: Vielen Dank für das Interview und ihre Zeit.

English // English

GW: You mentioned that you always separate the relatedness between tourism and hotel, because there are two different philosophies behind it. So I would like to divide the interview into two parts. What are the competences of the tourism association and what can it effect? Does it influence spatial planning?

CW: In general, the tourism association has no direct competences and influence, but the possibility to set guidelines or new ideas. We are an association of tourist businesses, we can basically do more by ‚lobbying‘, but finally always depend on the gov-

ernment and communes. Spatial planning was not on the agenda of the tourism association until recently. Since a few months, however, there is the new approach to perceive the Seefeld tourism area also as our local habitat and therefore consider the aspect of spatial planning. In the tourism region of Seefeld we possess the advantage of having a relatively large budget and are therefore, in some cases, able to enforce something without political background. But as I mentioned earlier, everything has to be coordinated with the government and communes. To sum up, we could say that we can give incentives and advices, and promote these ideas through funded projects.

GW: You mentioned that since last year a tourism strategy exists for the Olympiaregion Seefeld. How do you approach the topic climate change related to winter tourism? How does the TvB position itself to artificial snow making and the expansion of ski resorts in the future?

CW: First of all, we have to say that in our region comparatively little alpine tourism prevails, but strong cross-country skiing activities. This is because our region ‚overslept‘ almost 20 years. In the 70s Seefeld was one of the strongest tourism regions and had even more overnights than Ischgl. In the following years the tourism stagnated and afterwards the overnight stays decreased. Therefore, no investments were made in alpine skiing, which happened in most other regions. Nowadays, we could say that we benefit from it, as our landscape and mountains are more unspoiled and most tourists prefer it. To come back to the question: The climate change caused mainly investments in the snow security because the snow, or the cold starts later. During the development of our tourism strategy, it was proposed, for economic reasons, to use intensive artificial snow for 50 km of cross-country ski trails to guarantee a season, and thus turnover, from the 1st of November. Ultimately, the TvB has decided against it and we have set ourselves for the start of the season from mid-November. Only 10 km of cross-country trails are opened and made usable with the so-called ‚snow farming‘. This means that the snow from the previous season is covered with wood chips and stored over the summer. After all, we also have to resort to some form of artificial snow because we cannot survive economically only with natural snow, but this system is significantly more energy efficient. The alpine ski tourism in our regions is mainly carried out in two bigger areas. Of course, these work with many artificial snow-making systems. It must be said that Tyrol is the only region that uses ‚pure‘ water for snow-making, so no additives to lower the cooling temperature and to use the machines even at high temperatures. Nevertheless, there exist divergent opinions about it. One of the ski resorts in our region recently complained that these additives should also be used in Tyrol to guarantee the snow and thus the ‚timely‘ start of the season. After discussions, decisions were taken and even a law against the use of additives was decided. To summarize, the biggest problem is the

less and less cold nights in November and December, and the associated increased power consumption for the snowmaking systems. Therefore, in Tyrol we have the saying: 'Tyrol uses more electricity at night than during the day'. If you put the economic viability aside and respect the nature, the winter season should start at the end of December or even January when the nights are cold enough. For the last Olympics, e.g. a plant for a lot of money was purchased, which could snow according to the provider the entire area in 6 days. In the end it did not work because the nights were not cold enough. The danger here is that additional chemicals are needed to cool the temperature down. For this and for the direct sale of snow, there are various providers, such as SnoMax or TexAlpin, which consume a lot of energy, but above all are very expensive. For ski jumping in Oberhof, such methods are generally used.

GW: The Isar rises within the boundaries of the area of the tourism association Seefeld. What is your opinion, or of the TvB for the treatment and protection of river ecosystems? Are you working on this topic with together with Bavaria?

CW: In general, there is no cooperation on this topic, neither in tourism nor in river ecosystems. What is missing, however, is the awareness of protecting the river ecosystem. The Isar origin is used mainly for marketing purposes. It originates in the Karwendel nature reserve and was until recently an almost unpaved area, and was therefore not used for tourism purposes. Recently, we also offer walks in the Karwendel and use it as a tourist alternative to discover flora and fauna on site.

GW: Another topic of the tourism strategy is sustainable mobility. How do you think tourists can be motivated to more sustainable transport? And what are current approaches that are discussed in the TvB?

CW: Sustainable mobility is one of the most important topics of the tourism association Seefeld. Our advantage is that we have a direct rail connection and therefore a good connection to Munich and the surrounding area. In general, we observe that fewer and fewer people travel by car. Nevertheless, the biggest problem is the connection from the bus stop to the center, or to the attractions. Our public bus system is relatively modest and, above all, it does not work all year round, but only during the main seasons. There are hardly any buses for four months during the year, which explains why locals are barely aware of public transport. They are ultimately dependent on the car. Therefore, about two-thirds of our available budget is now spent on mobility. The main ideas focus on more intensive transport, but also new alternatives such as car sharing and autonomous driving. However, the critical mass is missing in our region. We are about 8000 inhabitants and sometimes up to 16,000 tourists. Therefore, these alternatives are hardly feasible. Another possibility is the existing Flixbus connection in Seefeld. The problem is that the stop is relatively

far from the center and the same thing happens as with the train. The last meters from station to the property are difficult to reach by public transport.

GW: Regardless of your membership in TvB Seefeld, you and your hotel business are a pioneer in sustainable tourism. EU projects and strategies often speak of 'soft' and all-year tourism as an innovative solution. What is your attitude to these concepts? And do you have other ideas?

CW: In general, you can divide the tourists into two groups. On the one hand, there are many guests who do not care about sustainability and simply want to ski with perfect conditions and then go for après ski. These guests prefer large ski resorts such as Sölden. There is a rather extreme development: overnight stays are rising steadily, but they are already at their limits and not designed for these crowds. On the other hand, there are also more and more tourists, where the longing for intact nature is priority. These guests come mainly from the urban area and value sustainability. An example of this is the Karwendel Nature Park. As I mentioned earlier, it was not used for tourism until 4-5 years ago and is now perceived as a new, alternative potential. We are currently building e.g. a 'Nature Park House', which is to inform about the nature reserve and offers nature guides for walks. The idea is to do business with nature and the environment rather than at the expense of it.

GW: In your opinion, how can a hotel business or a tourism company contribute a step towards sustainability?

CW: First of all, you have to ask yourself how you want to appear and be perceived. For example, our hotel has the EHC seal. This describes eco hotels that have a CO2 emission below a certain value. When we became aware of it, we looked at what resources are actually consumed in a hotel operation. We even counted the number of bulbs and ended up with 3,819. Gradually we have reduced the number and replaced it with LEDs. In the end, we calculated the CO2 value per night per guest and set ourselves the goal of reducing it by 10% each year. An average hotel consumes about 25kg, our company needed 14.8 kg 9 years ago and now only 9.6 kg. The competition with other eco-hotels stimulates this topic and motivates in the end to reduce ever further. Another project that we have initiated is 'Lebensbäume'. We plant trees in the Karwendel to guarantee a habitat for the local fauna. This is connected to the project 'woodpecker'. We found out that the daily room cleaning costs about 4 € (without staff). Each guest now has the choice to hang this woodpecker on his door and to decide against the daily cleaning of the room. The saved € 4 will be donated to the project Lebensbäume.

GW: You mentioned that your hotel only runs on electricity from a small hydroelectric power station in Tyrol. Can you explain the story and its implementation a little more? Is it a normal case, or rather

an exception?

CW: That's more of an exception. Our company works with 100% green electricity from the local enterprise 'Durchlaufwasserkraftwerke'. We opted for it at the time because the TIWAG electricity is not very transparent. You do not know if everything really comes from hydropower. It is said that Tyrol's persistent current comes mainly from cheaply imported nuclear power from Germany and that the peak electricity generated by the hydroelectric power plants is exported to Munich. When the electricity demand in Munich is high, it is mainly exported by the pumped storage power plants. TIWAG has also been planning new pumped storage power plants in Kühtai and Kaunertal for a long time. It has to be said that 'Durchlaufwasserkraftwerke' was also recently bought by TIWAG, so we are currently looking for a new regional supplier. However, most smaller operators sell their electricity to the TIWAG network, so it is difficult to find truly sustainable operators who do not do just 'green washing'.

GW: Is it possible to place a hydropower plant on the municipal level independently of TIWAG and the public grid?

CW: I do not know much about the legal situation, but I can tell you about two local projects. The municipality Seefeld has used the height difference of about 500m of the sewage treatment plant and installed a power plant. The same thing happens with drinking water. However, this electricity will be sold to TIWAG. In general, it can be said that there used to be a lot small, local hydroelectric power plants, but then they were overshadowed by the large pumped storage power plants and are experiencing their comeback again today.

GW: Finally, two questions that I asked myself during the interview. How is the tourism association financed? And what else besides cross-country skiing are the main tourist activities?

CW: We are a club, that means our money does not come from the government. Each guest pays a conscience part tourist tax and the tourist companies give part of their turnover to the club. Now to the alternative this brings also problems to the natural environment. The flora and fauna of these previously untouched places are now experiencing more and more visitors.

GW: Thank you for the interview and your time.

5. Elias Walser [28.03.2019]
Director of the tourism association of the Olympic region Seefeld, Strategic development of the region

Deutsch // German

GW: Sie sind seit 2016 Geschäftsführer des Tourismusverbandes Seefeld. Habt ihr als TvB Einfluss auf die Raumplanung, und wenn ja wie?
EW: Von der Gesetzesperspektive nur begrenzt, da Raumplanung in Österreich und Tirol Gemeindeangelegenheit ist. Allerdings hat der Tourismusverband teilweise die Möglichkeit einer Stellungnahme, vor allem bei größeren Projekten, die für den Tourismus relevant sind.

GW: Seit ihr bei der Finanzierung von Raumplanung betreffenden Projekten beteiligt?

EW: Generell investieren wir nicht in diese Art von Projekten, allerdings haben wir ein Mitspracherecht bei großen Projekten, wie z.B. der diesjährigen Weltmeisterschaft. Dabei haben wir vor allem in die Optik und ein kohärentes äußeres Erscheinungsbild investiert, sodass Seefeld dementsprechend dazu passt.

GW: Arbeiten sie mit anderen Sektoren zusammen oder mit dem Ministerium für Tourismus und Nachhaltigkeit? Und wie funktioniert die Zusammenarbeit?

EW: Das Ministerium für Nachhaltigkeit für Tourismus und Nachhaltigkeit ist relativ neu, und sehr relevant für uns, da es den Tourismus als Querschnitt von unterschiedlichen Branchen anerkennt. Dabei werden Sektoren wie Landwirtschaft, generell Wirtschaft, Energie, Transport, etc. miteinander vernetzt. Die ersten Projekte dieses Ministeriums in unserer Region haben mit dem Transport und Mobilität zu tun. Ein kleines Beispiel dazu: Die Schulbusse werden z.B. nur morgens und nach Schulschluss genutzt und die Idee dazu ist es, die Busse für andere Transportzwecke in den Restzeiten zu nutzen. Das läuft bereits und zeigt als gutes Beispiel wie Tourismus als Querschnittsthema genutzt werden soll.

GW: Wie sehen sie die Zukunft des Wintertourismus im Zusammenhang mit dem Klimawandel? Was sind alternative Formen des Skitourismus?

EW: In unserer Region haben wir nur zwei größere Skigebiete, und 4 ganz kleine. Die Region fokussiert sich eher auf das Langlaufen. Die Skigebiete befinden sich teilweise auf einer Höhe, die von dem Ansteigen der Schneefallgrenze gesichert sind, allerdings benötigen wir den Schnee auch für die Loipen auf den niedrigeren Höhen. In unserer Region hat der Sommertourismus bereits den Wintertourismus in den letzten drei Jahren überholt, also ca. 47% der Nächtigungen im Winter und 53% im Sommer. Der Grund dafür ist die Schneelage, aber auch

das Gästeverhalten. Das größte Problem in unserer Region sind häufigere Extremwittersituationen. Großwetterlagen bleiben quasi über den Alpen stehen, das kann lange trocken, aber auch lange Regenzeiten bedeuten und dies wirkt sich natürlich auf den Tourismus aus. Ein anderes Beispiel dafür ist die Almwirtschaft, die vor allem unter langen Trockenperioden leidet. Außerdem zeigte auch der letzte Winter mit den langen, kräftigen Schneefällen, dass teilweise Straßen versperrt waren, Lawinen herunterkamen und manche Orte nicht mehr erreicht werden konnten. Eine andere Auswirkung des Klimawandels ist, dass sich die Schneehöhe nach oben verschiebt und daher künstliche Beschneiung in manchen Gebieten nötig wird. Wir glauben, dass es in unseren Gebieten auch in naher Zukunft noch möglich ist diese zu beschneien, allerdings unter erschwerten Bedingungen. Das Problem dabei ist auch, dass es in vielen Gebieten zum Alpinski keine Alternativen gibt. Und angenommen, die Schneefallgrenze steigt weiter an, ist es sehr schwer sich Alternativen in den niedrigeren Gebieten vorzustellen, Viele Täler greifen auf das Wellnesskonzept zurück und planen Thermen, welche meiner Meinung nach ohne schöner Natur auch nur begrenzt Sinn ergeben. Ich denke, dass es den Skitourismus auf jeden Fall noch in den nächsten 15 Jahren geben wird, allerdings das Gästeverhalten ändern und Skifahren leider immer exklusiver wird. .

GW: Wann beginnt in der Tourismusregion Seefeld generell die Skisaison?

EW: Bei uns beginnt sie generell Ende November, Anfang Dezember je nach Witterung und endet meist Ende März. Für die Eröffnung ist es notwendig, dass es ein paar kalte Tage gibt, um die künstliche Beschneiung für die Basis der Pisten zu starten. Die Anzahl der benötigten kalten Nächte hat von Jahr zu Jahr abgenommen, da durch moderne Technologien die Anzahl verringert werden konnte. Früher, als ich selbst noch Skilehrer war und es keine künstliche Beschneiung gab, war es immer ein Bangen, ob der Schnee rechtzeitig zu Weihnachten kommt oder nicht. Oftmals kam es auch vor, dass es im November schon ein paar Tage schneit, jedoch der gesamte Schnee bis Dezember durch die warmen Temperaturen und den Regen wieder wegschmilzt.

GW: Wie funktioniert die Zusammenarbeit mit Bayern den Tourismus betreffend? Und werden dabei auch die Effekte des Tourismus auf das Flusssystem behandelt, also vor allem die Isar betreffend?

EW: Man merkt die Landesgrenze zwischen Bayern und Österreich auf jeden Fall. Generell arbeiten wir nicht mit Bayern zusammen, jedoch aber auf Projektebene mit Garmisch-Partenkirchen, wie z.B. mit dem Isar-Radweg, der über die Grenzen führt. Außerdem gibt es den Naturpark Karwendel, der auch für die Koordination zuständig ist und Projekte das Flusssystem betreffend initiiert. Der Tourismus ist in diesem Projekte bisher nicht involviert.

GW: Es gibt einige Förderprogramme der EU, die sich unter anderem auch mit nachhaltigem Tourismus beschäftigen, wie z.B. Alpine Space und Interreg BAY-AT, oder die EUSALP und die Alpenkonvention. Stehen sie in Kontakt mit diesen Programmen und nutzen Sie sie?

EW: Mit Interreg sind wir in Kontakt und bekommen auch Förderungen für Projekte, wie z.B. das Naturparkhaus im Karwendel, welches am Eingang des Parkes platziert wird. Die anderen Programme sind mir ein Begriff, allerdings haben wir in den letzten Jahren keine Projekte mit diesen abgeschlossen. Wenn wir ein grenzübergreifendes Projekt planen, sind wir jedoch über diese Möglichkeiten informiert.

GW: Was sind aktuelle Ansätze und Ideen für nachhaltige Mobilität in ihrer Region?

EW: Das ist ein sehr wichtiges Thema für uns, welches sich auch unheimlich schnell ändert. Generell ist die Verbindung von dem Voralpenland in die Berge sehr wichtig. Wir haben das Glück dass es eine Flixbusverbindung direkt nach Seefeld gibt, und die ICE-Strecke Hamburg – Dortmund Seefeld – Innsbruck dreimal pro Woche. Außerdem gibt es kollektives Shuttlesystem ‚4 seasons travel‘, dass Gäste direkt vom Flughafen abholt und sie zu ihrer Unterkunft bringt. Der Preis ist vergleichsweise billiger, als ein normales Taxi. Das zweite Problem ist der Transport vor Ort. In der Wintersaison funktioniert es vergleichsweise gut, da es einen Skibus gibt, aber in der Sommer- und Nebensaison ist die Frequenz deutlich geringer oder gar nicht existent. Davon sind vor allem die kleineren Seitentäler betroffen. Eine Möglichkeit für diese Bedingungen wäre kollektives autonomes Fahren, wie z.B. ein Minibus.

GW: Wie ist die generelle Haltung der lokalen Bevölkerung zum Tourismus? Gibt es bereits kritische Stimmungen dafür oder dagegen?

EW: Sowohl als auch. Die Tourismusgesinnung ist ein sehr wichtiger Punkt für uns. Die Idee ist es natürlich, die lokale Bevölkerung mit ins Boot zu holen, damit es sich nicht so entwickelt, wie z.B. in Venedig oder Barcelona. Das Problem sind oftmals die Tagestouristen und Reisebusse, da der Ertrag meist nicht in unserer Region bleibt und die Einheimischen fühlen sich nicht mehr als Gewinner des Tourismus, sondern bekommen nur mehr die Probleme zu spüren.

GW: Vielen Dank für ihre Zeit und ein sehr interessantes Interview.

English // English

GW: Since 2016 you are managing director of the tourism association Seefeld. As a Tourism Association, do you have any influence on spatial planning, and if so, how?

EW: Limited from the perspective of the law, since spatial planning in Austria and Tyrol is a municipality matter. However, the tourism association has the option of commenting, especially on larger projects that are relevant to tourism.

GW: Do you participate in the financing of spatial planning related projects?

EW: Generally speaking, we do not invest in these types of projects, but we do have a say in big projects, such as this year's World Cup. Here we have invested mainly in the appearance and a coherent external appearance, so Seefeld could accordingly fit in the regional environment.

GW: Do you work with other sectors or with the Ministry of Tourism and Sustainability? And how does the collaboration work?

EW: The Ministry of Sustainability for Tourism and Sustainability is relatively new and very relevant to us, as it recognizes tourism as a cross-section of different industries. In the process, sectors such as agriculture, in general business, energy, transport, etc. are linked with each other. The first projects of this ministry in our region have to do with transport and mobility. A small example of this: the school buses are e.g. used only in the morning and after school. The idea is to use the buses for other transport purposes in the remaining time. This is already happening and shows as a good example of how tourism should be used as a cross-cutting theme.

GW: How do you see the future of winter tourism in the context of climate change? What are alternative forms of ski tourism?

EW: In our region, we only have two larger ski resorts and 4 very small ones. The region focuses more on cross-country skiing. The ski areas are partly at a height, which is secured by the increase in the snow line, but we also need the snow for the trails at the lower altitudes. In our regions, summer tourism has already overtaken winter tourism in the last three years, about 47% of overnight stays in winter and 53% in summer. The reason for this is the snow situation, but also the guest behavior. The biggest problem in our region is more frequent extreme weather situations. Major weather conditions remain virtually over the Alps, which can be long dry, but also long rainy seasons and this, of course, has an impact on tourism. Another example of this is the alpine pasture, which suffers especially during long periods of drought. In addition, the last winter with the long, heavy snowfall showed that roads were partially blocked, avalanches came down and some places could no longer be reached. Another impact of climate change is that snow depths are shifting up and artificial snow is needed in some areas. We believe that it will still be possible to snow in our areas in the near future but under difficult conditions. The problem is that there are no alternatives to alpine skiing in many areas. And assuming the snow line continues to rise, it is very difficult to imagine

alternatives in the lower areas. Many valleys fall back on the wellness concept and plan spas, which in my opinion without beautiful nature even makes limited sense. I think that ski tourism will definitely be around in the next 15 years, but the guest behavior will change and skiing will become more and more exclusive.

GW: When does the ski season generally begin in the tourism region Seefeld?

EW: With us, it generally starts at the end of November, at the beginning of December depending on the weather and usually ends at the end of March. For the opening, it is necessary that there are some cold nights to start the artificial snow for the base of the slopes. The number of cold nights needed has been decreasing from year to year as modern technology has reduced the number. In the past, when I was still a ski instructor and there was no artificial snow, it was always a matter of concern whether the snow would arrive in time for Christmas or not. It often happens that it snows a few days in November, but the entire snow melts away again until December due to the warm temperatures and rain.

GW: How does cooperation with Bavaria work concerning tourism? And are the effects of tourism on the river ecosystem being dealt with, especially regarding the Isar?

EW: You definitely notice the border between Bavaria and Austria. In general, we do not work with Bavaria, but at the project level with Garmisch-Partenkirchen, such as with the Isar Cycle Route, which crosses the borders. There is also the Karwendel Nature Park, which is responsible for the coordination and initiates projects concerning the river ecosystem. Tourism is not involved in this project so far.

GW: There are some EU funding programs that also deal with sustainable tourism, such as Alpine Space and Interreg BAY-AT, or the EUSALP and the Alpine Convention. Are you in contact with these programs and are you using them?

EW: We are in contact with Interreg and also receive support for projects, such as the nature park house in the Karwendel, which is placed at the entrance of the park. The other programs are known, but we have not completed projects with them in recent years. However, if we are planning a cross-border project, we are aware of these possibilities.

GW: What are the current approaches and ideas for sustainable mobility in your region?

EW: This is a very important topic for us, which is also changing very fast. In general, the connection from the Alpine foothills to the mountains is very important. We are lucky that there is a Flixbus connection directly to Seefeld, and the ICE route Hamburg – Dortmund – Seefeld – Innsbruck three times a week. There is also a '4 seasons travel' collective

shuttle, which picks up guests directly from the airport and brings them to their accommodation. The price is comparatively cheaper than a normal taxi. The second problem is transport on site. In the winter season, it works comparatively well, as there is a ski bus, but in the summer and low season, the frequency is significantly lower or nonexistent. This mainly affects the smaller side valleys. One way for these conditions would be collective autonomous driving, such as a minibus.

GW: What is the general attitude of the local population towards tourism? Are there already critical sentiments for or against?

EW: Both as well. Tourism is a very important point for us. The idea, of course, is to get the local population on board so that it does not develop as it does e.g. in Venice or Barcelona. The problem is often the day trippers and coaches since the yield usually does not stay in our region and the locals no longer feel like winners of tourism, but only feel the problems.

GW: Thank you very much for your time and a very interesting interview!

6. Angelika Abderhalden [05.03.2019]
Member of WWF Switzerland and 'Pro Tierra Engadina', Collaborator in SPARE-Project

Deutsch // German

GW: Als Mitglied bei WWF, und 'der Stiftung Pro Terra Engiadina haben Sie bereits viel Erfahrung mit Flusseinzugsgebietsmanagement gesammelt. Was sind ihrer Meinung nach die wichtigsten Punkte, die bei der Erstellung dieser Pläne im Alpenraum zu beachten sind?

AA: Einer der wichtigsten Punkte ist generell die Kooperation zwischen den Alpenländern, um gemeinsame Lösungsansätze für verschiedene Themenbereiche zu finden. Außerdem ist die Zusammenarbeit der relevanten Sektoren wie z.B. Tourismus, Wasserversorgung, Landwirtschaft und Energie essenziell, um einen integralen Ansatz von Flusseinzugsgebietsmanagements zu gewährleisten. Der Wintertourismus ist vor allem wichtig im Alpenbereich, aber in Passau spielt er z.B. keine Rolle. Ein Beispiel ist das Engadin: Dort haben wir sehr hohe Übernachtungszahlen im Winter, im Vergleich zur ständigen Bevölkerung. Im Sommer sind die Zahlen geringer, jedoch treten vor allem in trockenen Sommern Probleme mit der Wasserverfügbarkeit auf. Auftretende Probleme mit der Wasserversorgung sind vor allem in sehr heißen Sommern bekannt. Sie werden entschärft, wenn der Winter schneereich war und die damit verbundene Wasserspeicherung davon profitierten konnte. 2018 gab es in vielen Regionen starke Probleme: Die Ernte war wie nahezu überall betroffen, aber zusätzlich kam es bei der Wasserversorgung zu Problemen. Die Hauptprioritäten für Flusseinzugsgebietsmanagement sind das Klima, bzw. Klimawandel und vor allem Ökologie, also Wasserverfügbarkeit und –qualität, und diese stehen immer über allen anderen Themen.

GW: Welches sind die Akteure, die ihrer Meinung nach auf jeden Fall miteinbezogen werden müssen?

AA: Das sind generell alle Wassernutzer die je nach Einzugsgebiet verschieden sind. In der Regel gehören dazu die Sektoren Energie, Wasserversorgung in den Gemeinden. Zuständige für Hochwasserschutz, Landwirtschaft und Tourismus sollten ebenfalls einbezogen werden. Unserer Meinung nach ist es allerdings auch wichtig, die Bevölkerung und vor allem Vertreter der Jugend miteinzubeziehen. Generell unterscheiden wir immer zwischen internen und externen Akteuren. Zu den internen zählen die Gemeinden, Amts- und Bundesstellen, welche man immer einbeziehen muss. Die externen Akteure beziehen sich auf alle anderen Wassernutzer, wie z.B. Tourismus, wie Wassersport und Erholung, Energie, Landwirtschaft, Fischerei und verschiedene NGOs.

GW: In der letzten E-mail erwähnten Sie, dass sie derzeit an verschiedenen Projekten arbeiten, die

sich mit dem Inn beschäftigen. Können Sie das Projekt zum Einzugsgebietsmanagement Inn weiter etwas detaillierter erläutern?

AA: Das Projekt gilt als Pilotprojekt des Kantons Graubünden. Der ursprüngliche Plan war als Perimeter den gesamten schweizer Teil des Inn zu nehmen. Allerdings war dies leider nicht möglich, da die Region des Oberengadins das Projekt aus politischen Gründen abgelehnt hatte und wir uns deshalb ausschließlich auf das Unterengadin fokussieren mussten. Das Integrale Einzugsgebietsmanagement wird teilweise vom Bund (BAFU) als Pilotprojekt für den Kanton Graubünden finanziert. Allerdings war von Anfang an das Ziel, dass wir den Austausch mit Österreich und Deutschland suchen. 2017 wurde ein länderübergreifenden Workshop organisiert, um die Akteure im Einzugsgebiet Inn aus den drei Ländern zusammenzubringen. Dabei hat sich herauskristallisiert, dass alle Akteure die Trinkwasserversorgung mit sehr hoher Priorität bewerten, da damit die meisten Probleme verbunden sind. Dies hat vor allem mit den saisonalen Verfügbarkeiten des Wassers zu tun und ist dazu sehr stark abhängig vom Klima und eben der Nutzung. Wenn es im Sommer sehr heiß ist und die Landwirte bewässern wollen, herrscht Knappheit in anderen Sektoren der Wasserversorgung. Außerdem ist auch der Schutz vor Wasser als sehr wichtig angesehen worden. Denn selbst wenn es im Sommer sehr heiß und trocken ist, können starke Niederschläge vorkommen und damit Rufen oder Überschwemmungen auslösen. Ein anderer relevanter Punkt ist die Geschiebedynamik. Entlang des Inn ist die Wasserkraftnutzung deutlich sichtbar. Dadurch ist die natürliche Abflussdynamik beeinflusst. Durch geringere Abflüsse wird das Geschiebe nicht regelmässig. Ein anderer wichtiger Faktor ist der Klimawandel und der damit verbundene schmelzende Permafrost. Um nun zu dem aktuellen Stand des Projekts zu kommen: Momentan stellen wir die Situationsanalyse fertig und darauf folgt das sogenannte 'Umsetzungskapitel'. Der Bericht wird der Region abgegeben und darauf ein Gremium gegründet mit jeweils einem Zuständigen pro Gemeinde. Sobald es Probleme oder Projekte im Bereich Wasser gibt, treffen sie sich und entscheiden gemeinsam. Das Projekt ist eher ein Prozess und wird nicht mit einem Bericht abgeschlossen, sondern implementiert und ständig weiterentwickelt.

GW: Was war die Rolle der EUSALP in diesem Prozess?

AA: Wir standen eigentlich in ständigem Kontakt, da sie EUSALP im Grunde die gleichen Ziele verfolgt. Allerdings fokussiert sie auf einer höheren Ebene, also speziell auf länderübergreifende Absprachen und Flusseinzugsgebietsplanung, generell Governance für alpine Gewässerwirtschaft. EUSALP sucht immer 'Best Practice'-Beispiele, und dafür war unser Projekt gut geeignet, um es anderen Regionen weiterzugeben; Sie spielen quasi die Multiplikatorenrolle in diesem Kontext. Andererseits ist es auch hilfreich, wenn man die gleichen Ziele wie EUSALP verfolgt und dadurch die Unterstützung der

AGs hat, länderübergreifende Projekte bei Förderinstitutionen wie z.B. Interreg einzugeben.

GW: Außerden haben Sie erwähnt, dass Sie derzeit an einem grenzüberschreitenden Aktionsplan am Inn arbeiten. Können Sie das etwas detaillierter erläutern?

AA: Das Projekt ist von WWF Schweiz, Österreich und Deustschland initiiert und in Zusammenarbeit mit der Universität Innsbruck, der Verbund AG und den verschieden Amtsstellen der Länder als Partner weiterentwickelt worden. Es ist ein relativ breit aufgestelltes Projekt und man versucht dabei direkt mit den Wassernutzern zusammenzuarbeiten. Dies ist besonderes relevant, da durch die EU Wasserrahmenrichtline der gesamte Inn, einbezüglich der Wasserkraftwerke, durchgängig sein muss und damit muss auch die Pflicht zur Revitalisierung oder zu Massnahmen zur Förderung der Durchgängigkeit wahrgenommen werden müssen. Das Projekt begrenzt sich auf den österreichischen und bayrischen Teil des Inns und fokussiert sich auf Sensibilisierungs- und Umsetzungsmaßnahmen mit einem besonderen Augenmerk auf Artenschutz. Auch bei diesem Projekt hatten wir regelmäßigen Kontakt mit EUSALP, da eines ihrer Prioritäten die Wiederherstellung der Konnektivität der Flüsse ist. Wir stellten also unser Projekt vor und es hat sich als Projekt für die Umsetzung der makroregionalen Strategie angeboten. Direkte Unterstützung erfuhren wir durch Kontakte und die Einladung zum internationalen Treffen Ende letzten Jahres in München. Daraufhin wurde mit den erwähnten Partnern ein Projektantrag an Interreg Bayern – Österreich eingereicht. Für den Fall, dass es angenommen wird, würde die Umsetzung dieses Projektes im Herbst dieses Jahres beginnen.

GW: Haben sie damals das Alpine Space Programm auch als Finanzierung in Erwägung gezogen?

AA: Das haben wir überlegt, allerdings fokussieren Alpine Space Projekte diese auf größere Projekte, d.h. auf Projekte die mehr als drei Länder miteinbeziehen. Theoretisch hätten wir noch Italien miteinbeziehen können, da diese auch zum Inn Einzugsgebiet zählen. Diesbezüglich wurden jedoch bisher keine Kontakte aufgenommen. .

GW: Und wie unterscheidet sich dieses Projekt thematisch von dem vorherigen im Engadin?

AA: Generell ist es bei diesem Projekt nicht mehr nötig, sich zu sehr auf das Abstimmen und Herausarbeiten der Konflikte zu fokussieren, da man über die meisten schon Bescheid weiß. Es geht mehr um die Verbesserung des Lebensraums für Mensch, Flora und Fauna. Ein Ziel ist, dass der Inn wieder als ökologisch intakte Lebensader wirkt. Daher kommt der Notwendigkeit eines grenzüberschreitenden Aktionsplan für Arten und Habitate mit direkter Umsetzung eine hohe Bedeutung zu. Mit der Zusammenarbeit zwischen NGO's, der Universität Innsbruck und Wassernutzern wie z.B. die Verbund

AG ist die Ziellerreichung realistisch.

GW: Außerdem erwähnten sie, dass in der EUSALP AG 7 einige Projekteingaben im aquatischen Bereich existieren. Was ist bei diesen Projekten der Hauptfokus?

AA: Generall beschäftigen sich die Projekte der AG7 mit der Governance von Alpenflüssen. Man versucht eher partizipative Prozesse, unter anderem auch das ‚Empowering‘ von verschiedenen Stakeholdergruppen. Und wie es auch in dem vorherigen Projekt beschrieben ist, das Unterstützen von Projekteingaben, die ähnliche Ziele verfolgen. Bei den großen Alpenflüssen steht eine eher politische Arbeit auf Bundes- und Landesebene im Vordergrund. Bei den kleineren Flüssen geht es eher um die Bereitstellung von Instrumenten und Wissen, um die Umsetzung, wie z.B. Revitalisierungen, schneller durchführen zu können; sie erfüllen quasi die Funktion eines ‚know how-support‘.

GW: Sie erwähnten, dass eines der Ziele das ‚Empowering‘ von Stakeholdern ist. Wer entscheidet denn heutzutage über die Gewässer und wo ist dabei das größte Problem?

AA: Das ist bei jedem Staat und teilweise auch jeder Region anders. Z.B. in der Schweiz im Kanton Graubünden liegt die Gewässerhohheit bei den Gemeinden, im Kanton Bern z.B. beim Kanton selbst. Wie sie sehen, gibt es bereits Unterschiede innerhalb der Schweiz, und das gleiche geschieht in Österreich und Deutschland. Deshalb muss man meist je nach Region entscheiden, welche Stakeholder wichtig sind. Die länderübergreifende Arbeit ist für mich daher sehr wichtig, denn dort können wir z.B. von Österreich und Italien lernen und umgekehrt. Ein Beispiel: Wir schicken das Wasser nach ‚unten‘, d.h. wenn wir viel mehr Wasser haben, wie es z.B. in der Zeit der Schneeschmelze der Fall sein kann, als die Bewohner am Unterlauf gerne hätten, sind sie abhängig von uns. Das ist ein Punkt, wo eine länderübergreifende Strategie greifen könnte, damitgrenzüberschreitende Maßnahmen erarbeitet werden. Deshalb ist die länderübergreifende Zusammenarbeit bei großen Flüssen besonders wichtig.

GW: In unserer letzten E-mail haben Sie auch von einer Flussrevitalisierung am Inn im Engadin gesprochen, die schon diesen März startet. Können sie das ein wenig mehr erläutern?

AA: Im Oberengadin gibt es schon seit längerem größere Flussrevitalisierungen. Ein grosser Anteil des Flusses ist verbaut oder begradigt. Im Unterengadin ist weniger begradigt, aber durch die Wasserkraftnutzung bestehen Probleme durch die fehlende Dynamik. Momentan arbeiten wir an der Revitalisierung der Aue Panasch und dieses Projekt ist teilweise durch Gelder aus dem ökologischen Erbsatz des Grenzkraftwerks Inn ‚GKI‘ und durch den ‚naturemade Star-Fonds von ewz finanziert. Dieser Fond bezieht sich auf ein Siegel von Ökowasser-

kraftwerken, bei welchen der Strom etwas teurer verkauft wird und ein Teil des Ertrags für ökologische Maßnahmen genutzt werden muss. Dadurch, dass dieser Fond in Zusammenhang zu Projekten mit Eingriffen in die Ressource Wasser gespiesen wird, kann man diese Gelder vor allem für Projekte, die mit Wasser verbunden sind, einsetzen.

GW: Nun zur letzten Frage. Wie sehen Sie die Zukunft des Tourismus im Zusammenhand mit dem Klimawandel?

AA: Im letzten Jahr hatten wir dazu eine sehr spannende Podiumsdiskussion, bei welcher Vertreter der Landwirtschaft und des Tourismus teilnahmen. Wir stellten die Idee des Einzugsgebietsmanagement vor und darauf bekamen wir sehr interessante Einsichten vor allem aus dem Tourismussektor. Die wichtigsten Punkte dieser Vertreter waren, dass sie vor allem mehr Angebote für den Sommer entwickeln wollen und die Zusammenarbeit mit dem Landwirtschaftssektor intensivierem müssen, um eine Möglichkeit zu haben, die Landschaft zu erhalten und nicht zu stark zu nutzen. Meiner Meinung nach brauchen wir nicht mehr Skigebiete, sondern wir sollten die existierenden gut bewirtschaften und auf deren Qualität und auf Alternativen setzen.

GW: Vielen Dank für das Interview und ihre Zeit.

English //Englisch

GW: As a member of WWF and the Pro Terra Engadina Foundation you already have a lot of experience in catchment area management. In your opinion, what are the most important points to consider when drawing up these plans in the Alpine region?

AA: One of the most important points is generally the cooperation between the Alpine countries in order to find common solutions for different topics. In addition, the cooperation of the relevant sectors, such as Tourism, water supply, agriculture, and energy are essential to ensure an integrated approach to river basin management. Winter tourism is especially important in the Alpine area, but in Passau, it plays e.g. not matter. An example is the Engadin: there we have very high numbers of overnight stays in winter, compared to the permanent population. In the summer, the numbers are lower, but especially in dry summers problems occur with the water availability. Rising problems with water supply are known especially in very hot summers. They are defused when the winter was snowy and the associated water storage could benefit from it. In 2018, there were major problems in many regions: The crop was affected as it was almost everywhere, but in addition, there were problems with the water supply. The main priorities for river basin management are climate or climate change, and above all ecology, water availability and quality, and these are always above all other issues.

GW: What are the actors that you think should definitely be involved?

AA: Generally, all water users are different depending on the catchment area. As a rule, these include the sectors of energy, water supply in the municipalities. Those responsible for flood protection, agriculture and tourism should also be involved. However, in our opinion, it is also important to involve the population and, above all, representatives of the youth. In general, we always distinguish between internal and external actors. Among the internal count the municipalities, official and federal agencies, which one must always include. The external actors refer to all other water users, e.g. Tourism, such as water sports and recreation, energy, agriculture, fishing, and various NGOs. GW: In the last e-mail you mentioned that they are currently working on various projects dealing with the river Inn. Can you explain the River Basin Management Project further in more detail?

GW: In the last e-mail you mentioned that you are currently working on various projects dealing with the Inn. Can you explain the River Basin Management Project in more detail?

AA: The project is considered a pilot project of the canton of Grisons. The original plan was to take the entire Swiss part of the Inn as a perimeter. Unfortunately, this was not possible because the region of the Upper Engadine had rejected the project for political reasons and we, therefore, had to focus exclusively on the Lower Engadine. Integral catchment area management is partly funded by the Federal Government (FOEN) as a pilot project for the canton of Grisons. However, the goal from the beginning was that we seek for exchange with Austria and Germany. In 2017, a transnational workshop was organized to bring together stakeholders in the Inn catchment area from the three countries. In the process, it has become clear that all actors value the drinking water supply with a very high priority, as this is the biggest problem. This has to do mainly with the seasonal availability of water and is very dependent on the climate and the use. When it is very hot in summer and farmers want to irrigate, scarcity prevails in other sectors of the water supply. In addition, protection against water has also been considered very important. Because even if it is very hot and dry in the summer, heavy rainfall can occur and thus cause Rufen or flooding. Another relevant point is the sediment dynamics. Along the Inn, the use of hydroelectric power is clearly visible. This influences the natural flow dynamics. Due to lower discharges, the attachment is not regular. Another important factor is climate change and the associated melting permafrost. In order to come to the current state of the project: At the moment we finish the situation analysis and this is followed by the so-called ‘implementation chapter’. The report will be submitted to the region and a panel will be established with one supervisor per municipality. As soon as there are water problems or projects, they meet and decide together. The project is more of

a process and is not completed with a report, but implemented and constantly evolving.

GW: What was the role of EUSALP in this process?

AA: Actually, we were in constant contact with EUSALP because they basically have the same goals. However, at a higher level, especially transnational agreements and catchment basin planning, it focuses on governance for alpine water management. EUSALP is always looking for 'best practice' examples, and our project was well suited to passing it on to other regions; They play the multiplier role in this context. On the other hand, it is also helpful to access transnational funding as e.g. Interreg, if one pursues the same goals as EUSALP and thereby has the support of the AGs.

GW: Besides, you mentioned that you are currently working on a cross-border action plan on the Inn. Can you explain this in more detail?

AA: The project was initiated by WWF Switzerland, Austria and Germany and further developed as a partner in cooperation with the University of Innsbruck, Verbund AG and the various offices of the federal states. It's a relatively broad project and they're trying to work directly with the water users. This is particularly relevant as the EU Water Framework Directive requires the entire Inn, including the hydroelectric power plants, to be consistent, and so must the need for revitalization or measures to promote continuity. The project is limited to the Austrian and Bavarian parts of the Inn and focuses on awareness-raising and implementation measures with a special focus on species protection. Again, we had regular contact with EUSALP on this project as one of its priorities is to restore the connectivity of the rivers. So we introduced our project and it offered itself as a project for the implementation of the macro-regional strategy. We received direct support through contacts and the invitation to the international meeting in Munich at the end of last year. As a result, a project application was submitted to the aforementioned partners to Interreg Bavaria - Austria. In case it is accepted, the implementation of this project would begin in the fall of this year.

GW: Did you also consider the Alpine Space program as a funding opportunity?

AA: We thought about that, but Alpine Space projects focus on larger projects, so on projects involving more than three countries. Theoretically, we could have included Italy, as they are also part of the Inn catchment area. In this regard, however, no contacts have been recorded so far.

GW: And how does this project differ thematically from the previous one in the Engadine?

AA: In general, this project no longer needs to focus too much on coordinating and working out the conflicts, as most people already know. It is more about

improving the habitat for humans, flora, and fauna. A goal is that the Inn again acts as an ecologically intact lifeline. Therefore, the need for a transnational action plan for species and habitats with direct implementation is very important. With cooperation between NGOs, the University of Innsbruck and water users such as Verbund AG it is realistic about the target achievement.

GW: In addition, you mentioned that in EUSALP AG 7 there are some project submissions in the aquatic area. What is the main focus of these projects?

AA: In general, AG7 projects are concerned with the governance of Alpine rivers. They try more participative processes, among other things, the empowering of different stakeholder groups. And as described in the previous project, supporting project inputs that share similar goals. The major Alpine rivers focus on more political work at the federal and state levels. The smaller streams are more concerned with providing tools and knowledge to facilitate implementation, such as revitalization; they virtually fulfill the function of know-how support.

GW: You mentioned that one of the goals is empowering stakeholders. Who decides today about the waters and where is the biggest problem?

AA: This is different for each state and sometimes every region. For example, in Switzerland, in the canton of Grisons, the municipalities are responsible for water quality, in the canton of Bern, it is the canton itself. As you can see, there are already differences within Switzerland, and the same is happening in Austria and Germany. That's why you usually have to decide which stakeholders are important, depending on the region. The transnational work is therefore very important to me, because there we can, for example, learn from Austria and Italy and vice versa. An example: we send the water down, e.g. if we have much more water, as e.g. In the time of snowmelt, as the inhabitants of the lower reaches would like to be, they are dependent on us. This is a point where a transnational strategy could apply so that cross-border measures are developed. That is why cross-border cooperation is very important for large rivers.

GW: In our last e-mail, you also talked about a river revitalization on the Inn in the Engadin, which starts this March. Can you explain that a little more?

AA: In the Upper Engadine, there have been major river revitalizations for some time now. A large portion of the river is blocked or straightened. In the Lower Engadine it is less straightened, but due to the use of hydropower problems occur by the lack of momentum. Currently, we are working on the revitalization of Aue Panas-ch and this project is partly funded by money from the ecological replacement of the Inn GKI border power station and ewz's nature-made Star Fund. This fund refers to a label of eco-hydropower plants, where the electricity is sold a bit more expensive and a part of the yield must

be used for ecological measures. The fact that this fund is used in connection with projects with interventions in the resource water, this money can be used especially for projects that are associated with water.

GW: Now coming to the last question. How do you see the future of tourism in the context of climate change?

AA: Last year we had a very exciting panel discussion with representatives of agriculture and tourism. We presented the idea of catchment management and we got very interesting insights, especially from the tourism sector. The main points of these representatives were that, above all, they want to develop more offers for the summer and intensify cooperation with the agricultural sector in order to have a chance to preserve the landscape and not overuse it. In my opinion, we no longer need ski resorts, but we should manage the existing well and rely on their quality and alternatives.

GW: Thank you for the interview and your time.

7. Elisabeth Sötz [08.03.2019]

Member of WWF Austria, Expert on Alpine Policy and the river Inn

Deutsch // German

GW: Angelika Abderhalden erwähnte in unserem letzten Gespräch, dass sie in dem Projekt über einen länderübergreifenden Flusseinzugsgebietsmanagementplan für den Inn involviert sind. Können sie das Projekt ein wenig mehr erläutern?

ES: Die langfristige Vision ist es einen Flusseinzugsgebietsmanagementplan für den Inn zu erarbeiten, allerdings sind wir uns bewusst, dass das ein langer Prozess ist, besonders bei einem länderübergreifenden Kontext, welches ca. 200 Gemeinden umfasst. In diesem Projekt, das wir jetzt zur Förderung eingereicht haben, geht es um Artenschutz und Umweltbildung, (noch) nicht um die anderen Sektoren. Bei dem Flusseinzugsgebietsmanagementplan des Engadins kam es ja schon zu Schwierigkeiten und einige Gemeinden sind letztendlich nicht daran beteiligt. Wir sind uns der Herausforderung bewusst und wollen uns schrittweise an diese Vision nähern. Im Sommer diesen Jahres werden wir Bescheid bekommen, ob unser Projekt angenommen wird. Es wäre auf jeden Fall ein übergreifendes Konzept zum Artenschutz. Momentan gibt es bereits verschiedene Pläne, allerdings nur für Teilstrecken oder einzelne Arten des Inns, wie z.B. ein Leitbild für Fische des bayrischen Inn. Die Idee unseres Projektes ist es, die existierenden Pläne und Studien zu allen großen Tier- und Pflanzengruppen zusammenszusetzen und dabei bereits aktive Maßnahmen zu verbinden, also eine eher koordinative Rolle zu erfüllen. Dabei steht die Kommunikation an erster Stelle und deshalb muss vor allem die lokale Bevölkerung miteinbezogen werden. Wir ermöglichen dies mit zwei Arbeitspaketen, eines für Umweltbildung und eines für Dialoge auf einer eher politischen Ebene. Bei weiteren werden Vertreter wichtiger wirtschaftlicher Sektoren, wie Landwirtschaft, Tourismus, Energie, sowie Gemeinden und Schutzgebietsbetreuung eingeladen. Neben den wirtschaftlichen Interessen sind auch die Konflikte innerhalb des Naturschutzes besonders wichtig, wie es z.B. am Inn zwischen den Fischereiverbänden und anderen Arten passiert. Die Natur ist letztendlich ein komplexes System, bei welcher verschiedene Teilsysteme ihre Berechtigungen haben. Der Fluss selbst ist ein Ökosystem, jedoch auch Uferzonen wie z.B. der Auwald oder extensive Weidewiesen. Um nun zusammenzufassen, bei dem Projekt handelt es sich eher um einen Prozess, der sich auf den Artenschutz spezialisiert und zeigen will, dass eine grenzüberschreitende Arbeit funktionieren kann. Wenn wir zeigen können, dass die Zusammenarbeit funktioniert, hoffen wir, diesen Ansatz auch auf die Wasserwirtschaft anwenden zu können. Die Periode des Projekts für den Artenschutz beschränkt sich auf drei Jahre, und danach würde langfristig die Vision auf die Wasser-

wirtschaftssektoren folgen.

GW: Wie funktioniert die momentane Zusammenarbeit zwischen Bayern und Österreich den Inn betreffend? Was sind die größten Probleme dabei?

ES: Das größte Problem sind die Vorurteile über die Schwierigkeit der Zusammenarbeit. Seit langer Zeit gibt es den Regensburger Vertrag zwischen den beiden Ländern, welches besagt, dass Bayern und Österreich in Sachen Wasser zusammenarbeiten müssen. Die zugehörige Kommission besteht ausschließlich aus Beamten und trifft sich ein- bis zweimal im Jahr. Außerdem haben wir 2017 einen sogenannten ‚Flussdialog‘ vorgeschlagen. Dabei handelt es sich um einen Workshop, bei welchem verschiedene Stakeholder zum Austausch eingeladen werden, um sich zu informieren, was in anderen Teilen des Inns bereits umgesetzt wird. Dieser Vorschlag wurde von der öffentlichen Verwaltung angenommen, jedoch haben sie sich nicht bereit erklärt die Organisation zu übernehmen, da die Zusammenarbeit zwischen drei Ländern als zu komplex angesehen wurde. Daraufhin haben wir uns mit der Universität Innsbruck getroffen und entschieden, zusammen zu organisieren. Der Schlüsselmoment in diesem Workshop war, dass wir in der Vorbereitung mit dem Leiter der Umweltschutzabteilung des Landes Tirols ein Gespräch hatten, in welchem er meinte, dass er eh wüsste, was in Bayern den Inn betreffend geschieht. Nach dem Workshop allerdings gab er zu, dass er dabei etwas neues gelernt hätte. Dazu noch eine andere Anekdote: Die Vils ist ein relativ kleiner Fluss, der in Tirol entspringt, darauf ca. 15 km in Bayern fließt und später wieder in Tirol in den Lech mündet. Dort schlug man ein integriertes Flussmanagement vor, allerdings wurde es wieder nur im Tiroler Teil ausgeführt, da die Zusammenarbeit mit Bayern als zu schwierig angesehen wurde. Kurz vor der Fertigstellung des Projekts stoßen sie aber auf ein Hindernis: Sie berücksichtigen nicht, was die Bayern bereits geplant haben. Dies beschreibt wieder das Vorurteil in den Köpfen. Ich bin mir sicher, dass die grenzüberschreitende Zusammenarbeit vieles komplizierter macht, aber das Verhältnis von Aufwand zu Nutzen ist im Nachhinein viel kleiner, als man sich vorstellt.

GW: Wie hat die Einführung der Europäischen Wasserrahmenrichtlinie 2000 die Zusammenarbeit verändert?

ES: Seit der WRRL haben Österreich und Deutschland die gleichen Ziele was Wasser angeht. Nationale und regionale Gesetze müssen der WRRL angepasst sein und resultiert daher in einer kohärenteren Gesetzeslage als zuvor. An und für sich ist das Ziel der WRRL Flusseinzugsgebietsmanagementpläne zu erstellen, jedoch geht sie in der Umsetzung einen Schritt zurück, da die grenzüberschreitende Zusammenarbeit als zu schwierig angesehen wird und letztendlich in nationalen und regionalen Plänen resultiert, die zusammenpassen sollen. Die ICPDR, die Donauschutzkommission, verwaltet die Flusseinzugsgebietsmanagementpläne und stückelt diese einzelnen

nationalen Pläne letztendlich zusammen. Ich glaube, auf einer theoretischen Ebene ist man sich bewusst, dass man grenzüberschreitend zusammenarbeiten muss, aber der Mut zur Umsetzung fehlt momentan noch. Dadurch dass man in Bayern und Österreich auch die gleiche Sprache spricht, sollte die Zusammenarbeit erleichtert sein, vor allem bei der Miteinbeziehung der lokalen Bevölkerung.

GW: Die Initiatoren sind WWF Österreich, Deutschland und Schweiz mit der Universität Innsbruck, der Verbund AG und verschiedenen Amtsstellen der Länder als Partner. Welche Stakeholder waren bei der Erarbeitung involviert?

ES: Die ursprüngliche Idee war zwischen dem Tiroler Fischereiverband und WWF Schweiz und Österreich. Das kommt z.B. daher, dass wir ähnliche Ansichten der Wasserkraft betreffend haben. Heutzutage laichen die meisten Fische z.B. gar nicht mehr im Inn selbst, sondern werden als Larven eingesetzt und im Nachhinein von den Fischern wieder rausgefischt. Dies ist letztendlich kein natürliches System, aber solange das Ökosystem nicht verbessert wird, haben die Fischer quasi keine andere Möglichkeit. Außer den Fischern gibt es im Tiroler Teil auch noch andere assoziierte Partner, wie z.B. Birdlife, die naturhistorische Sammlung des Landesmuseums, verschiedene Schulen, Umweltbildungsinstitutionen, EUREGIO Inntal, Wasserwirtschaft in Tirol und Oberösterreich. Das schwierigste war es bayrische Partner zu finden aufgrund einer juristischen Besonderheit. Der gesamte bayrische Inn ist eine Staukette durch die Vielzahl der installierten Wasserkraftwerke, die mittlerweile alle einer Tochterfirma der Verbund AG gehören. Der Verbund Konzern in Bayern hat insgesamt fünf Tochtergesellschaften, davon drei am Inn. Daher hat das Land Bayern in der Vergangenheit das sogenannte ‚Heimfallrecht‘ eingeführt, also das Recht den Fluss zurückzufordern. Allerdings hat er sich dagegen entschieden und im Gegenzug die Verantwortung der Umsetzung der WRRL an die Verbund AG abgegeben. Daher ist Verbund AG unser Partner als Rolle des bayrischer Delegierter des Umweltministeriums. Überspitzt formuliert ist der Inn in Privatbesitz und daher gibt es auch viel weniger Stakeholder. Die einzige Naturschutzorganisation, die noch am Inn arbeitet, ist ‚Bund Naturschutz Bayern‘, welche sich durch die Zusammenarbeit mit Verbund AG jedoch gegen eine Partnerschaft entschieden haben. Das gleiche wäre bei uns passiert, wenn es um eine Partnerschaft mit den Engadiner oder Tiroler Kraftwerken gegangen wäre, da die Konflikte zu groß sind. Wir haben TIWAG und IBK (Innsbrucker Bezirkskraftwerke) über unser Projekt informiert, diese verstehen aber Artenschutzmaßnahmen nur als Ausgleich zu Verschlechterungen durch neue Kraftwerke. Das ist jedoch für uns, den WWF, eine Grenze, da wir Artenschutz nicht als Ausgleichsmaßnahme akzeptieren können, sondern es als zusätzliche Verbesserungsmaßnahme sehen.

GW: Werden ‚lokale‘ Akteure einbezogen? Und wenn ja, wie?

ES: Dazu gibt es zwei verschiedene Arbeitspakete, Umweltbildung und Kommunikation. Bei dem Arbeitspaket Kommunikation sollen Veranstaltungen zum Austausch organisiert werden, bei denen alle Gemeinden am Inn, die Bezirksbehörden, die Tourismusverbände, die Landwirtschaftskammern, Fischereiverbände und die Kraftwerksbetreiber explizit eingeladen werden, jedoch das Event generell öffentlich zugänglich für jeden ist. Die Umweltbildung zielt mehr auf die lokale Bevölkerung ab. Dabei arbeiten wir besonders viel mit Schulen zusammen und bieten Naturkurse, sogenannte ‚Flusserlebnistage‘ und generell Projektarbeiten.

GW: Wie stellen Sie sich die Koordination und Kommunikation zwischen den verschiedenen Akteuren vor?

ES: Das wichtigste dabei ist Arbeitszeit. Die Kommunikation ist sehr intensiv und man benötigt Personen, die auch die Zeit dafür haben und daher werden wir auch eine extra Kommunikationsbeauftragte für das Projekt anstellen, die Gemeindeämter und Vereine kontaktiert. Wenn man ein Netzwerk hat, kann man viel über Internetplattformen machen, aber um überhaupt ein Netzwerk zu erschaffen, braucht es zuerst direkte Kontakte. Der Austausch soll vor allem während den Veranstaltungen stattfinden, aber ggf. auch runde lokale Tische können die Kommunikation unterstützen. Das schwierigste bei der Kommunikation ist, über das Vorurteil der Komplexität der Zusammenarbeit hinwegzuschauen.

GW: Was war die Rolle der EUSALP bei der Erarbeitung des Projekts?

ES: Der Hauptansprechpartner des Projekts ist die EUSALP AG 7, dessen Priorität ‚Ecological Connectivity & Green Infrastructure‘ ist. Diese AG erstellte eine Liste mit Flüssen und territorialen Gebieten, die einen grenzüberschreitenden Kontext besitzen und der Inn ist darunter miteinbegriffen. Diese AG gibt uns die Strategie vor, an der sich unser Projekt orientiert und hilft uns dabei auch, eine Finanzierung zu erlangen. D.h. unser Projekt positioniert sich innerhalb mehrerer Rahmen: Der WRRL, der Flora-Fauna-Habitat-Richtlinie, der Vogelschutzrichtlinie und letztendlich der Prioritäten der EUSALP AG 7 und AG 6 (Natural Resource Management).

GW: Meine Masterthesis beschäftigt sich vor allem mit der Beziehung des Vor- und inneren Alpenlandes. München und Umgebung liegt nicht am Inn, aber jedoch ist deren Bevölkerung eine der größten Strom- und Tourismuskonsumenten der Alpen. Involviert sind z.B. auch Konsumstakeholder, also Sektoren, die nicht direkt mit dem Inn verbunden sind, zur Erarbeitung dieses Flusseinzugsgebietsmanagementsplans?

ES: Ich würde sagen im Denken ja, aber am Projekt direkt nicht, da es auch Grenzen in der Machbarkeit gibt. WWF Deutschland beschäftigt sich intensiv mit der Isar und organisiert z.B. Flusserlebnistage.

München ist als Stadt generell auch relativ weit im Hinblick auf die Bevölkerung zu den Flüssen bringen; das beinhaltet die Ökologisierung des Stadtgebiets, die heutzutage als Naherholungsgebiet genutzt wird.

GW: Vielen Dank für Ihre Zeit und das interessante Interview.

English // Englisch

GW: Angelika Abderhalden mentioned in our last conversation that you are involved in the project for a cross-border river basin management plan for the Inn. Can you explain the project a little more?

ES: The long term vision of this project is to develop a River Basin Management Plan for the Inn, however, we are aware that this is a long process, especially in a transnational context, which includes about 200 communities. The Engadin River Basin Management Plan has already been in trouble and some communities are now not involved in the process. We are aware of the challenge and want to gradually approach this vision. In the summer of this year, we will be informed if our project is accepted. It would definitely be an overarching concept for species protection. Currently, there are already different plans, but only for partial routes or individual types of the Inn, such as a mission statement for fish of the Bavarian Inn. The idea of our project is to put together the existing plans and studies of all the bigger animal and plant groups and to combine already active measures, so to fulfill a more coordinative role. Communication is the top priority, which is why the local population must first and foremost be involved.

We do this with two work packages, one for environmental education and one for dialogue at a more political level. For the latter, representatives of important economic sectors, such as agriculture, tourism, energy, as well as municipalities and nature reserve management. In addition to economic interests, conflicts within nature conservation are also particularly important, as it happened e.g. at the Inn between the fishing associations and other species. Nature is ultimately a complex system in which different subsystems have their permissions. The river itself is an ecosystem, but also riparian zones such as the riparian forest or extensive meadows. To sum up, the project is more of a process that specializes in biodiversity and wants to show that cross-border cooperation can work. If we can show that cooperation works, we hope to apply that approach to water management as well. The period of the biodiversity project is limited to three years, and then the vision would follow on the water sectors.

GW: How does the current cooperation between Bavaria and Austria concerning the Inn work? What are the biggest problems with this?

ES: The biggest problem is the prejudices of the difficulty of working together. Since a long time, the Regensburg Treaty between the two countries exists, which states that Bavaria and Austria have to work together in matters of water. The associated commission consists exclusively of officials and meets once or twice a year. In addition, in 2017 we proposed a so-called 'river dialogue'. It is a workshop in which various stakeholders are invited to exchange information about what is already being implemented in other parts of the Inn. This proposal was accepted by public work, but they did not agree to take over the organization, as cooperation between three countries was considered too complex. Then we met with the University of Innsbruck and decided to organize together. The key moment in this workshop was that we had a conversation in preparation with the head of the environmental department of the state of Tyrol, in which he said that he knew anyway, what happens in Bavaria concerning the Inn. After the workshop, however, he admitted that he had learned something new. In addition, another anecdote: The Vils is a relatively small river, which rises in Tyrol, then flows about 15 km in Bavaria and later flows back into the Tyrol in the Lech. There they proposed integrated river management, however, it was again carried out only in the Tyrolean part, as the cooperation with Bavaria was considered too difficult. Shortly before the completion of the project, however, they encounter an obstacle: they did not take into account what Bavaria had already planned. This again describes the prejudice in the mind. I am sure that cross-border cooperation will make things much more complicated, but in hindsight, the ratio of effort and benefit is much smaller than you would expect.

GW: How did the introduction of the European Water Framework Directive in 2000 change cooperation?

ES: Since the WFD Austria and Germany have the same goals regarding water. National and regional laws must be adapted to the WFD and therefore result in a more coherent legal situation than before. The objective of the WFD is to create river basin management plans, but then it takes a step back in its implementation, as cross-border cooperation is considered too difficult and ultimately results in national and regional plans that should fit together. The ICPDR, the Danube Conservation Commission, manages the river basin management plans and ultimately pieces together these individual national plans. I believe that on a theoretical level, people are aware that we have to work together beyond borders, but the momentum for implementation is still lacking. The fact that the same language is spoken in Bavaria and Austria should facilitate cooperation, especially with the involvement of the local population.

GW: The initiators are WWF Austria, Germany, and Switzerland with the University of Innsbruck, the Verbund AG, and various regional authorities as

partners. Which stakeholders were involved in the development?

ES: The original idea was between the Tyrolean Fisherman Association and WWF Switzerland and Austria because we have e.g. similar views about hydropower. Nowadays most fish spawn, e.g. no longer in the Inn itself, but are used as larvae and fished out in the aftermath of the fishermen again. This is not a natural system after all, but as long as the ecosystem is not improved, fishermen have virtually no other option. In addition to the fishermen, there are also other associated partners in the Tyrolean part, such as Birdlife, the natural history collection of the Federal Museum, various schools, environmental education institutions, EUREGIO Inntal, water management in Tyrol and Upper Austria. The hardest thing was to find Bavarian partners because of a legal peculiarity. The entire Bavarian Inn is a congestion chain due to the large number of installed hydroelectric power plants, which now all belong to a subsidiary of Verbund AG. The Verbund Group in Bavaria has a total of five subsidiaries, three of which are located on the Inn. That is why the state of Bavaria has in the past introduced the so-called 'right of residence', in other words, the right to reclaim the river. However, they decided against it and in return gave the responsibility of the implementation of the WFD to Verbund AG. Therefore, Verbund AG is our partner as the role of the Bavarian delegate of the Ministry of Environment. To put it bluntly, the bavarian Inn is privately owned and therefore fewer stakeholders exist. The only conservation organization still working on the Inn is the "Bund Naturschutz Bayern", which, however, decided against the partnership through our cooperation with Verbund AG. The same thing would have happened to us when it came to a partnership with the Engadine or Tyrolean power plants because the conflicts are too big. We have informed TIWAG and IBK (Innsbrucker Bezirks Kraftwerke) about our project and they have argued that species protection is their compensatory measure. However, this is a limit for us because we can not accept conservation as a compensatory measure, but see it as an additional measure of improvement.

GW: Are 'local' actors involved? And if so, how?

ES: There are two different work packages, environmental education, and communication. The communication work package aims to organize exchanges that explicitly invite all communities on the Inn, district authorities, tourism associations, chambers of agriculture, fisheries associations and power plant operators, but the event is generally open to the public. Environmental education is more targeted at the local population. We work a lot with schools and offer nature courses, so-called 'Flusserlebnistage' and general project work.

GW: How do you imagine the coordination and communication between the different actors?

ES: The most important thing is the working time. The communication is very intense and you need

people who have the time for it and therefore we will also hire an extra communication officer for the project, who will contact municipal offices and associations. If you have a network, you can do a lot via internet platforms, but to create a network at all, you need direct contacts first. The exchange should take place especially during the events, but possibly also round local tables can support the communication. The most difficult part of communication is again overlooking the prejudice of the complexity of collaboration.

GW: What was the role of EUSALP in the development of the project?

ES: The main contact person of the project is EUSALP AG 7, whose priority is 'Ecological Connectivity & Green Infrastructure'. This AG produced a list of rivers and territorial areas that have a transboundary context and the Inn is included. This AG sets the strategy for our project and helps us to obtain financing. Our project is positioned within several frameworks: the WFD, the Flora and Fauna Directive, the Birds Directive and finally the priorities of EUSALP AG 7 and AG 6 (Natural Resource Management).

GW: My master thesis deals above all with the relationship between the pre- and inner-Alpine areas. Munich and its surrounding area are not located along the Inn, but their population is one of the biggest consumers of electricity and tourism in the Alps. Do you also involve consumption stakeholders, so sectors that are not directly located next to the Inn, to develop this river basin management plan?

ES: I would say in thinking yes, but not directly in the project, because there are also limits to the feasibility. WWF Germany deals intensively with the Isar and organizes e.g. River adventure days. As a city, Munich is generally relatively far in integrating the river into the city and its population; this includes the greening of the urban area, which is now used as a recreational area.

GW: Thank you very much for your time and the interesting interview.

IV.III Data and tables

Municipalities of Bavaria		Working population (excluding self employed)	Population 31.12.2017	Total power consumption (MWh/a)	Average consumption	Overnight stays/ Winter season 2017/2018	Tourism intensity	Jobs in Tourism (2016 - WKO)		GDP per capita
09	Bayern	7.404.000	12.997.204					179.682		44 215
091	Oberbayern	2.782.000	4.649.534					316.438	7%	54 554
09162	München, Landeshauptstadt	1.087.300	1.456.039	6.889.996	4,73	7.273.214	5,00	115.415	8%	75 186
09163	Rosenheim (Krfr.St)	48.600	63.080	1.372.352	21,76	80.130	1,27	4.838	8%	49 671
09171	Altötting (Lkr)	61.500	110.338	4.691.935	42,52	114.203	1,04	4.715	4%	46 518
09172	Berchtesgadener Land (Lkr)	53.500	105.052	450.745	4,29	903.560	8,60	6.150	6%	31 376
09173	Bad Tölz-Wolfratshausen (Lkr)	56.500	126.572	414.884	3,28	410.211	3,24	5.986	5%	28 037
09174	Dachau (Lkr)	60.400	152.703	465.352	3,05	150.185	0,98	7.175	5%	27 183
09175	Ebersberg (Lkr)	57.400	140.800	468.229	3,33	188.344	1,34	8.405	6%	30 967
09176	Eichstätt (Lkr)	56.000	131.646	773.424	5,88	264.205	2,01	4.838	4%	31 479
09177	Erding (Lkr)	62.200	136.884	464.875	3,40	602.987	4,41	8.774	6%	30 155
09178	Freising (Lkr)	103.300	177.997	870.616	4,89	436.100	2,45	19.434	11%	44 403
09179	Fürstenfeldbruck (Lkr)	76.800	217.831	589.907	2,71	119.895	0,55	9.758	4%	24 952
09180	Garmisch-Partenkirchen (Lkr)	44.500	88.155	299.501	3,40	1.269.564	14,40	5.904	7%	28 265
09181	Landsberg am Lech (Lkr)	54.500	119.141	641.969	5,39	87.610	0,74	5.863	5%	31 807
09182	Miesbach (Lkr)	49.900	99.189	404.787	4,08	822.564	8,29	6.601	7%	33 297
09183	Mühldorf a.Inn (Lkr)	55.200	114.486	577.150	5,04	75.885	0,66	5.207	5%	31 513
09184	München (Lkr)	275.600	346.433	1.842.208	5,32	1.027.886	2,97	41.779	12%	100 475
09186	Pfaffenhofen a.d.Ilm (Lkr)	54.200	126.244	831.559	6,59	115.667	0,92	6.150	5%	39 190
09187	Rosenheim (Lkr)	120.600	259.449	1.372.352	5,29	880.285	3,39	13.120	5%	30 263
09188	Starnberg (Lkr)	68.800	135.545	473.924	3,50	237.654	1,75	7.134	5%	40 658
09189	Traunstein (Lkr)	94.800	176.290	1.401.690	7,95	901.660	5,11	9.635	5%	38 227
09190	Weilheim-Schongau (Lkr)	70.400	134.252	830.425	6,19	227.048	1,69	6.724	5%	37 728
092	Niederbayern	663.500	1.230.037		-	4.832.064	3,93	63.632	5%	37 050
09261	Landshut (Krfr.St)	56.400	71.193	357.712	5,02	104.237	1,46	5.535	8%	55 345
09262	Passau (Krfr.St)	52.100	51.781	366.237	7,07	201.123	3,88	5.863	11%	63 668
09263	Straubing (Krfr.St)	40.500	47.586	293.109	6,16	70.998	1,49	4.674	10%	49 660
09271	Deggendorf (Lkr)	69.300	118.741	1.822.282	15,35	192.373	1,62	6.355	5%	37 872
09272	Freyung-Grafenau (Lkr)	37.300	78.345	322.367	4,11	557.482	7,12	3.690	5%	27 925
09273	Kelheim (Lkr)	54.000	121.119	962.631	7,95	362.349	2,99	4.838	4%	31 038
09274	Landshut (Lkr)	63.300	157.239	565.283	3,60	101.711	0,65	6.068	4%	34 003
09275	Passau (Lkr)	87.700	190.504	1.345.492	7,06	1.676.168	8,80	9.389	5%	28 042
09276	Regen (Lkr)	39.700	77.489	423.409	5,46	835.465	10,78	3.649	5%	30 327
09277	Rottal-Inn (Lkr)	56.400	120.371	423.583	3,52	403.681	3,35	5.412	4%	29 625
09278	Straubing-Bogen (Lkr)	39.700	99.838	438.253	4,39	263.918	2,64	3.075	3%	26 839
09279	Dingolfing-Landau (Lkr)	67.100	95.831	845.218	8,82	62.559	0,65	5.043	5%	65 627
093	Oberpfalz	627.100	1.104.407		-	2.118.214	1,92	58.138	5%	39 419
09361	Amberg (Krfr.St)	35.800	42.248	506.856	12,00	37.440	0,89	2.624	6%	52 635
09362	Regensburg (Krfr.St)	155.800	150.894	1.354.248	8,97	450.742	2,99	14.391	10%	82 967
09363	Weiden i.d.OPf. (Krfr.St)	41.800	42.543	479.685	11,28	35.407	0,83	5.576	13%	53 734
09371	Amberg-Weizbach (Lkr)	39.700	102.836	506.856	4,93	103.847	1,01	3.690	4%	25 579
09372	Cham (Lkr)	72.200	127.339	619.051	4,86	746.958	5,87	6.519	5%	34 012
09373	Neumarkt i.d.OPf. (Lkr)	65.600	132.644	629.171	4,74	170.542	1,29	5.904	4%	36 199
09374	Neustadt a.d.Waldnaab (Lkr)	39.800	94.486	479.685	5,08	112.725	1,19	2.952	3%	29 312
09375	Regensburg (Lkr)	65.900	192.200	598.148	3,11	176.411	0,92	7.216	4%	24 254
09376	Schwandorf (Lkr)	75.900	146.487	1.108.075	7,56	143.655	0,98	6.560	4%	34 101
09377	Tirschenreuth (Lkr)	34.700	72.730		-	140.487	1,93	2.747	4%	33 698

Municipalities in Austria

Tirol	323.260	754.821	5.439.995		27.580.594	36,54	46.480	14%	45.200 €
Innsbruck Stadt	52.974	132.164	952.506	7,21	737.644	5,58	7.283	14%	43.300 €
Imst	16.793	60.088	433.054	7,21	4.007.929	66,70	5.217	31%	46.100 €
Innsbrucker Land	48.363	179.338	1.292.489	7,21	2.839.759	15,83	7.322	15%	43.300 €
Kitzbühel	20.083	63.879	460.376	7,21	3.416.675	53,49	6.938	35%	44.800 €
Kufstein	34.634	109.695	790.572	7,21	2.287.716	20,86	5.422	16%	
Landeck	12.781	44.379	319.839	7,21	6.239.332	140,59	5.447	43%	46.100 €
Reutte	10.322	32.688	235.582	7,21	1.733.423	53,03	3.406	33%	46.700 €
Schwaz	28.334	83.826	604.134	7,21	5.407.888	64,51	8.216	29%	44.800 €
Salzburg	263.083	555.298	4.002.033	7,21	15.974.366	28,77	49.671	19%	50.100 €
Salzburg Stadt	101.501	154.228	1.111.521	7,21	1.226.782	7,95	11.964	12%	
Flachgau	60.226	152.319	1.097.763	7,21	661.663	4,34	7.267	12%	52.900 €
Tennengau	19.885	60.164	433.602	7,21	493.705	8,21	2.123	11%	
Pongau	35.443	80.570	580.668	7,21	5.793.531	71,91	12.193	34%	42.100 €
Pinzgau	38.686	87.477	630.447	7,21	6.744.242	77,10	14.774	38%	
Lungau	7.342	20.319	146.439	7,21	1.054.443	51,89	1.351	18%	33.600 €
Oberösterreich	611.330	1.482.300	10.682.936	7,21	2.981.670	2,01	57.464	9%	43.100 €
Braunau am Inn	41.064	104.426	752.598	7,21	94.758	0,91	2.837	7%	
Schärding	21.491	57.327	413.156	7,21	50.069	0,87	2.083	10%	42.100 €
Ried im Innkreis	25.787	61.210	441.140	7,21	93.030	1,52	2.432	9%	

Sources: Bayrisches Landesamt für Statistik, WKO Österreich, Statistica Österreich

		Jan	Winter		Apr	Spring		Jul	Summer		Oct	Autumn		Dec	
			Feb	Mar		May	Jun		Aug	Sep		Nov			
München-Stadt	1989		1,69	3,82	8,81	8,42	14,88	15,72	19,05	18,38	14,54	10,75	2,5	2,64	
	Temperature	last 10 years	0,86	0,97	5,71	10,91	14,24	17,81	20,06	19,69	14,98	10,09	5,77	2,59	10,31
		last 30 years	0,91	1,89	5,81	9,90	14,59	17,63	19,53	19,27	14,58	10,11	4,79	1,68	10,06
		Change	-0,35			0,28			0,45			0,62			1,00
Precipitation	last 10 years		68,81	40,86	49,07	45,40	113,64	138,29	110,63	112,70	80,27	62,88	49,80	60,85	933,20
	last 30 years		49,79	44,47	60,47	60,74	102,76	120,71	122,11	111,83	81,04	65,73	61,56	59,18	940,40
	Change		1,34			4,37			-3,79			-4,32			-2,40
Mittenwald	1989		0,73	2,63	5,76	6,44	10,22	11,6	15,1	14,55	11,7	8,88	2,14	1,36	
	Temperature	last 10 years	-1,87	-1,67	2,72	7,36	10,58	14,32	15,92	15,87	12,27	8,14	4,25	-0,13	7,31
		last 30 years	-1,01	-0,39	2,99	6,59	11,10	14,23	15,84	15,51	11,73	8,17	3,25	-0,25	7,31
		Change	-0,80			0,11			0,33			0,36			0,00
Precipitation	last 10 years		90,72	53,74	65,73	70,38	196,60	202,00	184,65	189,05	127,65	106,84	55,10	73,96	1416,42
	last 30 years		70,92	70,13	93,72	96,28	155,55	188,77	186,39	182,00	123,60	90,02	79,50	76,39	1413,27
	Change		-8,19			9,46			3,12			-3,34			1,05
Innsbruck U.															
	Temperature	last 10 years	-0,14	1,29	6,28	11,27	14,84	18,38	19,99	19,58	14,98	10,25	5,2	0,59	10,21
		last 30 years	-0,40	1,40	5,96	10,15	14,88	17,90	19,46	18,99	14,50	10,04	4,42	0,11	9,78
		Change	0,16			0,52			0,53			0,49			1,70
Precipitation	last 10 years		59,90	35,80	43,70	44,50	90,00	117,20	123,70	159,40	84,00	77,50	51,78	47,33	934,8
	last 30 years		43,24	39,31	53,72	57,48	80,00	116,86	126,59	135,38	79,21	66,14	61,04	47,86	906,8
	Change		1,04			-0,88			8,64			0,53			9,33
Patscherkofel															
	Temperature	last 10 years	-6,63	-7,66	-4,18	-0,31	3,15	7,13	9,37	9,6	5,62	2,21	-1,18	-5,04	1,01
		last 30 years	-5,93	-6,72	-4,42	-1,64	3,14	6,75	8,85	9,07	5,06	2,23	-2,48	-5,37	0,71
		Change	-0,47			0,57			0,54			0,54			1,18
Precipitation	last 10 years		51,1	35,4	41,4	46,7	91,4	115,4	115,3	155,7	88,8	70,3	43,9	41,6	897,0
	last 30 years		39,54	37,56	55,46	53,36	71,93	111,48	124,28	130,52	76,79	58,03	47,24	42,62	848,8
	Change		-1,55			5,58			9,40			2,62			16,05
Brenner															
	Temperature	1990	-2,3	-0,2	2,1	2	9,4	10,9	13,3	13,5	8,2	6,7	-0,8	-6	
		last 10 years	-3,51	-3,52	0,42	5,41	9	12,68	14,83	14,69	10,17	6,23	1,68	-2,5	5,47
		last 30 years	-3,64	-3,20	0,17	3,84	8,67	11,95	13,86	13,60	9,35	5,56	0,34	-3,20	4,78
Precipitation		Change	0,02			0,88			0,96			0,90			2,76
	last 10 years		61,0	45,7	51,2	62,1	121,2	141,4	141,7	184,1	122,7	92,7	85,5	61,5	1170,811
	last 30 years		43,0	37,6	51,4	69,7	104,2	145,6	151,0	151,3	104,5	99,1	91,7	52,1	1101,242
	Change		8,63			1,75			13,90			-1,08			23,19
			-0,29			0,47			0,56			0,58			
			0,25			4,05			6,25			-1,12			

Sources: Deutscher Wetterdienst,ZAMG

IV.IV EUSALP '3-Horizon' workshop

The workshop called *'Increase, preserve and re-connect...but what about the next 15 years?'* took place at the EUSALP Annual Forum 2018 in Innsbruck. It was organized by Rocco Scalozzi of Trento University and aims for the elaboration of visions for the EUSALP region regarding economy, education, nature and culture. Thereby the method of a '3-Horizon model' by Bill Sharpe was used and elaborated in various small mixed groups.

'Horizon 1' describes 'Business as usual' and explores the biggest concerns, but concludes finally with aspects, which are worth preserving. Followed by the next step, 'Horizon 3', viable systems fitting within new conditions are defined. The last stage, 'Horizon 2', responds the 'how?'. It explores innovations, which contest to the pressure of change and aim towards a viable future.

The main outcome of the 'Horizon 1' exercise confirmed my problem statement, but at the same time opened up an opportunity to understand the region by different aspects. The focus on education and economy revealed concerns such as the role of education in the changing nature experience among generations and the future adequacy of the labour market. This brought an added value to my research and was helpful for the definition of a desirable future.

Relevant conclusions in the second part of the workshop, so desirable aspects for the future, are endogenous development, a nature friendly energy transition, a general respect for natural resources and awareness of value chains.

Lastly, the 'Horizon 2' exercise explored possible innovations in order to move to 'Horizon 3'. The outcomes were quite general considering the short time available. Nevertheless, some aspects like early stimulation for nature awareness, responsible management education (PRME) and the statement 'more cooperation instead of competition' guide the elaboration of my future scenario.

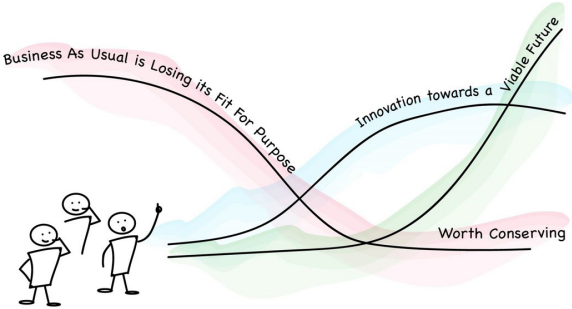


Figure 161: 3-Horizon model
Source: www.h3uni.org

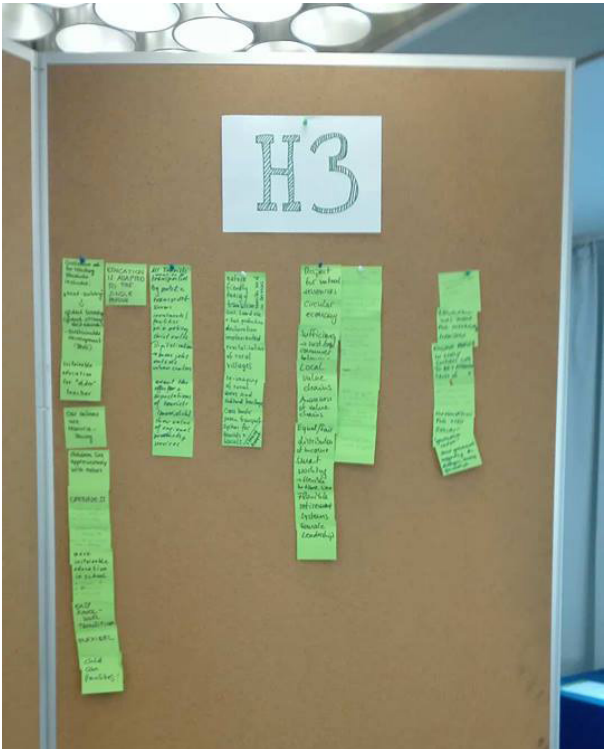
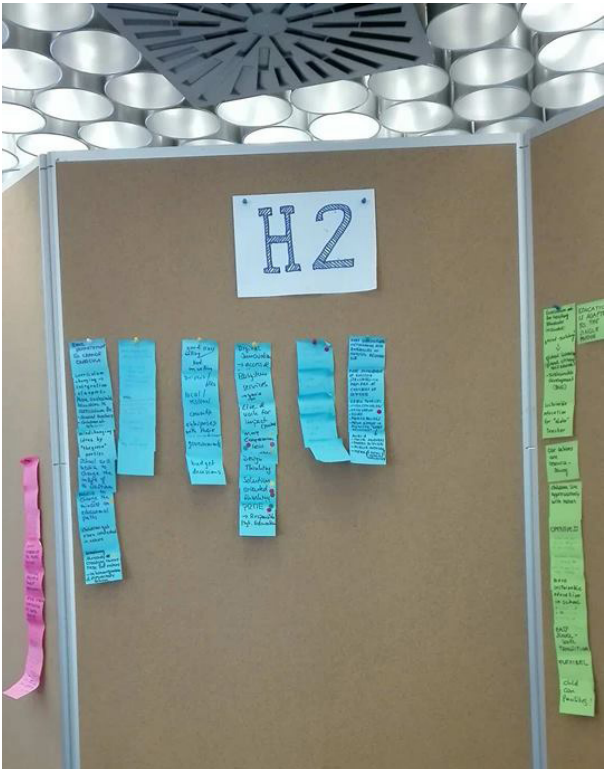


Figure 160: results of EUSALP '3-horizon' workshop
Source: Author