Food-hub as a common platform for food in Luleå

Is urban food growing the educational tool needed to increase Norrbotten´s self-sufficiency?

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Abstract

Food has lost its important role in city’s life thus its presence in people’s life has also weakened. Cities are less able to sustain themselves and rely on import food. Supermarkets, which offer a broad scale of groceries from all around the world, are the number one food resource in Sweden while people are getting detached from the region they live in and from the origins of the food they consume. Local farmers struggle to survive economically while the population is slowly increasing, so does the demand for food.¹ The current context leads to the question: can Norrland be less reliant on import food? This thesis seeks answers and possibilities for cities with cold climates specifically using Luleå in Northern Sweden as a prototype and urban agriculture as a tool. It researches the past and the current situation of food production in the area. It also explores existing initiatives which are working on local food level and possibilities for cultivation in cold climates. The purpose is to understand the existing environment, the structure of resources in and around the city.

In addition to existing resources, this thesis also explores urban voids for indoor production and connects them to the main intervention, a hub, which works as a platform for education, meetings, and distribution of local products. The focus of the proposal is the public, urban level. This platform is located close to the city center and has a scale which makes it able to reconnect the otherwise fragmented city. By parks included, which are planted with autochthon plants this intervention becomes a representation of the region, a living exhibition of the possibilities in Norrbotten. It accommodates several functions such as restaurant, greenhouse, shop, research center and a market in order to reach a broad scale of users.

The intervention introduced in this paper is an outcome of the specific context rather than an ultimate solution for every city with cold climates. This proposal suggests possibilities to bring food closer to the people by raising awareness and seeking opportunities to implement food production into architectural planning and design as well as showing the existing possibilities in Norrbotten.

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Preface

This research started with an interest based on personal experience. I come from Hungary where like in other Eastern European countries, it is common to have access to fresh food via horticultural gardens or local markets. I experienced a significant difference when I moved to Northern Sweden. Back home I used to buy fresh food products at the market where its origin is clearer, and the supermarket was place for buying processed food and other items. In contrast, in Northern Sweden supermarket is the first option for almost everything. This puts the country in a vulnerable position. Possible solutions for alternatives are investigated and discussed in this paper.
Introduction

Food and agriculture have played a crucial role in the development of settlements through historical times. People have always had a close connection to food production in one way or the other, that secured their survival. However, this has changed radically during the process of urbanization. New lifestyle has appeared, and urban citizens have been detached from food production. People had not only lost connection to food but also to the region and each other. There is a disconnection between urban areas and productive landscapes which is a new phenomenon. Large part of the food chain is invisible to the people who live in cities as they often meet only with the final product when they pick it from the supermarket’s shelf.

Supermarkets are common and dominating option for groceries in Norther Sweden. This is problematic because supermarkets are prioritizing the profit over sustainability and relying on cheap, import food. Importing food from great distances extends the use of fossil fuels and hence air pollution but it has other consequences as well. While in certain countries -for example in Eastern Europe- it is still common to buy vegetables and fruits on the local market or even grow them in the backyard, the situation is quite different in Northern Sweden. But does it necessarily have to be this way? Does Norrland have to rely on import food? It is commonly thought so due to the climatic circumstances. But there are possibilities despite of the cold climate. Norrland could be more self-sufficient than it is today because it has already been more self-sufficient before. Figure 1 with the data from Elisabeth Öberg who is a farmer herself and a consultant in Börjelsbyn shows how many percent of the consumed food is produced in Sweden and Norrbotten. The percentage shows Sweden’s and Norrbotten’s self-sufficiency in 2014 compared to previous times.

![Figure 1. Percentage change in Norrbotten’s self-sufficiency (Data is from Elisabeth Öberg’s presentation from Branschdialog in Boden, 2018)](image)

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3 Martin Mcauliffe, Samantha L. (red.), Food and architecture - at the table, 2016
It also exposes that the food consumed in Norrbotten is produced somewhere else. Food being transported from distant countries increases vulnerability and dependency on several factors such as political, economic, climatic and social. That certain city, which the food is imported into has no influence on these factors. In addition, a large amount of packaging is created to secure the journey of the foodstuff through the long-distance transport.\(^4\) This packaging has a short lifecycle and becomes waste as soon as the product is consumed. It is stated in the publication called 'Food Packaging-Roles, Materials, and Environmental Issues\(^4\)' that a part of these packaging is created to secure the product during distribution and hereby prevent food waste. Nevertheless, it does not name it as an issue but focuses on eco-friendly solutions instead. I believe however, that inventing environment friendly packaging can be a good thing in those cases when packaging is unavoidable, but the focus should be on how to avoid it in the first place. It has an environmental impact no matter how environment friendly it is. In summary, a certain amount of waste could be avoided by shortening down the food product’s journey and choosing locally produced goods instead of imported ones.

Importing has a bad influence on the quality of the product too because the fruits and vegetables are often being harvested before they ripe to ensure that they are not rotten by the end of the journey. However, the amount of imported food in Sweden is increasing every year\(^5\). Importing food also hides the background of the product, which decreases its value in the eyes of the customer. This phenomenon does not help decreasing the consumption, but rather the opposite. In other words, importing makes the food invisible in the city. Invisibility of food creates unawareness which hinder a responsible choice when it comes to purchase and consume a food product.

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Figure 2. The impact of industrial and local, organic agriculture (figure is made by the author)
Figure 2 shows that importing food has a larger impact on the Earth’s climate than locally produced food and plays role in climate change. Northern Sweden has subpolar and Baltic semi-continental climate now, however it is not going to be like this forever. Experts in meteorological fields are creating different scenarios for future climate based on tendencies in the latest decades. According to Sveriges Meteorologiska och Hydrologiska Institut (SMHI) there are three different scenarios in climate change and they say the one with the biggest changes is the most likely to happen. These changes are also going to affect one of the most crucial resources: food. Figure 3 shows that the picture of lands suitable for agriculture is going to change significantly: areas which are dominating in distribution today will become unfertile while areas now depending on import might take over the role of the food distributor. These are long term speculations, but one thing seems to be sure: there are going to be changes in climate however, the exact scale and consequences are yet unknown. But it is likely, that countries like Sweden may experience large shift in their economy and agriculture.

Figure 3. Percentage change in yields between present and 2050

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7 Sveriges Meteorologiska och Hydrologiska Institut, Klimatscenarier, https://www.smhi.se/klimat/framtidens-klimat/klimatscenarier
But where does architecture fit into the picture? Architecture is very much related to land and productive land is a finite resource. Land used for non-productive purposes creates the dependency on distant food sources and decrease the areas available for agriculture. This is compensated with more intensive agriculture methods in smaller areas, which means larger investment of energy. A conventional urban tissue is a non-productive use of land. What is the role of the architect in this matter? The architect has a possibility to think of this issue and try to change it by for example integrate surfaces into the design which have a potential for productivity. As Bjarke Ingels says “this what makes it interesting to be an architect: as life evolves, our cities and our architecture need to evolve with it.”

A complex matter such as food’s presence in cities requires complex response and architecture is only one of them. The architectural proposal which addresses the food issue must be carefully thought-out. It should consider the climatic, geographic, social and cultural attributes of the location and understand the urban context of the site.

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11 BIG Bjarke Ingels Group, *Yes is more: an archicomic on architectural evolution*, Evergreen, Köln, 2009, pg 20-21
Super(? )markets: Economic instead of social exchange

Supermarkets have a dominating role in supplying cities with food but how does it effects people’s lives? It is relatively known how supermarkets are designed to make customers spend more money, but it is less known that they influence human psychology such as they manipulate the sense of time and consciously stressing the customers to take fast, even irresponsible decisions. The dominance of supermarket has other harmful effects as well. According to Carolyn Steel, supermarkets:

“...support individual lifestyles, not sociability; a characteristic they share with iPods and computers. The internet may be a great communicative tool, but it can’t replace the connection we feel when we meet people in the flesh. That is where food is so powerful. It brings us together in physical space, forging bonds other media can’t reach.”

Steel states the concept of the supermarket is alien in the city’s structure as they are clashing with the basic concept of the city which is the activity of buying and selling food. Therefore, to bring back food to modern cities is important. One way for the presence of food in the cities is a market. It is much more than a place where one can buy food, it has been historically the heart of the city. As she further describes through an example of cheese tasting at Borough Market, unlike anonymous shopping experience in supermarkets, a local market has additional advantages: it reinforces the social connections between citizens and farmers, people and land, and it adds name to the labels as well as personal stories. The purchase of a product from a local farmer is not only an exchange of an item and money but an exchange of knowledge, tradition, and history. However, she also writes that Borough Market today serves food tourism rather than the population’s daily routine. It is a strange case of not caring that much of food on a regular daily basis, but almost worshipping it as a tourist. Local food markets serve tourists and not local people, and many visit these places only abroad. This phenomenon appears in western food markets and roots in one thing: food is not part of our culture. Buying things on market is considered as a treatment, a trend so to speak, and not a basic need. Paradoxically Borough Market is a symbol of disconnection between people in Britain and food and not the other way around.

As a conclusion, food market is one way to bring food back to the cities but there are other ways of doing that such as making local producers and food production visible. It can be done for example, by providing a constant distributional space for farmers, creating indoor production within the urban tissue as a climate specific strategy. These strategies are going to be tested in this project through Luleå as an example.

The context

Luleå is a coastal city in Norrbotten, Norther Sweden around 280 km from the arctic circle, with a population of approximately 76 000 people. Norrbotten county is considered as a supplier in terms of iron ore and wood. But the county has valuable resources in terms of food as well. Figure 4 shows these resources close to Luleå. This project intends to unite the fragmented city by reconnecting abandoned industrial building to the city’s metabolism and creating a bridge between the city center and the coasts in the north and south. It also aims to become a common platform for actors involved in food production in Norrbotten region. It is meant to be a living, open air exhibition for the productive landscape of the north and the actors who are involved in it.

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12 Dolphijn, Rick, Foodscapes: towards a Deleuzian ethics of consumption, Eburon, Delft, 2004
13 Steel, Carolyn, Hungry city: how food shapes our lives, Chatto & Windus, London, 2008 pg 114
14 Steel, Carolyn, Hungry city: how food shapes our lives, Chatto & Windus, London, 2008 pg 112
15 Steel, Carolyn, Hungry city: how food shapes our lives, Chatto & Windus, London, 2008 pg 106
16 Steel, Carolyn, Hungry city: how food shapes our lives, Chatto & Windus, London, 2008 pg 111
Figure 4. Existing resources around Luleå (figure is made by the author)
Interviews and case studies

The research started as a desktop research by looking up existing resources and regulations which applies to Luleå. It was useful because it showed how the politicians and the city planners are thinking about the city and what visions they have about it. Furthermore, it was also important to see what food and agriculture related initiatives exists today in the region.

Mer Nära Mat (´More Close Food´) is an ongoing project run by LRF (Landbrukarnas Riksförbund= Farmer´s National Association). It takes place within the EU financed ´regional grocery strategy´ which aims to improve the local foodstuff market within Norrbotten region. The Mer Nära Mat project focuses on strengthening the connection between restaurants and local food producers as well as propagating local food as a sustainable choice for facilities within tourism.\(^\text{17}\) They organize meetings and workshops in order to spread knowledge and raise awareness of the existing local food producers and to build a network with them.

Through LRF I was able to receive some information about the current situation in Norrbotten and see it from a different angle. To see what already exists and see it as a potential partner rather than proposing the same thing was crucial in the design process as well as too see what strategies they apply to make the situation better.

I also participated in a meeting (branschdialog) in Boden held by Upphandlingsmyndigheten (= The National Agency for Public Procurement). It was a one-day program with presentations and group discussions among food producers, wholesalers, and public purchasers. During the presentations we received information about the challenges that Swedish farmers face and how different authorities work. There was also a group discussion where we discussed the problems and suggested solutions. From these discussions, it was clear that there is a lack of information and competency among the actors.

The key word was: information. We also agreed in that spreading information, organizing meetings and workshops can help to improve the situation.

Another issue is the low number of farmers in Norrbotten and this number is decreasing as many had to shut off the business or retired and there are only a few young people choose farming as a carrier. It might be a common issue for whole Norrland because similar issues were named on the “Klimatforum-Mat och Klimat i Västerbotten” (Food and Climate in Västerbotten). This event took place in Skellefteå in november 2017 and the main topic was the food situation in Västerbotten county in terms of sustainability. There were similarities between Norrbotten and Västerbotten, however there are challenges which are typifying Norrbotten. It is the biggest county in Sweden but the least populated. Due to that there are great distances between settlements and this causes a challenge in logistic of foodstuff. These distances between different actors in the food path makes it difficult to solve the question of economical transport.

The other difficulty is the price. Swedish products in general have higher price than those which are imported. The reason for that is the difference between regulations in Sweden and other countries.

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\(^{17}\) Landbrukarnas Riksförbund, Projekten Mer Nära Mat i full gång, https://www.lrf.se/mitt-lrf/nyheter/norrbotten/2017/12/mer-nara-mat-i-full-gang/
In Sweden, there are high requirements in animal welfare, wages, usage of renewable energy and a strict regulation of antibiotics. These are reasons which causes the higher price of a Swedish product. Because of these regulations Swedish food products often have higher quality and less impact on the environment. However, people’s choice is often driven by the price and there is a dilemma one faces when it comes to the question of choosing local food or cheap food. As Carolyn Steel describes in the example of Borough Market:

“Of course high cost is the price one pays for real food, made in traditional ways- it is a real cost, as opposed to the artificially low prices we have got used to paying for industrial food.”\(^{18}\)

There are financial reasons why this phenomenon is common but is not discussed in this paper. My aim is to discuss whether locally produced food can be popularized through architecture/through architectural tools and if so, how?

It is possible to educate and inform people, so they can understand what makes a food product good and valuable and the architect can create a platform for that. In this sense awareness of food can play a key role. I believe that the current food standards must be challenged and changed. If there is a platform which physically connects people with farmers and as Steel calls it real food then it becomes obvious that the bigger, redder, aesthetically perfect strawberry is not necessary tastes better than the other ones.

Figure 7 shows that the 18% of the households’ income is spent on food in Sweden and the amount of money spent in restaurants had increased by five times more than money spent on food in grocery stores. This suggests that there is a social stratum which can afford more expensive food supplements.\(^ {19}\)

\(^{18}\) Steel, Carolyn, Hungry city: how food shapes our lives, Chatto & Windus, London, 2008 pg 105

\(^{19}\) Statistiska Centralbyrån, Svenskarna äter ute mer, https://www.scb.se/sv_/Hitta-statistik/Artiklar/Svenskarna-aeter-ute-mer/
Possibilities, methodology

The strategy applied to this proposal consists of cooperation of existing local producers, establishing new ones close to the city and create a place where all of them meet. It is also a desired outcome to popularize farmer as a carrier choice and unalienate food production from people in the city. This is meant to be done with education and workshops, using urban agriculture as a tool. It is basically cultivation in urban environment or a way to use urban spaces for cultivation. The intervention is a living exhibition for food related possibilities in the area. Cultivation is strongly connected to the climate and this must not be forgotten in the case of Luleå. The climate, the distances between different actors and the attributes of the city are all considerable factors.

In the webinar called ‘Edible perennials and winter vegetables in temperate climate’, held by Permaculture Sweden it was discussed how it is possible to do permaculture in cold climate. The guest speaker was Stephen Barstow, former oceanographer, the writer of the book Around the World in 80 plants. He was talking about his own permaculture practice in Trondheim and introduced perennials which were used in his ‘extreme salad’. His inspiring story is a justification for permaculture as a possibility also in places like Luleå. Permaculture can be done in urban environment as well. Urban agriculture is an expanding movement with an increasing interest and popularity all around the world. It provides food security, food accessibility and food literacy as well as job skills training, employment, community building and recreation while adding valuable green surfaces to the urban environment which enriches the ecosystem. As Stephen Barstow’s example shows it, it is possible also in cold climate.

Cultivation in urban environment has many positive qualities however, it has some risk which must be prevented and must not be forgotten, says Beatrix Alsanius, professor in horticulture at Swedish University of Agriculture (Sveriges Lantbruksuniversitet, SLU). In her article in the newspaper Lantbruk (=Agriculture) she states that there is a risk for infectivity, polluted cultivation areas, bad air quality but even a possibility for bowel diseases, for example salmonella which can be spread by birds, rats but even pets. Nevertheless, she is not against urban agriculture, but she wants to remind for the possible negative effects of it. In this article it is not discussed how the size of the risk may vary depending on geographical location or the size of the city, so it remains unclear how likely these scenarios are in Luleå.

The Proposal

Through studying the city, some mis-, or underused spaces were identified, and my proposal aims to suggest an alternative use for them.

As Figure 8 shows, there are already active agricultural actors in the area. The idea is not to compete with them but rather to connect and complete them and to make people aware of the region’s possibilities. It is also crucial to respect the given climatic circumstances. Currently, in Luleå the winter and the growing season are equally long, and it is essential when it comes to planning cultivation related activities. It is also necessary to accept, that the scale of available crops varies during the different periods of the year.

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Figure 8. Urban voids in Luleå (figure is made by the author)
Spatial Actors: Reconnecting urban voids to the city through food production

Luleå has always been an industrial city. But the city and the industry has changed over time, which has left empty buildings behind and created urban voids. My approach is to pick a couple of these valuable buildings and propose indoor cultivation in them, which will fill them with a new function, and reconnect them to the city’s metabolism. I have talked to the city architect of Luleå, and he said that alternative uses of the described buildings above are welcomed.

Indoor cultivation faces several challenges, such as a question of start-up price and energy supplement during operation but it is a promising alternative for overlooked food deserts such as cities with cold climate.23

Locomotive workshop- as an aquaponic farm

This building is owned by Jernhusen and lays around 4 km from the city centre. It has been recently nominated for cultural heritage and is available for rent.

Area: 3000 m²

Production numbers by using Nelson and Pade’s 8-1200 system as a reference24

Vegetable production: 248800-276400 leafy green plants/year
(680-760 plants/day)

Fish production: 7144 kg tilapia/year
(430 kg/ 3 weeks)

Figure 9. Rough sketch of the working principle of the production building and its location (figure is made by the author)


Roundhouse- as a hydroponic farm

This building is owned by Trafikverket and located next to the train station in the city centre and is used as a garage for machines today.

Area: 2400 m²

Vegetable production by using Zip-Farm technology as a reference

Total production: 4748 kg
70% greens: 3635 kg/week
30% herbs: 1113 kg/week

Figure 10. Rough sketch of the working principle of the production building and its location (figure is made by the author)

Abandoned industrial building - as a fungi farm

This building is owned by LKAB and located towards the industrial area of the city, approximately 2 km from the city centre and stands empty now.

Area: 280 m²
Production numbers by using Gourmet mushrooms as a reference:
Mushroom production: 27967 kg/year
(3495 kg/harvest)

Figure 11. Rough sketch of the working principle of the production building and its location (figure is made by the author)

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26 Gourmet Mushrooms, *Boom Times For Oyster & Shiitake Mushroom Growers*,
https://www.profitableplantsdigest.com/mushrooms/
Main platform: From fuel stations to food hub

The actors would be connected to a central, common platform, which is located close to the city center. This site was chosen because of its location and current use. The nearness of the city centre makes it ideal for a public meeting space and with a correct use, it can create a continuity from the city centre to the coast. However, there are two fuel stations and a recycling center on this site today. Through this project I want to question the central position of the fuel stations in the city, and to begin a discussion about it because our cities look like how we build them. It is the people who shape the city and not the other way around and I believe that the architect has tools and responsibility in this. It is not necessary to adapt to the existing cityscape, which can be defined by symbols of the past. This critique is not meant for any older building but for buildings with no architectural value such as a road with a heavy traffic or a fuel station. The presence of the two fuel stations on the site is a symbol of something which strongly influences today’s world but will soon belong to the past. However, today’s world is still dominated by fossil fuels. Even tough, this seems like common knowledge, it still may be important to name. This domination is so strong that it is even being prioritized over the very basic need: food. As David Holmgren writes: “As we have burnt nearly half the world’s fossil carbon in oil (and somewhat less of the coal), we have “burnt” over half of the soil carbon in the world’s farmlands.” The current low oil prices make transporting food cheap. Currently it is economically beneficial to focus on urban development and import food from somewhere else where there is more focus on agriculture, but fossil fuel is a finite resource and will run out one day. When this happens, the oil prices are going to rise which puts the city in a great risk that it will not be able to feed itself. In other words it is not fuel what people need but food. Recognizing this is essential to avoid disasters.

The tendencies which point from fossil fuel towards other energy sources are recognizable in Luleå as well. According to the agreement between EU and Sweden, Luleå has a goal to be CO2 free by 2050. The municipality is working on increasing the use of biogas towards fossil fuels. There is a active biogas plant in Uddebo which provides heating, electricity and biogas for local buses and the vehicle fleet used by the Luleå municipality. After 2019 the organic waste management is going to be taken over by the biogas plant, so the scale of the production will increase radically. The proposal is partially laying on biogas as a source of energy with a complementation of wind and solar energy.

The unsustainable food economy has bad influence on the climate. The diagram (Figure 12) below shows, that 72% of the CO2 emission in Luleå comes from transport from which 56% comes from consumption. This number can be decreased by moving food production closer to its market: the city itself. Therefore, I argue that a fuel station which partly causes these numbers should not have place in

27 BIG Bjarke Ingels Group, Yes is more: an archicomic on architectural evolution, Evergreen, Köln, 2009, pg 14
32 Luleå Kommun, Biogasutveckling i Luleå, https://www.lulea.se/boende--miljo/biogasutveckling-i-lulea.html
35 Luleå Kommun, Utsläpp av växthusgaser, https://www.lulea.se/boende--miljo/energi-el--varme/energistatistik-for-lulea/utslapp-av-vaxthusgaser.html
the heart of the city. This argument can be supported by the fact that the masterplan proposing the relocation of the fuel stations in the city center as well as encouraging urban agriculture.\textsuperscript{36, 37}

![Figure 12. CO$_2$ emission in Luleå (the diagram is adapted and translated from the original one from the Municipality of Luleå)](image)

**Functions**

I introduce a new function for this site through this design proposal which is shaped by the attributes of the context. It’s purpose is to propagate local food production and introduce the possibilities in Luleå and Norrbotten region, as well as to work with seasonality, which is a strong characteristic of the area. The intervention proposes food related facilities on the site, creates edible forest gardens by the coastline and connects these two with a productive landscape. It is meant to strengthen the connection between people and the region by connecting physical activities with the experience of local. It includes several, cooperating functions to ensure that the building and the site attracts a wide scale of people. Figure 13 and 14 shows how the building looks like and where the different functions are. These functions are the following:

\textsuperscript{36} Luleå Kommun, Program B-Rum för möten, https://www.lulea.se/kommun--politik/hallbar-utveckling/vision-lulea-2050/program-till-vision-lulea-2050/program-b---rum-for-moten.html#Text3

\textsuperscript{37} Luleå Kommun, Områdesrekommenationer, https://www.lulea.se/download/18.63c3002313f55efaeddb4/1371546651800/Omr%C3%A5desrekommandationer%2027%20maj%2020213-webb.pdf
Figure 13. Rough illustration of the design (figure is made by the author)

Figure 14. Exploded axonometric illustration about the functions in the building (figure is made by the author)
Food storage: To collect available goods

The uneven production of fresh food is a typical characteristic of cold climates. The growing season is short however, a surplus of good quality food can be produced. Due to the lack of storage space, these goods are being transported and sold. Later, when the growing season ends, they have to be imported. The intention with a local food storage is to keep this surplus within the city and use it for a longer period. As David Holmgren argues in his book, that the one of the many, traditional ways of catching and storing energy is to preserve seasonal surplus.\(^{38}\) Since food, as a fuel for a body is a vital form of energy, this argument can be applied for storing food as well. Food storage is an important function, especially in cold climate and it was also named as a wish by local farmers because it would help with the logistical problems what they have to face with.

Shop and Farmer’s Market: To buy and sell local products

This is a place where the goods could be distributed, a shop which diverges from regular supermarkets. There were a couple of reasons described previously why supermarkets are harmful for the city, so delivering more goods to them might seem the easy way to go but it would not address the origin of the food problem. It requires time until people start to recognize and trust a brand or a producer which can happen slowly in this small scale and supermarkets wants instant profit. In other words, the product will be removed from the shelves before the breakthrough. Giving an individual platform for only local products also can draw more attention than just a shelf in a large store and dissolve the competition with cheap import products. There are available organic and ecological products in supermarkets in Sweden, but the label like organic is still a mysterious designation and cannot be compared to the real transparency of farmer-consumer relationship which is only available with local products.\(^{39}\)

A local product is the better-quality product and it should be prized that it reflects its value. However, competing with supermarkets is a really challenging task. The challenge, that local shops cannot offer the same range of products as supermarkets do is a common problem that they face with. That is why it is important to understand what is available from local producers and complement the missing products through indoor production to fulfil the customers’ expectations in terms of range of product choice. Due to the climate, the inevitably changing variety of available products means an additional challenge as people expect continuity and prefer steady range of choice. “Supermarket customers get upset, apparently if they have to change the variety of apple they buy from season to season.”\(^{40}\) However, it is hard to expect people to give up things what they like for the better good. It is unlikely that many would not eat for example tomatoes in January just because they are not available in the north in that period of the year. These products can still can be produced locally with indoor growth within the city instead of importing them. That is the role what the industrial buildings play in this project.

The important role of the market in the city was already described previously and it was a clear goal to include this program in the design as well. The farmer’s market is an extension of the shop and is open to everyone however, it is held only occasionally and is not a constant event. One of the reasons for that is the uneven production throughout the year. The other reason is that during the short but busy growing season not every farmer would be able to leave the work behind and participate in the market. Therefore, a constant shop where a hired personal do this for them and keeping the market aside as an extra service seemed like a more stable solution. There is a farmer’s market today however, it is very


small and barely known. Nevertheless, a demand for a farmer’s market exists as the example in Umeå proves. Thanks for the increasing interest in local produced food, the farmer’s market is a popular initiative in Umeå⁴¹.

**Research centre and seed bank: To learn about permaculture and ensure biodiversity**

A facility which offers education through communal activities. There is a need for changing people’s relation to the environment and their lifestyle towards a more resilient one. In terms of food, this can be done via workshops which are cooking, or permaculture related. In cooking workshops new, innovative use of local ingredients, cheaper and less wasteful ways of cooking can be researched while learning cultivation helps to popularise farming among children and youth.

According to David Holmgren, permaculture has good affection on people’s behaviour and can change the way how they see things: “As such, permaculture has provided a wholistic framework for reorganising the lives and values of a small minority ready for more fundamental change.” ⁴² Even later in the book he mentions: “If we expose very young children to the delight of foraging food in a garden, they are more likely to grow up with a deep and intuitive understanding of our dependence on nature and its abundance”⁴³. He sees permaculture as an effective tool for a necessary breakthrough needed to achieve a more sustainable future:

> “The process of providing for people’s needs in more sustainable ways requires a cultural revolution, but to propose such a step as a prerequisite can alienate people and inhibit productive steps toward personal and social change. Permaculture has avoided some of the obstacles and opposition that revolutionary ideas encounter.”⁴⁴

In the same building, a seed bank takes also place, because it is closely related to research and permaculture. It helps to preserve biodiversity, works as a storage for seeds, and provides an exchange of knowledge between people who cultivate in the area. The risk for inbreeding is minimalized by leaving seeds there and taking other ones and can also offer a possibility to test different sorts in different part of the area. Furthermore, seeds are also a very effective and compact way of catching and storing energy.⁴⁵

**Restaurant and Greenhouse**

Restaurants are popular in Luleå, which was a reason to include a restaurant in the design too. The purpose of this restaurant is to increase food awareness and interest for local food. It’s speciality is not only the exclusive use of locally grown food but also food grown in the restaurant’s greenhouse where the guests see it. It can also be considered as a part of the research centre and the extension of the shop, where people have a possibility to try out dishes and taste the represented products. This

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⁴¹ Umeå Kommun, *Motion om införande av en stadsodlingsnorm*, http://www.umea.se/download/18.75d45d0a15b0cb9be8f20d81/148319686949/17439.pdf
program might reach a target group which is not interested in workshops or courses but like to go out and eat. So, this restaurant broadens the scale of people involved in this proposal.

**Productive landscape**

According to the climate forecasts, heavy rains will be more common in Luleå, which means that the sewage system has to deal with large amount of water in a short period of time. This is going to be a challenge as the Luleå’s sewage system has already reached its limits. Rain gardens and green areas are an effective and environmental friendly way of handling rainwater. The rainfall from rooftops and streets ends up in the rain garden, a ditch planted with autochthonal plants with deep roots. These gardens delay the arrival of the rainfall to the sewage system and divide it into smaller amounts to avoid the overload of the existing infrastructure. In addition, they fulfil a cleaning function as well. Rain gardens can be planted with local plants, even edibles. In this design the rain gardens are planted on the coastal side to clean the water which comes from the city before it reaches the sea but could work as a protector for the city if the water level raises.

In summary, this design proposal is a complex facility which includes several functions in order to reach a broad scale of users and it intends to be different than the current available shopping facilities in the city. Victor Gruen also supports this idea by saying, “The shopping centre which can do more than fulfil practical shopping needs, the one that will afford an opportunity for cultural, social, civic and recreational activities will reap the greatest benefits.” The building has several faces and atmospheres throughout the year and it reflects the diversity of the north. Functions like the shop, the restaurant and the workshop might vary in programs and range of available products depending on the season. Nevertheless, we can say that these functions operate mainly in the same way all year round however, the landscape itself has two radically different characteristics in the summer and in the winter which a natural characteristic of the region.

**The role of the households**

The proposal described above puts direct focus on public actors in the common platform and involves individual households indirectly. It works on urban scale which offers opportunity for people to take something into their homes if they want, rather than inventing a new housing typology which includes cultivation. It seems more effective to propose on urban scale which eventually drains into the households than start to reform the way of housing. However, involving households is also important. To revitalize the city in terms of food production, focusing only on the commercial sector might not be successful. The goal in the private sector is not the profit nor the big scale production but an alternative for a hobby, learning, recreation, and social connections. A hobby farmer has different perspective and preferences in food which can encourage the responsible decision-making when it comes to purchasing food products.

The introduced common food-hub is a place which offers possibility for citizens to cultivate. Other platforms elsewhere can be possible such as a greenhouse on the plot or the rooftop, a piece of land or a room in the cellar; the scale of the possibilities is broad.

Conventional, soil-based agriculture has a great potential because it is cheap to start up and is familiar to most of the people. It could work as the parking lot system in rental apartments in Sweden: a piece of land would be assured by the landlord and the residents would have a possibility to rent a parcel for an

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extra fee and pay for it together with the rent. This type of private cultivation can operate during the cultivation season, while the commercial actors are productive all year long. However, an intervention is successful if it is used. It is hard to measure the interest in cultivation in actual housing blocks and the question of labour also raises. An alternative solution for that could be a sheltered home (trygghetsboende in Swedish). It is a type of home for elderly but still healthy and active people in Sweden. It would connect the need for activities for these people with the need for labor which is a challenge in urban agriculture. By doing gardening, pensioner have a socially active and light physical hobby which their generation might be even quiet familiar with. At the same time, they could support themselves and their families with fresh food or could get extra income. This type of cooperation, when the cultivation worker is pensioner is common in Japan.  

**Conclusion**

It is argued in this paper, that food-related spaces have an essential role in cities’ life. Proposing to remove a well-used commercial building and replace it with another one, which’s function is -at least today- is quite unusual, seems brave. However, replacing an outdated, symbolic building of the unsustainable past with a building which supports self-sufficiency and social connections as pin points of a new, sustainable future seems like a good idea. Food is more than just a ‘fuel’ for the body. It offers an alternative to spend free-time, it could be a hobby, a leisure activity, and could connect people regardless age, profession, political orientation, or nationality. The proposal seeks an alternative for the presence of food production in Luleå by considering the existing resources as well as the city’s masterplan. It is a combination of preservation of existing qualities and adding new ones. However, it is desirable to avoid the case of the other Western markets. This project is not about promoting a new trendy way to purchase food but aims for bring attention to serious issues about the current food system through architecture and urban planning in order to avoid future food crisis. The point is to make people think how we shape our environment and to show one alternative for how the city would look like if we prioritized our resources differently. Several different typologies were tested during the design process and it was not an easy decision to make but I chose to take advantage of the academic circumstances and picked the introduced design because it was the most spectacular and ambitious one. Due to its uncommonness and extent, this design gets people’s attention easier than other, more humble proposals. This design is a statement and a provocation and it likely that people will have an opinion about it.  

“The use of food to foster urban renewal is a relatively new phenomenon” so there are no well tried out ways of doing it. Therefore, it is challenging to predict how successful it could be due to the lack of existing models. Furthermore, this proposal requires a substantial investment, and at present, potential investors have other priorities. However, the main aim is to begin a conversation about the presence of local food in Luleå and an alternative use for the site. To make major changes in urban planning this conversation is essential and should be open for everyone who is interested. It is just the beginning of a slow process which might take years until a visible result. Thus, it is not too soon to act now.

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