





**Left:** Hamlet in winter in Valle Imagna. (Pepi Merisio)

**New farming** - beginning farmers, back-to-the land migrants looking for a more fulfilling lifestyle and self-decided economic success . Can be linked to activities of service such as care, tourism and land maintenance.

(Gretter et al. 2019)

# Organisation.

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In a world where AI is used to create the spatially and economically most efficient floorplans and where the goals becomes to fill as many homes as efficient as possible, we are almost forgetting that there also is a need for pleasing spaces. Architecture always starts within an already existing environment, therefore the choice of location can be seen as the first architectural decision of the project. The outdoors can in a way be seen as the biggest space created and therefore shouldn't be neglected. With this project I would like to create something that doesn't persee become the centre of attention but rather complements it's surrounding ecology and culture. Creating rather small scale architecture with a high functionality, being able to make conscious decisions about every small physical detail.

# Problem statement

## The migration between the mountain and the city.

The industrialization of the 1900's many villages started losing it's population. More work was to be found in the bigger cities, making the younger generations leave the Alps, which went with the cost of the running economy. The centralization, in both the economic and political sector made the isolated alpine towns to be forgotten. The challenging natural environment made it hard for the economical sector to thrive and the big spread of municipalities makes them have a small influence on policies. In Italy 900-thousand people have left mountainous areas in the second half of the 20th century, though the population has grown with 12 million (Cerea and Marcantoni, 2016). The amount of Italians living in mountainous regions accounts for 15%, while the mountainous regions take up nearly half of the countries area. (De Rossi, 2022) The large area, but with a relatively small population density, 60 inhabitants per square km versus 200 inhabitants being the countries average, makes for conflicting concerns between the ecological and more social needs.

### Counterurbanization

- describes the rediscovery and reevaluation of rural areas as residential and commercial space by mostly urban people ("urban refugees").

**Amenity migration** - not only encompasses permanent migrations, which largely correspond with the counterurban pattern, but also seasonal and intermittent relocations, which involve multiple residences.

**Rural autonomy** - local communities were assigned competence for ... in particular, woodlands and pastures-lands. (Cantiani et al. 2016)

**Hamlet** - a small settlement, generally one smaller than a village





*The structures of the (old) alpine farms surrounding villages in the Alps*

The traditional mountain crafts, for instance the construction of the irregular stacked stone walls, have been passed on from generation to generation. Part of the preservation also aims to preserve these crafts, crafts that in the modern architecture are again something to learn from. This more 'hands-on' architecture without architects is focussing on what is build rather than the way projects are presented in the first way. In 1964 Bernard Rudofsky praised this, often called primitive, type of architecture in his work 'Architecture without architects' for being an art work resulting from years of human intelligence. He mentions the sense of community creating the visually appealing uniformity, in for instance the mountainous villages, calling these towns "picture-postcard towns" (Rudofsky, 1964) Another craft that can be found is that of the **alpine farming**, historically an important sector for the elevated towns. The combination of cattle and agricultural farming was strongly woven in the social economical communities. The towns are communities that are in need of each other and with this are strongly connected. It's not an economical race against your neighbours, but rather a collective effort to live of the mountain, something that with the changing societal needs is not to be neglected.

#### **Economic dependency.**

Though, as permanent habitants start to move down to the lowlands, the culture partly vanished. It is visible that, with the shift away from the cities, there is a slight rise in the number of **neo ruralists**, having a second home away from the city and often enjoying or living off of tourism and agriculture. Though the older generations, that have been living there since birth, are in some cases the last generation of permanent citizens. One case being the farms, often run by single families for decades, not being economically feasible anymore. In the Alpine convention of 2018 it was mentioned that in 30 years the number of farms dropped from 570,000 to 260,000. (Gretter et al. 2019) These farms used to be the main income source and a huge reliable in the alpine life and culture. Löfflers amenity migration doesn't only speak of the immigrants living there, but also the tourists passing by. The mountains being a large recreational area for skiers, climbers and hikers, is something not to be neglected. Both in the preservation of the ecology as well as its use in economic value.

#### **Ecological value.**

The traditional farms that can be found throughout the whole of the Alps have a large influence on the ecology surrounding the living environment. As mentioned before, with the migration of the younger generation, the craft of the alpine farms seems to be coming to an end. The traditional way of planting, using different crops and having minimal coordination on the growth, showed an increase in biodiversity, both animals and plants. This makes it that the farms are needed for a sustainable town, both if the town grows or remains the same. As stated in the 2017 UN meeting, the mountains house a large number of natural resources, plants, soils and drinking water. (UN, 2017) These materials, as well as the area itself, are of high importance, for both the people from the mountains as those around. In a world where scarcity of resources is starting to form a problem and urbanization is increasing, the need for rural areas and its materials is growing. The area, its views and ecology are important recreational areas, areas where people, from urban areas, go to hide from their work life. Its preservation therefore also matters to those in the lower lands surrounding the alpine area.

**Alpine farming** - 'Alp-wirtschaft' exploitation of, and staged movement between, two contrasting spaces: the home fields and the alpage. (Dodgson, 2019)

**Neo Ruralism** - involves a deliberate and often voluntary return to rural or countryside living from urban areas or a reimagining of rural life. (Chevalier 1981)

# Design goals

**Sustainable mountain development** - Document following the 2017 meeting of the United Nations regarding the preservation of alpine regions. (UN, 2017)

**Social Innovation** - determines a reconfiguration of social practices traditionally embedded in mountain territories, including habits and customs, networks of cooperation and decision-making processes (Howaldt et al. 2015)

**New farming** - beginning farmers, back-to-the land migrants looking for a more fulfilling lifestyle and self-decided economic success. Can be linked to activities of service such as care, tourism and land maintenance. (Greter et al. 2019)

**Bio-based materials** - comprising biodegradable biofibers, biopolymers and bio-composites (Vinod, 2020)

The question arises how these towns, high up in the mountains, can survive in the current economical market, specifically focussing on the Italian town of Ostana. (Löffler et al. 2016) How can an immigration of habitants be realized, but without neglecting the cultural heritage and preserving the ecology? How can family farms, strong in history and tradition, but not surviving in the economical market, be revived? An example of how, in other places in the Alps, the economy is brought back is by generation of ski resorts, generating a large economy, though going at the cost of the ecology and in cases the culture. This shows that there is a fine line between conservation and replacement. Following the document of **sustainable mountain development** by the UN this fine line has to be defined to create a to follow guide in the design.

## Social integration

As life in the alps is a collective effort to sustain a running economy there is a need for both work and habitants. One of the goals of the project is to bring life back to Ostana, both in tourism and permanent residents. With specific research on the tangible and non-tangible values of its culture and ecology, a plan is made (multiple) small and specific architectural implementations to bring life back while maintaining these values. To A focus within this on local material on the one hand and the strong cultural heritage on the other has to preserve the identity of Ostana.

Where the disconnection to the rest of society created a strong identity, it also made it that it is behind on the growth and development of larger urban areas. For **social innovation** there is a need to integrate the habitants and emphasize the need of the community, as the way it used to be. Case studies show that community wellbeing is of high importance in social innovations. These start can start from a theoretical framework but can only be embedded in the context by integration of residents. (Greter et al. 2019) From a cultural perspective the goal of the project is to continue in the long generational line of history to conserve what is there.

## A new agriculture

*“Therefore, an essential question will be the extent to which amenity migration generates new farming activities that contribute to, maintain, and/or modify the Alpine cultural landscape in order to strengthen the pull factors for further in-migration as well as potentially reducing vulnerability to natural hazards. This appears to be a prerequisite for a sustainable settlement.”* (Löffler et al. 2016)

From a technical perspective the focus will be on the use of locally found materials, in the surrounding area, the architecture and the agriculture. To revive the farms, research will be done on the growth and use of biobased building materials, using both the existing culture as well as creating a town of innovative importance. Where these farms can't compete with the food production of the lower lands, the, still little produced, biobased materials will be a less challenging market as it is considered as **new farming**. The new farms can function as both a place of production as well as a place for research and education, creating economic opportunities as well as attracting those interested in the mountains.



The project has to properly showcase the beauty of the area, almost being a pledge for its preservation, using both the existing architecture and researched biobased building materials. With this the goal of creating an architectural design that implies the needs for the regrowth of Ostana, while maintaining the culture and ecology, with suitable functions, materials and techniques has to be achieved.

## Biobased building materials

Currently a lot of research is done in the creation and application of bio-based materials in the architecture sector. The currently widely used synthetic materials have a negative impact on the environment, harming the air, water and land. (Geyer, 2017) With the worldwide need for preservation of the natural resources also the build environment has to change. One way this is done by replacing these synthetic by **bio-based materials**, which can be obtained from animals, plants or minerals and all being biodegradable. (Vinod, 2020) The current industry is yet still build around the implementation of mainly concrete, steel and treated wood, making the use of bio-based materials The design will look into facilitating the implementation of these materials.

## Architecture

From an architectural point of view the least acknowledgement towards the town is to research the already existing architectural uniformity. The current building techniques and aesthetics are, with using the local materials, embedded in the environment. The architecture adapted to the landscape instead of the other way around and the strong history almost makes it that the area can't be seen without the stone buildings. A detailed research is needed to create an architectural typology that looks into the detail of the singular materials. By looking at both the technical features as well as the aesthetical features a construction has to be made that doesn't neglect its aesthetics and influence on the experience of the spaces.

**Left:** Design prospective, using the patterns of the remaining traditional farms in the creation of the 'new farming' concept.

# Research questions

## Design question:

*How can the traditional farms of the town of Ostana in the Italian Alps be revived throughout the principle of new farming and the implementation of biobased materials, while maintaining the cultural identity and ecological biodiversity?*

Thematic topic questions:

*Culture - How can the town grow while still preserving the strong cultural identity?*

Throughout the Alps towns can be found where a strong visual distinction can be made between the building typologies before and after the industrialization. The need for homes created a need for the construction of new buildings, while this in some cases goes at the cost of the cultural identity.

*Materials - What can be learned from the locally used crafts and materials in the existing architecture when forming a new architectural design?* As Bernard Rudofsky said in his work there's something to learn from the hands-on architectural craft that was the leading design principle when a large percentage of the current urban fabric was build. In the new architectural design this very detailed and knowledgable architecture should be integrated.

*Proces- What influence does the proces of the growth, production and implementation of biobased building materials have on the design?* The newly implemented biobased building materials from the research will play a leading role in the construction of the architectural design. The proces has to be studied form a proces that is well adapted to the local economy and urban fabric.

*Ecology and agriculture - What can be done to, while expanding the urban fabric, preserve te currently valuable ecology?* Research has shown that the traditional way of farming had a positive influence on the local biodiversity. The project tackles the question of how the revival of these farms can again positively influence the local biodiversity while the urban fabric is expanding.

## Research question:

*How can the growth, production and implementation, in local architecture, of biobased materials support the preservation of the town of Ostana, while maintaining or improving its cultural identity and economy?*

Sub-questions:

What biobased building materials can be **grown** in the mountainous area around the town of Ostana, looking at the specific soil, local climate and height, and what is it's influence on the surrounding ecology?

What building-products can be **produced** from the grown materials?

In what way can the locally grown biobased building materials be **implemented** in the local architecture of Ostana?

# Research goal

The thematic research will go into the use of bio-based building materials in the revival of Alpine towns. The link will be made with the revival of the old farms, a traditional craft that has been brought down generation after generation. The research will look into the ecological and economical possibilities regarding grown biobased building materials on the old farms. It will look into the growth and it's influence on the ecology, the certain products that can be made and the connection to the strong local architecture. With the revival of the farms, both a link with the preservation of the ecology and culture will be made. The implementation of biobased building materials can, if the research is positive, have an influence on both the economy and architecture. For the research the choice is made to make it site specific rather than to research only one part of the process but for a larger area, therefor creating an example for other places. The process of biobased materials can be divided into three parts, the growth, the production and the implementation.

## Growth

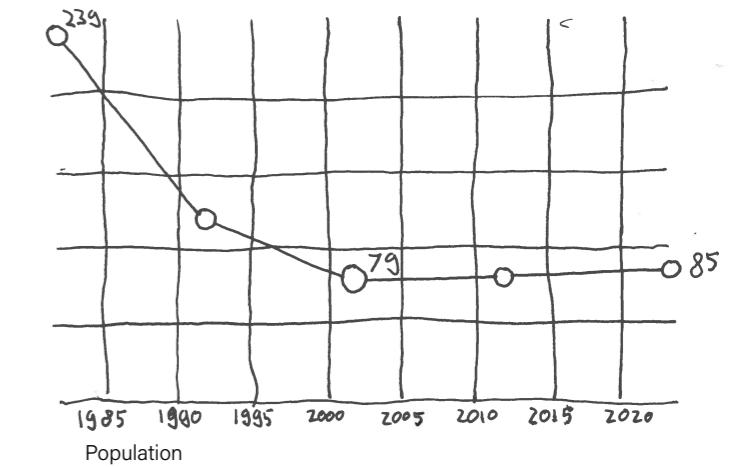
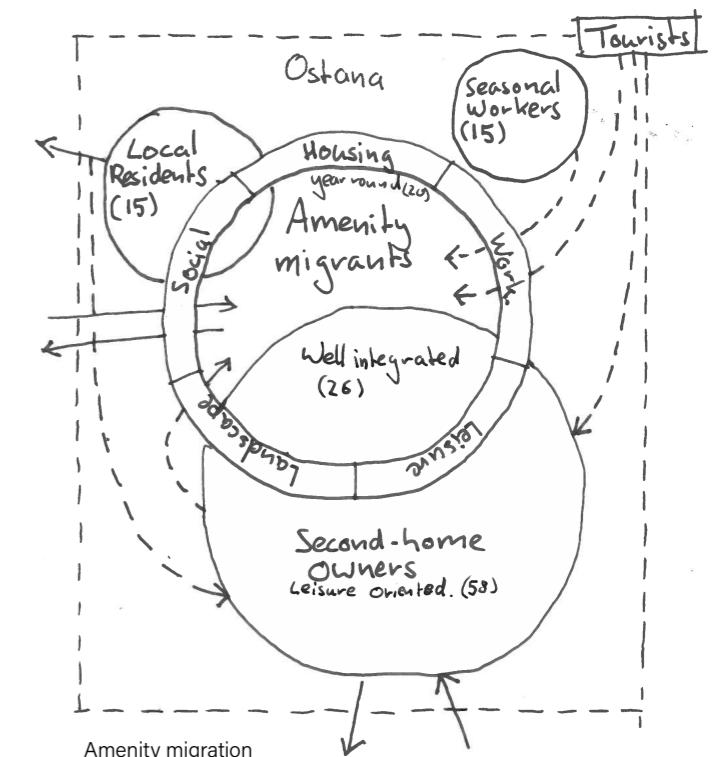
The growth is the first part that is site specific. It tackles two questions. First it will research the plants that are able to grow in the area surrounding Ostana, looking into the local climate and different elevations. The traditional farms and it's crops had an effect on the ecology and biodiversity. The second part will look into the effects of different plants and type of agriculture on the surrounding ecology.

## Production

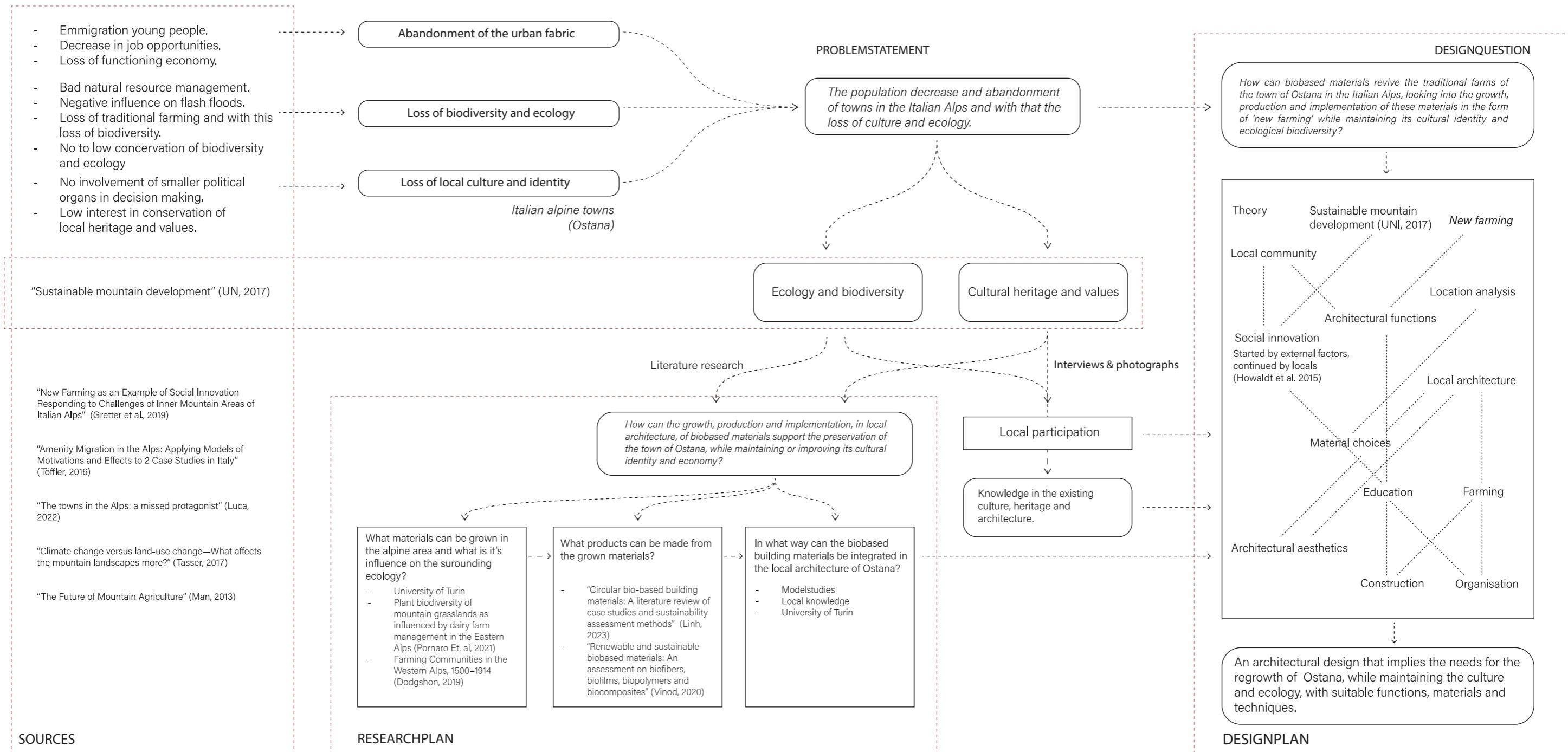
The second part of the research will go into the production of biobased building materials. By doing model studies, the grown materials will be researched in what products can be created.

## Implementation

The last part will look into the connection between the biobased building materials and the local architecture. Ostana has a strong uniformity in architecture that has to be researched. It's combination with the grown materials will form the conclusion of how this can be integrated in the local architecture.



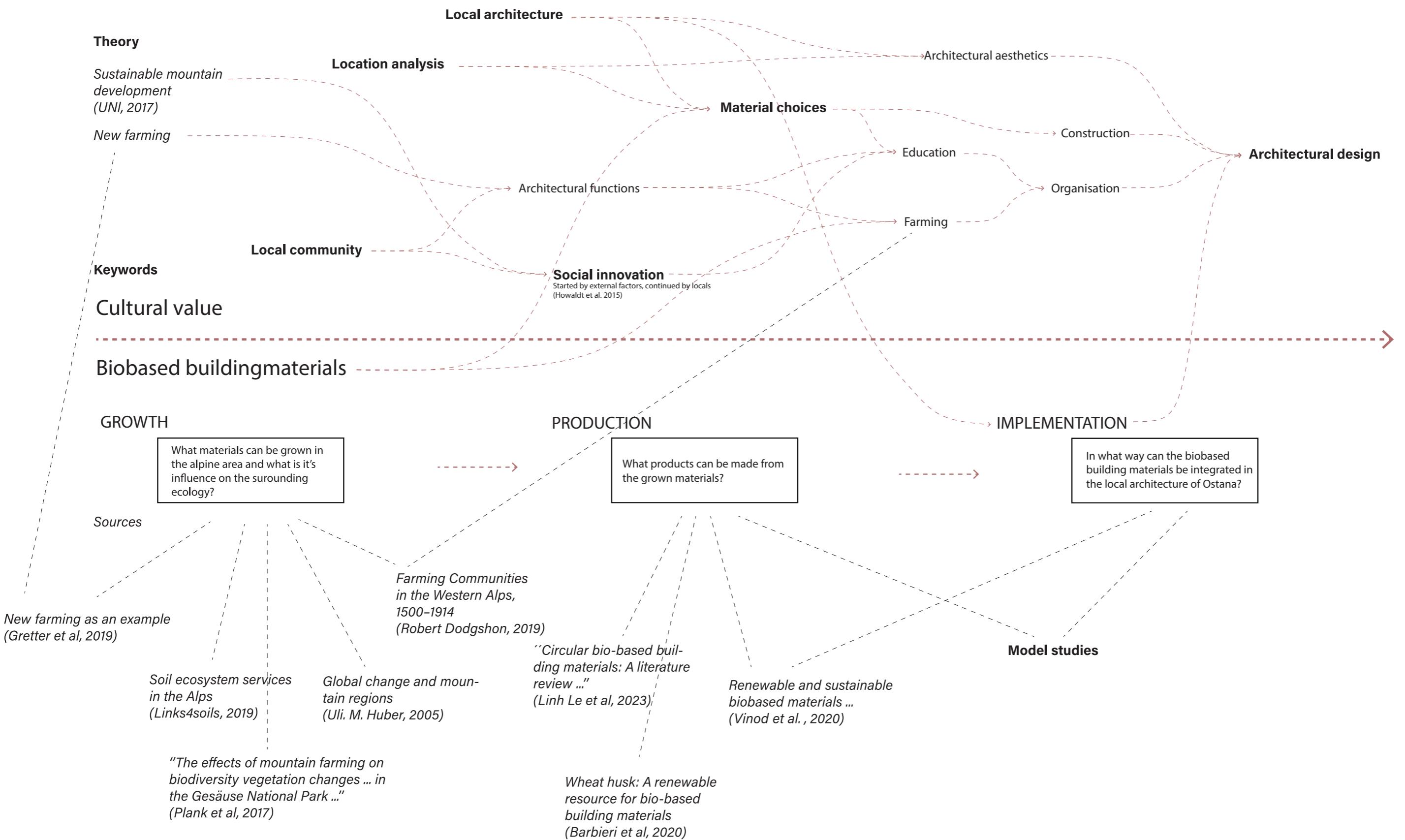
# Project structure



The project structure can be divided into three parts; the sources, the researchplan and the designplan. The sources, being the start for the problem statement can be divided into abandonment, culture and ecology. The UN division in ecology and culture will be used in the project, where the ecology will be researched through the researchprogram and the cultural identity will be researched through strong integration of the residents.

The researchplan separates the research on building materials in growth, production and implementation. The designprocess won't be a linear process and is therefore harder to predict. By researching through designing, model making and writing the project will get in a further stadium.

# Theoretical framework



# Research hypothesis/methodology

The result of the research will be the answer to the question if biobased building materials can support the cultural, ecological and economic growth of Ostana. It will be a **manual** that can be used, at first for Ostana, on how the growing and implementation of these biobased building materials. The research will therefore be written and displayed that it can be used by local residents. The sub-questions will be researched chronically, since they answer consecutive parts of the implementation process and build further on the previous answer.

## Growth

The first question looks into the local growth of the biobased materials, both the possible crops that are growing or can grow and their influence on the surrounding area. The research will be divided into two parts, a historical research looking into the local traditional farming and a more ecological interview, looking into the effects of the farm and the (changing) environment. Both the researches will be done through **literature**.

The **historical part** will use the work by Robert Dodgson, that looks into the farming communities in the western alps from 1500 to 1900. (Dodgson, 2019). The second part will use both **literature and data** to look into the **current environment**. By looking into the history of the local alpine farming and the growth of biobased materials a selection can be made on what crops will be favourable, being influenced by the growth possibilities, their influence on the surrounding biodiversity and the possible made building products. My hypothesis for this chapter is that there will most likely be an overlap between the already used crops and the selection that is favorable for this project, since the craft of alpine farming has been there for centuries and the currently grown materials are specifically chosen after all these years of farming. This being various grains, like wheat, rye, barley and oats, but also certain trees that are currently growing. (Dodgson, 2019) The research will therefore mostly be innovative in the choice of which of these are suitable for biobased materials, the influence of these crops on the local biodiversity and the influence of the changing climate..

## Production

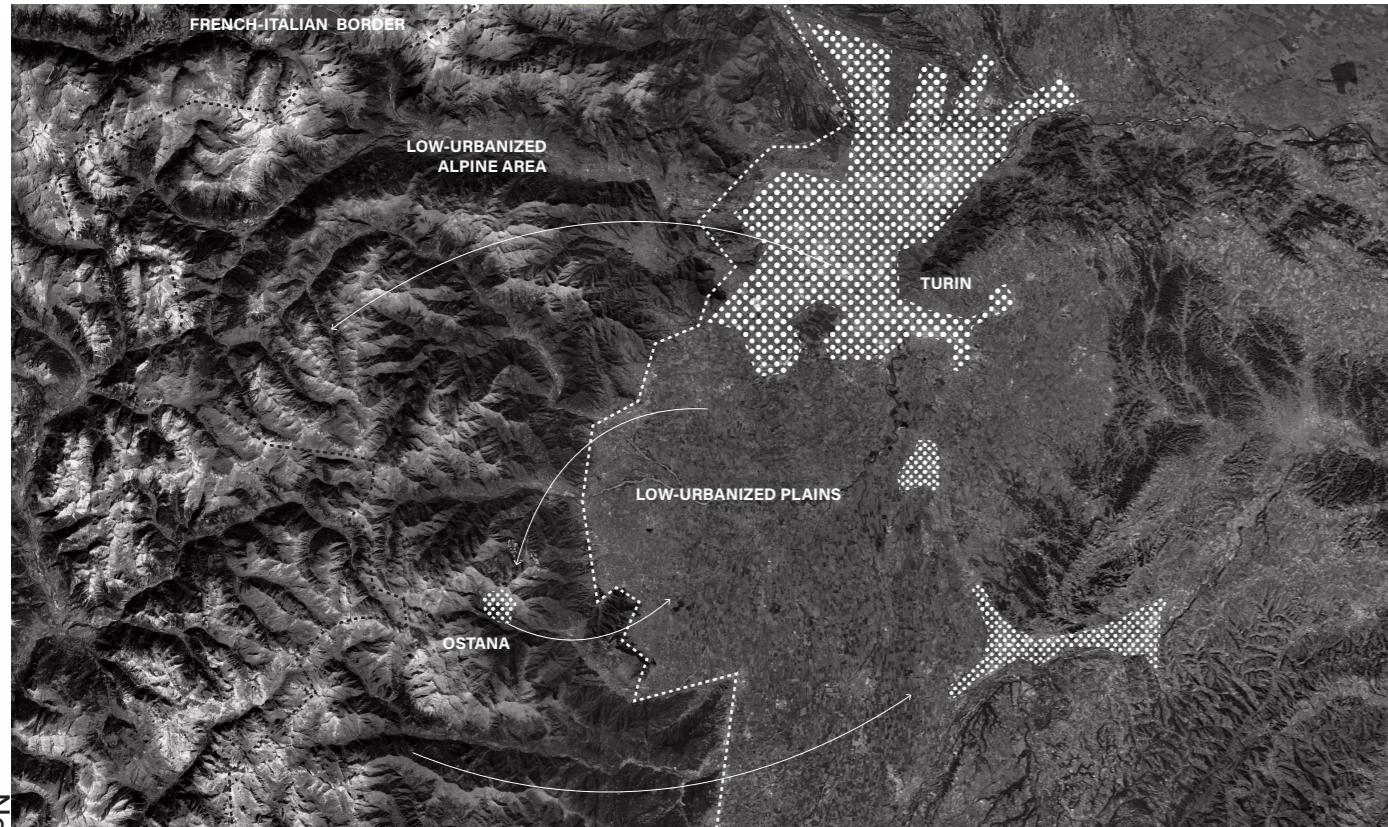
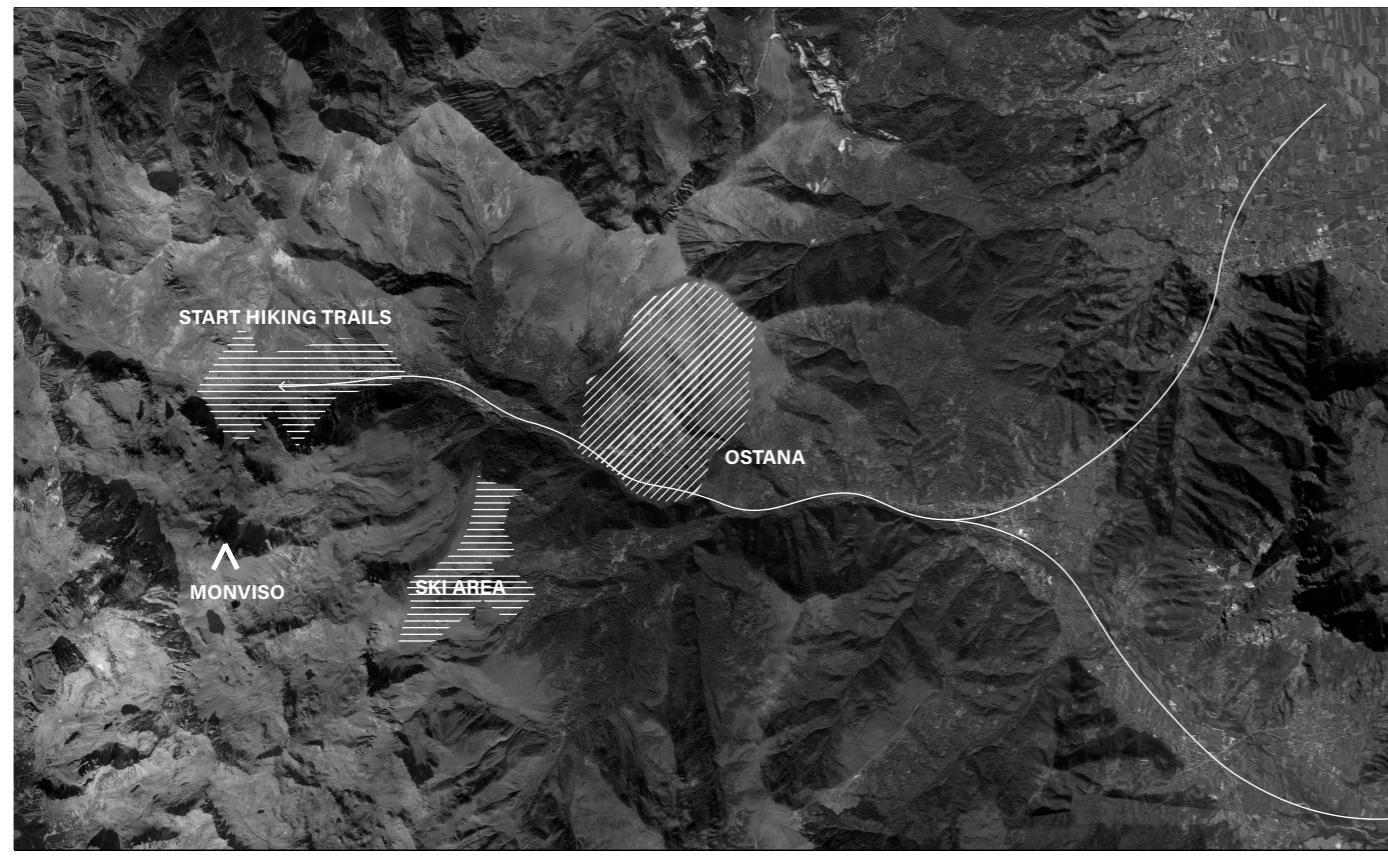
The production step of the research will start with a more **data focussed research**. Using existing data on the selected materials in the growth-phase to research what materials can be produced. For instance the work of Dinh Linh Le, Roberta Salomone and Quan T. Nguyen already shows examples of components or type of building, their biological origin and bio-based building material. (Linh Le, 2023) This research won't show newly found materials, but rather ones that are most (economically) feasible and desirable in the specific location of Ostana. After this a more physical research will be done by the creation of these materials, to look into different possibilities. By making **physical material samples** the workability of the selected materials will be shown.

## Implementation

The implementation research will also be divided into two parts, the local architecture and the implementation of the materials. The first part is research on the local architecture, looking in the (construction) details and patterns. Through both **photography and drawings** as well as **physical models** a clear overview will be made that shows the reoccurring patterns and details. With the use of physical models research will be done on how the selected biobased building materials can be implemented. The goal of this part is to create a manual that shows the implementation of the different materials on certain places in the building. The manual will mostly focus on implementations that can be done by the residents themselves, since in the local environment there is a strong self-reliance culture in the area. It will be a **guidebook** on the different materials, their applications and a manual on how this can be done, focussing on techniques that don't have to be done by professionals.



Local architecture



Ostana  
(Author, 2023)

**The research project** will focus on the implementation of biobased building materials on specifically the town of Ostana. The knowledge around biobased building materials is already there, though there needs to be an extra step before it will be implemented on a large scale. The car sector is for instance already using biobased materials for small parts. (Vinod, 2020) This project aims to narrow the gap between the knowledge and large scale implementation.

By having a rather small context area the project can go more into dept, researching the whole process from growth to implementation. This though does not mean that it can only be used in this context, the (different parts of the) project can be used in other area's. The more in line the area is with the context of Ostana, the simpler it is to implement the manual. When an area is less in line, more adaptations will have to be made. The manual can also be seen as an experiment for what is needed to be researched throughout the world to start the growth and use of locally grown biobased building materials.

**The architectural design project** will focus on the whole preservation-process of the town of Ostana. Similarly as the research it will be a guide on a **local scale** on what can be done to help preserve the town of Ostana, though in this case it will also research the influence of culture and economy. The goal of the project is to help Ostana prosper and with this help the residents of the town. Though the project can also be seen as an experiment for surrounding towns as well as the fact that the preservation of the recreational area and locally resourced materials will have an influence on a **regional scale**. The United Nations document of 2017 stated the importance of innovative solutions for the livelihood and income of local mountain communities. (United Nations, 2017) The project that looks into the tangible design as well as the non-tangible process can function as an exploration on one of these solutions that can be applied on a more **global scale**. Furthermore the UN mentions the need for the preservation of mountain resources and sustainable forest management, though being a small part of the bigger picture this project aims to achieve this in the area of the Western Alps.

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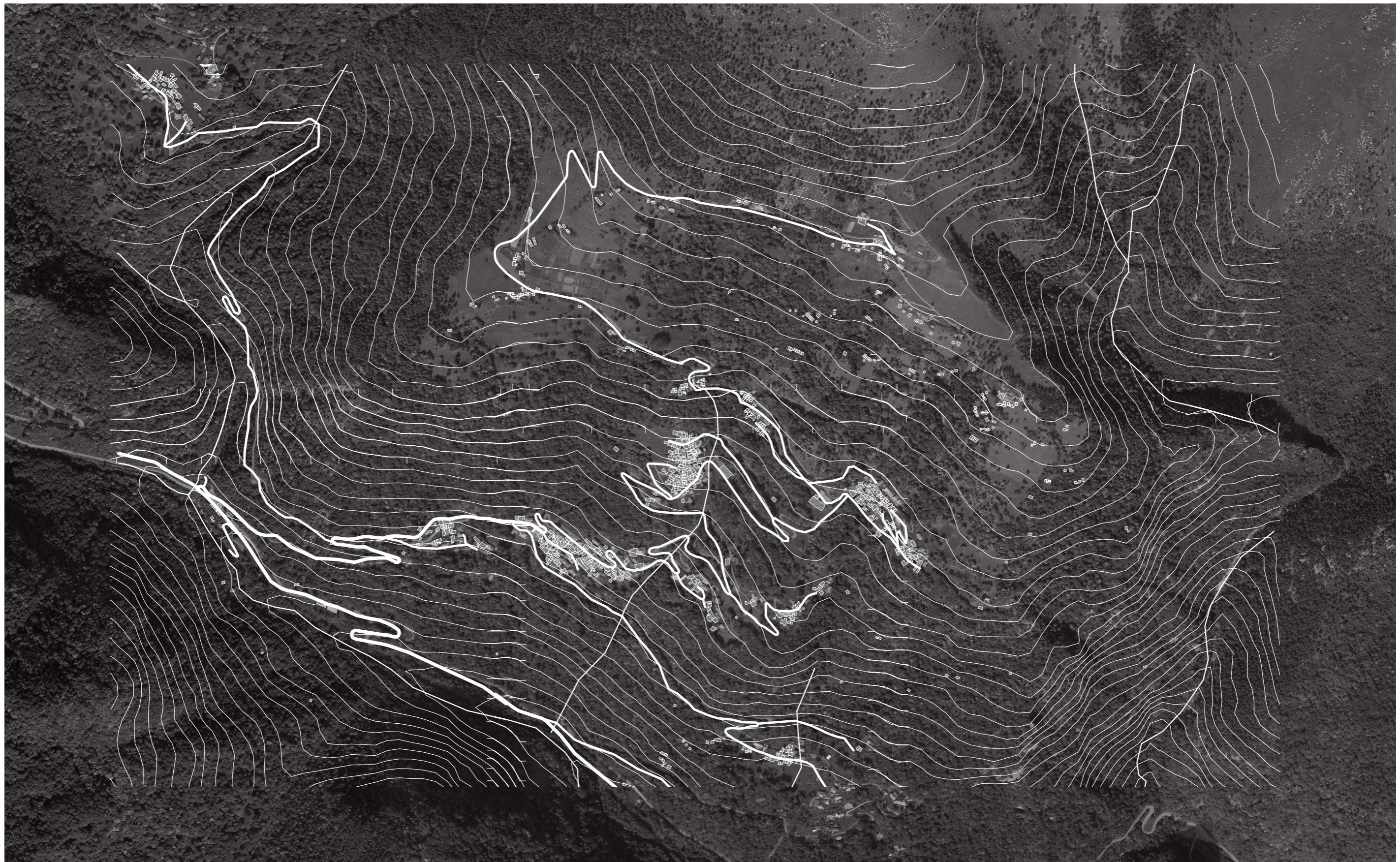
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Local architecture Ostana  
(Renato Maurino)

# Appendix 1.

Site.



# Appendix 2.

# Process.

