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 political 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 hydropower 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.

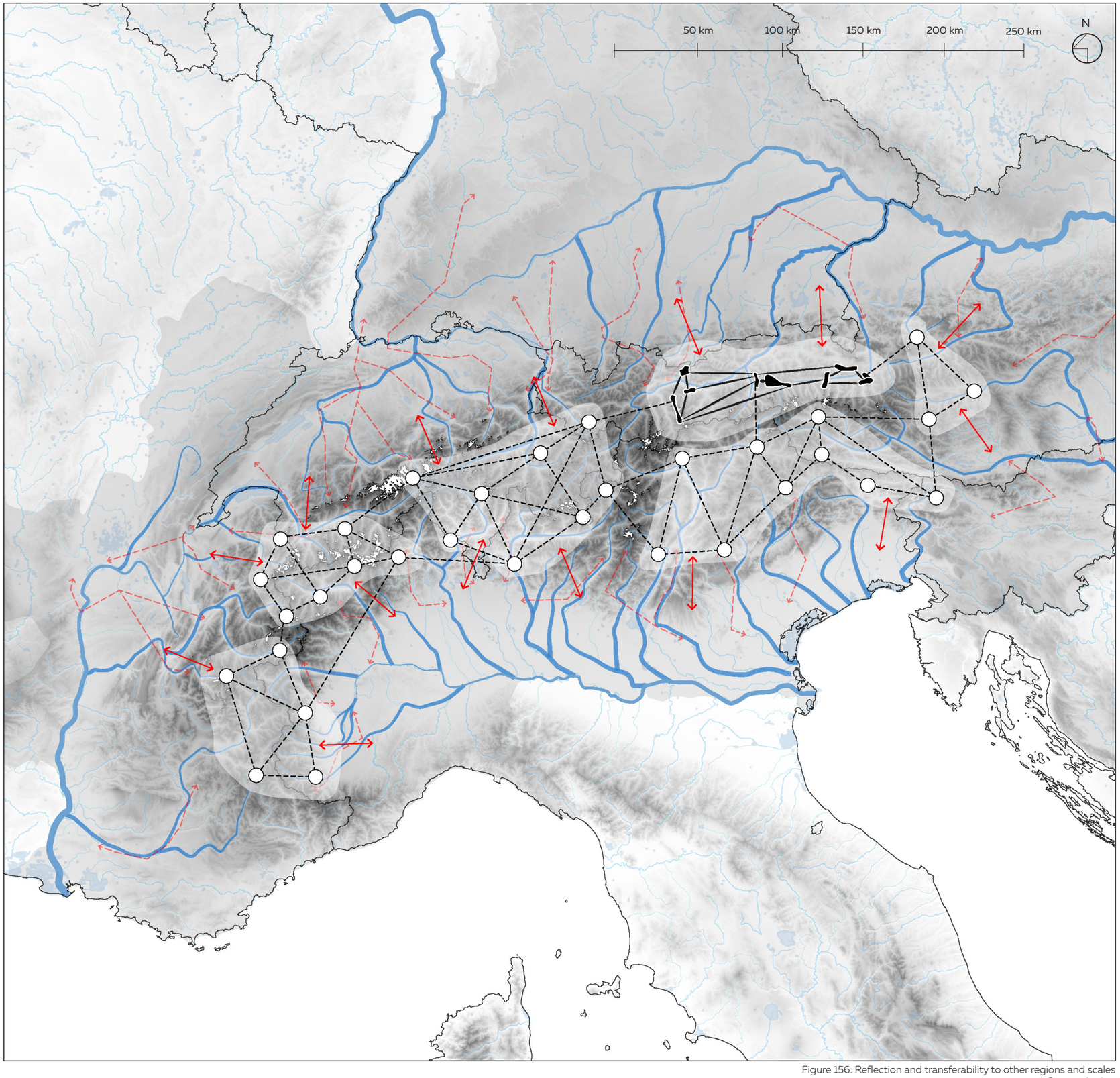

Figure 156: Reflection and transferability to other regions and scales
Source: Author

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.

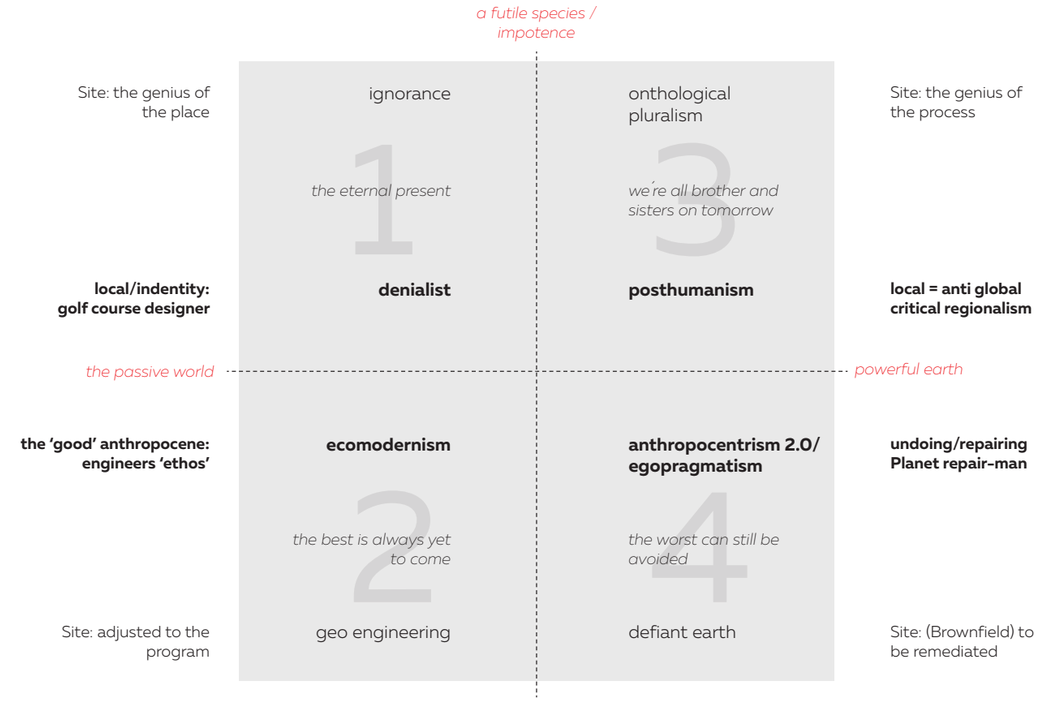

Figure 157: Diagram extracted from 'Defiant Earth', 2018
Source: Clive Hamilton

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.