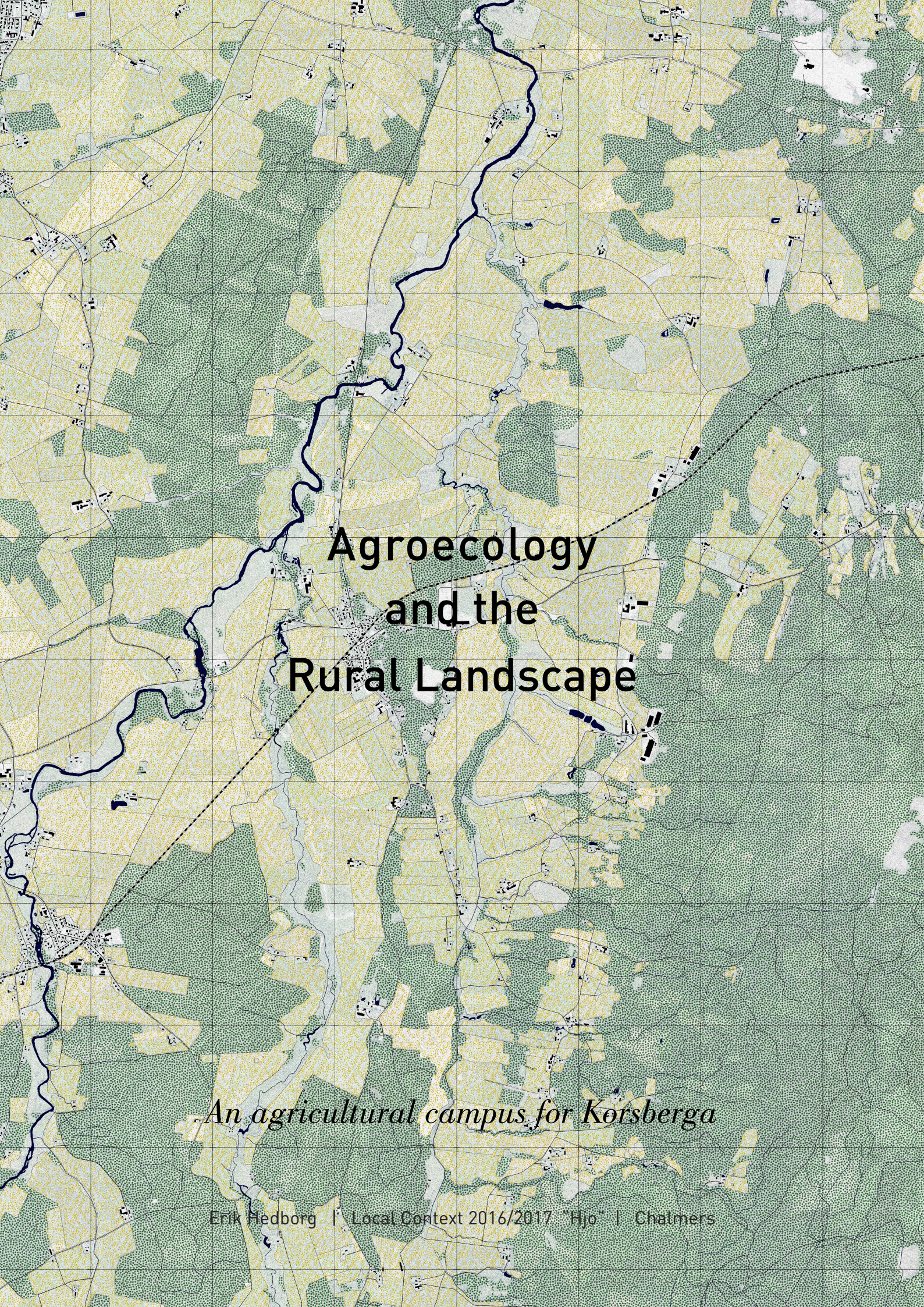


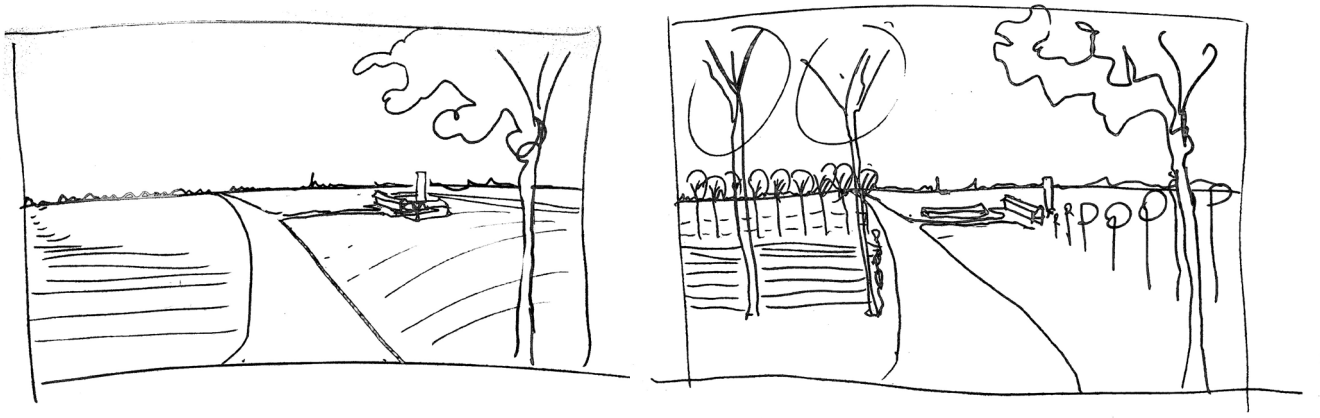
Agroecology and the Rural Landscape

An agricultural campus for Korsberga

Erik Hedborg | Local Context 2016/2017 "Hjo" | Chalmers

Abstract

Today, many of our agricultural practices are unsustainable. We exhaust the soil, we loose diversity through the use of mono-cropping and we introduce novel chemicals into our nature. These practices are often maintained by the argument that it is the only rational way to produce food for our ever growing population. This project tries to challenge this position. It is done via a proof of concept farm, proposed to be an agricultural campus. It is a space for both learning and farming, but the practices are general and can be applicable in all farming. The project bridges landscape and building design territory and tries to find principles applicable to both.
This booklet is divided into two parts. (I) First a theoretical one, where terms and definitions are explained and the academical framework is set. It looks at the problems facing agriculture today and establishes a main vision for the project, which is to scale up agroecology. It also provides some suggested solutions to the problems, including no-till and intercropping practices. It also looks at parcelling of agricultural fields and proposes a set of morphological principles on how to in the future shape the landscape. (II) Secondly the Agricultural campus is presented. The program is argued for and defined in a technical and spatial way. An argument is made on why rural buildings and farm buildings especially can be used as a reference for many different projects. After that, the different qualities of the building is further presented in plan, section and detail. Material qualities are presented in rendered perspectives.



Early sketch for the project

Notes on objectivity and academic rigour

Everything written that is not explicitly a quote is in some way paraphrased or transformed by the author. Be it in semantics, prioritization or context. I acknowledge the complexity of the subject approached, and the reason for separate disciplines. This project attempts a synthesis between ecology, agriculture and architecture, and this in the scope of six weeks of a student project.

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I - Theory

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Gardening is an active participation in the deepest mysteries of the universe.

Thomas Berry (1914-2009) QI (2016)

Landscape is history made visible

J B Jackson (1909-1996)

The ultimate source of energy is the sun
The ultimate fate of energy in ecosystems is for it to be lost as heat.
Inorganic nutrients are cycled, energy is not.

Dave McShaffrey (of Marietta College) McShaffrey (2006)

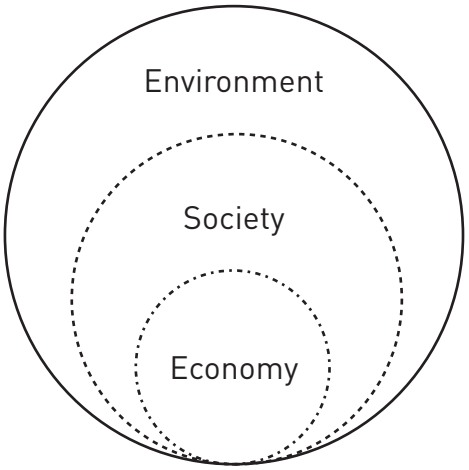
I - Theory

Painting in the burial chamber of Sennedjem

Terms and Definitions

Sustainability

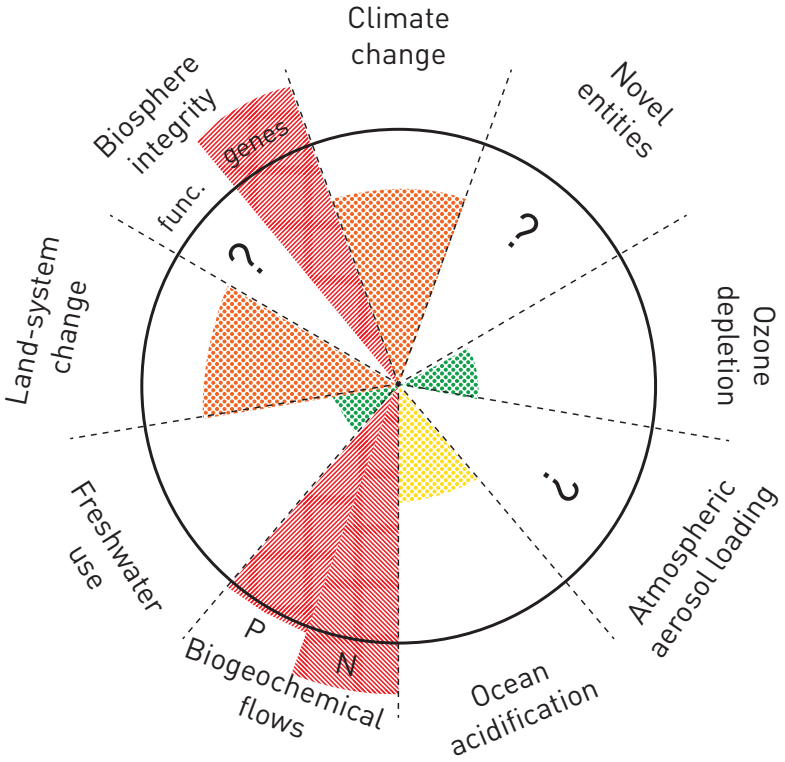
The intergenerational responsibility between the people alive today and people of the future. The environment sets the outer limits for what we can do, and society and economy are the engines for transformation.



Planetary boundaries

Framework developed by the Stockholm Resilience Institute, it is now used world wide as a way to discuss the safe operating space of the planet. It is based on a huge body of research and modelling of earth systems science. Nine categories of which two are still unquantified, and one is partly quantified (it is uncertain how to quantify functional biodiversity).

(Rockström 2015)



Landscape

Originally in the English language, landscape was a term used by artists to mean **a portion of the land that the eye can comprehend at a glance** (Jackson 1986). For this project, it has a much wider meaning, of something that has to do with ecology, geography, aesthetics and culture. Therefore, a narrower definition is needed. Famous geographer Von Humboldt used to talk about landscape as **the total character of a region,** which will do the job perfectly for this project. Region is arbitrary enough to mean anything from the garden scale to hundreds thousands of hectares, and character is subject-independent and can be about technical aspects as well as subjective.

David Hockney "Between Kilham and Langtoft"

Landscape ecology

The part of the landscape which deals with its organisms and theirs interdependencies. It is the **patterns that connect** species to species, the way life propagates, the relation of environment-organisms.

Agroecology

More strictly defined as the combined study of agronomy and ecology. However, is often used as a category of agricultural practices that utilizes ecological knowledge in order to be sustainable. *As a set of agricultural practices, agroecology seeks ways to enhance agricultural systems by mimicking natural processes, thus creating beneficial biological interactions and synergies among the components of the agroecosystem* (Human Rights Council, 2010, p.8).

Morphology

From the Greek, meaning "study of shape". In here used as the pure spatial organization of things rather than their technical specificities (such as the form of a tree rather than it's species).

Agricultural parcel

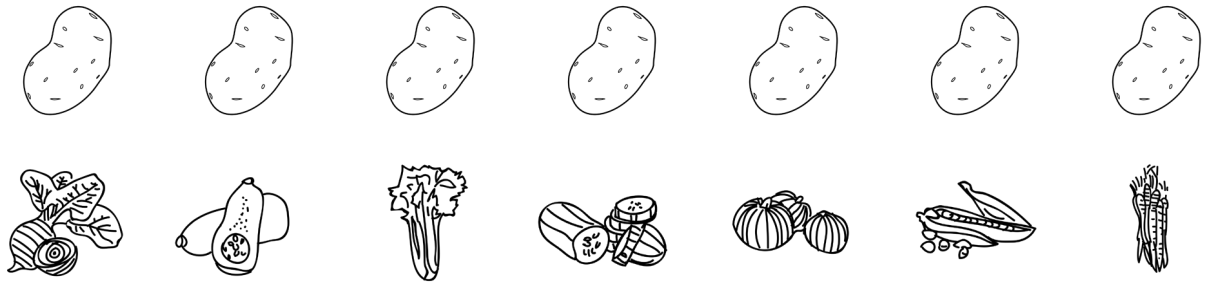
Smallest size of agricultural land division. Not based on ownership but often correlates.

The Diagnosis

What are the challenges? There are many problems with today's agriculture. When looking at the planetary boundaries, the two most alarming boundaries we have overstepped are the biogeochemical flows (nutrients) and the biodiversity. Tightly following threats are climate change and land use change.

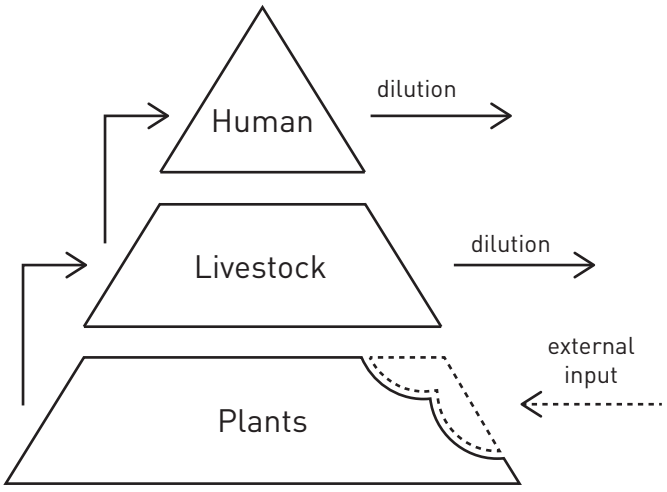
Monocropping and biodiversity

Cropping annual plants in big fields makes the gene pool diverge, and the biomass becomes less resilient, prone to disease and invasive species. The great Irish potato famine was caused by this weakness, with millions of people dying from starvation due to a blight affecting this one species of potato used. Therefore, fighting biodiversity loss makes sense not only in an environmental-ethics kind of way, but also from an ecosystems services perspective.

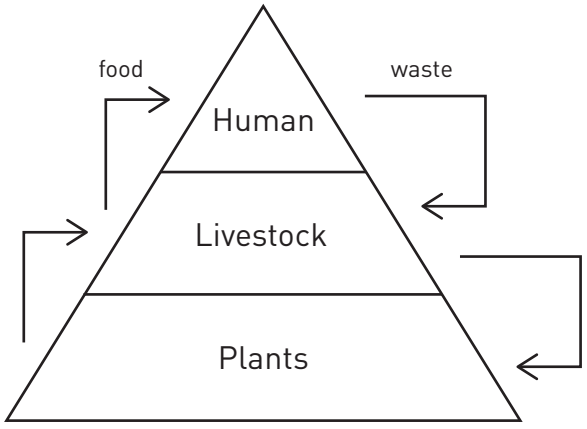


Broken nutrient cycles

Macro- and micro nutrients, plants need both big and small building blocks to grow. They do use the energy of the sun and the carbon in the air, but phosphorus (which your DNA is made of) and nitrogen (used for all amino-acids), they rest in the soil and can get depleted over time. Today, phosphorus is mined from the lithosphere, and is therefore a finite resource. Nitrogen is extracted from the air using fossil fuels. This combination, or industrial fertilizer is then systematically overused on fields, and therefore pollute our waterways through over-fertilization.



Industrial model



Ecological model

Peak Phosphorus

There exists low energy ways to fix nitrogen from the air, through certain plants and bacteria. However, phosphorus is a heavier element, and does not reside in the air. Instead, it is mined and extracted from phosphate rock. This is quite a limited supply of such mines in the world, with a supply for another 50-100 years. And while supply is decreasing, demand is going up, and a peak phosphorus event is predicted to happen somewhere around 2030.
(Cordell 2009)

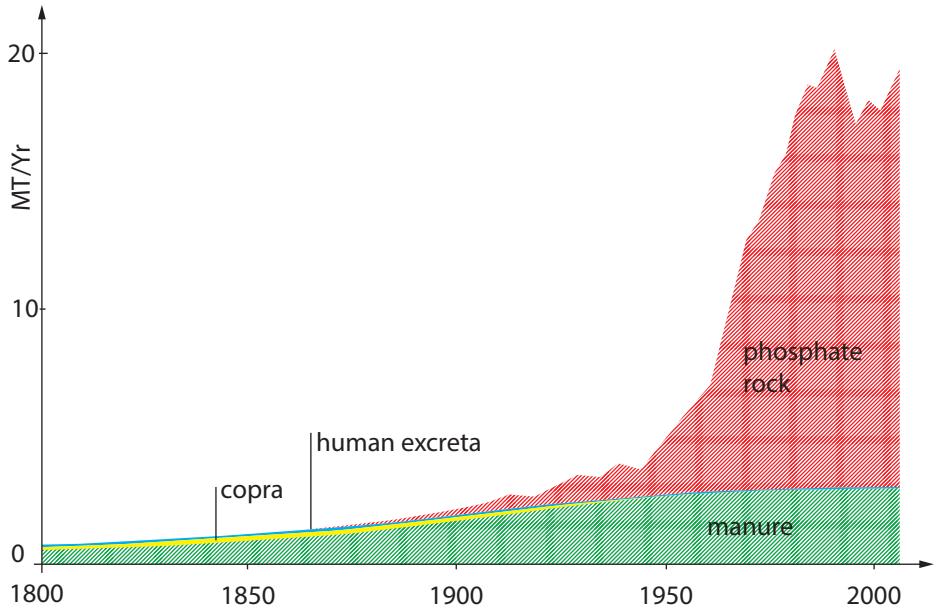


Diagram from (Cordell 2009)

Fossil fuels

Sweden has a very modern and mechanized agricultural industry. It is dependent mainly on diesel to run, for farm equipment and transports. Also, more and more farms are dependent on grid electricity, for climate control, refrigeration, milk robots etc. Not only does this lead to emissions of GHG's, it also makes for a quite fragile food security system. If Sweden gets cut off from global trade, such as in an event of war or crisis, the agriculture can not manage without diesel, fertilizer and fodder from abroad (Eriksson et al 2016).

Sometimes you only have supply for 2-3 days on the farm. The farms have just like the industry appropriated a just-in-time way of thinking.

(Eriksson et al 2016)

Towards a scaled up Agroecology

In a paper published by the United Nations in 2016, it is argued that agroecology is not only a sustainable way of producing food, but also creates higher yields (Human Rights Council 2010). It is therefore not only necessary in a long term environmental perspective, but also as a way to proverbially "feed the world".

That "organic" farming produces a higher yield than regular might sound like wishful thinking by the sceptical reader. And that reader is partly correct. Organic farming today is focused on what **not** to use (synthetic fertilizer, GE plants, pesti- and herbicides), but sometimes fails to replace these non-sustainable additives. Such farming can therefore result in lower yields. Over-fertilization is bad, but so is under-fertilization (Formas 2010, p. 412). We should look at entirely different systems of land management, that densifies crops, cycles nutrients, and increases yields through synergy effects.

The reason why agroecological practices are not already implemented is that even though efficiency in energy, resources and land is increased, the added labour costs a lot of money and makes the economical margins go down. Put differently, contemporary industrial agriculture excels at rationalizing labour. This is illustrated by the fact that we have gone from the vast majority of people working on farms (60-80%) in the late middle ages to as low numbers as a couple of percent (1-5%) of the population.

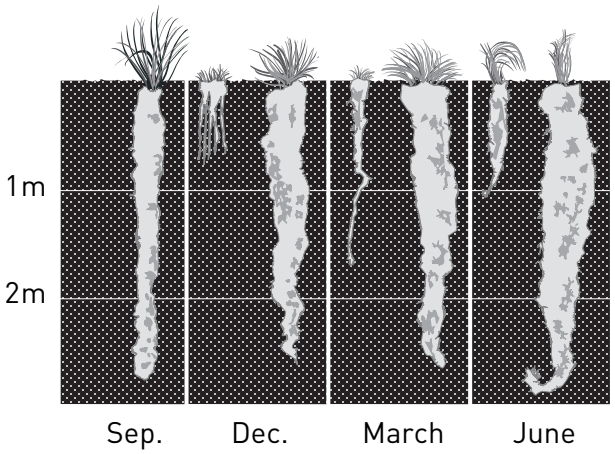
To argue for an alternative to conventional agriculture we therefore need to do three things.
1) Show that efficiency in land, energy and resource use are necessary,.
2) Show that a greater engagement in food production by the population can be a positive narrative and a way to create social inclusion.
3) Show that organic farming can be improved and that these types of practices can have a rationalities of their own (and is therefore economically viable).

Intercropping

An important aspect to increase yield and biodiversity is to intercrop. This is when crops of various kinds are placed next to each other. It can be different crops of similar scale. It can also be different crops of different scales, such as combining bushes, trees and ground cover crops. This is sometimes also called promiscuous agriculture. Intercropping increases biodiversity and therefore the resilience of the ecosystem in general. It also makes for a wider variety of goods in the local produce available, which increases the resilience of the local society. Also, a wide range of plants can help return nitrogen to the soil. For example, legumes fix nitrogen from the air and save it in the soil through their roots.

No till

To be able to plant seeds, weeds need to be cleared and the soil must be opened. This is usually done through tilling. However, tilling has many negative consequences for the land. It means disrupting the micro bacteria of the soil, moving the anaerobic bacteria to the surface and the aerobic bacteria to the underworld, in a typical lose-lose situation. It limits the size of root systems and therefore makes nutrient retainment difficult. Traditionally, no-till is done by herbicides. That's no good, instead, perennial plants, and mulch weed cover can be used.

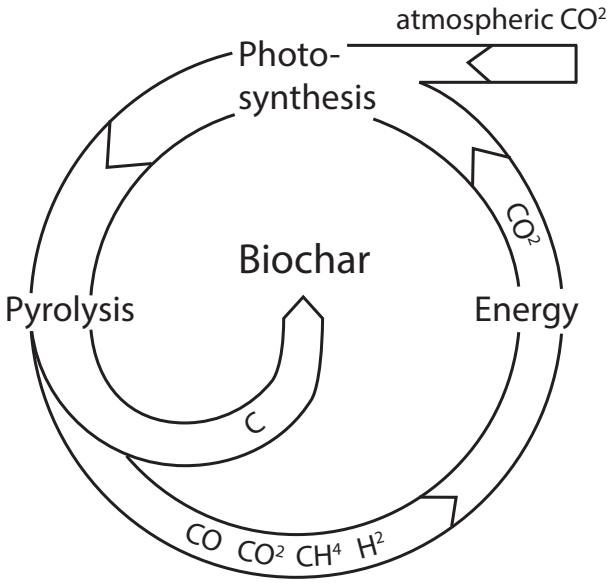


How perennial plants can develop their root system for greater water and nutrient absorption, which is impossible with tilling practices. (Formas 2010, p. 190)

Biochar

By burning biomass in a low oxygen environment, burnable gas is separated from the charcoal. This charcoal (the same that you would put on your barbecue) is then dubbed biochar when used in processes that ameliorate the environment. For example, the coal can be dug down in the soil to help retain nutrients and water. Also, using biochar is a feasible way to sequester carbon on a large scale, that is to take carbon (main driver of climate change) out of the cycle and therefore out of the atmosphere. We have been burning billions of tons of fossil fuels now since the beginning of the industrial revolution, maybe it is time to put some back?

The bi-product of biochar production is gas (high grade heat) and low grade heat. The gas can be used for vehicles such as the tractors or other farm equipment that needs to be run on combustibles. It can also be used for brick production, burning clay for a more refined product that can be used as ground-cover or building material.



The pre-columbian Amazon indigenous people used similar techniques (slash-and-char) in order to increase the fertility of their soils. This phenomenon is known as terra-preta, or burnt earth, and can be used by archaeologists to map ancient settlements. If biochar can be used to improve the soils of the modern world, it is certainly an ancient technology brought back to the modern world. (Brand 2009)

Spatial organization, morphology

The way that crops, trees, buildings are organized has effect on how eco systems interact. In this project, i have worked to creating more biological competition and synergy through the increase of biotope surface area. But how do one organize the design work in order to reach such effects? Christopher Alexander, mathematician, architect and design theorist, proposes 15 spatial principles on which all living structure is based on (Alexander 2002). They are expressed through pictograms and examples, and can be used as rules of thumb when designing through any media.

Landscape Ecology, Functional Boundary Conditions

In landscape ecology, one category of pattern that emerges as important for biodiversity are the boundaries (Herlin 2001). Both boundaries between different natural occurring biotopes and boundaries between cultural and natural landscapes are important. Boundary conditions between farmland and forest, or farmland and streams of water, can be interesting to ameliorate in order to have a rich biodiversity on site.

Boundary functions	Major characteristics	Examples
Conduits	Movement along the boundary	Wildlife corridors Green paths for people
Filters or barriers	Inhibition or acceleration of movement across the boundary	Visual borders Transition zone Barrier for wildlife Buffer zones for nutrients and pollutants
Sources	Net flow from the boundary to adjacent patches	Food sources for animals Source of insect-predators Source of pollinators
Sinks	Absorption or accumulation of objects by a boundary	Accumulation of snow Accumulation of animal species taking advantage of cover
Habitats	Special environmental conditions and species that characterize edges	Wildlife habitats for edge species or species using two or more habitats

Table based on paper by Ingrid Sarlöv Herlin (Herlin 2001)

Such boundaries can be curvilinear or straight, and they can be sharp or soft. The idea is to increase "friction" between flora and fauna through the use of spatial principles. Increasing the amount of boundaries by interlocking, making them thicker and softer, will be an aim of this project, with the hypothesis that this is important for the biodiversity and in the end the resilience of the landscape.

Morphological principles

Here are my versions of Alexander's (2002) principles, formulated for this project. Nr 1-3 deals primarily with landscape ecology, nr 4-5 with rationality and 6 with perception.

1. Levels of scale

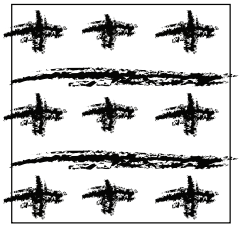
In a natural system, there are far many more small things than big things, and this relationship is fractal (Jiang & Brandt 2016). That is to say, patterns repeat throughout the scales. There should always be intricacy left to find when an observer gets closer.

2. Thick boundaries

Soft and wide boundary zones help increase biodiversity. Also, wide filters around waterways, so called riparian buffers, help retain nutrients, break down pollutants, and so on. It also creates aisle and limits for human perception.

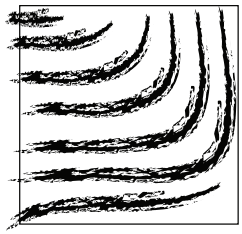
3. Deep interlock

Just as in the car catalytic converter, which increases the amount of chemical interaction in order to clean the exhaust, surface area is the key. By having fingers of forest and agricultural land intermingle, more interaction between species are possible.



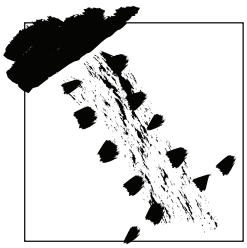
4. Repetitive elements

In order to have a rational system of agriculture, it is necessary to have repeating elements. The distance between lines of crops, the relationship between a fruit tree and a path. Rationality lies partly in predictable structure, but not necessary in similar structure.



5. Linearity

Laying the landscape out along lines is a good way to ensure tools can be used to increase efficiency. However, that does not mean it has to be straight - curvilinear is also allowed.



6. Local symmetries

To create vistas, readable environments, symmetries are encouraged, These can then, in the spirit of (1-Levels of Scale), be repeated but with individual local symmetries (that need not be right angle to the global)

Parcels - synchronic study

This comparison shows some different scales of parcellation. It gives a clue towards where Hjo is in the world when it comes to levels of scale in the landscape. Countries like the USA and Russia are dominated by large scale orthogonal systems, at the same time as other rich developed countries, like England, have maintained their pre-modern land divisions.

The areal views are cropped 2 km wide and presented at equal scales. Source: Bing Maps

Parcels - diachronic study

The first cartographers that charted the Swedish countryside did so on behalf of the King in the mid 17th century. These maps show a very fine division of several plots, that the village distributed in order to have a fair division of soil qualities and types. What followed in the 18th and especially 19th century was a series of reforms in order to rationalize the agriculture. It can also be seen as a result individualization and enlightenment ideals (Cserhalmi 1998, p. 123). The main task was to merge parcels in order to increase efficiency and reduce dependency between farmers. By law, if just one farmer wanted the reform, it had to be carried out.

Storskifte	1749-1827
Enskifte	1803-
Laga skifte	1827-1928

(Cserhalmi 1998)

2016 source: maps.slu.se

1645

source: Lantmäteriet

1814
(Enskifte)

2016

2026

A building is not something you finish. It is something you start.

Stewart Brand in How Buildings Learn (1994)

When I am working on a problem, I never think about beauty - but when I have finished, if the solution is not beautiful, I know it is wrong.

R. Buckminster Fuller (1895 - 1983)

Compared to farmers, I think it is generally agreed that others understand very little about anything of consequence.

Henry Mitchell (1923-1993) QI (2016)

II - Agricultural Campus

Early sketch for the campus buildings

Summary of pre-project analysis

Before this in-depth project was carried out, a broader analysis of Hjo, it's local situation and the broader context was carried out. This resulted in a SWOT analysis, development objectives and strategies to reach those. The idea is to use the result in order to let strengths deal with threats, and let opportunities improve weaknesses.

Strengths

Cultural heritage: Natural heritage, built heritage, agricultural heritage
Proximity (physical): Within Hjo and in relation to the region
Community: Social capital, social trust, social spaces
Local resources: Lake Vättern, productive landscape, forest, clay, fish
Closeness to nature (physical and mental): Diversity of natural systems, recreation, habitat

Weaknesses

Lack of diversity: People, housing, development, monocultural agriculture
Lack of access: Inadequate pedestrian and bicycle lanes, public transport
Disconnection: urban-rural, formal-informal space
Low resilience: Jobs, activities, food, resources
Dependency of seasonal tourism
Demographic unbalance
High ecological footprint

Opportunities

Growing interest in local resources: Renewable resources, agriculture innovation, organic foods and goods
Growing interest in eco-tourism
Increased environmental awareness: Individual and political level
Immigration and multiculturalism
Increase in sharing economies: resources, knowledge, services
Slow city trend / Ruralisation
New technologies / digitalization connects Hjo and it's labour market to the world

Threats

Aging population
Climate change: jeopardizing agriculture, loss of biodiversity, extreme weather
Urbanization: young people moving out, centralization of services
Individualization: decreasing community engagement
Globalization: external dependency makes Hjo less resilient, dilution of local cultures, loss of local traditional knowledges
Unsustainable agricultural and forestry practices: Diminishing global resources / Peak everything

Seven strategies for sustainable Hjo

Promote the production and distribution of local organic food

Increase sharing and collaboration in the community

Raising awareness of local resources and cyclic systems

Optimise the production and use of local resources

Create a more diverse and resilient landscape

Enhance the rural and urban relationship

Construct and develop systems for locally produced sustainable energy

An agricultural campus

Agroecology is knowledge-intensive. It requires the development of both ecological literacy and decision-making skills in farmer communities. Investments in agricultural extension and agricultural research are key in this regard. (Human Rights Council 2010, p. 17)

Hjo, like many other smaller municipalities in Sweden, struggle to keep up with the bigger cities when it comes to economy, services, jobs. What it does have is a great natural capital, a richness in resources that bigger cities can envy. The fact that urban settings are dependent on the rural is something often underestimated and sometimes forgotten.

When sketching out a sustainable future for Hjo, improving agriculture is one of the most important parts: since agriculture affects such a big portion of the land use, changes done here will have a great effect. But working with agriculture is also a part of improving urban-rural relationships. Giving agriculture a bigger part of the local, but also national continuousness, is a way to improve the status of the rural.

Conventional agriculture requires huge amounts of fossil energy and industrial fertilizer. This is not a sustainable practice, and a transition into agroecological practices are needed. Hjo, with its richness of agricultural lands, can host a proof of concept. This project explores ecological principles applied to an agricultural campus in Korsberga.

It is a type of pilot project exploring sustainable practices in agriculture. It could be a joint effort by Hjo municipality, local stakeholders and the Swedish University of Agricultural Sciences (SLU). SLU already have a campus in Skara, which this could be affiliated to.

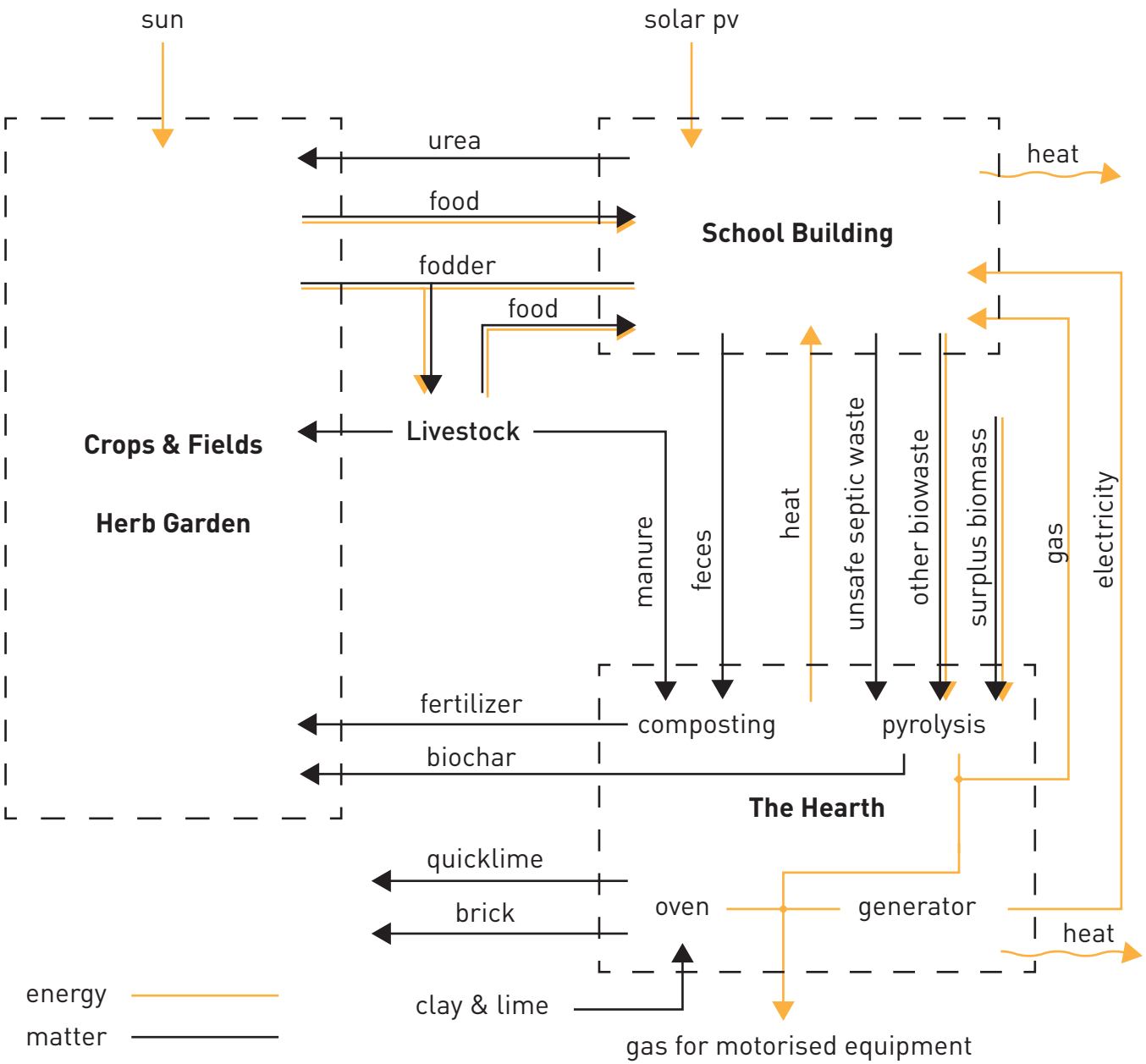
It is a place to conduct research, but also to produce food for local consumption. It is a didactic platform, accepting schools and locals to come and help, learning by doing. Working with education is also a way to bring a younger population to Hjo, to fill that demographic gap. Collaboration with the folk high school seems natural. It creates diversity in the rural setting and create activities for the winter. Read when it snows then plant when it thaws.

Summary

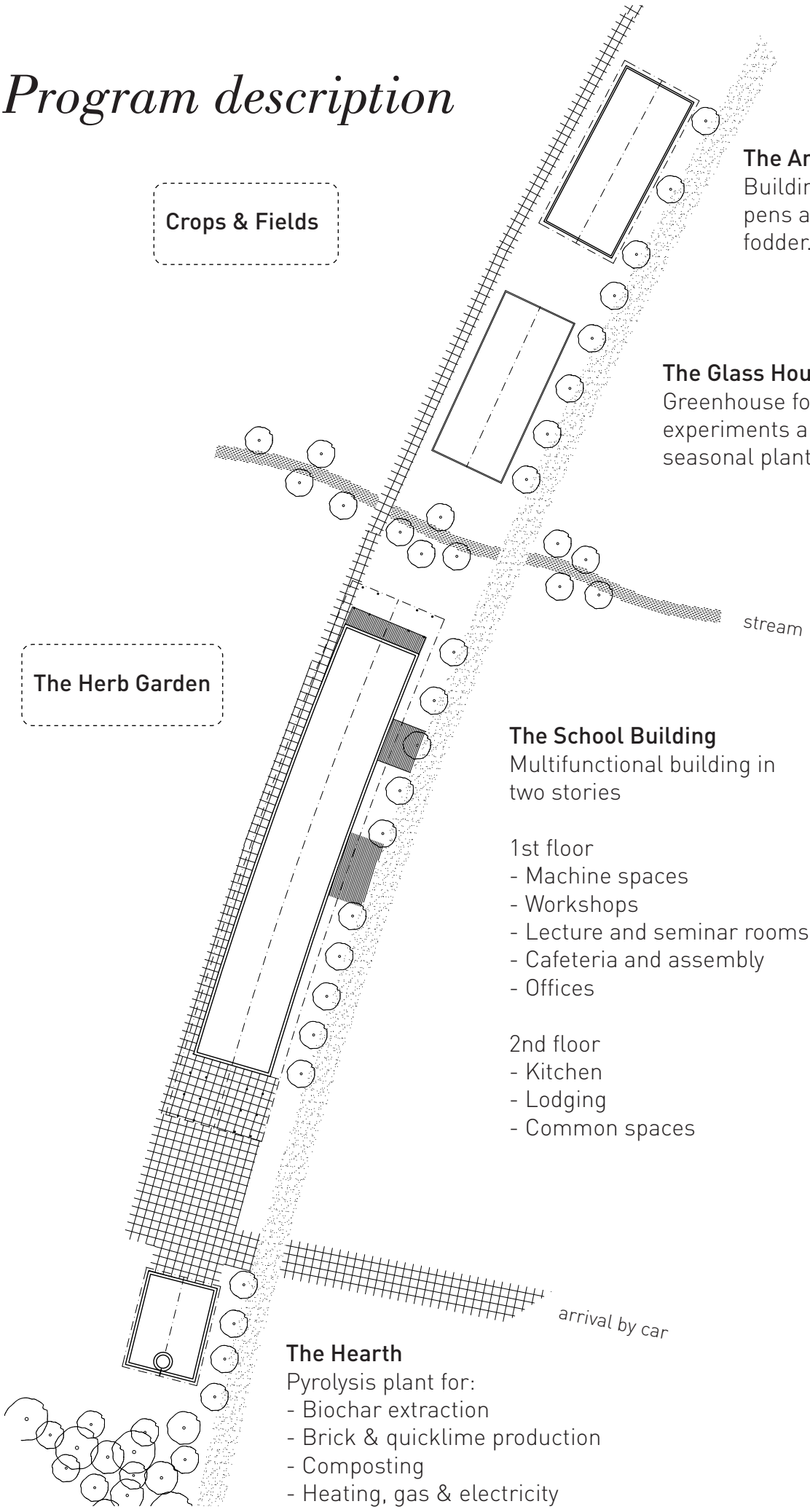
- ⬡ Becomes a test platform and proof-of-concept for important changes of agricultural practices for a sustainable future.
- ⬡ Connects researchers and practitioners, bridging the gap between academia and industry.
- ⬡ Sequesters greenhouse gasses through biochar, mitigating climate change. Keeps nutrients out of streams and sea.
- ○ Brings young jobs to Hjo.
- ○ Activates the old railroad track as a strong point of interest on the new bike and hike trail.
- ○ Winter activities that complement summer.

Closed nutrient cycles

The only energy source is the sun. The ultimate fate of all energy is to be lost as heat, after performing useful work. The ultimate fate of all nutrients is to be recycled back into the system.
The pyrolysis and compost plant on site, named The Hearth, becomes the heart of recycling in the project. This facility converts waste into useful energy and nutrients for the soil. As a by-product of biochar production, it creates gas that can be used for internal combustion engines. This is then used for cooking, electricity, and farm equipment.



Program description



The Animal Barn
Building with animal pens and storage for fodder.

The Glass House
Greenhouse for controlled plant experiments and extended seasonal plantation.

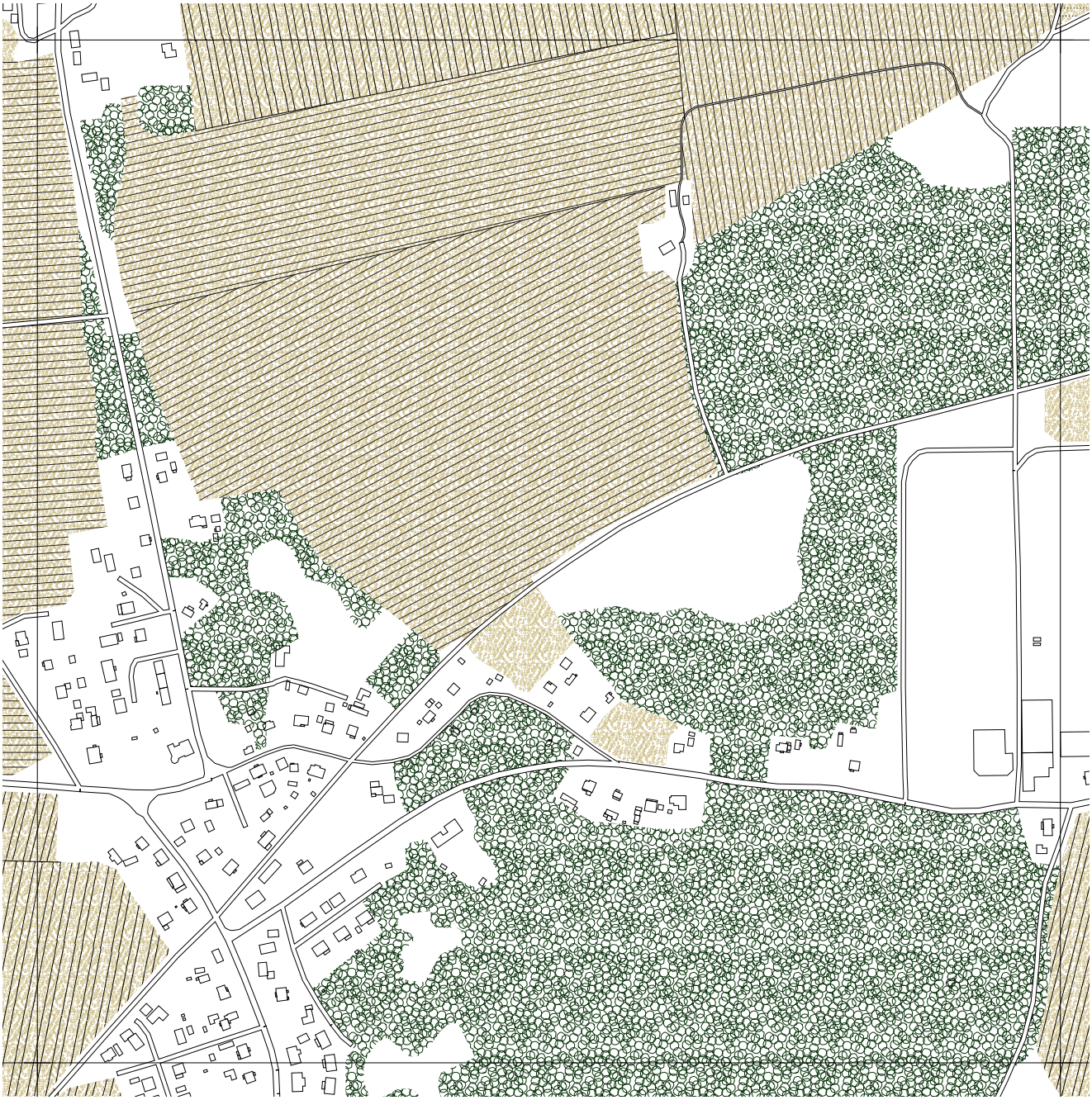
The School Building
Multifunctional building in two stories

1st floor
- Machine spaces
- Workshops
- Lecture and seminar rooms
- Cafeteria and assembly
- Offices

2nd floor
- Kitchen
- Lodging
- Common spaces

The Hearth
Pyrolysis plant for:
- Biochar extraction
- Brick & quicklime production
- Composting
- Heating, gas & electricity

The changing landscape



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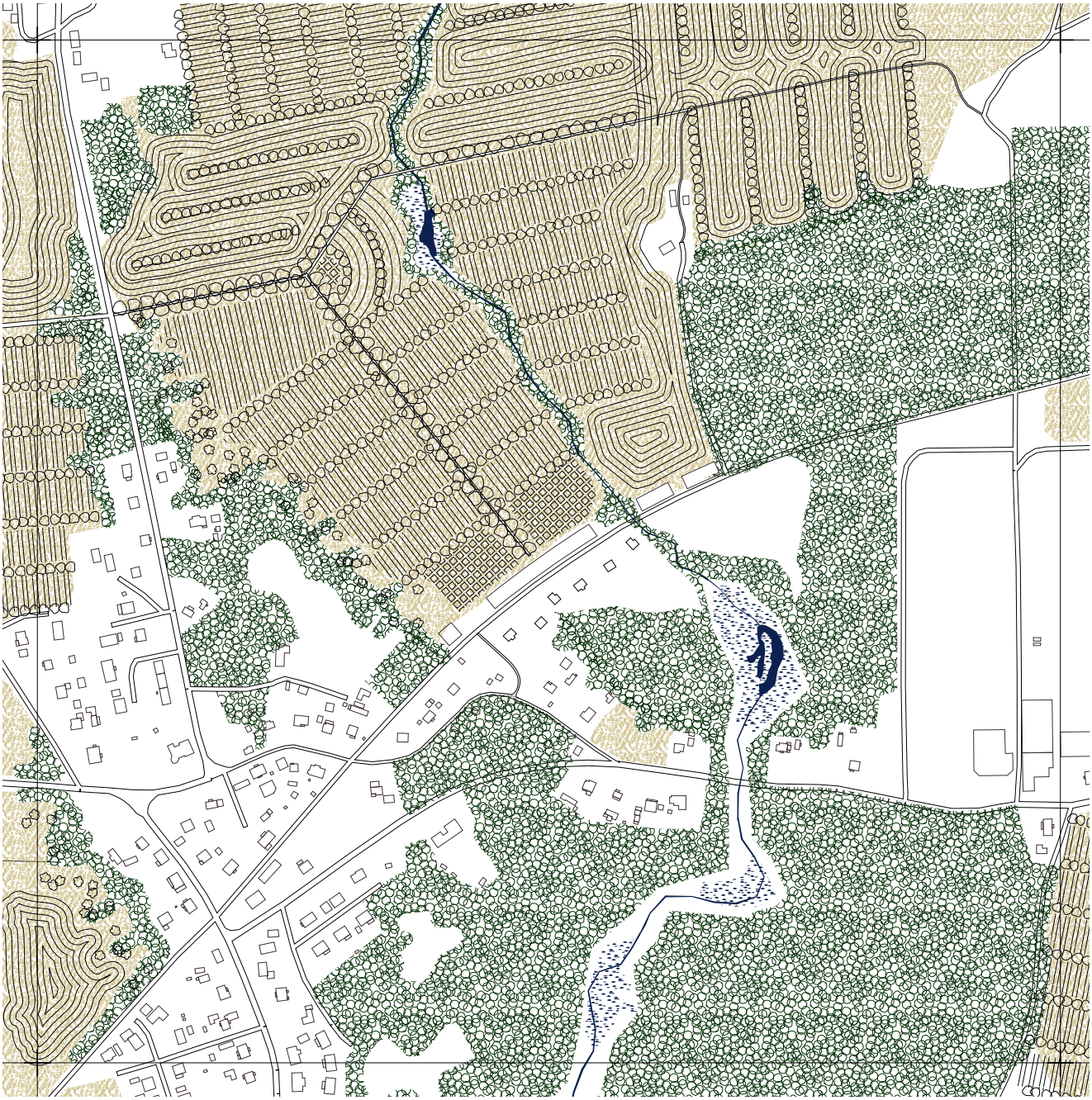

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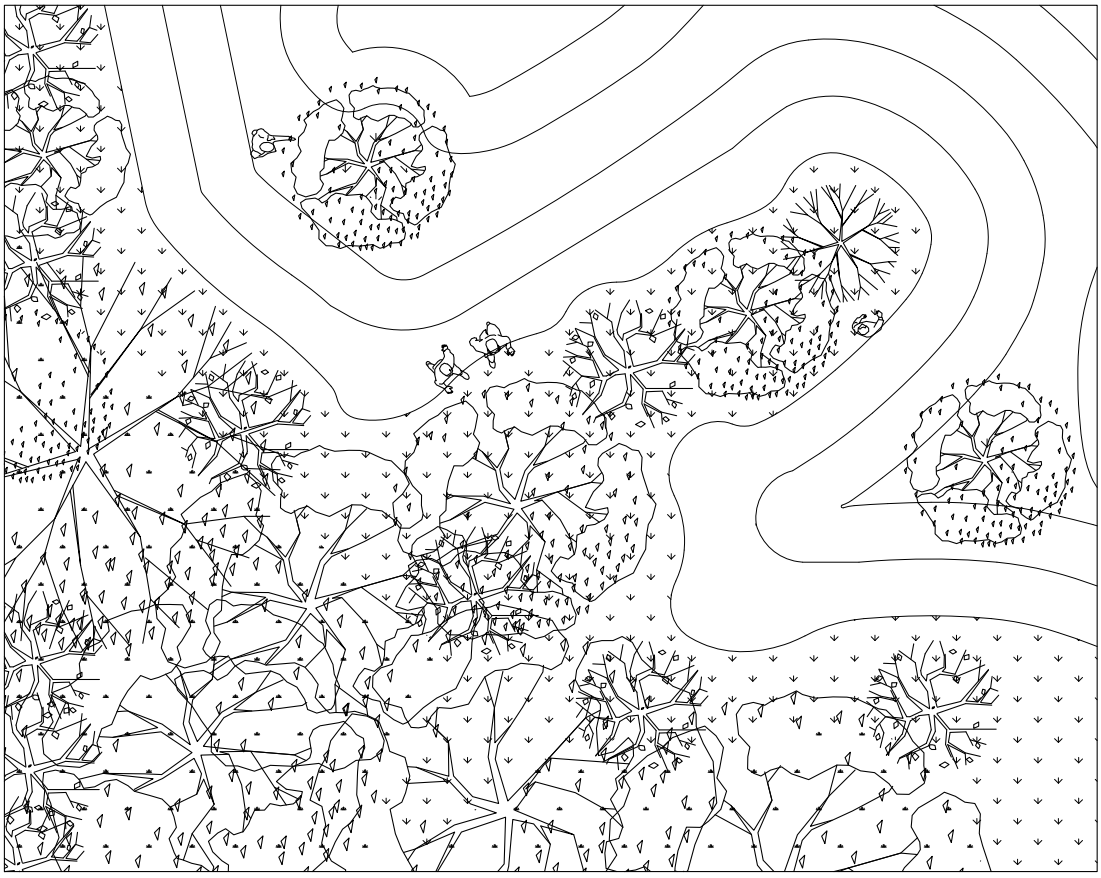
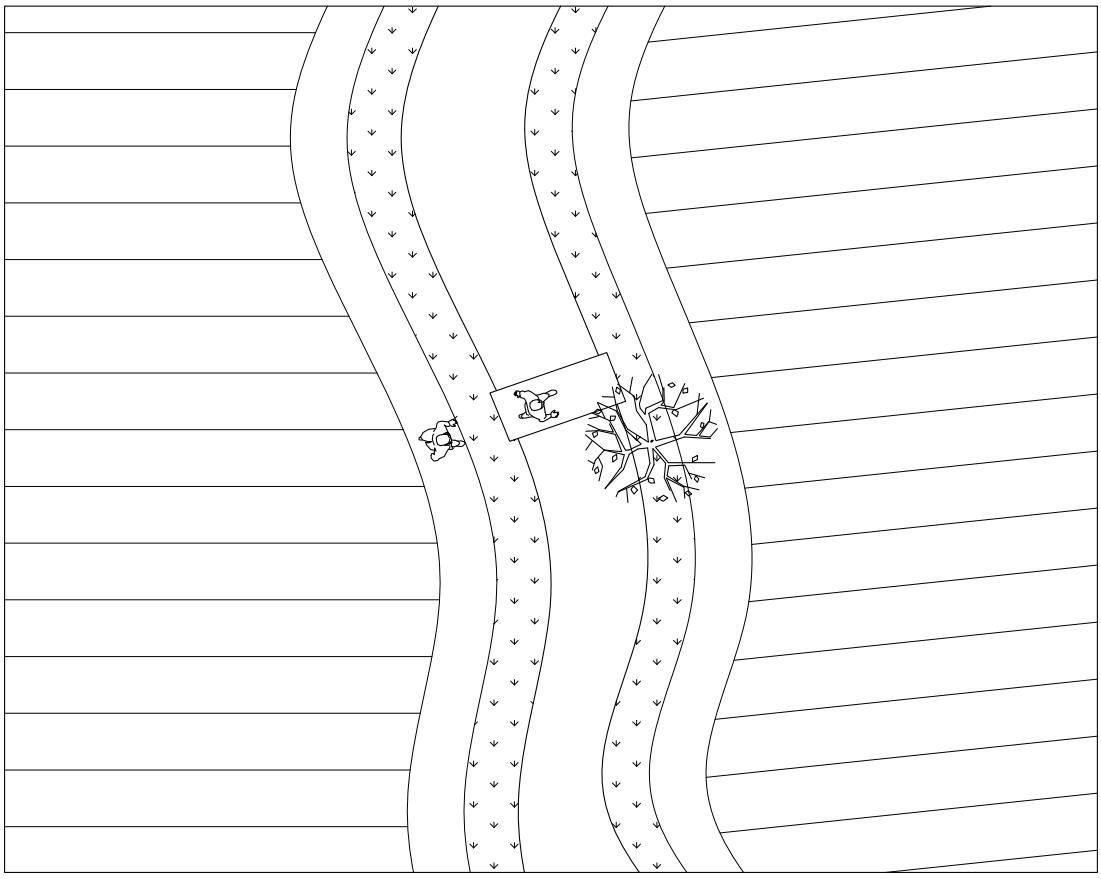
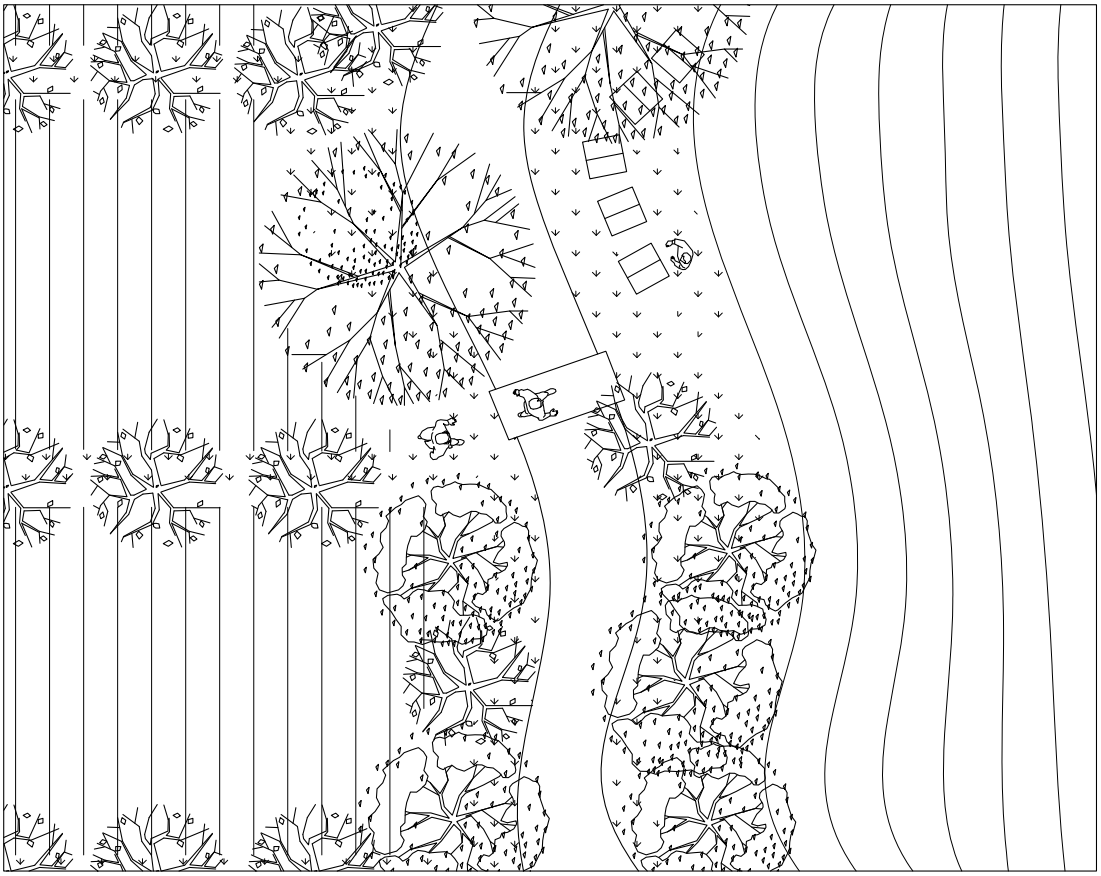
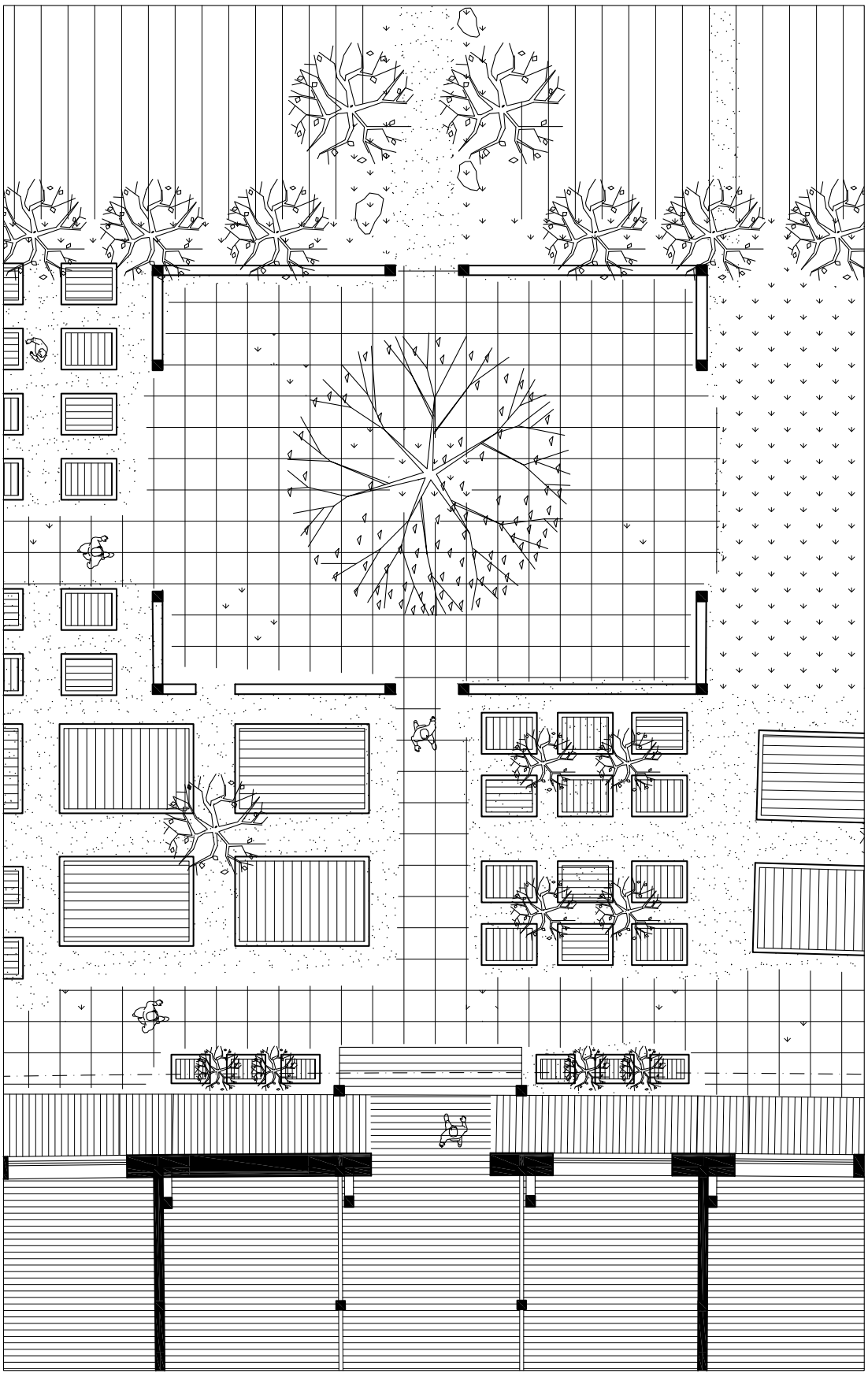


How forests and agricultural lands interlock and create more interplay of species.





How to treat the boundaries between streams of water and agricultural land with a riparian buffer.



Excerpt from the herb garden. The composition contains multiple levels of scale, in a fractal pattern.

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Learning from the rural

Built for change.
A farm building is built for many purposes. But it is not the many purposes of a Swiss army knife, with a specialized pointy thing for every occasion. Instead it is like a one size fits all glove. The building is designed with a "loose fit" to encompass many different programs and functions. They are built big, for equipment, animals, and produce. They are built cheaply and easily.
No wonder farm buildings are so great as objects of transformation – all functions are welcome, no one is discriminated. Buildings of the city should learn adaptability and simplicity from them.
Farm buildings need not be (and is not) purely for productive use, they are also perfect for social gatherings such as flea markets, parties, indoor sports etcetera. They can be the public space of the rural.

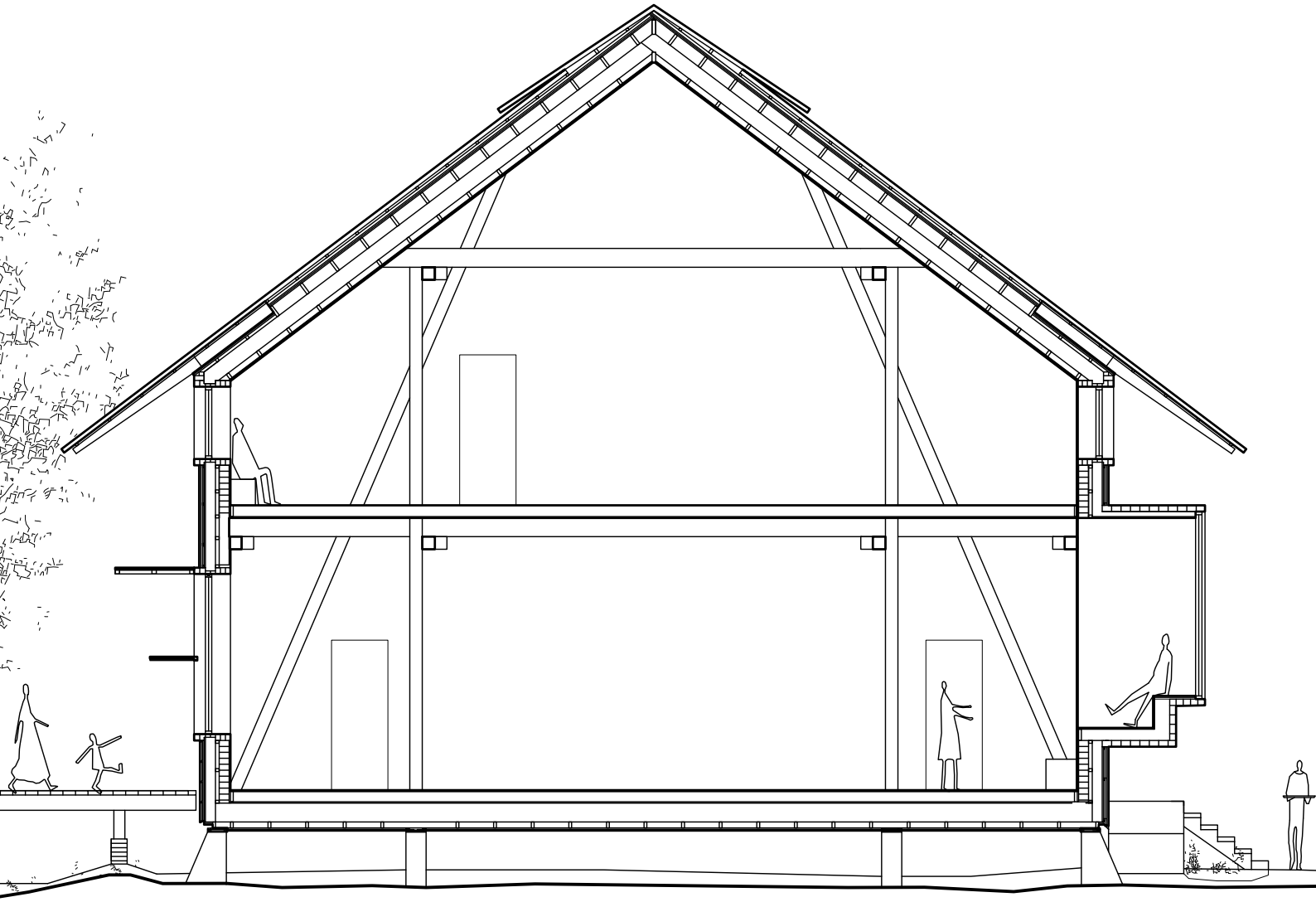
Big protective roof that protects from the elements, even in a far from perfect building envelope. Brick where the building meets the moist ground, wood where it should be lightweight and economical.

The farmhouse is a productive building, for sure. But it is also an aesthetic element in the landscape, and a social place for the local people.

The shed is a marvel in pragmatism and common sense. It rests on concrete pylons rather than slabs, so it touches the earth lightly. Its roof cantilevers when necessary.

Structure, skin, services, space plan

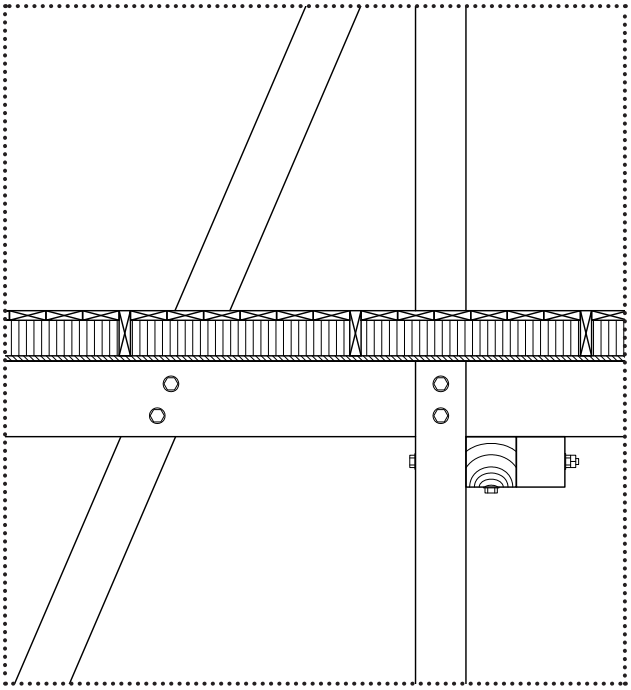
In order to build for future disassembly, and to avoid fixing space plan, skin, services and structure, a heavy timber frame is used. Compared to the balloon frame, the majority here of the structure is exposed, and the soundness of the structure is naturally inspected daily. Diagonal members take up horizontal force and are placed in such a way to make access possible but still create a series of more personal spaces.
The building is placed on the boundary between the railroad and the fields, and it, together with it's garden, helps make this transition wide.



15 m

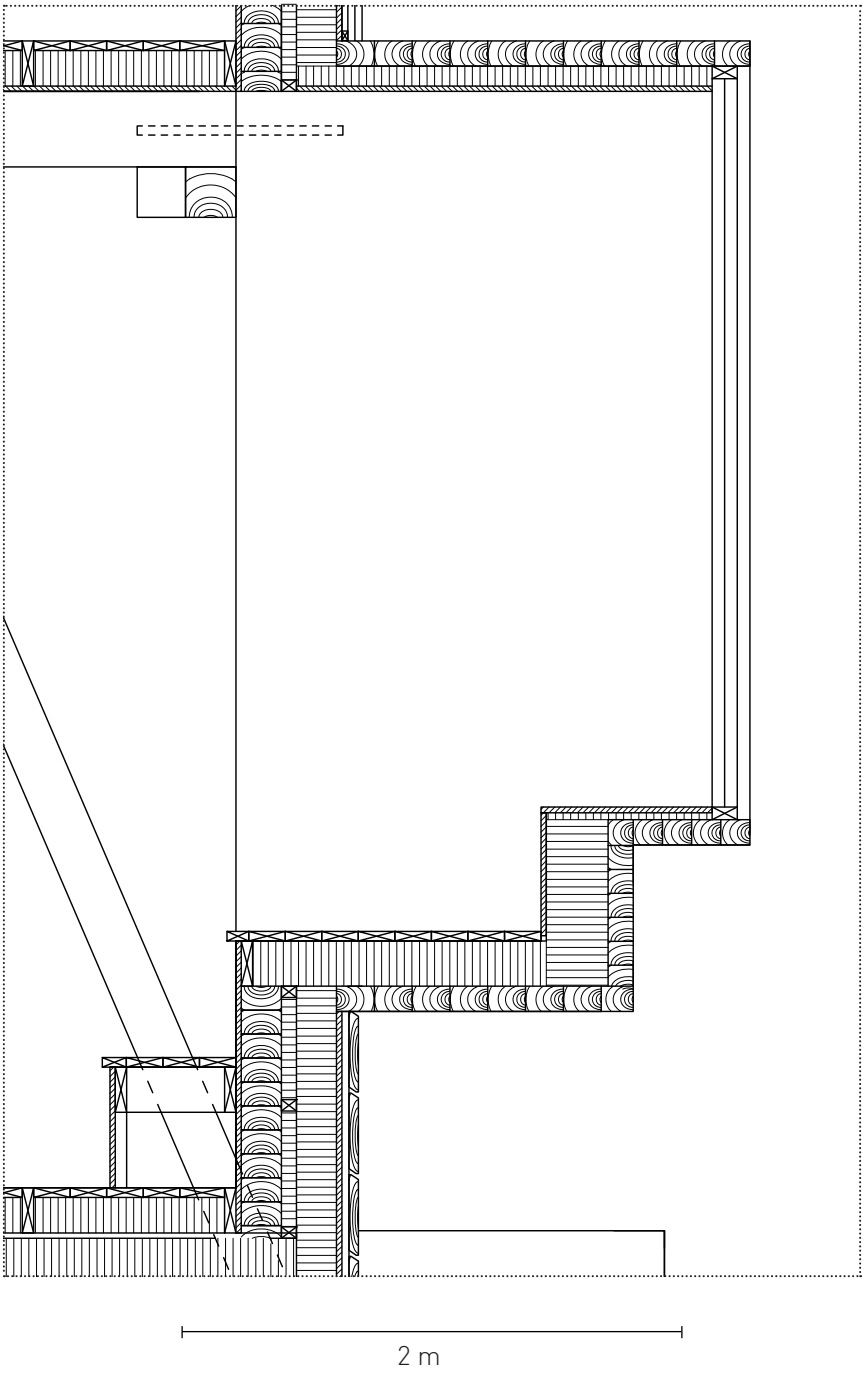
Detail 1:30, Joints

The construction is made with overlapping members that are fixed with screw and nut joints, to simplify building and disassembly. ▶



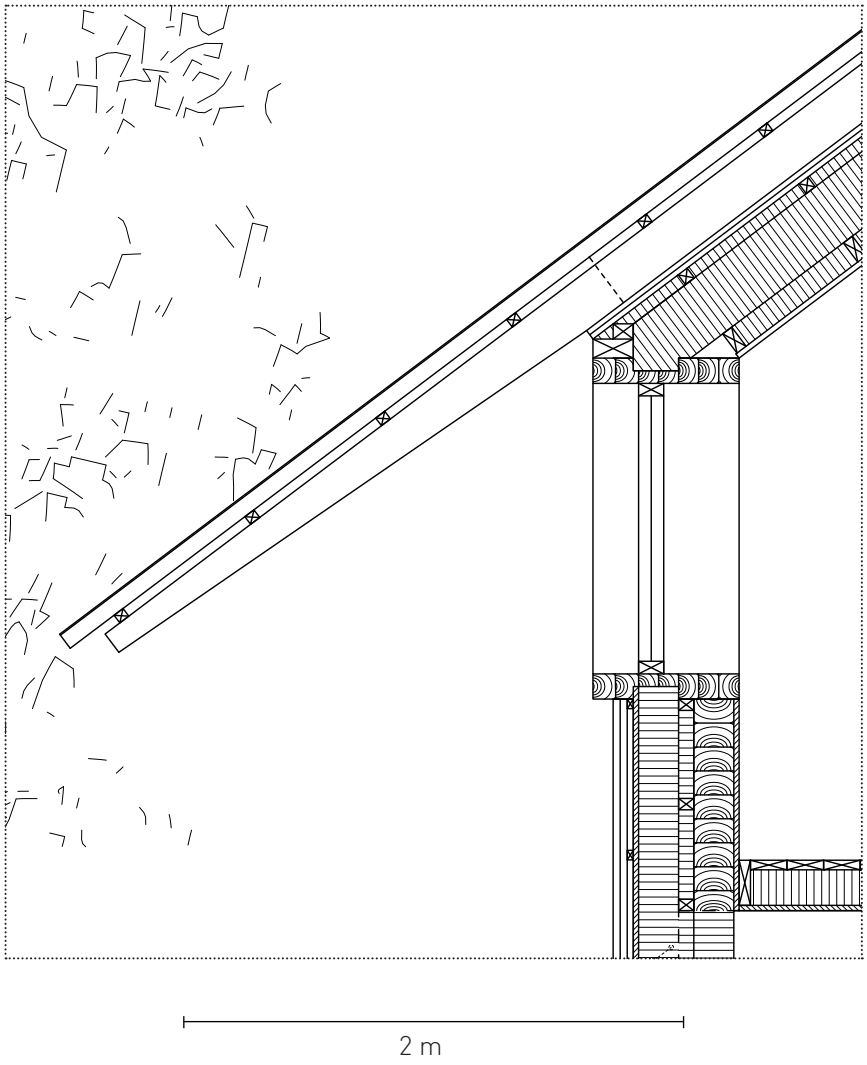
Cross-section 1:100

Detail 1:30, Alcoves



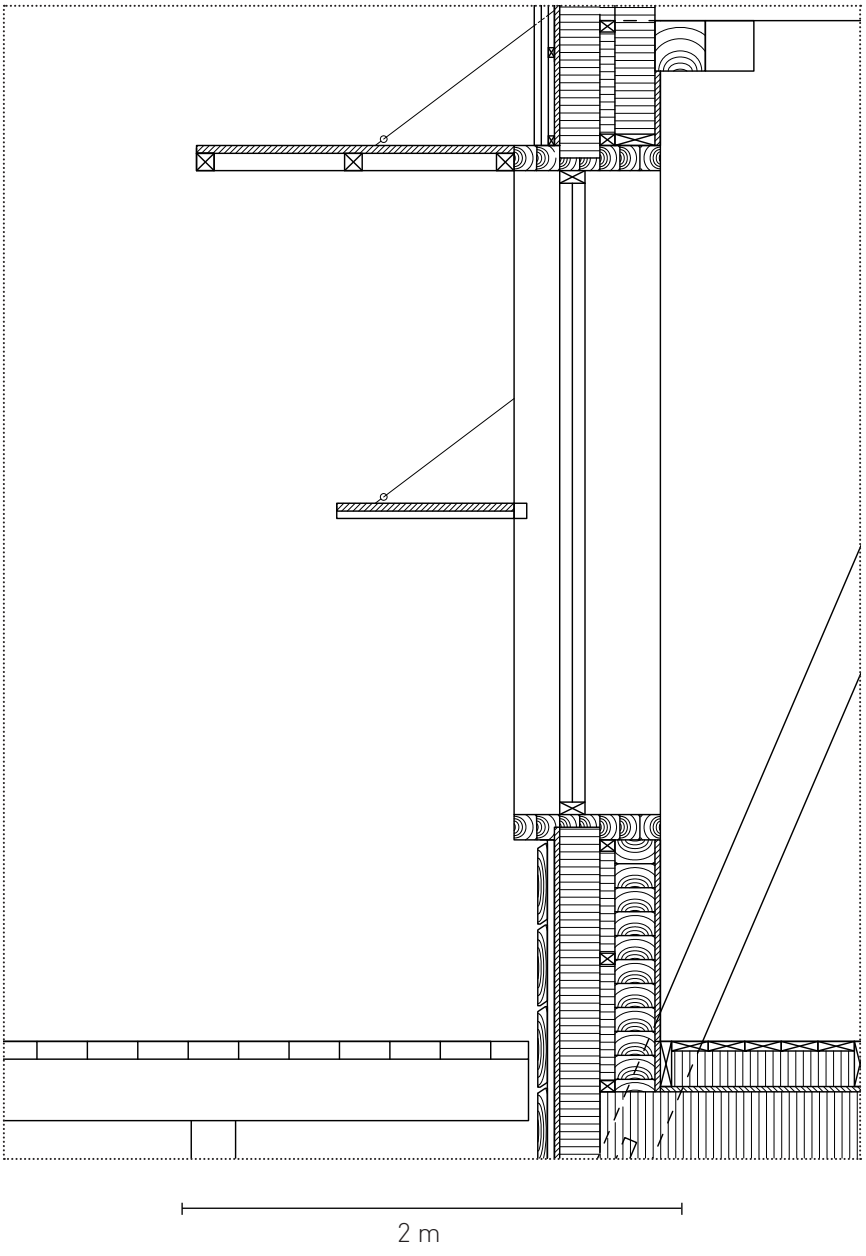
In certain places, the interior space pokes out, creating a kind of alcove in which to sit and read or have a more private conversation.

Detail 1:30, Overhang



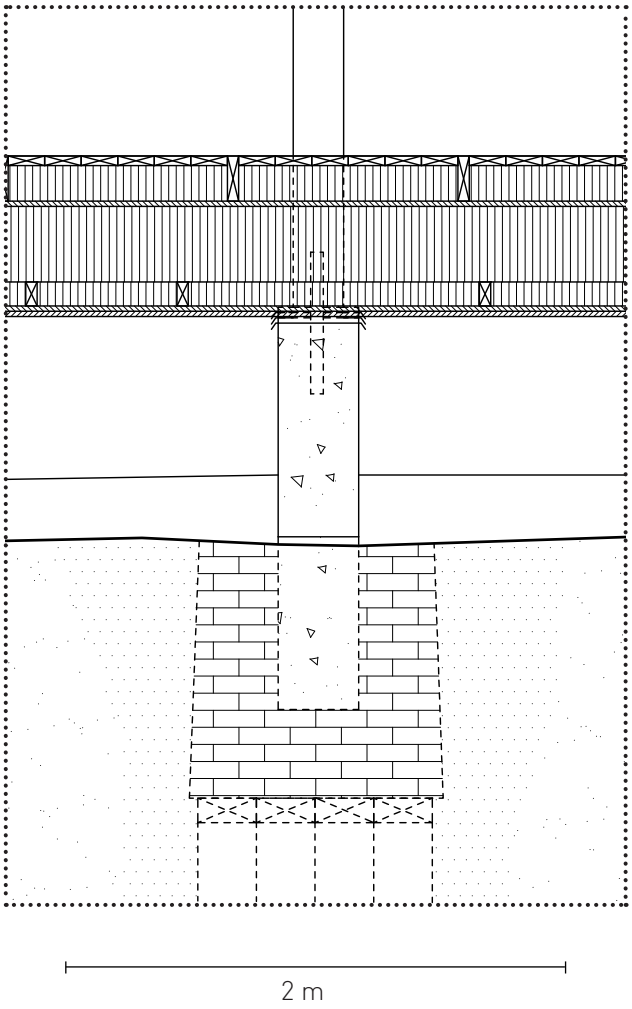
The roof is shelter. The big overhang decreased rainwater pressure on the facade, covers windows from the cold night sky, and protects from the sun. The angle of the roof is set to 37 degrees, which is the optimal angle for solar photovoltaic on this latitude.

Detail 1:30, Windows

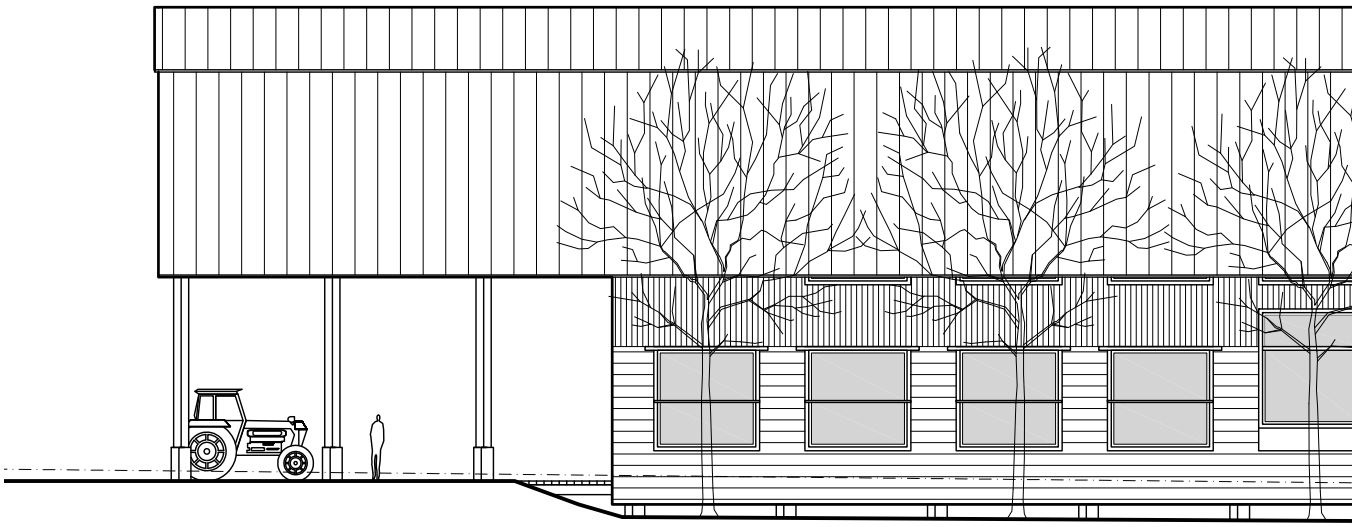


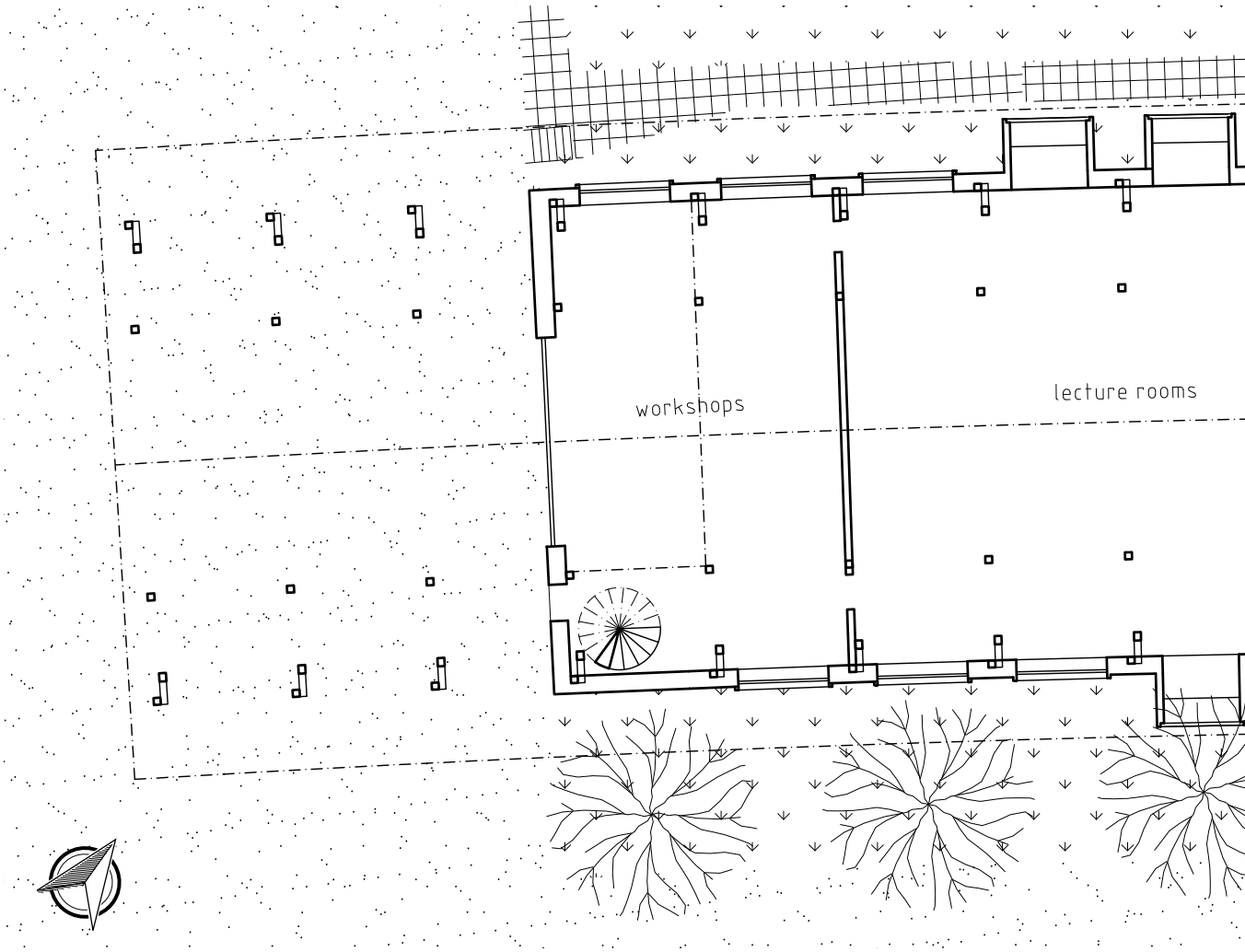
On the south facade, the big windows are designed to let in a lot of warm sunlight in the winter, when the sun is low on the sky, and shelter it from the high sun of the summer.

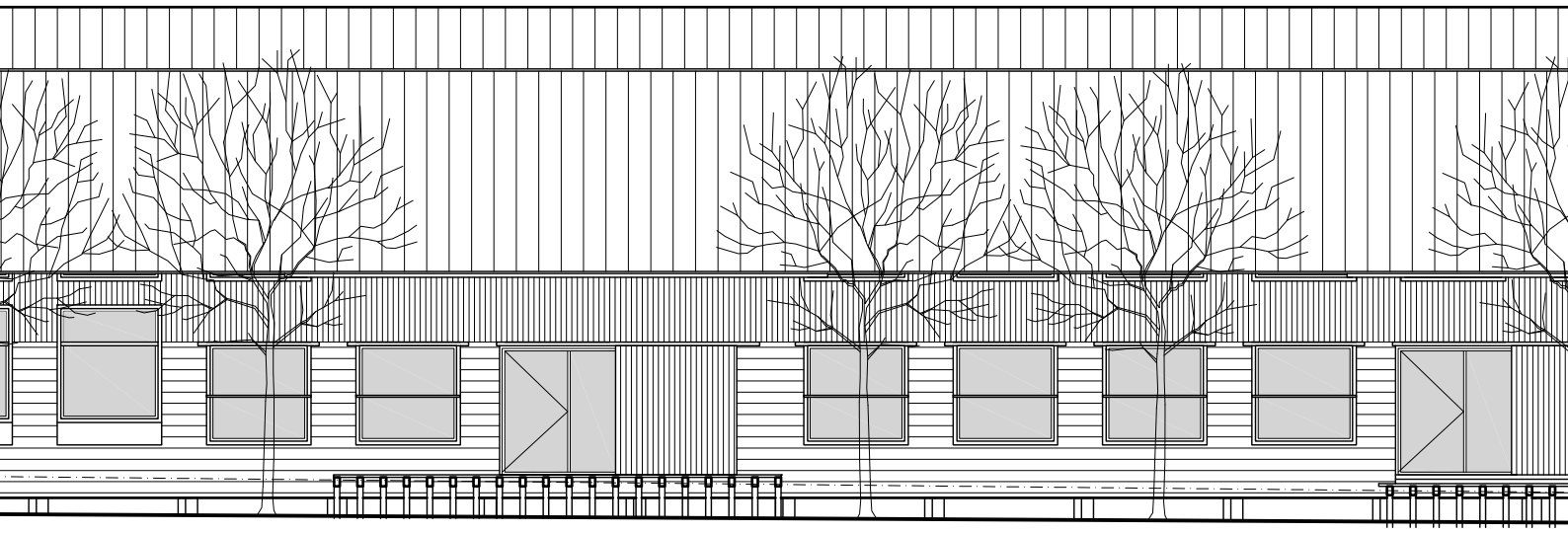
Detail 1:30, Foundation



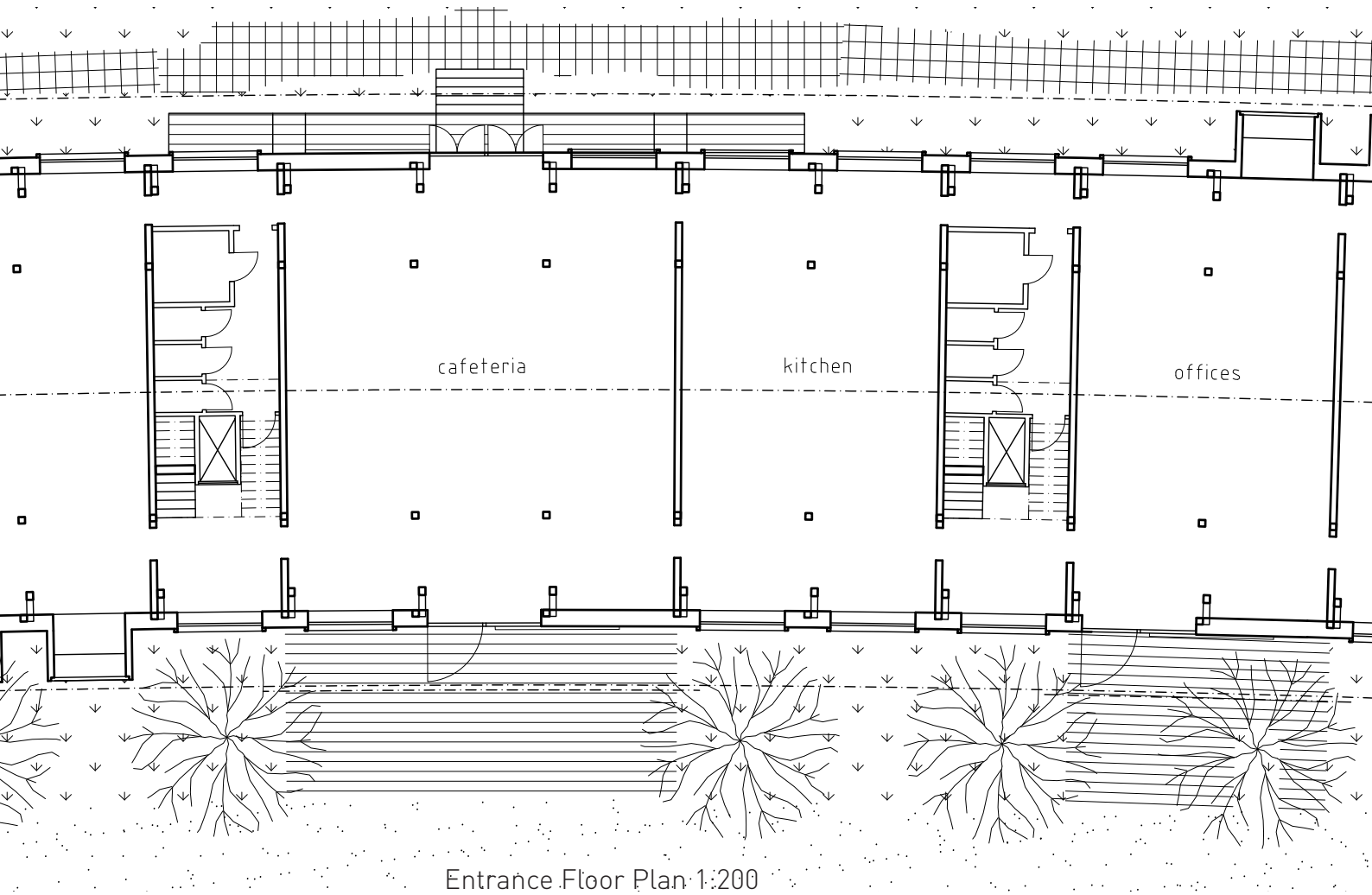
The building touches the earth lightly, in order to be as reversible as possible for the landscape. Inorganic materials such as concrete and brick are used where the building touches the moist ground. Where the end grain of the wooden structure meets the concrete, several layers of overlapping tar felt is used.
This is where the most use of "unsustainable" materials in the building are, but it is used where their properties are most needed.




workshops
lecture rooms



South Facade Elevation 1:200



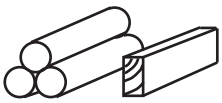
Entrance Floor Plan 1:200

30 m

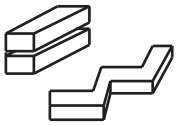
View down the former railroad, looking north-east.

Good Materials

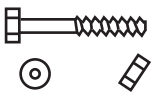
The buildings are designed with cheap, locally sourced and healthy materials, which are easy to work with.



Ask an engineer or scientist to design a new material. The material should be used in buildings, both structurally and as cladding. It should be able to withstand forces in both tension and compression. It should be easy to shape with both hand- and power tools. It should insulate, but be able to store heat. It should be healthy and free of out gassing. It should be able to last hundreds of years – but easy to repair if it does not. When requested, by the change of environmental conditions, it should be able to decompose and returned into a closed ecological loop. It is to be produced automatically, with as small investments and short supply chains as possible. And also, while it is doing this, it should have positive effects on as many ecological systems as possible.
This material that you ask of the scientist already exists. It is wood.



Clay is one of the oldest building materials. It is abundant in many agricultural lands, such as those around Hjo. This is why the railroad once made a brick factory possible here. The high quality clay made for a high quality product. The project boasts its own micro facility for burning bricks using the gasses from the pyrolysis. These bricks can be used where the ground cover needs to be made sturdy for vehicles or people. They can be made with holes or laid down with generous spacing so that they still allow water to permeate the soil.



Steel is a high grade super material and should be seen and used as such. Fasteners such as screws and nuts are perfect when designing for maintenance. If they are sufficiently protected from corrosion, almost all material can be recycled and reused for centuries. However, all non biological materials are finite. Therefore it is necessary to be frugal.

When materials mature with civilization, we learn how to use them but also love them. Wood, stone, clay and steel have this feeling of empowerment at the same time as they are loved for their aesthetic quality, their roughness and patina.

Perspective, from inside looking out over the herb garden and fields.

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