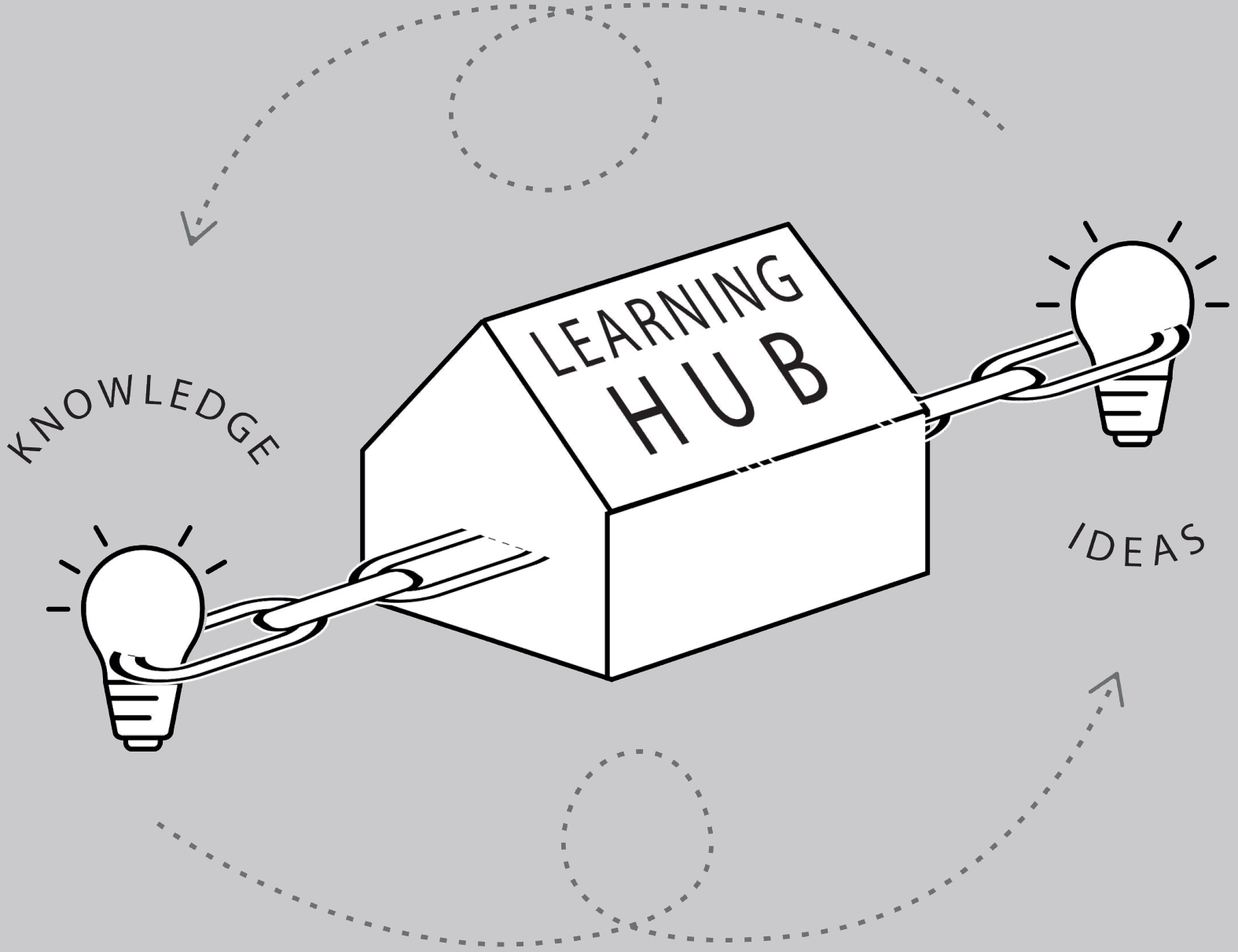


CHALMERS ARCHITECTURE

Master's Programme Design for Sustainable Development 2016/2017
HJO - Towards Resilient Urban-Rural Interactions and Transitions
Design studio part B / In-Depth Project
Coralie Szolosi | Gheorghe Maleca | Peter M. Samburu
Learning Hub

INDEX

Introduction

Points of Departure....6
Aim of the project....6
Objectives....6
Planning & Design Strategies....6
SWOT Analysis....6
Project Description....7
Tenets of the Learning Hub....8
Stakeholders Mapping....10

Data Collection

Interviews....14
Workshop....15
Sketching....16
Photography....17

Site Selection

Suitability Analysis....20
Potential Areas....21
Site investigation / Analysis....21
Abutting Developments to the Site....25

Design

Sustainable Design Strategies....28
Placement of Buildings On site....30
Workshop & Exhibition Building....32
Greenhouse Building....34
Orchards....35
Conference, Administration & Kitchen Building....36
Shop....38

Appendixes

Criteria for site selection & maps....40
Reference project....44

References

....45

INTRODUCTION

Point of Departure

In a TED Talk called 'Where Good Ideas Come from', Steven Johnson explores the role of a 'coffee house' in the birth of the Enlightenment -- it provided "a space where people would get together from different backgrounds, fields of expertise, and share." The Learning Hub is a project with a focus of designing a space without barriers. A place where children, farmers, business people, craftsmen, refugees, inhabitants and tourists of Hjo town can meet, collaborate, learn, share and communicate ideas for sustainable community development.

Aim of the Project

The project aims at creating a platform for experimentation, Interaction discussion, and exploration of new ideas for sustainable development in Hjo Town.

Objectives

This project deals in particular with three objectives 'Towards Resilient Urban-Rural Interactions and Transition in Hjo' produced in the earlier stage of the course which are:

Hjo is a place of inclusion where differences and diversity are valued and represented in an equitable community.

Hjo Inhabitants have awareness of sustainable lifestyles and has an ecological footprint below one.

New buildings and transformations in Hjo are primarily to be built with local resources and be carbon negative.

Planning and Design Strategies

Our project connects to the following planning and Design Strategies formulated in the earlier stage of the Course.

- Provide a place to creatively produce, sell, and share knowledge of local products and local craftsmanship
- Provide environmental education across all social and age groups
- Promote a Learning environment in local resource cycles

Swot analysis

Below is an extract of the Swot analysis that relate to our project as formulated in the earlier stage of the course.

S

* Close to nature
*Community: Social capital, social trust, social spaces
*Proximity (physical): Within Hjo and in relation to the region

W

* Sleeping city: daily, seasonal
*Low resilience: Jobs, activities, food, resources
*Lack of diversity: People, housing, development, monocultural agriculture

O

*Increase in sharing economies: resources, knowledge, services
*New technologies connects Hjo to the world
*Immigration and multiculturality

T

* Urbanization: young people moving out, centralization of services within Hjo and in the region
*Individualization: decreasing community engagement
*Xenophobia

Project Description

It has long been known that a combination of both formal and informal Learning is an effective way of turning theory into practice. This includes working and Learning alongside more experienced people, both online and face-to-face (Selinger, 2013).

The nature of Learning is changing, and new Learning technologies are proliferating. People therefore need alternative models and novel spaces for developing their skills and gaining further knowledge as well as places to engage with peers and mentors (Selinger, 2013). The Learning Hub is a good solution as it offers a platform for experimentation, interaction, discussions, and exploration of new ideas for Sustainable Development. Experienced craftsmen, farmers, businessmen and the elderly will play a key role in providing knowledge and skills to children, inhabitants, refugees and tourists of Hjo town.

At the Learning Hub, people will have access to numerous programs like exhibitions (indoor /outdoor exhibitions), workshops (culinary, carpentry, artistic, Building, up cycling), Courses and Conferences (Learning events), lessons about Sustainable building systems (food cycle,water treatment and energy loop), and discussions. The Municipality of Hjo in collaboration with other Local associations and investors will play a key role in the implementation of the Learning Hub´s activities and programmes.
The scheme at right illustrates the concept of the project graphically.

Tenets of the Learning Hub

As opposed to study centres , community centres or traditional classrooms, the Learning Hub should be:

Located in the best possible place away from major roads, noise and pollution (Wheway, 2007). A suitability analysis was conducted based on: distance from Industrial areas, major roads, access roads, and rivers/creek, schools; Slope; and Land uses of Hjo town in order to find the best locations for placing the Learning Hub

Designed to fit the surroundings, local environment, and complement attractive spaces (Nebelong, 2002). When designing spaces, careful consideration should be given to the qualities of the site such as existing buildings, trees with character, history of the place, an old sculpture or something else.

Close to nature since most people benefit from access to natural environments which are attractive and fit for Learning (Lester & Maudsley, 2006). Trees attract birds and other wildlife to literally bring live a Learning environment. Deciding upon a site to put up a Learning Hub should therefore take into consideration the necessity of nature.

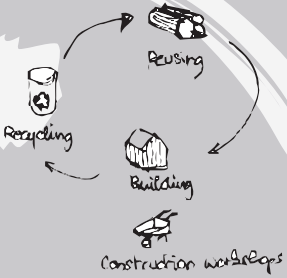
Inclusive as it will be used in different ways by people of different ages and interests. This implies that the design should flexible to embrace a combination of different features which appeal to different target groups.

A space loved by the community and where everyone would want to go. The design should be attractive and meet the aspirations of people in a competitive manner.

Built with Local Materials which are natural, recycled and recyclable and do not damage the ecosystems.

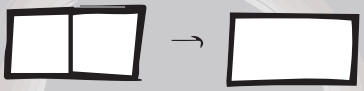
PRESERVATION OF THE TREES

DIFFERENT VOLUMES TO CREATE INNER SPACE AND ACTIVATE THE SITE



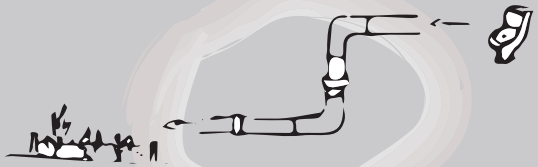
CIRCULAR ECONOMY

USE OF LOCAL MATERIALS



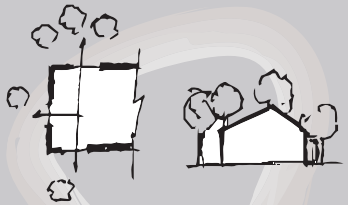
FLEXIBILITY

LOCAL DESIGN INSPIRATION



EXPOSED TECHNICAL SYSTEM

GREEN FACADE AND ORIENTATION



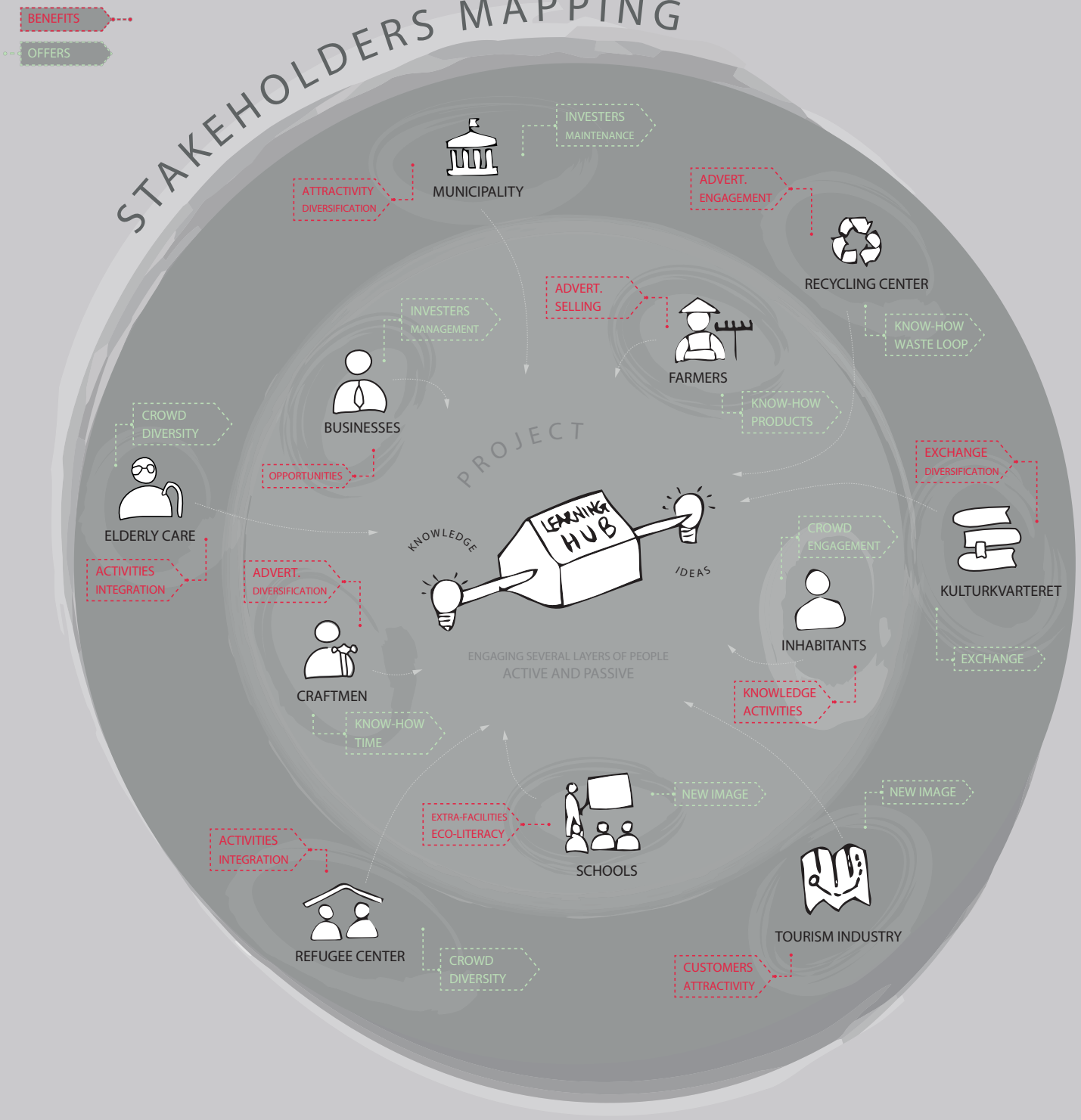
VIEW ON NATURE AND SURROUNDINGS

USE OF SYMBOLS AS UNIVERSAL LANGAGES

Stakeholders Mapping

This was an essential component of the project and involved identification of both active and passive stakeholders. The active stakeholders were considered as those that will strive to affect directly the actions of the Learning Hub. They include craftsmen, schools, inhabitants, farmers, and business people. The passive stakeholders (refugee centre, Tourists, Recycling centre, Municipality, and Elderly Care Centres) will influence and are affected by the activities of the Learning Hub but not directly engaged in its activities.

STAKEHOLDERS MAPPING



DATA COLLECTION

Interviews

Per-Åke Johansson

Environmental Strategist Hjo Municipality

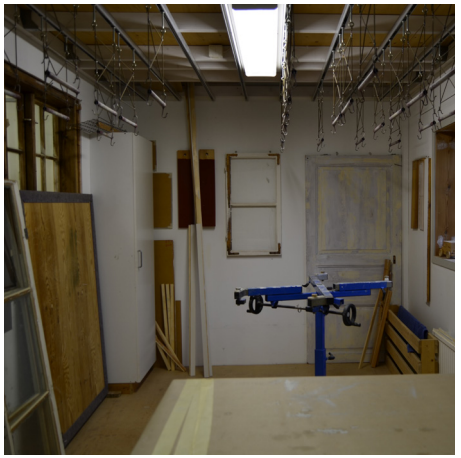
He told us that the former City architect (Per-Göran Ylander) organised Exhibitions and workshops to educate and inspire people about the local craftsmanship, history and identity of the town. However, he asserted that these activities are currently in-existent and that, within the municipality, there isn't an educational centre focused on local craftsmanship. Some local craftsmen in the town include: Matts Renstrom who runs a business called K-märkt (specialise in repairs and fixing wooden parts of buildings); Gunilla Sander who specializes in pottery;Falk (metalworking) and many other artists involved in painting and repairing of old buildings.

Fred Lagnemar

Carpenter K-märkt

Fred studied in Mariestad at a local Gothenburg University section. He is often invited for workshops by the University to teach students.

In the company, there is a mason, metalworker, and carpenters. They focus mostly on the restoration of old wooden buildings. Their activity goes beyond the borders of the municipality. At the time of the interview they were working on the restoration of some wooden pieces of a castle outside Stockholm.

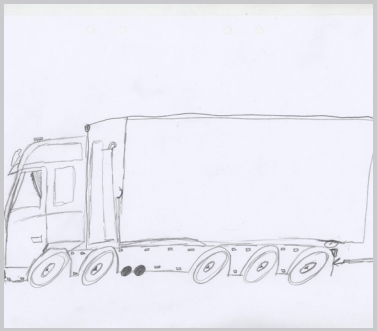



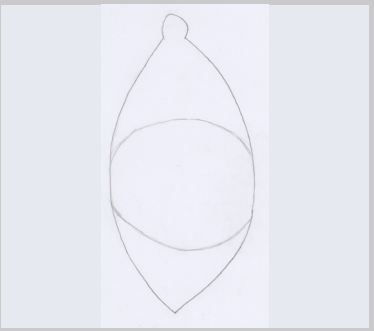


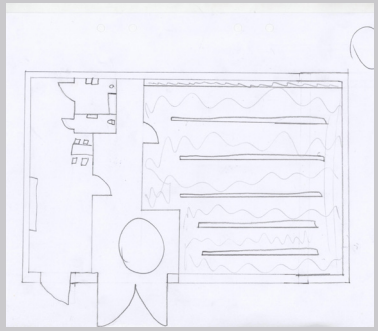
Photos taken from K-märkt workshop

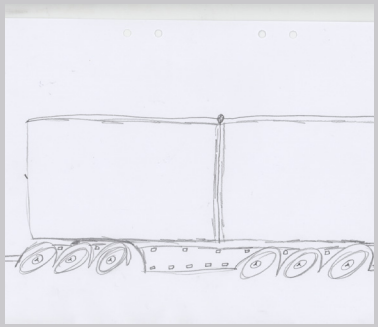
Workshop

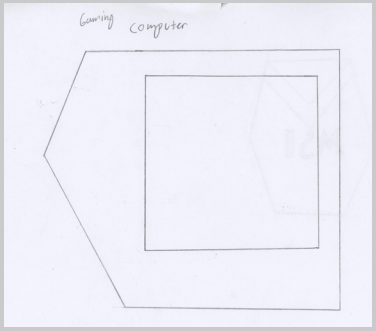
We had a workshop with the students from Guldkroksskolan during one of their lectures of technical drawing. We asked them to draw something they would like to know how to build given all the necessary tools and knowledge. Here are the drawings

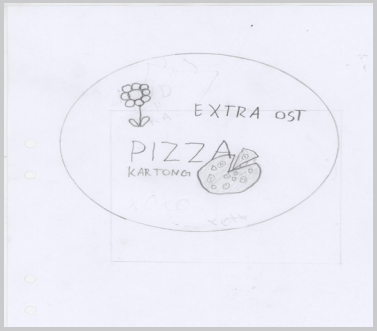


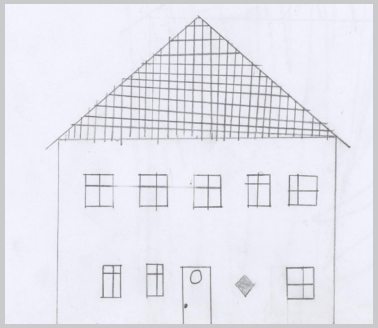


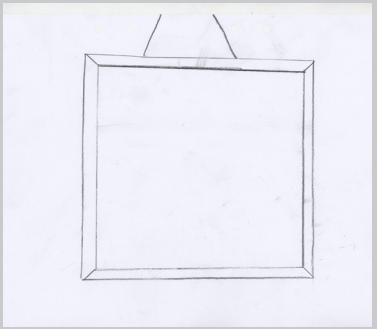


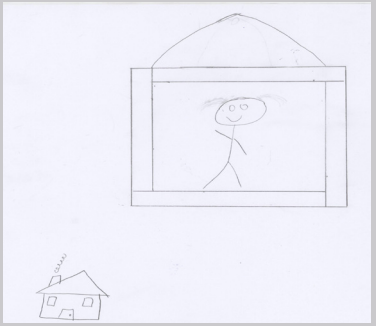


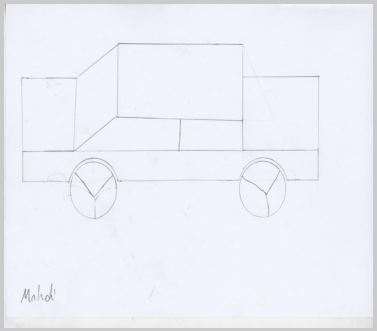


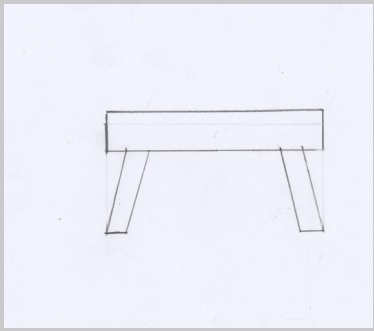


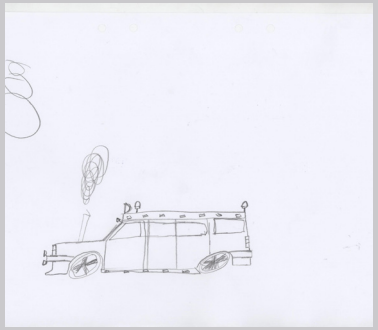


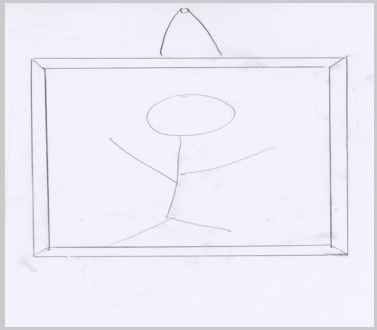


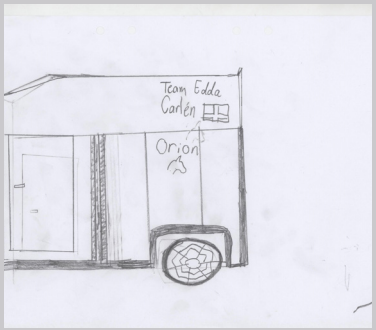


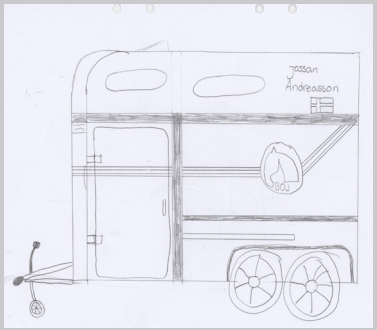


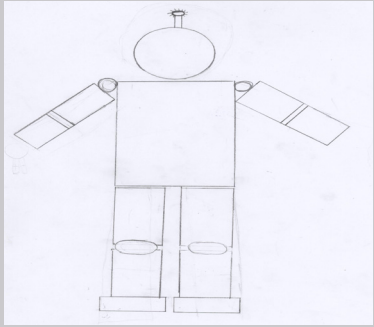




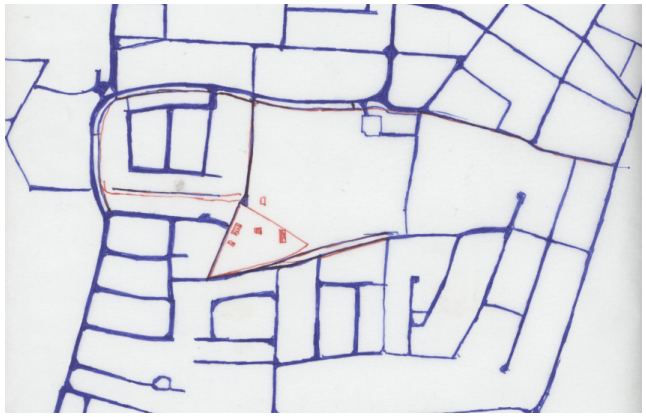


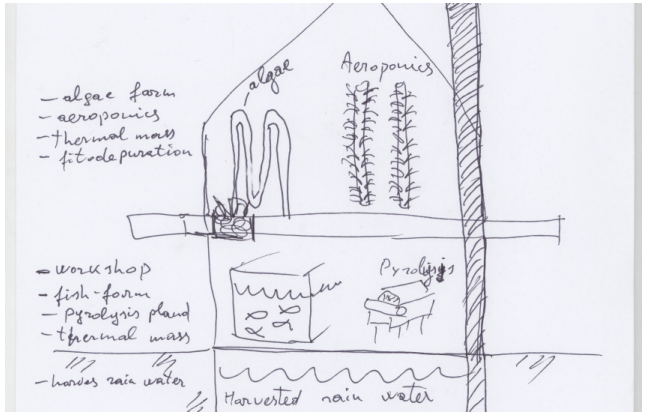






Sketching




- algae farm
- aeroponics
- thermal mass
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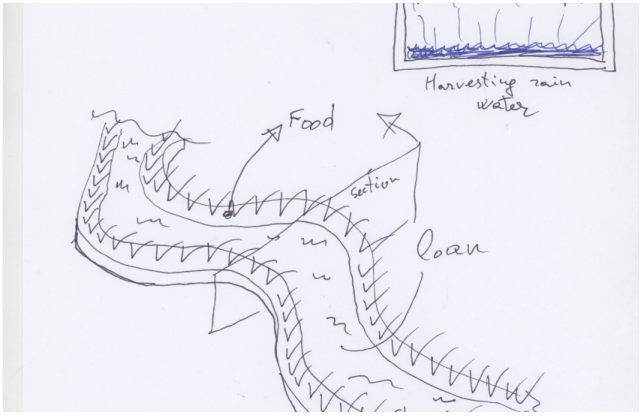
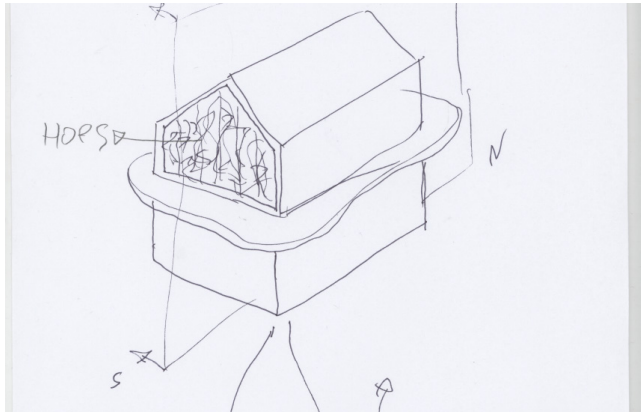
algae
Aeroponics
- workshop
- fish-farm
- pyrolysis plant
- thermal mass
- hanves rain water
Harvested rain water


Harvesting rain water
Food
Section
Loam


grass


HOPS
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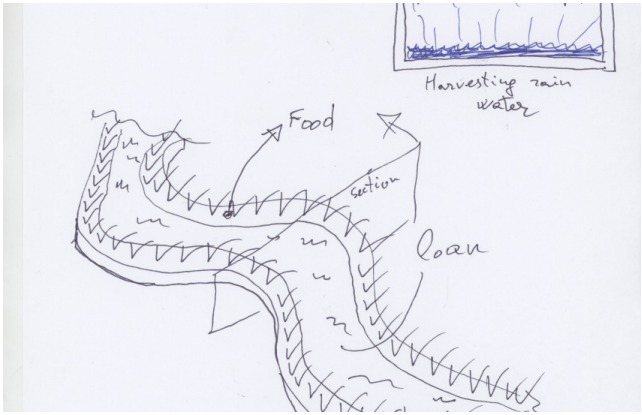

Harvesting rain water
Food
Section
Loam

Photography

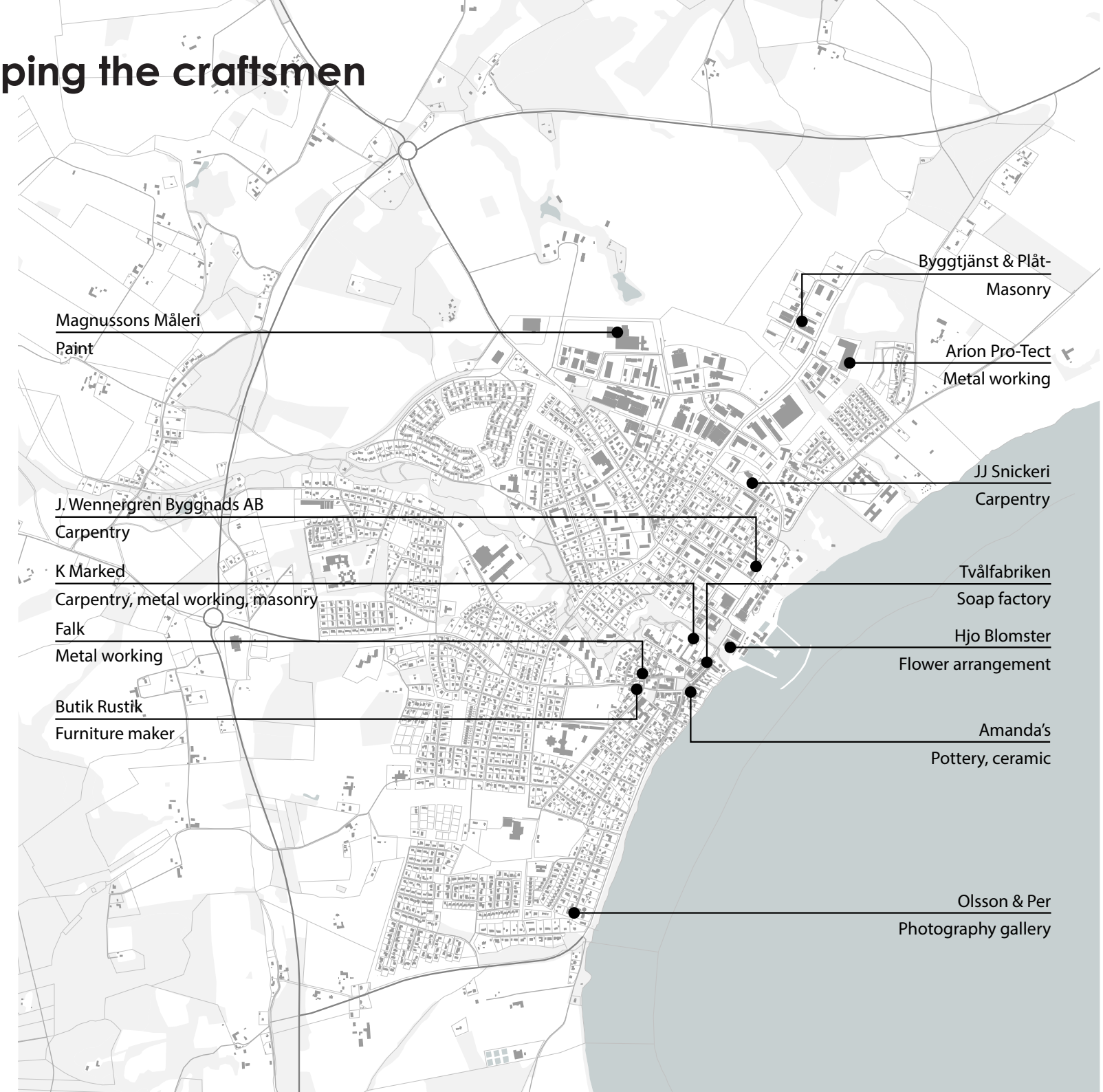








Mapping the craftsmen



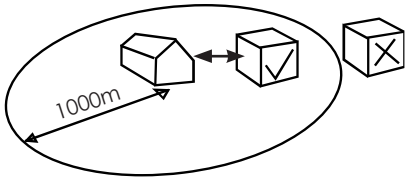
SITE SELECTION

Suitability Analysis

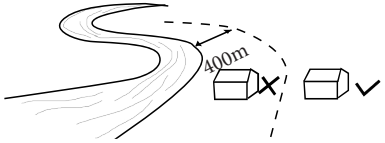
Site selection or suitability analysis was used to determine the best sites for placing the Learning Hub. A design criteria was formulated based on such factors as: distance from existing schools, industrial areas, major roads, access roads, distance from streams/creek, slope, and land uses.

Design Criteria

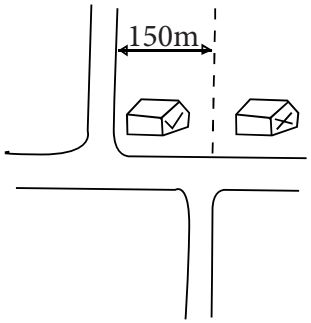
1. Distance from existing schools – Proximity to existing schools was an most important criterion for site selection to ensure easy access. Therefore, distances between 500m – 1000m were the most suitable while distances greater than 1000m are unsuitable (see appendix 1.1).



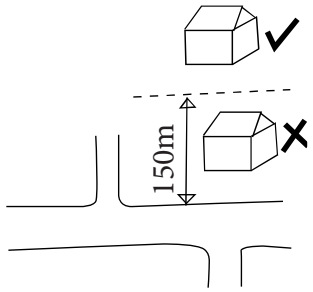
2. Distance from rivers – Distance less than 100m from a river have a high flood and pollution risk whereas risk decreases with greater distances (Patsialis et al. 2015). For this therefore, we considered distances greater than 400m as most suitable for the Learning Hub in order to conserve the rivers and its riparians (see appendix 1.2).



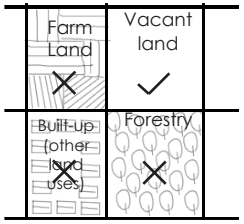
3. Proximity to Town access roads - it should be in an accessible distance in order to minimize commute time and use of cars. Thus, access to a road of sufficient capacity is important. Access roads have lower traffic and hence low noise levels. Therefore, a distance of 0-150m would most suitable and greater than 450m Unsuitable (see appendix 1.3)



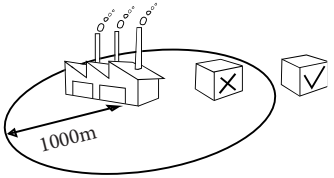
4. Distance from major road ways – this was a direct opposite of the criteria used for access roads. This is due to high noise levels and traffic associated with these roads. Therefore, a distance of 0m -150m will be unsuitable and distances greater than 450m will be most suitable (see appendix 1.4).



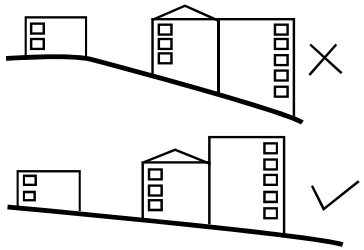
5. Land Uses - Landuse classified as vacant and subjected to no use are more suitable while forested, agricultural and built up areas unsuitable (see appendix 1.5).



6. Distance from industrial areas – should be located away from industrial areas due to safety risk caused by the traffic of the routes, noise and air pollution. Hence distances below 500m are unsuitable and greater than 1000m most suitable (see appendix 1.6).



7. Slope – The overall slope of a site should be flat enough to allow for ease of construction, and yet be steep enough for proper site drainage. A steep piece of property is generally not suitable for elderly or physically disabled residents, and is expensive to build on (leveling the ground). As a rule, slopes of 0-10% are desirable and easy to build on (LaGro,2001). For the Learning Hub, we apply the same rule and consider sites of a gradient greater than 20% as unsuitable and slopes of up to 10% most suitable. (See appendix 1.7).



Potential Areas

The potential sites are those that satisfied almost all of our set design criteria for Site Selection. The map indicates an extract of the most suitable areas and the selected site (see appendix 1.8).

Appendix 1 Indicates a more detailed analysis maps, design criteria and process used for the site selection.

Site Investigation & Analysis

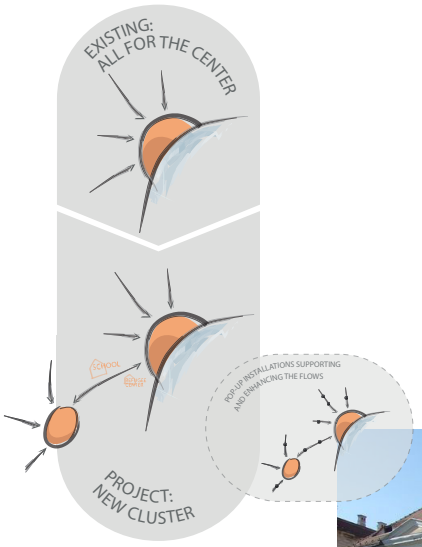
Our analysis revealed various sites which are suitable for locating the Learning Hub. Among the areas suitable is a portion currently under new development. Our idea was to have an area that satisfies our criteria for selection and be large enough to accommodate all functions and facilities of the Learning Hub. We have chosen to locate it to a site adjacent to existing sport facilities because of the following:

Design Criteria: The site satisfies all our set criteria for selection. It is close to an access road, existing schools, has a gentle slope, is not developed and it's far from major roads, rivers and industrial areas.

Ownership: Our investigations revealed that the land parcel is owned by the Municipality of Hjo, hence implementable at a low cost.

New development area. Adjacent to the site is a new development area hence locating the Learning Hub at the site will give effect and service to the area.

Contribute to Urban Development: The location of the Learning Hub will influence the urban structure of Hjo Town by Revitalising the area as an Interactive node. This will increase vitality, a good identity as well as influence the current flows (movements) of the Town. We envisage a shift of flows of movement from the town centre the new area (Learning Hub) hence serving as a good urban core de-congesting strategy. To enhance the future flows and advertise the activities of the Learning Hub, we propose to have pope up installations in the town centre and along the streets.



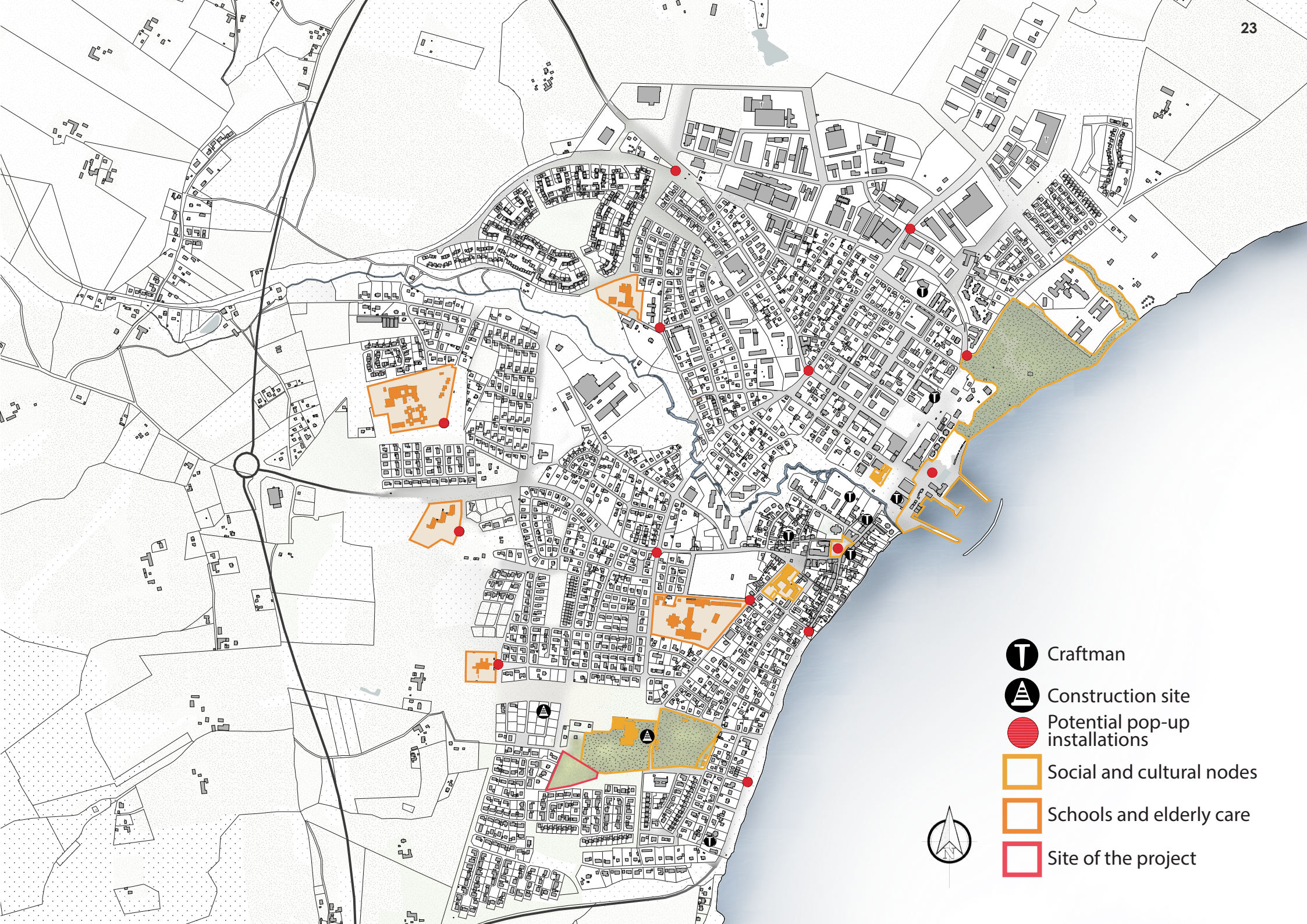
Thus the Learning Hub offer a new cluster within the town of Hjo, leading to new flows supported and enhanced by the pop-up installations.

These installations are temporary and will shift throughout the town in different spots, activating different areas.

Existence of Nature: During our visit to the site, we found the that the site has a good coverage and attraction of nature. Trees here attract birds and other wildlife making the site more lively and a better ambient for Learning.

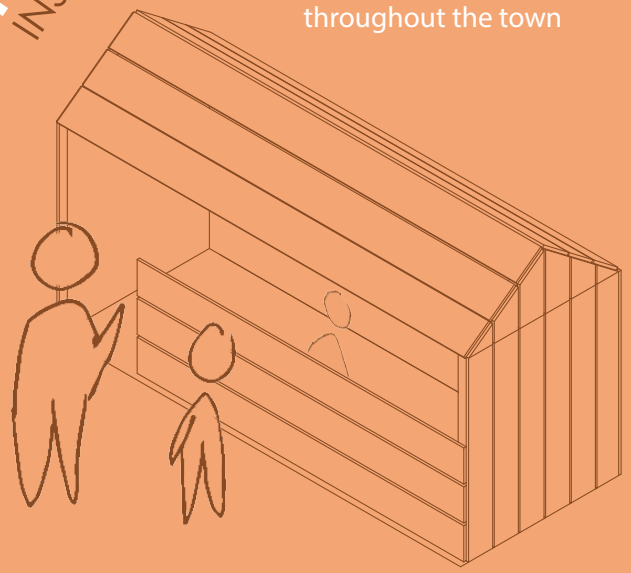
Enhance more connections to the Site: The site is in a position of a local distribution core which is highly underdeveloped at the moment. The Learning Hub will enhance the connections within the neighbourhood and with the town centre.

Linking of Social and Cultural Nodes: The social and cultural nodes such as the cultural centre, square, park, Harbor, craft activities and businesses (ICA) are mainly concentrated in the centre of the town. Proximal to the site is Guldkroksskolan and sportive facilities. The Learning Hub will improve interaction between these nodes hence strengthening the links. This will also promote the identity of the place and a rich public life in the area.


Craftman
Construction site
Potential pop-up installations
Social and cultural nodes
Schools and elderly care
Site of the project

POP-UP! INSTALLATIONS

Let the people build and imagine by themselves to spread their knowledges and ideas throughout the town



Abutting Developments to the Site

Adjacent to the site is the new development area, residential areas and sportive facilities. There is a good transport network with infrastructure for walking and cycling. Existing on site are trees and a building.

The existing access road will be limited to ambulance and fire engines. Parking for spaces for bicycles and people with disabilities should be provided

DESIGN

Sustainable Design Strategies

The following strategies were applied in the design process:

Construction materials: materials selection plays a significant role in sustainable building operation because of the environmental and health consequences associated with the entire lifecycle of materials. Use of local materials reduces the use of non-recyclable resources, thus supporting healthier societies (Iyengar, 2015). Existence of forestry resources in Hjo provides a good source of logs (wood) which were used in the design of the Learning Hub. The main walls are built in rammed earth therefore it uses local and clean materials such as clay, crushed recycled glass as substitute to sand, small percentage of concrete and water.

Water Management: the guiding philosophy in efficient water use is reduction in the generation of waste water and potable water demand, while at the same time making every effort to increase the local aquifer recharge. It is possible to decrease the use of potable water for sewage conveyance by utilising gray/black and rainwater. Black water will be processed in a septic tank after which it will be cleaned with gray water through phytoremediation system. The treated water will be used for flushing toilets and landscape irrigation (orchards), while the rainwater is harvested and used to feed the green house(refilling the fish tank).

Food will be grown on site in a green house and orchards using manure sourced from composting of organic waste. For the Aquaponic and aeroponic the nutrients come from the fishing tank and algae is used to feed the tropical fish

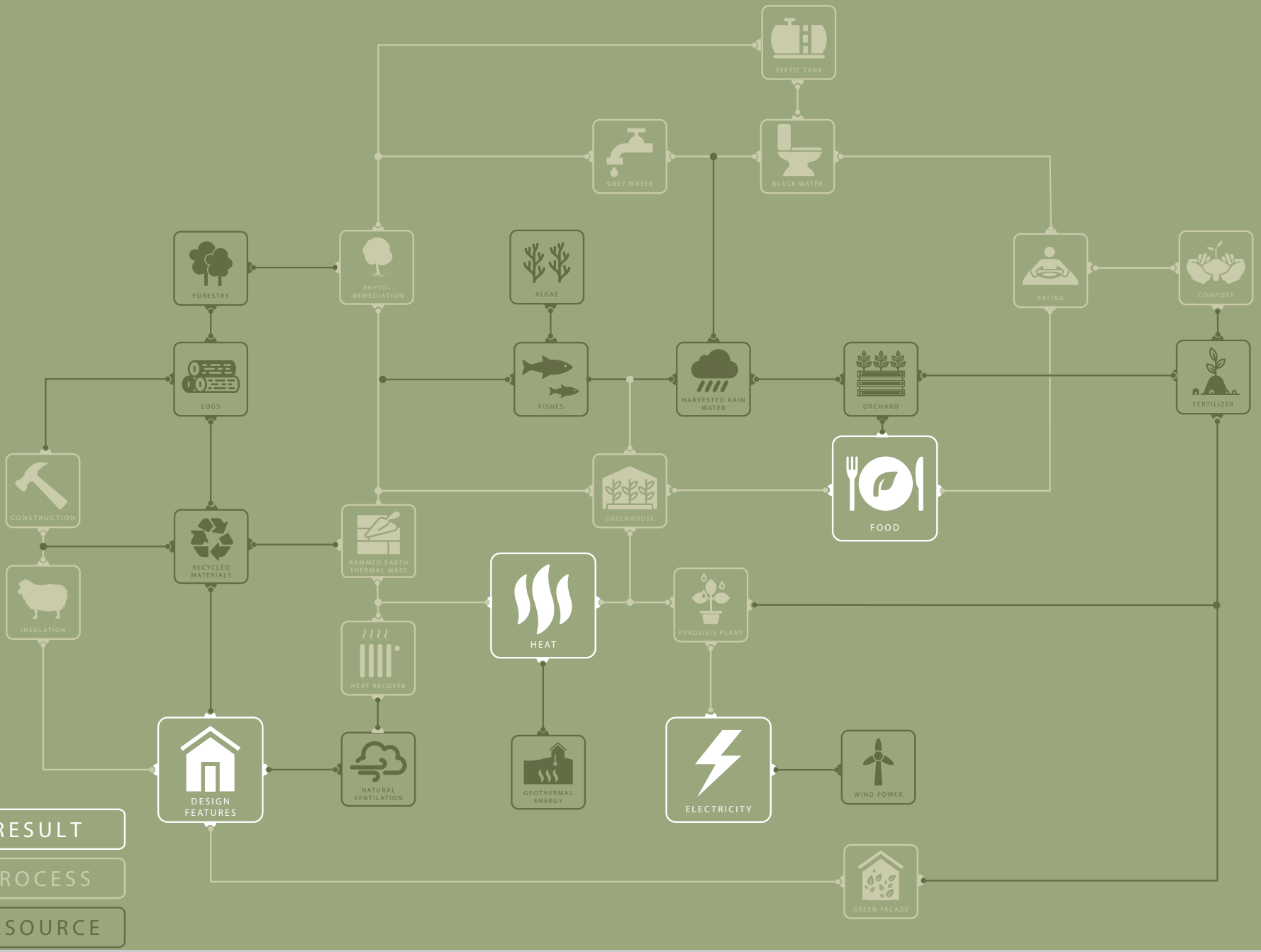
Organic Waste: sustainable architectural designs should minimise waste and reuse much of the waste generated by human activities (Iyengar, 2015). All the organic waste resulting from the alimentary sector will be processed in a pyrolysis plant to produce biogas and fertiliser. The biogas will be used for producing electricity and heating for the green house.

Natural ventilation is essential as it delivers fresh air into buildings. This helps in alleviating odours to provide oxygen for breathing, and to increase thermal energy (Iyengar, 2015). During winter, the buildings will use mechanical ventilation with heat recovery and natural ventilation during summer. To ensure good natural ventilation, the buildings will have high ceilings on the last levels and free air flow throughout all sections.

Electricity for the functioning of the Learning Hub will be sourced from windmills within the municipality and biogas generated by the pyrolysis plant.

The diagram to the right illustrates the links between resources, processes and results of these strategies.

SUSTAINABLE DESIGN STRATEGIES



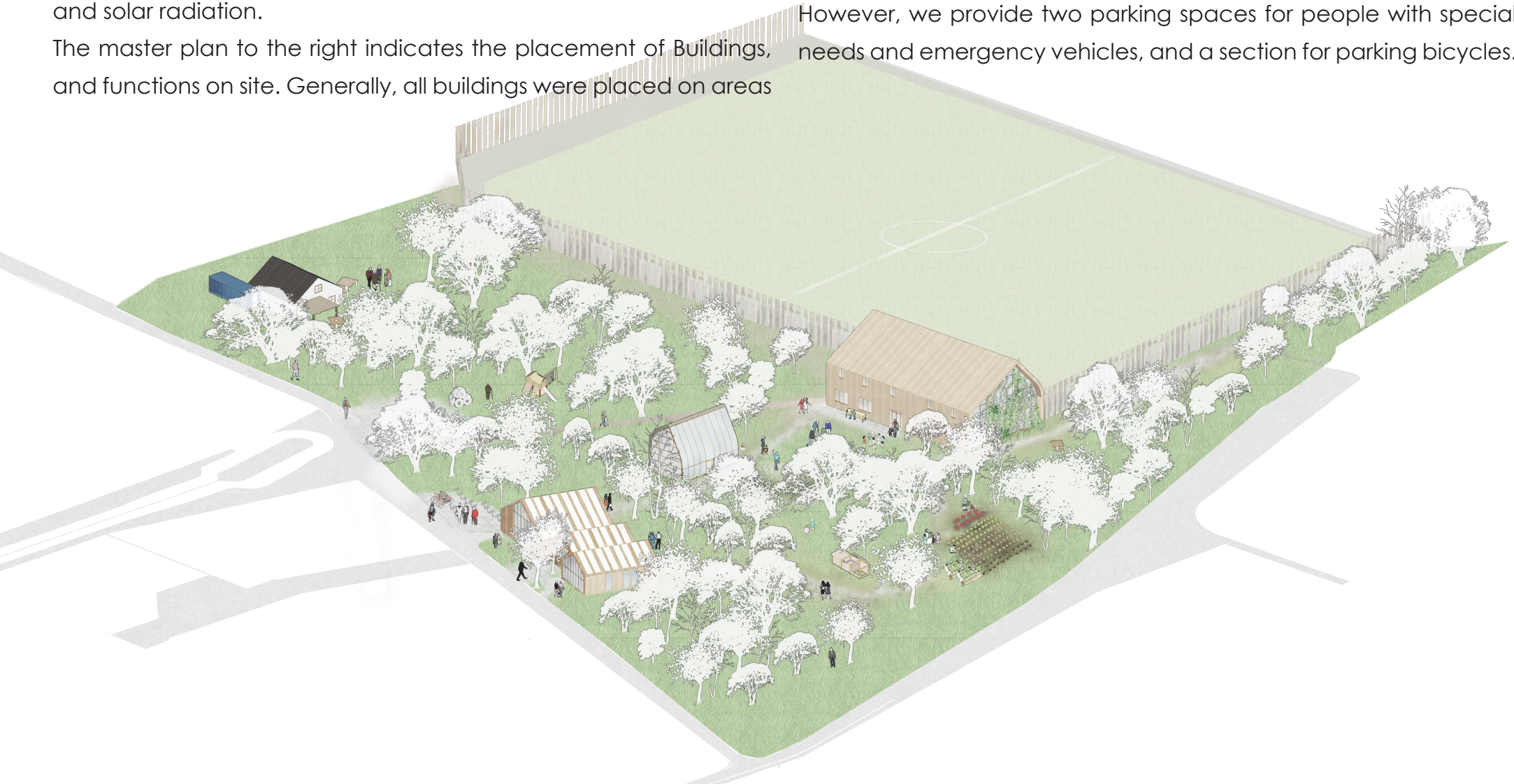
Placement of Buildings on site

A well-planned and appropriately oriented building supports Energy efficiency through passive solar heating and cooling when needed; Natural ventilation; and daylighting (Iyengar, 2015)).

During the placement of buildings on site we took into account the importance of site slopes, natural systems (to minimize the impact on the environment), storm water management, public access, and solar radiation.

The master plan to the right indicates the placement of Buildings, and functions on site. Generally, all buildings were placed on areas which has a good drainage, gentle slopes, and no trees**.** Building one (workshop & Exhibition) and was placed close to a road to allow easy transportation of equipments. For the shop, we proposed a change of use the existing building on the site.

For the Learning Hub, we encourage the use of bicycles or car pools in order to reduce parking spaces and increase green spaces. However, we provide two parking spaces for people with special needs and emergency vehicles, and a section for parking bicycles.



Shop
- Proximity to the access road
- No trees
- Existing Building
- Gentle slope
- Good drainage

Green House
- Intimacy
- No trees
- Gentle slope
- Good drainage

Conference, Administration, & Kitchen
- No trees
- Gentle slope
- Good drainage
- Good view towards the football pitch
- Intimacy

Workshop & Exhibition
- Proximity to the access road
- No trees
- Gentle slope
- Good drainage

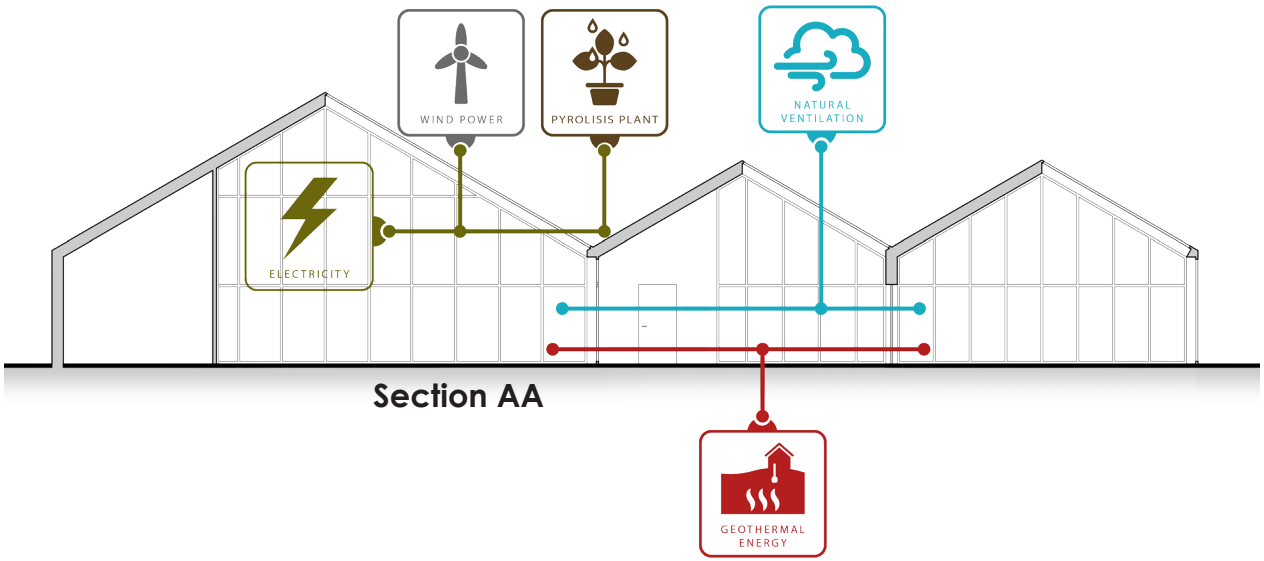
Orchard
-No trees

Exhibition & Workshop Building

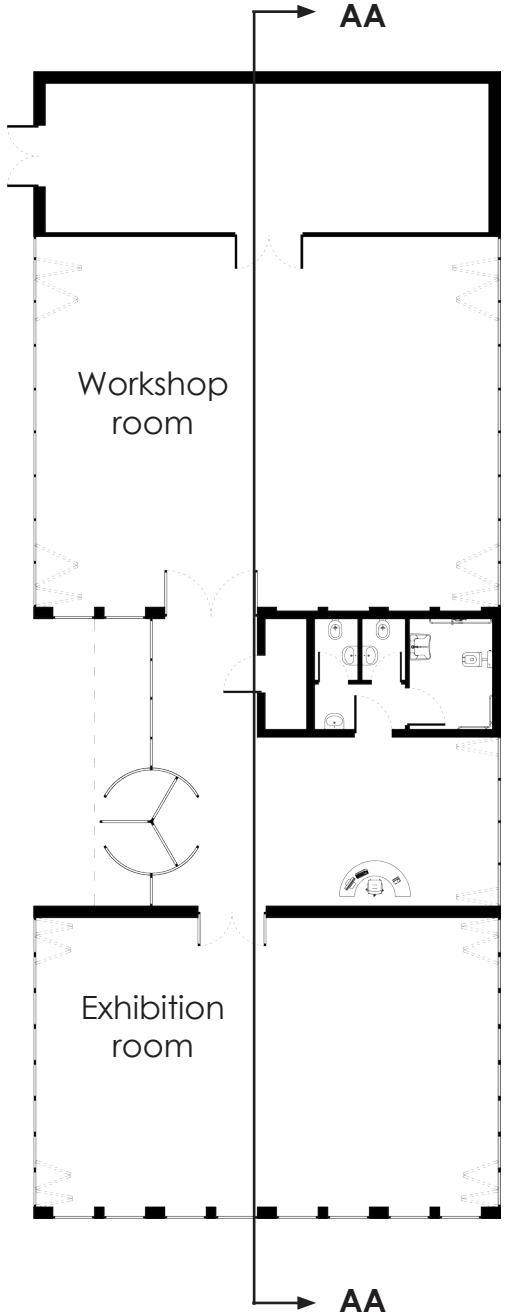
Exhibition Space: This space is allocated for exhibiting the designs and products made in the workshop. The aim is to promote the creativity and interaction among people.

Workshop: it is accessible to the public and aims at providing people with necessary toolkits, skills and knowledge for them to experiment new ideas for sustainable development. Key focus will be on carpentry, painting, up-cycling, metal working, and other artistic and technical skills .

The buildings will get electricity from a pyrolysis plant, and wind. Geothermal energy will be used for heating during winter. To ensure good natural ventilation during warmer periods, the buildings have high ceilings and openings on the roof top to allow air circulation.



Section AA



Floor plan 1:200z

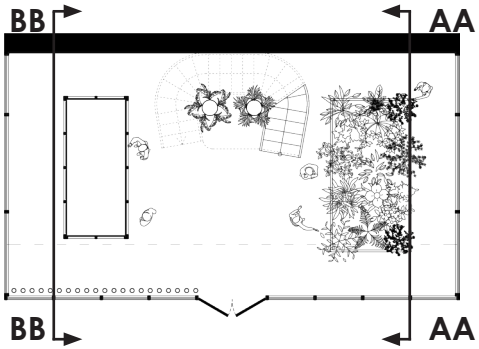
View of the exhibition and workshop building from West

View of the exhibition and workshop building from North

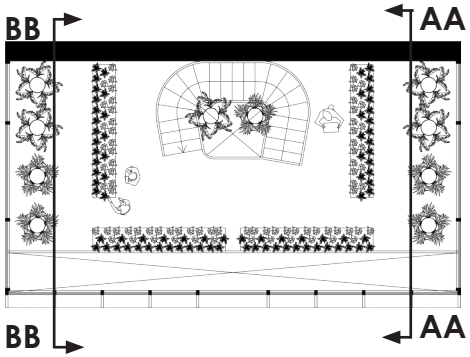
Learning from the Workshop

Greenhouse Building

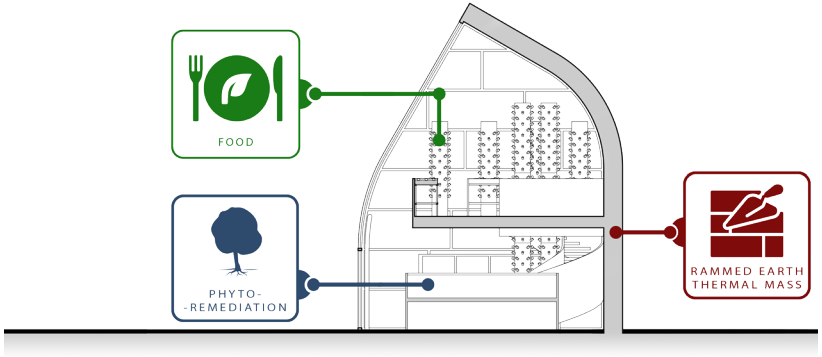
The greenhouse will provide knowledge about new techniques of growing food and phytoremediation. The fish tank, aquaponics and aeroponic system will provide the kitchen and shop with vegetables, salads and Fish. Phytoremediation system serves as a natural filter which will clean gray water. Harvested rainwater will be used to refill the fish tank. The northern wall of the building is made using rammed earth in order to provide thermal mass to regulate temperatures



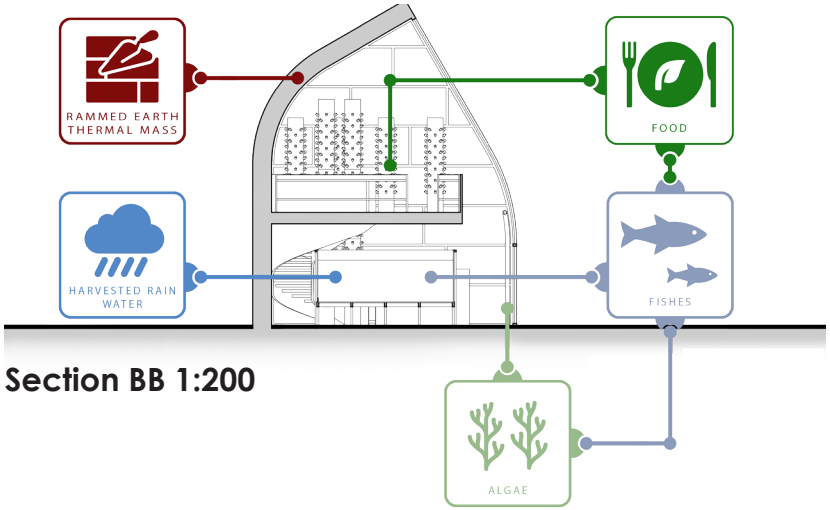
Ground floor 1:200



First floor 1:200



Section AA 1:200



Section BB 1:200

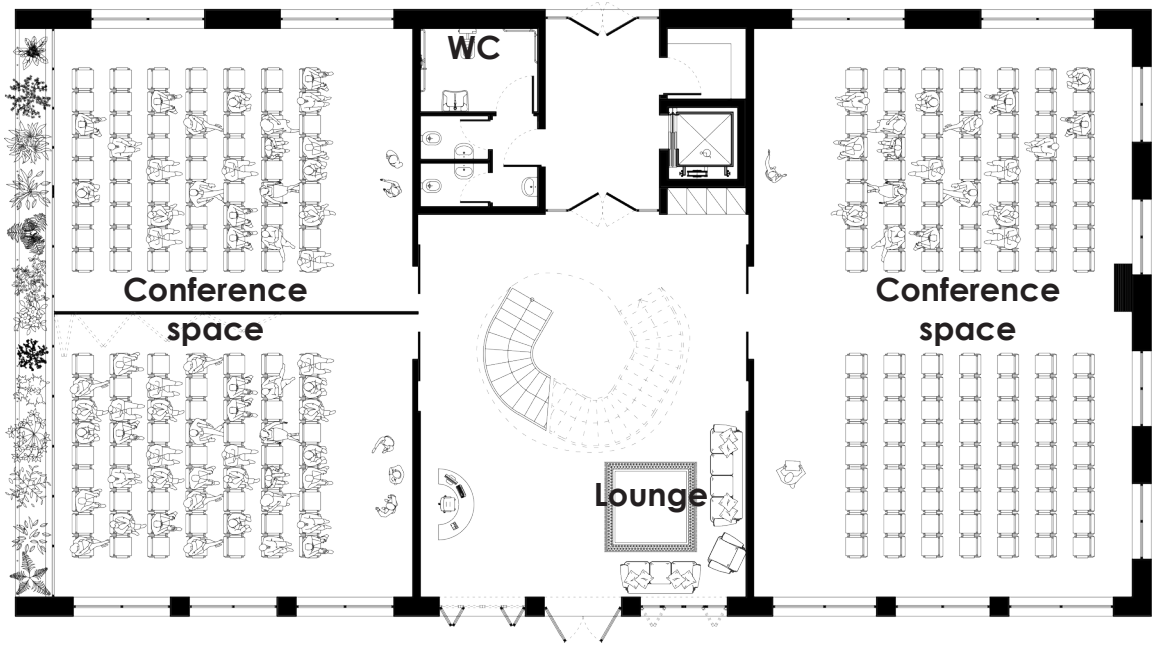
Orchards

The orchards will complement the greenhouse to produce more food for the kitchen and shop.

Source: http://www.bing.com/images/search?q=Orchards+-for+vagetables&view

Conference & public kitchen

Ground floor - comprises of flexible spaces for large meetings ,conferences, discussions, Interviews, presentations, studying, and exhibitions. All the technical space functions are concentrated in the entrance area in order to leave the rest of the floor as flexible as possible. The floor has four different conference rooms and each pair has a removable wall as dividing element. Therefore, they can be expanded to host large events. In the middle of the lobby, there is a staircase leading to the first floor.

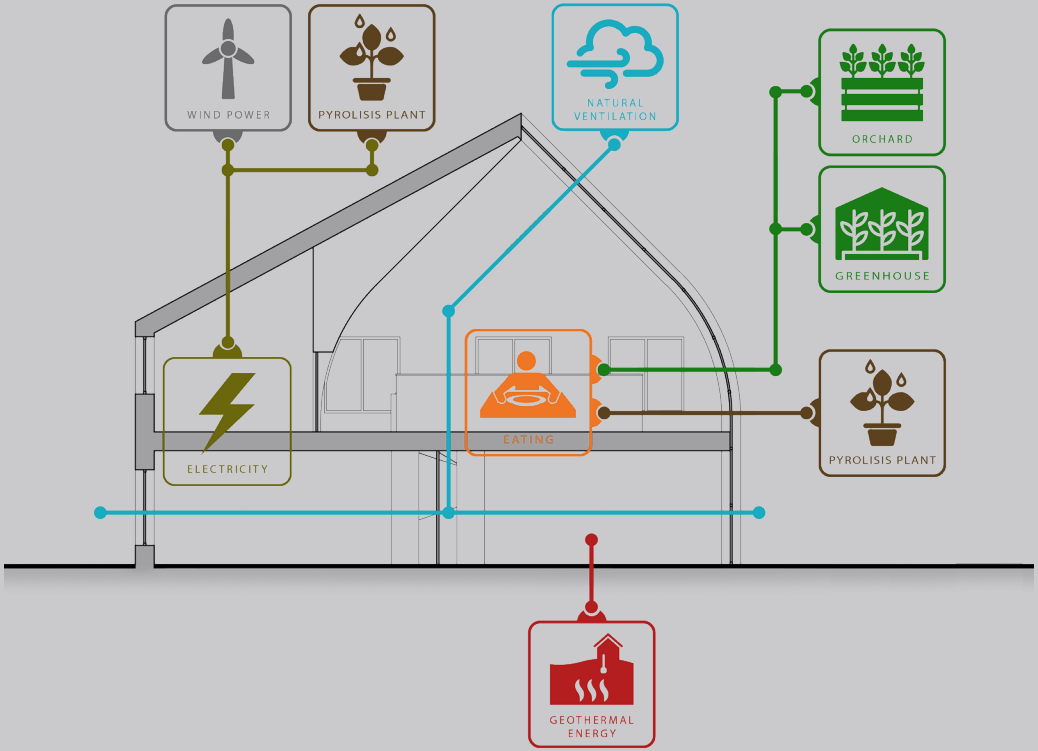


Ground floor 1:200

First Floor - The first floor is accessible through a staircase which ends in the centre of a big open space and of a public kitchen. The to the west of floor is administration offices and all other necessary technical spaces. The kitchen is accessible to all and will serve as a social core for all other functions of the Learning Hub. As well, it can be rented for hosting events such as a formal dinner or a birthday party.

In the kitchen, people can organise workshops to learn how to make good meals. To the south there is a lounge next to the curtail wall which is shaded in the summer time by climbing plants which disintegrate during winter letting sunlight in the building.

First floor 1:200



The building will get electricity from a pyrolysis plant, and wind. Geothermal energy will be used for heating during winter. To ensure good natural ventilation during warmer periods, the buildings have high ceilings and openings on the roof top to allow air circulation. Products from the green house and orchards will be used in the kitchen to prepare food so that people can experience local produced food, their own production!

View of the building from the southern access path

Shop

At the Shop, customers will find products produced locally from the green house, orchards, workshop, and local farms. It will serve as a marketplace of the visitors, staff and residents. For this shop, we propose a change of use of the existing building on the site.

Existing building on the site

APPENDIXES

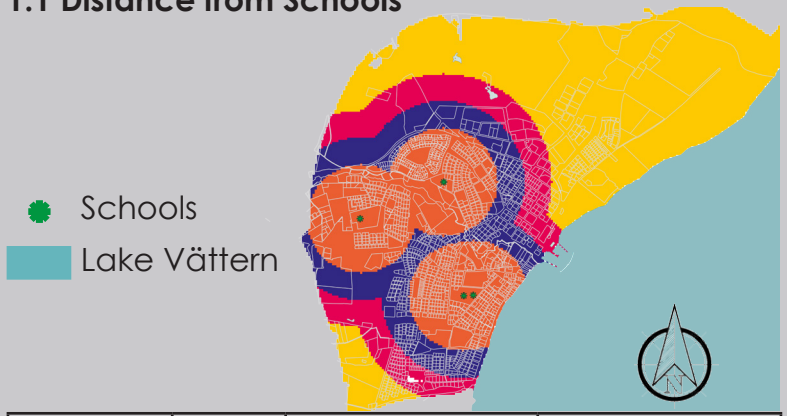
CRITERIA FOR SITE SELECTION

Site selection or suitability analysis is a type of analysis used in Geographical Information System (GIS) to determine the best place or site for placing something. Among others, Suitability analysis can include the location of a new hospital, store, landfill, new residential areas, wind and solar farms, place of worship or schools. However, the subject of this study was to determine suitable sites for locating a Learning Hub in the town of Hjo.

This study undertook an Analytic Hierarchical Process (AHP) for site selection. A design criterion was formulated based on such factors as: distance from existing schools, Industrial areas, major roads, access roads, distance from streams/creek, Slope, and Land uses. This was then classified into four scores: 1- Unsuitable, 2- Less Suitable, 3- Suitable and 4 – Most Suitable (See table).

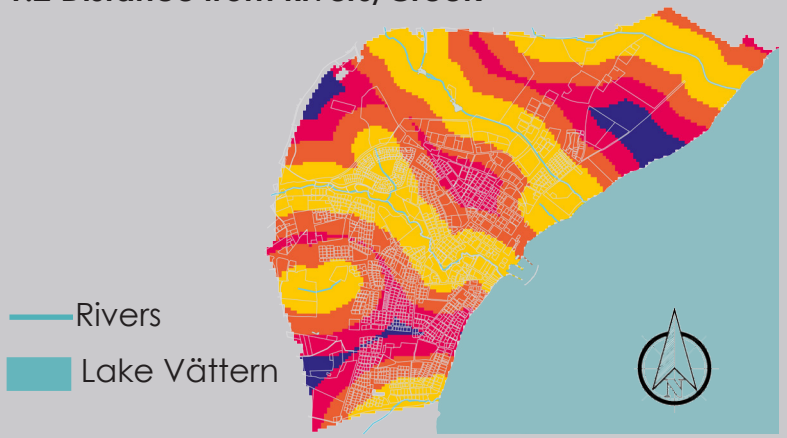
Criteria	**Score**	**Classification**
Distance from existing School (in metres)		
0-500m	2	Less suitable
501-1000m	3	Most Suitable
1001-1500m	4	Suitable
Above 1500m	1	Unsuitable
Distance from River/Creek (in metres)		
0 - 200	1	Unsuitable
200 - 400	2	Less Suitable
400 - 600	3	Suitable
Greater than 600	4	Most Suitable
Distance from access Roads (in metres)		
0 - 150	4	Most Suitable
150 - 300	3	Suitable
301 - 450	2	Less Suitable
Greater than 450	1	Unsuitable
Distance from Major Roads (in metres)		
0-150	1	Unsuitable
150-300	2	Less Suitable
301-450	3	Suitable
Above 450	4	Most Suitable
Land Uses		
Built up areas	1	Unsuitable
Forestry	2	Less suitable
Agricultural Land	3	Suitable
Vacant land	4	Most Suitable
Distance from Industries		
0-300m	1	Unsuitable
301-500m	2	Less Suitable
501-1000m	3	Suitable
1000m and above	4	Most Suitable
Slope (in percentage)		
0 – 10	4	Most suitable
11-15	3	Suitable
16-20	2	Less Suitable
Greater than 20	1	Unsuitable

1.1 Distance from Schools



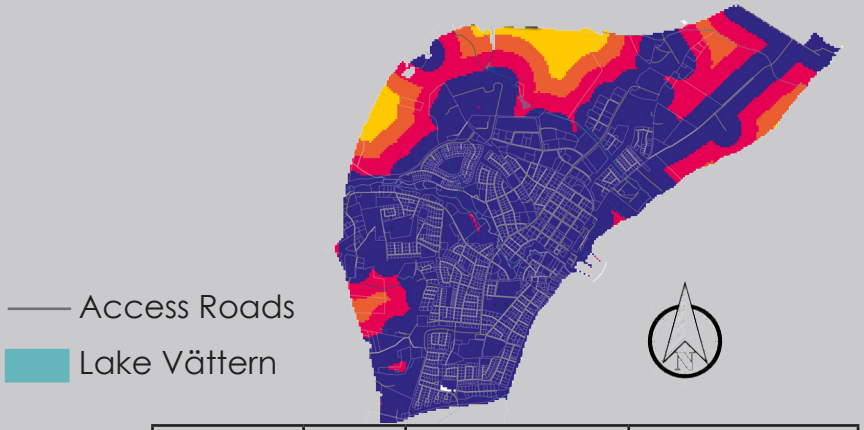
Legend	Rank	Distance (m)	Classification
	1	0-500m	Unsuitable
	2	Above 1500m	Less suitable
	3	1001-1500m	Suitable
	4	501-1000m	Most suitable

1.2 Distance from Rivers/Creek



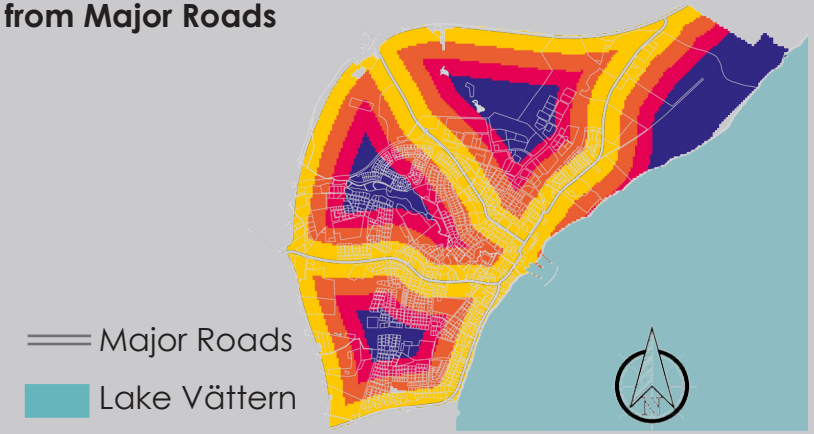
Legend	Rank	Distance (m)	Classification
	1	0 - 200	Unsuitable
	2	200 - 400	Less suitable
	3	400 - 600	Suitable
	4	>600m	Most suitable

1.3 Distance from Access roads



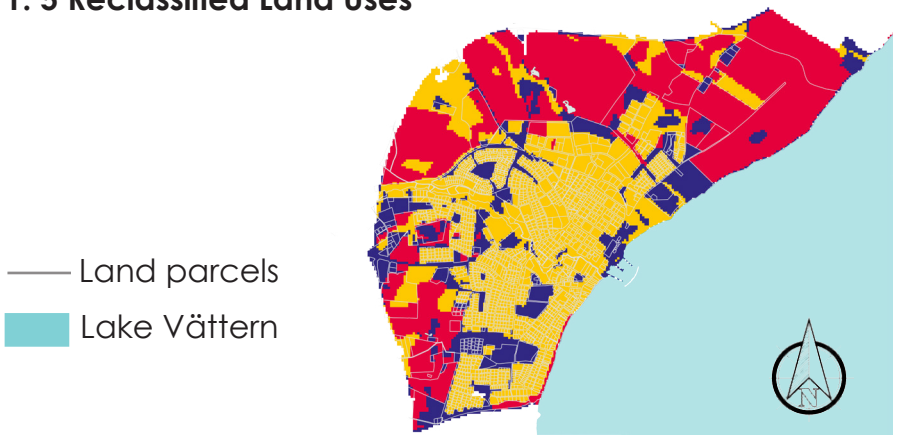
Legend	Rank	Distance (m)	Classification
	1	Above 450	Unsuitable
	2	301-450	Less suitable
	3	151-300	Suitable
	4	0-150	Most suitable

1.4 Distance from Major Roads



Legend	Rank	Distance (m)	Classification
	1	0-150	Unsuitable
	2	150-300	Less suitable
	3	301-450	Suitable
	4	> 450	Most suitable

1. 5 Reclassified Land Uses

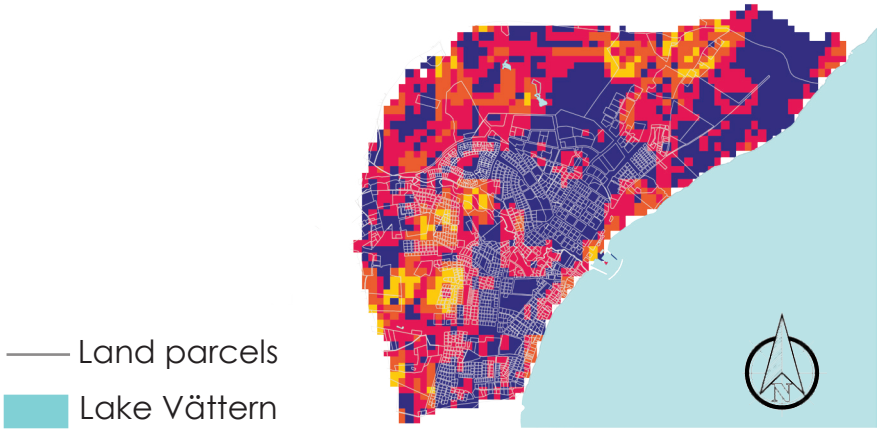


Legend	Rank	Land use	Classification
	1	Bebhög, Bebind, Beblåg, Beslut, Skogbarr, Skoglöv, Öptorg	Unsuitable
	2	Agricultural	Less Suitable
	4	Vacant/Undeveloped	Most suitable

1.6 Distance from Industries

Legend	Rank	Distance (m)	Classification
	1	0-300	Unsuitable
	2	301-500	Less suitable
	3	501-1000	Suitable
	4	Above 1000	Most suitable

1. 7. Reclassified Slope



Legend	Rank	Slope (percent)	Classification
	1	Above 20	Unsuitable
	2	16-20	Less suitable
	3	11-15	Suitable
	4	0 – 10	Most suitable

RESULTS

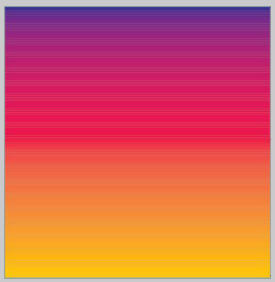
The maps above were combined using the weighted linear combination using the raster calculator (Spatial Analyst Tool in ArcGIS 10.2). The Weights were generated though an Analytic Hierarchical Process (AHP) and were based on personal ranking due to time constraints (Normally, it should be a participatory process).

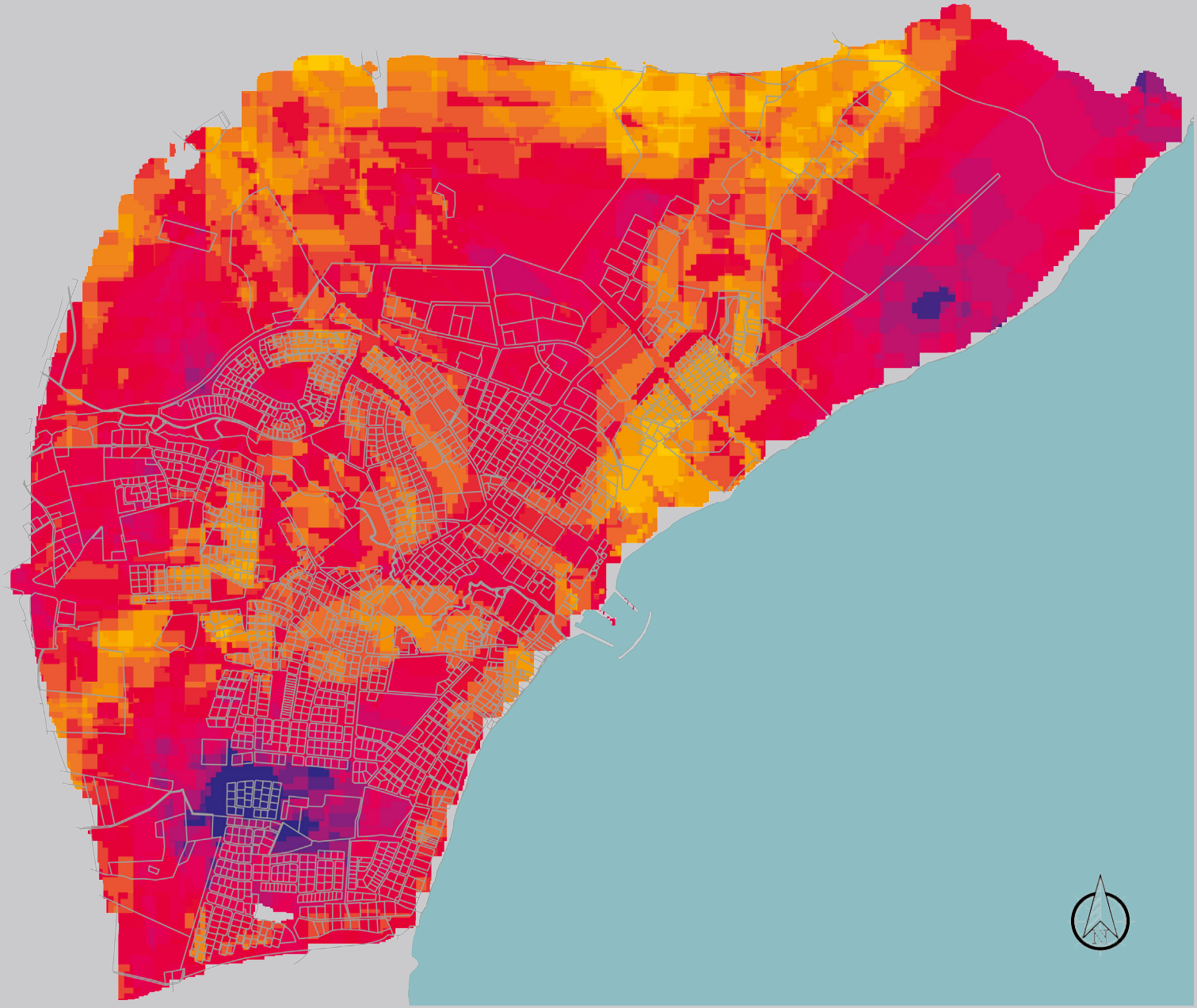
("Slope" * 0.14) +("accessrd" * 0.1) + ("landuse" * 0.13) + ("Industrial" * 0.12) + ("Streams" * 0.14) + ("Majorrds" * 0.22) + ("School" * 0.14)

The result of the above was a suitability map indicating the best positions for the Learning Hub

1.8 SUITABILITY MAP

Legend	Rank	Classification
	1	Unsuitable
	2	Less suitable
	3	Suitable
	4	Most suitable





REFERENCE PROJECT

Ekocentrum: Eco-education for business and school children

Located outside Göteborg, Ekocentrum is an independent, non-profit educational centre founded in 1993. It teaches business employees and school children about the converging funnel of global environmental trends and practical steps that individuals can take to move in a more sustainable direction. It is the largest environmental Education centre in Scandinavia and offers environmental education courses, presentations, and also environmental exhibits for visitors. Here, people learn practical ways to change personal, household, and business practises to help reduce environmental damaging practises. It serves as a neutral venue and meeting place for research, industry, government, NGOs, students, inventors, and general public. This creates a common platform for knowledge, bonding and inspiration towards sustainability.

Combining theory and practise, talks and demonstrations, are keys to Ekocentrum success in helping children and adults to better understand the deteriorating global trends and what individuals and businesses can do to help. Since 1993, almost 100,000 people have learned about sustainable practises at this centre.

ekocentrum
Kunskap & inspiration

Image Sources: https://www.ekocentrum.se/miljoutbildning/

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Shapefile data sources

https://zeus.slu.se/get/?drop=

Hjo Municipality maps

Pictures

http://www.bing.com/images/

https://www.ekocentrum.se/miljoutbildning/

http://www.bing.com/images/search?q=Orchards+for+v Vegetables&view