Deliverable Proof – Reports resulting from the finalization of project Cross KIC Sustainable Cities Amsterdam - EIT-BP2020 - Task ID: EIT_9.8.1_201917_P504_1A

Name of KIC project the report results from that contributed to/ resulted in the deliverable	Cross-KIC Sustainable Cities Amsterdam Capitalizing on Collaboration to Drive System Change in Food Logistics and Delivery 201917-Do2
Name of report	Report and Visualization of the Supply Chain Map Between Flevoland and Amsterdam
Summary/ brief description of report	To obtain a solid understanding of the food supply chain and its impacts one must understand the nature and quantity of food being produced, moved, consumed and wasted we as well the socio-political ecosystem within which given supply chains function. We gained this understanding by conducting a system mapping where we sought to document i) what food is grown/produced, ii) where it is being sold, and iii) how it is getting there. Through desk research we identified existing data and information which was then complemented with key-informant interviews to put forward the most up-to-date knowledge on context-specific reasons why transportation and logistics are barriers for Flevoland farmers to supplying the Amsterdam Metropole Region. These discussions helped us reveal missed opportunities for collaboration and efficiency, weak points which will be the targets of proposed interventions in this project. In this document we will first present an overview of the agricultural and logistical system in the Netherlands to situate the supply chains we analyze. We then focus on five supply chains, which act as case studies showcasing the variety of ways in which food currently travels from Flevoland to Amsterdam. Lastly, in a section dedicated to identifying barriers and opportunities we identify common barriers as well as possible solutions. We want to thank you all for sharing your knowledge and contributing time to this document. There is a lot more detail and complexity that could not be capture here, but we hope that it will give us all an overview of where our consortium stands as a group and which avenues are available to us to successfully create a viable business case for Flevoland farmers and associated supply chain actors.
Date of report	January 21st 2021

Climate-KIC is supported by the EIT, a body of the European Union

CAPITALIZING ON COLLABORATION TO DRIVE SYSTEM CHANGE IN FOOD LOGISTICS AND DELIVERY

Supply Chain Mapping

This activity has received funding from the European Institute of Innovation and Technology (EIT), a body of the European Union, under Horizon 2020, the EU Framework Programme for Research and Innovation

Table of Contents

Key Dynamics in Agriculture and Logistics

The global industrial food system has 'liberated' consumers, giving them an infinite choice of goods from all around the world, but has locked farmers into highly unsustainable production systems. It has been argued that in order to emancipate farmers, a transition towards regional food economies is needed, with the realization of short food supply chains (SFSCs) as a promising approach (Kneasfey et al., 2013; Wiskerke, 2015). A regional food system has also been argued to be "the most appropriate level of scale to develop and implement an integrated and comprehensive solution for a future proof urban food system" (p. 15). SFSCs as decentralized food networks would democratize the food industry and minimize the gap between consumers and producers, critical steps towards an environmentally and economically sustainable food system (McNamara, 2016).

However, establishing SFSCs is not easy: while changing supply streams to more regional markets is increasingly seen as a good opportunity for many Flevoland farmers, the export market continues to be more profitable. The challenge here will be to propose a business case to farmers that presents a hassle-free and cost-effective path to supply the local market. With logistics as a major barrier to scaling SFSCs, the focus of this Cross KIC Sustainable Cities project is on improving the efficiency of existing transportation and logistics infrastructure as well as testing new solutions to allow farmers' logistics and transportation needs to be met in a sustainable way, ensuring healthy and livable urban environments.

For the purpose of this project, SFSCs are supply chains "involving a limited number of economic operators, committed to cooperation, local economic development, and close geographical and social relations between food producers, processors and consumers." (EU Rural Development Regulation 1305/2013)

National Level

The Netherlands developed as a polycentric system dominated by several second-tier cities, a design that enabled regional food procurement. However, rapid urbanization, the intensification of agricultural production, economic globalization, and a comfortable condition of food abundance in the second half of the 20th century ensued a decoupling process of urban and rural development (Gaast et al, 2020) resulting is the somewhat segregated socio-political landscape often referred to as the rural-urban disconnect. Rural planning now focuses on agricultural production, while urban planning pays little attention to food systems, emphasizing urban priorities such as industrial development, public transportation and housing (Gaast et al., 2020).

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There are several characteristics of the contemporary Dutch food system that are important to keep in mind, as they shape the horizon of possibilities for intervention. The first has to do with the production side, and the second with the retail sector. In the post-war period, functionality and efficiency became dogma in Dutch rural planning. Rural areas became characterized by large-scale, highly efficient and export-oriented food production, developments which were enforced by the EU Common Agricultural Policy. We

are currently living out the consequences of this trajectory, largely unaltered until recently when the negative externalities of such a system started becoming impossible to ignore.

On the other end of the supply chain is the powerful supermarket sector where "suppliers are negotiated to the bone". The supermarket sector is highly centralized and well organized. There are 5 purchasing offices and 25 supermarket formulas of which the largest two control 44% of the market. Centralized practices inhibit more direct connections with regional producers (Wertheim-Heck et al., 2018). Research confirms that the current supermarket system lends itself to a situation where regional products are largely unavailable or unrecognizable (although this is changing). Currently, in leading supermarkets 80%+ of fruits and 60%+ of vegetables are internationally sourced. The largest share of nationally sourced produce (50%) was found in the organic sections of supermarkets (Wertheim-Heck et al., 2018).

Despite being such a well-connected, densely populated, flat, wealthy, small country, the result of very intentional agricultural planning toward maximizing efficiency and, further along the supply chain, the powerful centralized supermarket sector, means that it is astoundingly difficult to *financially* justify SFSCs; the efficiency and convenience of the export market keep farmers hooked, and the same goes for Dutch consumers who find the supermarket offer hard to beat.

However, the status quo is increasingly put into question. The raising awareness of externalized costs of large-scale export-oriented farming (most notably nitrogen pollution in the case of livestock, but also decreasing biodiversity and soil erosion), the destabilization of the global agricultural markets, and climate change are leading to a growing demand for regional and sustainable products and a shift in the institutional landscape towards supporting circularity and sustainability. An ecosystem map conducted by Local2Local (Appendix 1) shows that there is a lot happening in the SFSC field, albeit still small scale and fragmented. Enabling better communication and cooperation among various parties interested in the same end goals can greatly speed up the transition to a more sustainable food system.

Regional Level

Farming in Flevoland

Flevoland was developed to be a highly industrial, productive, export-oriented agricultural region which prides itself for "feeding the world". The food landscape is characterized by long supply chains, with produce from Flevoland being sold on the global market, while demand in the surrounding urban areas is serviced by food processors, retailers, and wholesalers rather than farmers themselves (FC4EU, 2019). There are currently 1784 agricultural producers in Flevoland, 64% of which grow vegetables. Arable land is mainly covered by onion (37%), potato (36%), carrot (12%), chicory (7%). Most farmers are integrated in the export market and find it hard to transition towards supplying the regional market. Even the crops that they grow, bred for long shelf life and ability to withstand transportation and storage, differ from those grown for the regional market. However, external factors are increasingly invalidating some of the assumptions that held the industrial export-model in place, creating space for new models to emerge.

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Flevoland does have a community of farmers and food producers who are committed to supplying the local market. Our consortium partner Flevofood is an organization of farmers and food producers dedicated to SFSCs and to showcasing the diversity of products coming out of the

region. Flevofood is not selective when it comes to production methods, and their members farm in a variety of ways from conventional to biodynamic (Appendix 3). The organization also represents an impressive array of goods including fruits, vegetables, grains and baked goods, meat, fish, dairy, eggs, and other specialty items like honey, nuts, jams, etc. (Appendix 4).

However, there is no established local logistics system, and farmers must overwhelmingly develop their own logistical solutions which is costly, time consuming, and inefficient. They connect with the 'market' through farm shops, online web shops, generally selling outside of traditional retail avenues in Flevoland predominantly. Some have relationships with restaurants in Amsterdam, but there is not yet an established supply chain connecting these producers to the MRA. In order to compete with the existing food supply chain - to have regionally sourced food become the new norm - a smart supply chain needs to be created that not only delivers food efficiently to the city, but that is also convenient for the farmer and end consumer.

With its high yields and diverse range of products Flevoland holds great potential for impact if a logistics solution is implemented that opens up the Amsterdam market to Flevoland producers. Transitioning to local food production is a daunting task, and the world needs successful case studies to get this transition started. Flevoland can be that beacon of hope, proof that a highly intensive export-oriented region can transition to supply Amsterdam, improving the resilience of farmers, the health of city dwellers, and greatly reducing the carbon footprint of the food system.

> *We need smart solutions to be able to continue bringing in more goods while reducing the number of traffic disrupting vehicles, carbon emissions and other forms of pollution.* ”

Logistics in Amsterdam

The MRA (2.5 million residents) covers all parts of the food supply chain (Van Bossum, 2018): 1300+ companies employ 19,000 people working in food production and processing; 3300+ wholesalers and logistics service providers employ 20,000 people; 4,200+ food retailers (of which approx. 400 supermarkets) employ 70,000 employees; 13,000+ catering establishments employ 110,000 people. This food demand requires a lot of transportation, which in turn emits a lot of carbon dioxide (CO_2) and creates street congestion (Rademakers & Bossum, 2019).

Overall, traffic and transport make up 20% of the total CO_2 emissions from Amsterdam. Of this, city logistics (distribution of goods) are responsible for 10%. Approximately 30% of all registered vehicles are agri-food related with 75% of food supplied by local suppliers (either local farmers and producers or logistics companies with distribution centers within 30km of Amsterdam), a figure which sheds light on the density of food-related traffic in and around the city center. The trend is for this density to continue increasing: between 2015-16 the city saw a 20% increase in delivery vans (CE Delft, 2017).

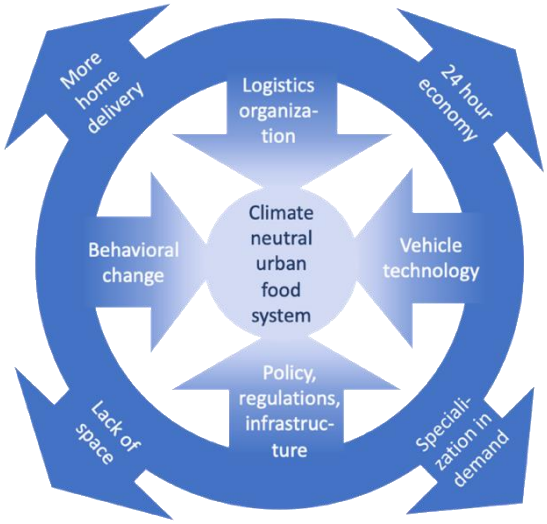


Figure 1: The push and pull factors in Amsterdam's transition to a climate-neutral urban food system.

Figure 1 provides an outline of the many factors that help the city move towards a sustainable climate-neutral food system and those that pull it away from such a state. Below we go into more detail on a few of these.

Amsterdam needs to find a way to ensure that continued population growth doesn't bring the city center to a standstill, all while working towards improving the living conditions for its inhabitants. We need smart solutions to be able to continue bringing in more goods while reducing the number of traffic disrupting vehicles, carbon emissions and other forms of pollution. Thus far this has been a constant battle: urbanization and population growth consistently outweigh any efficiency gains from smart logistics innovations, leading to ever more delivery trucks and vans in the city.

Key Issues

Extreme Consumer Orientation Among Logistical Companies

The consumer has gained disproportionate power to influence distribution routes: the receiving end can request anything and the logistical service companies are obliged to deliver. The increasing popularity of e-commerce does not help. In the 'old' logistical system, it was the logistical company that would set a delivery time that optimizes their route.

This "extreme customer orientation" is a problem that the market won't solve. We need policy makers to reverse this trend. This can be in the form of designing urban neighborhoods to take logistics into account and by creating infrastructure such as packing spaces or hubs. Public actors can also get more involved in organizing the delivery of large volumes. The MRA and other municipalities realize this, but the question is how to go about this without over breaching privacy. Such public coordination in logistics would require opensource data and allow the municipality to know what kind of trucks are entering the city, what they are carrying, where they are going, etc.

Increasing Costs for Last-mile Delivery

Last-mile costs for distributors are quickly increasing due to a combination of diminishing access to city centers (both for transportation and storage) and an increase in demand for goods. Home deliveries in particular have spiked: there are now more customers, that order smaller volumes, more often, than ever. As was mentioned above, in the past logistic service providers could plan their distribution so to optimize their volumes transported to decrease costs but nowadays the extreme consumer orientation has shifted the power along the supply chain. Same day or even same hour delivery makes logistical planning much more difficult and extremely inefficient, and therefore costly.

The solutions for improving last-mile delivery are either too expensive, or non-existent. Cost-effective electrification for vans will be available in a few years, but for trucks it could be another decade. Furthermore, the cooling units needed for food transportation makes electric vehicles even more expensive and energy consuming. Even for large parties with many customers and large volumes, it is currently impossible to make their last-mile transport more sustainable without incurring substantially higher costs.

The Rise of Short Chain Logistics

> *Sparse distribution of low volumes is a logistical nightmare, but it seems to be the dominant system for SFSCs*

The rise of short chain logistics is putting extra pressure on distribution**.** Local and sustainable food has been a growing trend. This has two important effects on the food market: i) there are more and more suppliers who deliver specialized products in small volumes; ii) there are farmers who deliver directly to consumers, oftentimes with their own transport (FSIN, 2018). Sparse distribution of low volumes is a logistical nightmare, but it seems to be the dominant system for SFSCs: on average local suppliers delivers only 1 or 2 colli[1] in the city, compared to 8-25 colli for more efficient suppliers.

Such inefficient logistics are not only expensive for the farmer, but they also generate new distribution flows from the region to the city, contributing to the "transport clutter". Suppliers in such logistics systems have to charge a higher margin for their products to cover costs. Some customers are willing to pay, but it is not a scalable business model.

> *Without a significant innovation in logistics, the growth in demand for local products and proliferation of short-chain logistics will create serious problems for city distribution and logistics.*

For the individual farmer there is little incentive to develop solutions to this. As long as he or she is able to cover costs with the premium, the system works. The issues arise at the aggregate level. Without outside intervention, the benefits of engaging in collaborative behavior are too costly. The people who do have to deal with the aggregate level problems are, for example, wholesalers. They see the rise of short chain logistics as a major problem, and while they are including more local products in their range to satisfy customer demand, they would prefer not to be involved in the local food market. The costs of handling these small volumes is relatively high resulting in low and even negative margins, and the lack of volume means there is no incentive on behalf of these large wholesalers to invest in smarter logistics for local products (Rademakers & Bossum, 2019). Without a significant innovation in logistics, the growth in demand for local products and proliferation of short-chain logistics will create serious problems for city distribution and logistics.

Recent Developments: Accelerating Change

From the above outline we see that Flevoland is a region not particularly well-suited for the development of regional food procurement and distribution due to its entrenchment in the export market. Furthermore, logistics seem to be one of the hardest aspects of food supply chains to address due to its complexity and elusiveness: it operates all along the supply chain, connecting various actors, while seeking to be as unnoticeable as possible. The odds, it seems, are against us. However, three recent developments have created fertile grounds for successfully implementing SFSCs with improved logistics between Flevofood and MRA:

1. The creation of farmers cooperatives is considered a key practice for establishing successful SFSCs: for the many smaller farmers an alternative to being bought out is to search for cooperation with other entrepreneurs and organizations in the food chain to make a collective leap in scale (RAAK MKB, 2015). Cooperatives have recently been created and are active in Flevoland. Notable is Flevofood, our project partner.

[1] "Colli" is the logistical term used to describe a packaging unit of goods, regardless of its shape, size or weight.

2. The Covid-19 crises created an opportunity for the establishment of new logistical routes for surplus food from farmers whose supply to horeca was disrupted. Several initiatives sprung up *ad hoc* to re-route this surplus to families in need who were suffering the economic downturn. During the crisis local retailers, such as Local2Local, experienced a surge of demand because i) people want to support local farmers to show solidarity; and ii) farmers needed a quick market for surplus goods, even at a very low price.

3. Public interest in agriculture, short food supply chains, the "emancipation of farmers" to protect them from market volatility and climate change is on the rise. This is reflected in a variety of policies and trends (Appendix 1).

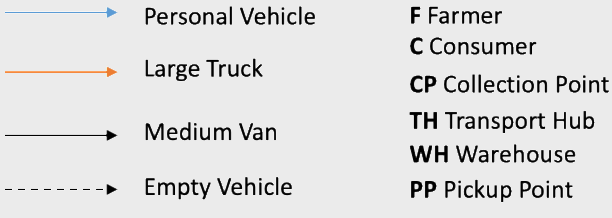
These three developments have created a lot of momentum for establishing regional food systems. We want to ensure that this project builds on the activities and initiatives already taking place. Flevofood participates in two ad-hoc short-food supply chains, one supported by Rabobank and the other by the Red Cross. It is important to note that while successful in finding a last-minute market for surplus produce, these supply chains do not currently present a viable business model to be replicated or scaled. In the section below we dig deeper into several supply chain case studies to better understand the context-specific barriers to establishing viable SFSC logistics.

Supply Chain Archetypes

Within the scope of this project it would be impossible to accurately map all of the food that is being transported from Flevoland to Amsterdam; the flow of food is relatively small and fragmented with no available secondary data. We have therefore decided - as per the proposal - to focus on the farmers/producers who are a part of the Flevofood network.

After initial desk research of several Flevofood producers, patterns began to emerge with regards to market-type and logistics characteristics in the form of three supply chain archetypes: the "Food Box Archetype", the "Bulk Food Archetype" and the "Direct Sales Archetype". We excluded the "Direct Sales Archetype" which covered those farmers personally and directly delivering to one or several restaurants and instead focused on the other two which offer a more opportunity for collaborative logistical interventions. To give a more grounded understanding of these archetypes, we provide five case studies of real supply chains. For each case study we present a stylized supply chain, map out the transportation routes, identify the most prominent actors, depict a price breakdown, and list the pros and cons of the supply chain.

To the right is a guide for understanding the supply chain visualization. The arrows show the direction of food flow, each color depicting a different size. Along the supply chain various standard locations are identified using the listed acronyms.



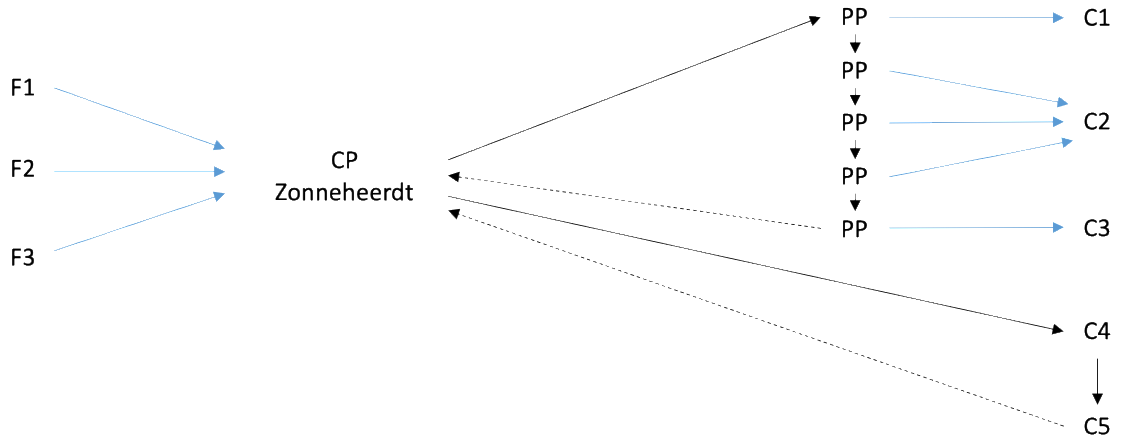
Food Box Archetype (B2C)

The Food Box archetype describes a standard approach in SFSCs whereby a group of farmers supplies produce to create a box with a diverse arrangement of seasonal produce which is then distributed to individual consumers.

Flevour Box: The High-end Food Box

The Flevour Box is an initiative of Flevofood which seeks to give consumers a fun and easy way to taste the diversity of produce and products being produced in Flevoland. The customers live in Flevoland and for 50 euro a month can purchase a box with both fresh and processed food. Each month a chef and Flevofood member decide what to included, guided mainly by seasonality, and create a list of recipes based on the products in the box. While the Flevour Box is not yet being delivered to Amsterdam, with improved logistics members of Flevofood would like to see its range broaden. This month 86 boxes were order (last month this was 62) and Flevofood expects that within the Flevoland region there is a potential customer base of 400.

Supply Chain Visualization

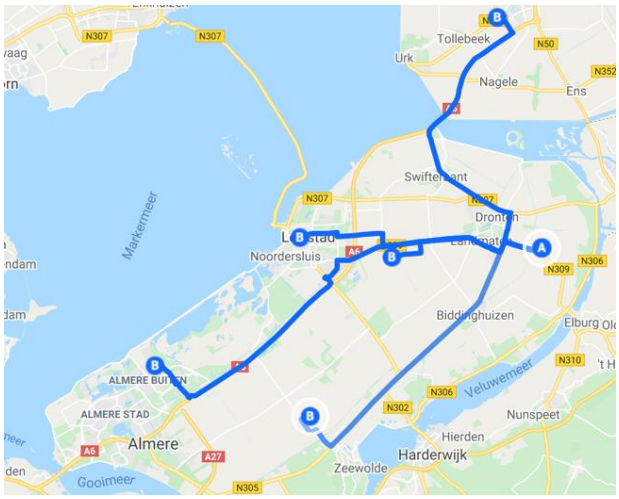


Wednesday morning farmers bring their produce to Zonneheerdt, a fruit and vegetable farm run by Flevofood board member Martin Topper. Twelve producers participated in the last box, with the average distance travelled to the collection point being 30kms. The number of producers and type of products change on a monthly basis. On Thursday a simple production line is used to assemble the products and prepare the boxes. Five people are involved in this process, all hired through the Impact Organization which gives employment opportunities to disabled people. Their income is subsidized by the government, so that the cost of labor in this case is relatively cheap.

Friday morning a Makro truck comes to pick up the boxes and in one trip visits all pickup points, most of them farm shops. Boxes are available for pick up during the working hours of the farm shops on Friday and Saturday. For an extra cost, customers can get boxes delivered to their doorstep, and 80% of the boxes are delivered this way. However, home delivery is still a work in progress. Last month DHL fiet-curriers was hired to do the deliveries but it was a complete disaster. This month the boxes are being distributed by a Flevofood member.

Geographical Depiction of Routes

Collection Route



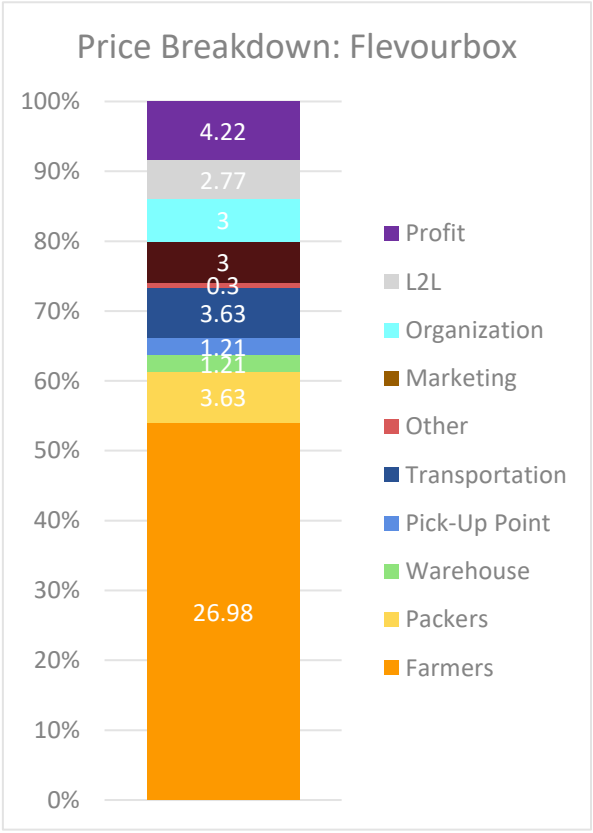
Delivery Route

Price Breakdown

To the right is the price breakdown of the Flevour Box. Just over 50% of the price consumers pay stays with the farmers, approximately 19% goes to transportation and logistics, 18% to marketing and organization, and Flevofood collects 9% as profit.

The value of the goods in the box are currently set at 25 Euro, and the farmers themselves set the price for the produce. However, it is still a competitive environment with the lower bid making it into the box. However, a farmer will not bid lower than what they would make through more traditional routes, so even with a downward price pressure, the price always is higher that what the farmer would otherwise make.

Potatoes on average cost 0.25c/kg to be distribution ready (washed and packaged). Selling to AH farmers make between 0.26c-0.28c per kilo. Farmers supplying the Flevour Box generally make 0.28c-0.30c per kilo. There is always some bidding among the farmers, with the lower offer making it into the box. But it is always going to be more than it would be through conventional routes.



Key Actors

Existing: Farmers, Martin Topper, Flevofood, Makro, L2L, Pick-up Point Operators

Missing actors: Logistics for last mile delivery, Marketing and communication

Pros and Cons

PROS	CONS
• Diversity of products • Monthly subscription model • The ordering system (via L2L) • Hub pickup point model	• Home delivery via Fiets Curriers is expensive and inefficient • Cannot currently deliver to Amsterdam due to costs • Viability depends on the contributions of few key figures • Hasn't sold as much as expected • Last Mile Delivery • Lack of advertising outlets

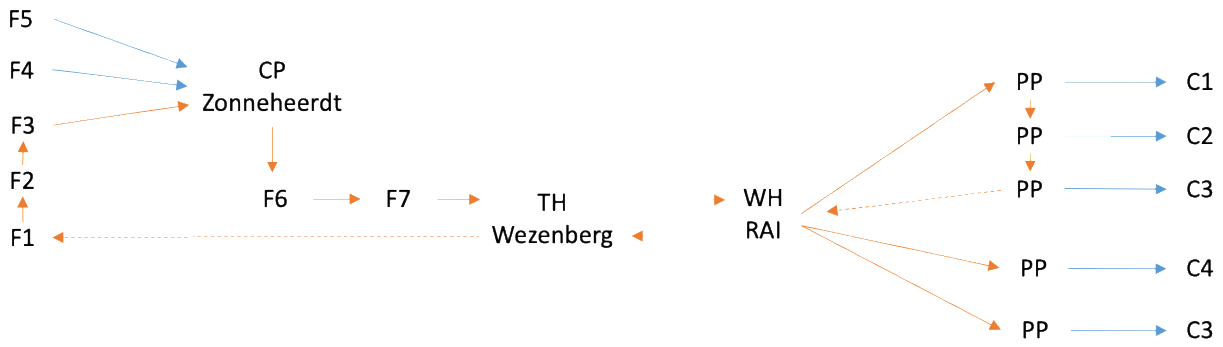
Boeren voor Buren: The Social Service Box

Boeren voor Buren is a foundation which connects Dutch farmers with lower-income communities in Amsterdam to ensure that everybody has access to healthy and local food. Their goal is to ensure that financially vulnerable Amsterdammers can buy healthy food every week at low prices. Forming a foundation was a strategic move: without the need to make profit, supplying local produce at a reasonable price for both consumer and farmer became possible. The foundation has direct contact with the farmers providing them a weekly insight into seasonal and ''residual'' streams of produce. Moreover, they buy a variety of fruit and vegetables, including those that are not deemed good enough for the supermarket due to slight imperfections.

These boxes are currently being offered every 2 weeks at three pick-up points in Amsterdam. Consumers have to bring their own bags for collection. Boxes filled with fresh fruit and vegetables are available for low-income communities which possess a ''city card''. The consumers can choose out of 3 volumes (5kg, 10kg or 16kg).

Connection and financial assistance came from Rabobank Amsterdam and the municipality of Amsterdam. Studiezalen organized the volunteers who make packages and prepare address lists. 4,500 kilos of fruit and vegetables come every two weeks from Zonneheerdt, Polder Potato and Fruithal Smits, via Flevofood. The transport is in the hands of Motion Transport, Cargoroo and Uber, Port of Amsterdam and RAI Amsterdam made a warehouse available via ORAM and the Amsterdam Economic Board and Beaumont Communicatie contribute with organization and communication.

Supply Chain Visualization

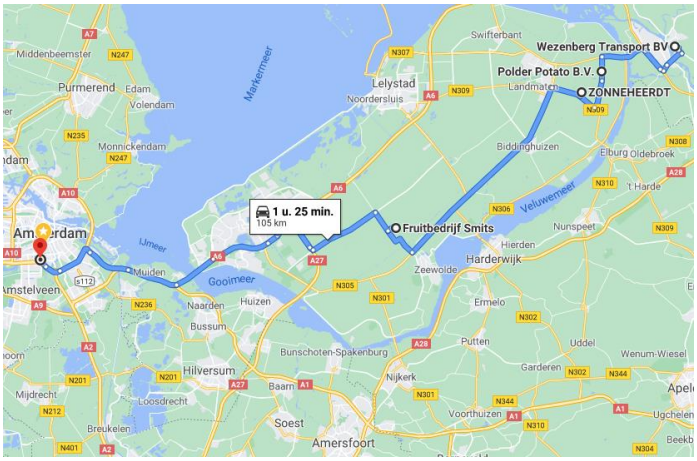


Thursday the produce is collected from various farms and brought to Zonneheerdt which acts as the collection point. This collection of produce is included within the existing transport of Wezenberg logistics which totals 351 km. Friday the ordered amounts of produce are transported by Wezenberg logistics company from Zonneheerdt to RAI Amsterdam warehouse, stopping along the way at Polder potato and Fruithal Smits for collecting the remaining produce (105 km). Friday afternoon volunteers prepare the orders for the 3 pick-up points in Amsterdam.

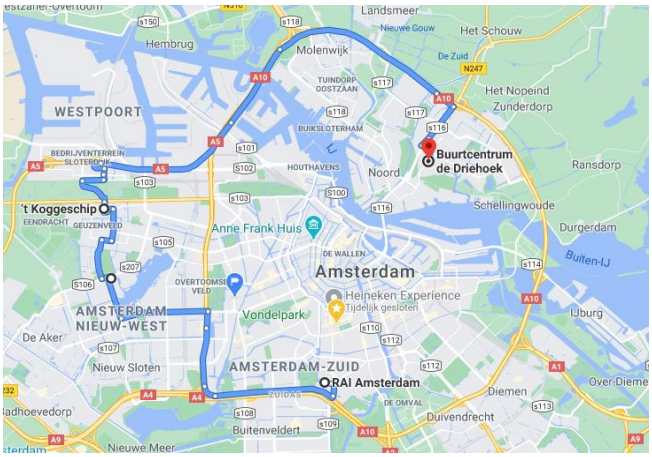
Saturday morning the orders are transported to the pick-up points in Amsterdam (29 km) and the consumers can collect their orders throughout the day. After all orders have been collected crates and trolleys are returned back to RAI Amsterdam warehouse (29 km). When there are enough crates to fill an entire truck these are taken back by Wezenberg transport (every 4-6 weeks) to prepare for the next order at Zonneheerdt (100 km).

Geographical Depiction of Routes

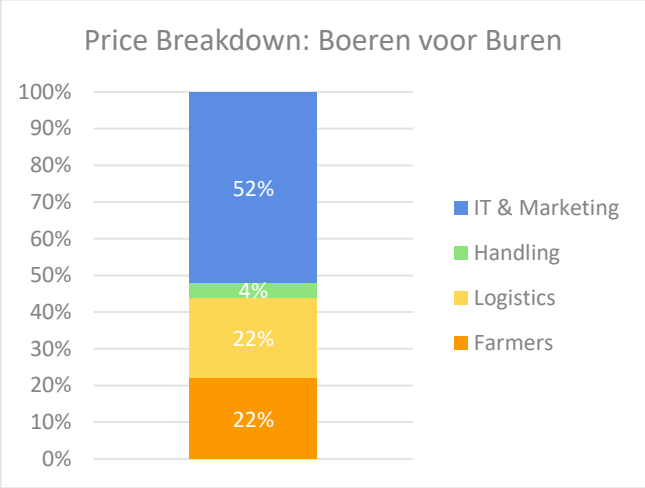
Collection Route



Delivery Route



Price Breakdown



Key Actors

Rabobank Amsterdam, the municipality of Amsterdam, Studiezalen, Zonneheerdt, Polder Potato and Fruithal Smits, Flevofood, Wezenberg logistics, Motion Transport, Cargoroo, Uber, Port of Amsterdam, RAI Amsterdam, ORAM and the Amsterdam Economic Board and Beaumont Communication.

Pros and Cons

PROS	CONS
• Good price for produce • Delivered in Amsterdam • Good coordination among various parties in the supply chain • Re-use of crates • No packaging • Creates alternate stream for otherwise discarded produce	• Relies on volunteers • Limited pick-up locations and times • Offers only fresh produce

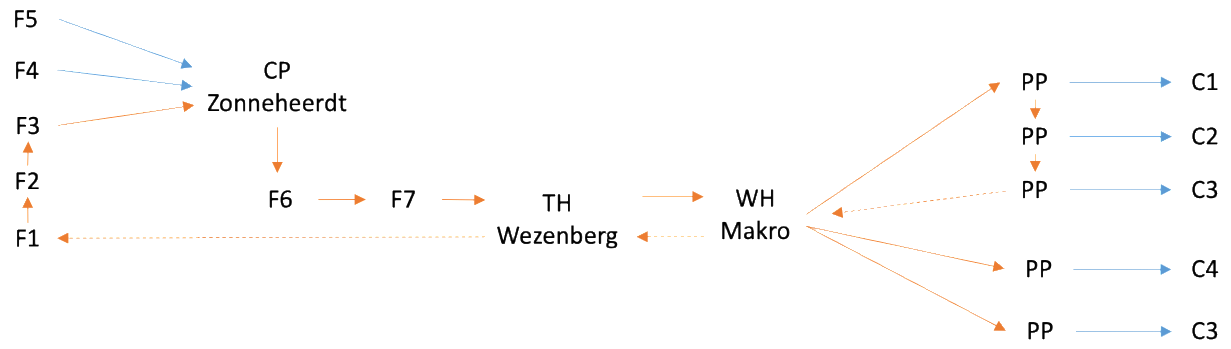
Red Cross: The Rapid Response Box

The Red Cross provided food boxes to people that were hit hard by the corona crisis. Think of migrant workers, undocumented migrants and families who are barely able to make ends meet due to corona-related income losses. This project has been very successful, delivering 2250 food boxes every week with enough food to cook 2-3 meals for two people. This case study is a good example of a sustainable solution for people who temporarily fall between the cracks.

To achieve the large number of deliveries, the Red Cross collaborated with Taskforce Korte Keten, Local2Local and Makro, joining forces with farmers who had difficulty selling their fresh products either because they couldn't export their products or sell them via the catering industry.

The Red Cross also supports various Food Banks in the Netherlands. For example, volunteers and civilian aid workers from the Red Cross Ready2Help network help the Food Bank to bring food packages to people's homes. Normally these people pick up the packages. Due to the corona measures, this is currently not possible at all locations

Supply Chain Visualization



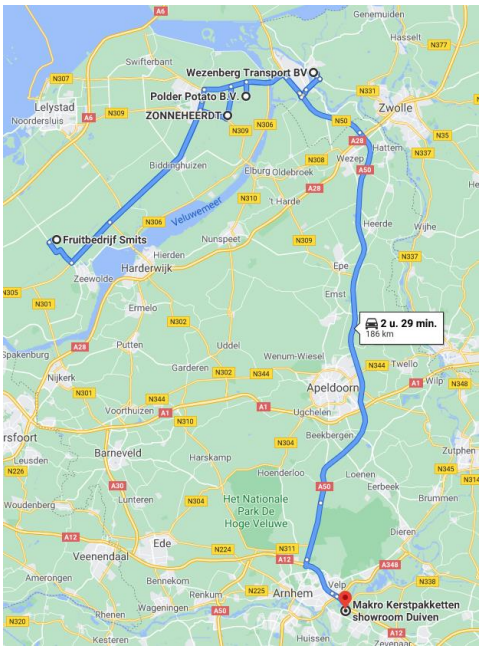
Every week an order for the amount of needed food aid boxes is communicated by the Red Cross to Local2Local. The available vegetables and fruits are inventoried with Flevofood and the appropriate order is filled. Certain produce from NL farmers are collected by Wezenberg logistics in their usual traffic route, these products are brought to Zonneheerdt in Dronten, this is coordinated by Martin Topper (351 km).

Monday Wezenberg logistics collects the ordered amounts from Zonneheerdt, Polder Potato and Fruithal Smits. The produce is stored overnight in the truck at the Wezenberg distribution center (219 km). Tuesday morning the order is transported to the Makro packaging facility where the boxes are filled with local produce. Wednesday morning the boxes are complemented with regular products to ensure a varied box.

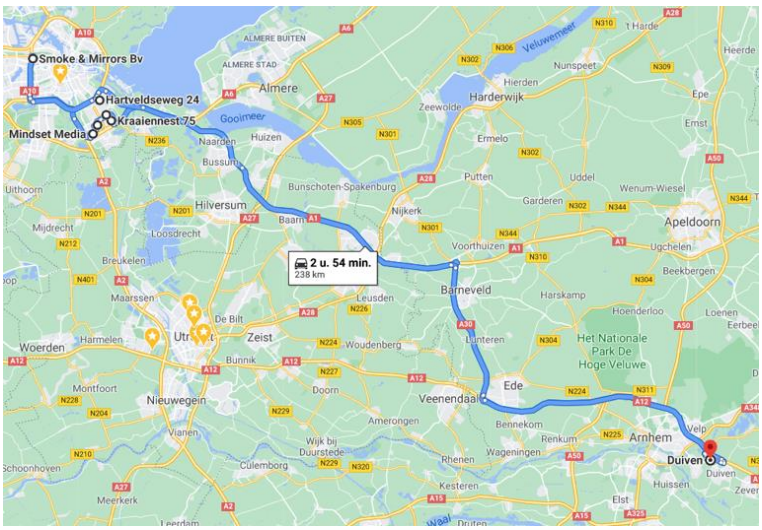
Wednesday afternoon and Thursday morning the orders are collected by Melis Logistics which delivers the boxes to the various Red Cross pick-up points in Amsterdam, Rotterdam, Utrecht Region, Flevoland Region, Tilburg and Maastricht. Friday and Saturday the boxes are handed out by Red Cross volunteers to people in need that collect their food aid boxes up at the pick-up points.

Geographical Depiction of Routes

Collection Route

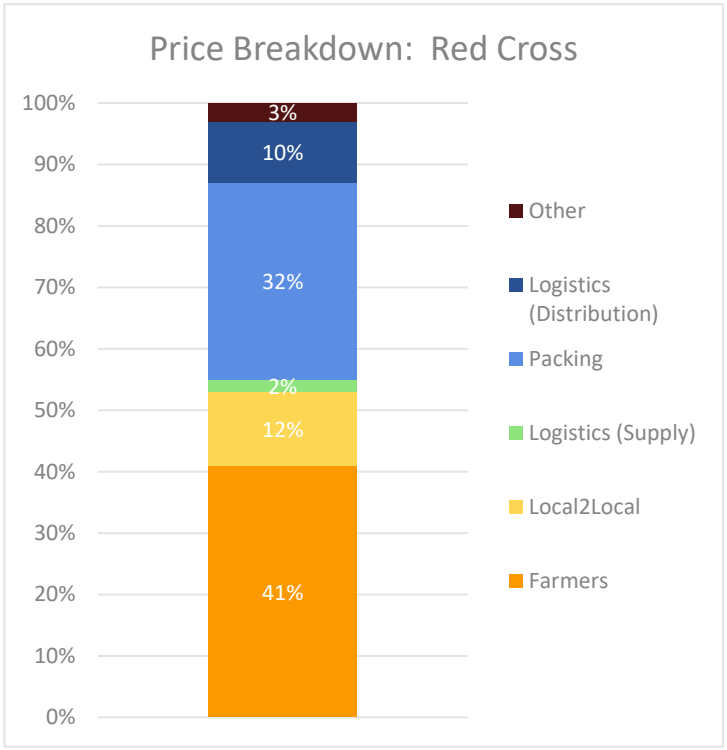


Delivery Route



Price Breakdown

The Red Cross model is able to deliver 41% of the price of the final box back to the farmers. Logistics and transportation together account for 44% of the total price of the box, with packaging being particularly expensive. It is important to note that as a non-profit, the Red Cross does not make a profit from the distribution of these boxes.



Key Actors

Existing: Farmers, Makro (Hampers), Van Melis, Local2Local, Red cross.

Pros and Cons

PROS	CONS
• Diversity of products • Flexibility in product offer • Collaboration with Makro and Melis Logistics • Combination of local products and regular products • The hub pickup point model	• Number of stakeholders pushing the sales price • No refrigerated products • Third party for the B2B/ B2C logistics • Location of Makro Hampers (Duiven) • Coordination is time consuming due to the many chain partners • High operational costs

Bulk Food Archetype (B2B)

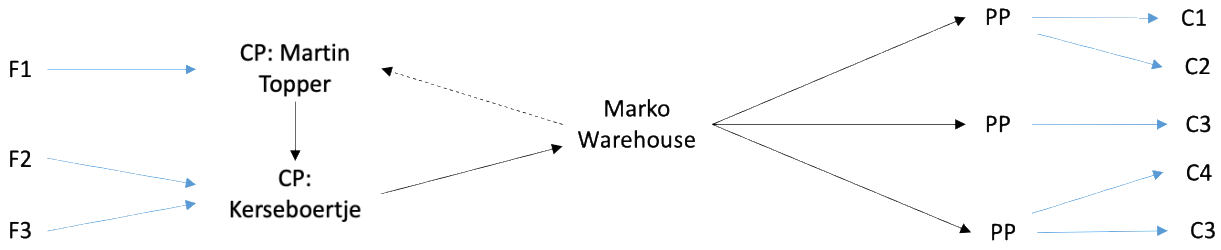
There are several instances of traditional long food supply chains catering to Amsterdam, albeit through a very roundabout way. A lot of times some of the produce of farmers who are primarily engaged with the export market gets diverted to the regional market. The case study for this instance is Polder Potato. As was mentioned before, wholesalers are increasing the percentage of local food in their offering. Local2local and Makro have collaborated on such premises making their supply chain another interesting case study.

Local2Local & Cash&Carry: The e-commerce wholesale model

Local2Local is supported through a logistical partnership with Makro for scaling-up logistical practices in order to increase the consumption of local produce. This strategic collaboration is 5 years in the making. The vision, values and strategies of Local2Local form the foundation of this strategic partnership. The ability to link food distribution software of local parties with larger wholesalers is a key characteristic of the success of this partnership.

Since August 2020 Flevofood and Local2Local started delivering in collaboration with Makro. Both Flevofood and Local2Local have their own websites through which businesses can order local produce which are now being delivered by Makro in their existing B2B delivery service. Additionally, the Makro store in Amsterdam has dedicated an area for processing and selling these local products.

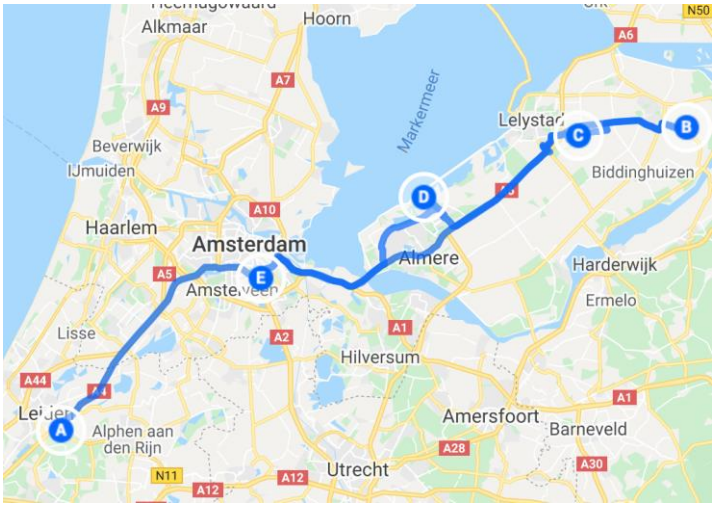
Supply Chain Visualization



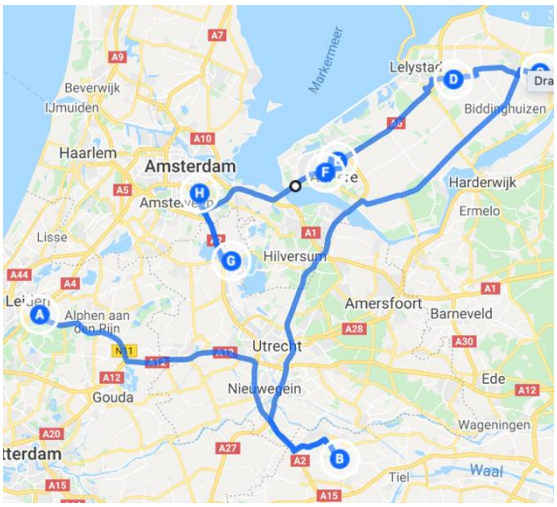
Throughout the week Flevofood farmers bring their products to two collection hubs, one in Almere and one in Dronten. Monday a Makro truck drives a certain collection round for local products passing Zoeterwoude and throughout Flevoland (243 km). Wednesday the Makro truck drives further collecting local produce from Zoeterwoude, Betuwe Region, Utrecht Region and Flevoland (326 km). These products are then stored for stock at Makro Amsterdam where B2B consumers can buy their local produce in the store. Moreover, the Makro delivery services for B2B clients deliver local produce throughout Amsterdam (average of 17 km per delivery).

Geographical Depiction of Routes

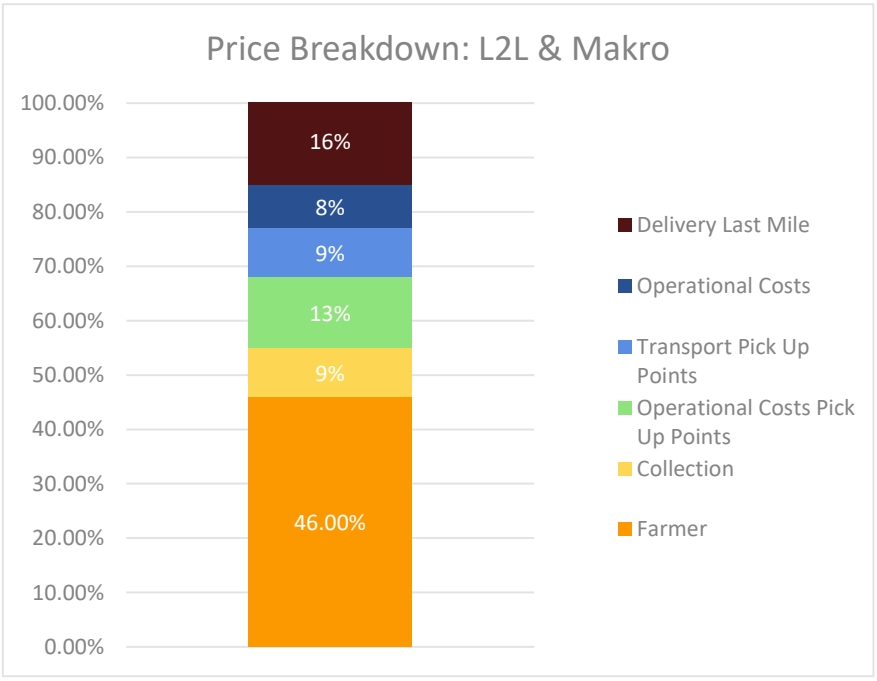
Collection Route



Delivery Route



Price Breakdown



Key Actors

Farmers, producers, Vereniging Flevo Food, Local2Local, Makro and customers

Pros and Cons

PROS	CONS
• Diversity of products. • Ordering system Makro works well. • Local proposition in a professional shopping environment. • HACCP check. • Leadtime 2 or 4 days. • The hub pickup point model works well. • Flexibility of transport. • Future integration to de food service delivery model. • Increasing the drop amount and the profitability of the model for all parties.	• Dedicated transport. • No integration yet to the food service delivery model. • Adding carbon emission, not yet using existing transport options in Flevoland. • No use of electric transportation yet. • Low drop amount when customers only order local products. • Difficult to integrate one order delivery schedule for all farmers and producers. • More collaboration between farmers for more efficient logistics.

Polder Potato: The multi-stream model

Polder Potato is a large-scale export-oriented potato farm which caters to several markets. Their potatoes end up making their way to supermarkets in the Netherlands, Germany and Belgium. A recent collaboration with Huuskes Caterer means that their potatoes are also channeled into ready-made meals for retirement homes and hospitals. Furthermore, as a member of Flevofood, potatoes from Polder Potato also make their way into the three food boxes listed above. While we were not able to get any primary data to inform this case study, we thought including the supply chain visualization and routes would be useful contribution to show how a large-scale farmer can also participate in SFSCs.

Supply Chain Visualization

Conclusions

Organizing logistics, especially for food, is a very complex and demanding undertaking. Farmers generally don't have the time to set up effective logistics' systems and there is relatively little research on short chains logistics because of the novelty of this topic. Furthermore, logistics need to be location specific. Nonetheless, in this research we sought to gain a deeper understanding of local supply chains by analyzing five specific case studies. The concrete insights gained from these case studies are explored and contextualized in the "Barriers and Opportunities" section. These insights should go on to inform our thinking on practical interventions to help Flevofood farmers become key actors in Amsterdam's transition to a more sustainable food system. But first, a brief section on the Life Cycle Assessment.

Life Cycle Assessment

While the economic benefits for small scale farmers and social benefits for participating actors of regional food sourcing via short food supply chains are indisputable, recent literature has pushed back against the assumption that fewer food miles automatically mean less carbon emissions (Majewski et al., 2020). Beyond food miles, several factors regarding the characteristics of transportation and logistics are important in determining the environmental impact of a given supply chain. These include: (i) the infrastructure along the supply chain; (ii) the type (capacity) of vehicles used; (iii) the conditions in which food is transported, stored (e.g., refrigerators, freezers, etc.) and displayed in retail outlets.

The LCA report of four short food chain initiatives is included in Annex 1. On surface level, the goal of any LCA is to provide the environmental impact of a product or process from its (in this case literal) roots to its disposal. In the context of this project, the knowledge obtained during the process will be applied to serve as a comparison model. In order to keep the LCA concise and context-specific, only relevant environmental impacts were selected, with the emissions of carbon dioxide as central. Furthermore, as many processes rely on fossil fuel, it is important to consider the total amount of fossil fuel used. Lastly, the environmental impact Water Use is selected. Since the vegetables have to be washed before they get sold, the amount of water used to do so is interesting to look at.

During the system mapping phase and pilot phase a lot of data has been gathered to conduct the LCAs in order to calculate the environmental impacts. While a significant number of assumptions have been made due to lack of precise data, direct comparison between the separate LCAs and the integrated LCA is possible due to the fact that the same sources were used.

The biggest loss is occurring in low haul loads and the milk run (Table 2). Many farmers deliver the goods themselves, whereas they should be ideally all picked up in one milk run by one truck. The results of each environmental impact indicator are provided in Annex 1.

SFSC initiative	Milkrun (collection)	Inbound logistics (DC)	Delivery
Local2Local	38,54 Kg CO2	121,77 Kg CO2	39,85 Kg CO2
BvB	260,51 Kg CO2	124,41 Kg CO2	83,7 Kg CO2
Flevourbox	71,85 Kg CO2	not applicable	208,12 Kg CO2
Red Cross	239,11 Kg CO2	66,42 Kg CO2	101,50 Kg CO2

Table 2. Overview of CO2 emissions of the SFSC initiatives

Barriers and Opportunities – Towards a Pilot Project

"I really believe that this game of transitioning agriculture has already been won. It is happening too fast, through too many different farmers now, to be stopped. It is multi-focal, it's got all of the right stakeholders at the table (…) but we don't have the time for the linear change that typically takes to happen, we need to inspire everybody to go faster in the lanes they are already going, and then synergistically and strategically zip them together into more functional units." – Zach Bush, physician and regenerative agriculture advocate

These words ring true for our experience: public consciousness, consumer demand, political will, farmer desires are all coalescing around a similar vision where food and agriculture are taking center stage in the transformation to a more sustainable society. The Covid crisis has acted as a catalyst, exposing the flaws of the globalized and industrial food system and strengthening the logic for supporting a regional food economy. However, we cannot afford to wait for linear change. We need a concerted effort to hasten the transition to a new agri-*cultural* paradigm. Here, collaboration can act as a powerful tool to speed up this transition.

We need to inspire everybody to go faster in the lanes they are already going, and then synergistically and strategically zip them together into more functional units.

The first step is identifying all the actors who are working towards a new agricultural system. The next is sharing knowledge and experience to diminish the burden on the newcomers and eliminate the time-consuming (and costly) process of trial-and-error. We then need to have an interdisciplinary and multi-level structure to coordinate short-food supply chain actors. Important for smaller farmers is to come together in cooperatives to take advantage of the cost reduction that comes with scale. Good news for us, all of this has already been achieved! This project is part of an effort to showcase the kind of integral and lasting solutions that can emerge when various parties along the supply chain are given the chance to collaborate, given the space to implement changes that bypass the usual incremental steps towards a given goal, to actually create lasting change.

In this section we will integrate the preliminary lessons learned from our case studies to outline the major barriers and opportunities relevant for our context. The barriers will be location-specific, but contextualized in broader debates, whereas the opportunities will relate to our consortium offering, while also identifying other relevant ideas.

Barriers

Typical SFSC Barriers

In order to 'scale up' SFSCs in any meaningful and lasting way it is essential to change our mentality from individualistic to collective. While the individual success and expansion of enterprises within the SFSC is also important, transformation and lasting success occurs through the "proliferation, co-ordination and connecting-up" of many small-scale but complementary initiatives (EIT, 2015). Typical problems to scaling SFSCs include:

- **Limited volume** - high uncertainty, fluctuation of product volumes, unpredictable supply of raw materials, high cost of meeting retailer requirements.

- **Perishability of products** - postharvest decay, short shelf-life.
- **Limited access to resources** - lack of raw materials, lack of IT system, of financial resources, production infrastructure, legal information.
- **Limited labor availability** - difficulties to employ people, lack of seasonal workforce.
- **High cost of logistics** - high cost of transport due to small volume, simplifying and streamlining logistics because of small scale, low margin. Lack of efficient cold chains.
- **Poor direct access to consumer** - lack of information on consumer needs, market trends limited access to market (time, cost, visibility), lack of information to consumers about the products, lack of marketing knowledge.
- **Lack of consumer trust** – need for better communication between farmer and consumer and innovations to enable traceability.
- **Low negotiating power** - with retailers, large service providers, large customers, municipal governments.
- **Relatively high price** - lack of cooperation for joint selling to retailers, lack of competitive strategy, lack of differentiation strategy.
- **Lack of information and knowledge of product development**
- **Lack of collaboration –** lack of collaboration between supply chain partners and competitors, both horizontal and vertical.

Context Specific Barriers

Common barriers from supply chain case studies:

- **Low Volume** continues to be a barrier toward economic viability. The reasons for this are twofold: limited market access and high logistical costs.
- **Last-mile delivery** as barrier to successful delivery to cities, both because of costs and lack of time to do the necessary research to pursue such business expansion. For example: last month Flevour Box was delivered with DHL fiets-curriers but this was a complete disaster. DHL is not equipped to handle food. Many of the boxes arrived damaged and several never made it to their final destination. A Flevofood member had to personally deliver the missing and damaged boxes. This month a Flevofood will again personally deliver the boxes to customers houses and will continue doing so until a better logistical service is identified.
- **Reliance on consumer involvement and determination**: many farmers supplying the local market process orders online or deliver to small farm shops. This means that only consumers who are interested in local food and are willing/able sacrifice convenience to purchase products they deem superior will participate in this supply chain. This severely limits the market reach.
- **Reliance on volunteers** to provide competitive price. Many of our case studies depend on volunteers (free labor) along their supply chain to be able to offer a competitive price.
- **Reliance on several key player** without which the whole system would collapse. This is the case for the food box case studies where several key players are critical to the functioning of the whole. Dependence on several key players makes the whole supply chain quite vulnerable, and also not sustainable for long-term functioning, or for the long-term wellbeing of the individuals.
- **Organizing distributions:** low volume logistics is akin to the poverty trap. Because of low volumes, logistics are always (too) expensive, meaning that prices for deliveries are relatively high. Because of this, customer demand will not grow, keeping the volume low and logistical costs high. It is a vicious cycle.

- **Timeslots:** Customers demand specific delivery windows, adjusted to their own personal or household timetable. These are difficult to organize for SFSC parties because of low volumes.
- **Logistical costs due to mistakes.** The highest costs of any logistics systems are the mistakes, when everything runs smoothly it is generally quite cost effective. In nascent SFSCs logistics are not yet developed, and mistakes end up being very costly.
- **IT is still a barrier for SFSCs**. This problem materialized in two ways. In large organizations there is a very complex and often old IT system that is not flexible to "plug and play". The IT backbone is very traditional, preventing these actors from implementing the many exciting IT innovations that are in the making. On the other hand, IT could easily be implemented in the functioning of smaller, independently working actors, but here the cost of such systems is prohibitive. There is also a general lack of knowledge about logistics and IT.
- **Food boxes are not a viable long-term strategy:** while at the beginning of the corona crisis sales of food boxes went up, they are now going down again. In general, many food box initiatives start and then fail. What happens is they start off good, but they reach a limit on sales faster than expected and lack the volume they were expecting to have to make their services cost-effective. At this point they cut down on customer service, and their customer base dwindles.
- **Fear of collaboration**: entrepreneurs in general fear collaboration, and rightfully so because the idea or product they have worked on could be available to others for no direct benefits to the entrepreneur. There is also fear among competitors, whereby disclosing sensitive data would threaten their business. The power imbalance among supply-chain actors also leads to a fear among smaller player of being taken-over, or pressured into certain decisions, by larger players.
- **Big player bias**: Governmental systems rules, taxes and subsidies all favor large parties in large supply chains (because this is where you get the biggest impact). Corona also shows this: the large companies benefit the most from the rescue packages.
- **Benefits and burdens of collaboration not evenly distributed,** as a result of which cooperation provides insufficient economic benefit for some stakeholders.
- **Lack of time:** organizing logistics takes time, something that farmers have very little of. This means that many small-scale farmers and producers are transporting their goods separately to individual homes, shops or markets, when more efficient, environmentally friendly and cost-effective solutions could be found through collaboration, but they requires time to reach out to people, discuss potentials for collaboration, and then actually implementing the changes.

Opportunities

Typical SFSC Opportunities

There are many innovations in supply chain logistics that are meant to increase efficiency: automated lockers for drop off and pick up to overcome time frame issues, backhauling to maximize truck storage capacity, cross-docking to eliminate the need for storage facilities, etc. Many of these focus on very specific logistics issues, ignoring the ecosystem within which these logistical systems function. While these are all useful, they are not the transformational solutions this project hopes to pilot.

> *Many current innovations focus on very specific logistics issues, ignoring the ecosystem within which these systems function. For structural change, integral solutions are needed, with every party in the food supply chain from customer to producer having a role.*

First and foremost, for structural change, integral solutions are needed, with every party in the food supply chain from customer to producer having a role. Creating such a collaborative environment is complex, time consuming and costly. At this point it should be clear that a collaborative approach forms the foundation of many solutions for solving the interrelated issues of volume and costly logistics in SFSCs. EIT lists many benefits to engaging in collaborative behavior, including:

- **Improved product range**: the product range can be diversified and/or increased so that more producers can be involved and more jobs can be created through retaining the added value in each territory. More people can be supplied with a greater diversity of products, in more convenient formats. Larger customers can also be supplied (such as public procurement).
- **Resource sharing**: equipment, tools, processing facilities, transport and logistics can be shared in order to improve efficiency and share costs. Knowledge and skills can also be shared (playing to the strengths of different actors, so that each member of the collaborative SFC, for example, needs not necessarily be an expert in producing, processing, logistics and marketing).
- **Maintaining infrastructure**: retaining or reinstating local processing facilities such as abattoirs or farmers' shop. The loss of small abattoirs is frequently mentioned as a barrier to SFCs because so many are now concentrated in huge units, that can be reached only after hours of travel.
- **Increased negotiating power**: more weight in contract negotiations, ensuring fair terms and conditions, gaining access to public and larger scale markets. More power to draw decision makers' attention to legal problems as hygiene rules
- **Reduced competition**: between many small un-coordinated SFCs in a region
- **Mutual support**: collaboration can combat isolation felt by small-scale producers; it can assist the integration of newcomers into food and farming sectors.

Collaboration is already occurring in the case study supply chains, but it often comes at a high cost for several key players and is not yet established to the point of enabling seamless and effortless logistics. By strategically tweaking several aspects of the existing SFSC, and enabling mutually beneficial collaborations, the benefits of collaboration can be further strengthened.

Context Specific Opportunities

Multiple logistical streams

Some farmers have already set up two logistical streams (Polder Potato). If this could become a replicable model for other export-oriented farmers it would go a long way to increase volume. Then, finding ways to efficiently collect small volumes from different farmers would create a business model that can be competitive with the conventional. The first mile is a tough system, and there has been a lack of interest in first-mile solutions.

First mile collection through multifunctional food hubs

Multifunctional food hubs can be valuable in many different ways, from supporting new forms of food retail and distribution to providing incubation units for new food entrepreneurs or creating a space for community education and action (Guzman & Reynolds, 2019). Martin Topper's farm Zonneheerdt already unofficially functions as a multifunctional food hub. It is a key location in all supply chains we mapped, acting as a collection point, storage space, and packing location for several farmers. Zonneheerdt also participates as a food supplier for various supply chains. A question might be "How do we improve the

role of Zonneheerdt as *the* multifunctional food hub for Flevofood producers? Can we create a model for Flevoland farmers to establish themselves as food hubs for other farmer groups?"

A multi-functional food hub might increase efficiency and volume but would require more people to be involved in organizing logistics. These so-called operational groups can set up collaborative logistics and distribution solutions if there are big enough volumes to transport. This would include sourcing the most appropriate and energy efficient vehicles, using IT to identify the most efficient routes and opportunities for back-filling and joint deliveries, the development of online portals so that many producers can share the costs of having a sophisticated online presence that can also process orders, deliveries and payments.

Last Mile Delivery – Foodlogica

Shortening the food chain is one of the goals Foodlogica seeks to address with their last-mile food delivery solution. It seeks to disrupt global food systems by enabling clean, flexible and cost-effective last mile delivery. Part of Foodlogica's mission is to work with good food brands, with over 80% of their revenue coming from clients who are focused on local, sustainable and innovative food products.

Foodlogica has established itself as a hybrid seeking to provide the volumes and quality of delivery vans, but the flexibility of bike-couriers. It uses active cooling to compete with the trucks, recognizing that people who care about good food demand that it be treated with the utmost care during transportation.

Foodlogica uses standard crates, bikes have a 20 create capacity and deliver crates in four-hour shifts, from 7am to 10pm. They are all HAACP approved which already is a huge win. Foodlogica also uses the hub model for their distribution. Clients deliver food to one of two hubs, and from there Foodlogica vehicles take care of the final mile(s). Extra services are offered such as storage at the hubs, drivers arrange products in retail spaces. Optimization of the routes is done with external software, with the goal being to maximize the density of deliverable: the less time a driver has to travel between drop-off locations, the more efficient the process is.

As a consortium partner Foodlogica is eager to provide its services for the last mile delivery of the collaborative supply chain innovation we will implement during the pilot project. However, there are several barriers that need to be addressed as well:

- **Work at the hub is inefficient**, everything is currently done manually. There is need for a better system here. Using rolling cages that would ideally be custom made for the bikes would greatly decrease the workload at hubs.
- **Drivers' salaries contribute to a large percentage of the costs**. As a social enterprise Foodlogica is committed to offer a decent income for the drivers, also aware that this is a tough job (you need to drive all year around, regardless of the weather). Drivers are also responsible for other activities, they check the temperature, they sort products at drop off locations, and help when needed at the hub. Foodlogica does not want to reduce drivers' wages but rather find other ways to increase efficiency so that the driver salary is not such a big cost for the business.
- **Drivers are currently responsible for a lot of activities apart from driving**. Reducing drivers' responsibility with, for example, a sensor system for temperature checks that is connected to software would enable them to focus more on deliveries. Labor-reducing technologies cost money, but it would allow people at the office to have an overview of the whole system real time and improve delivery times.

- **Low volume** is a bottleneck for reducing service costs. Volume will enable Foodlogica to offer cheaper services. With more volume the cheaper, shorter the distance between drops the more money you make. Density is important.
- **There is a lot of collaboration, but there is no action, no incentives for businesses**. To make change you have to prove that something a successful business.

Increasing volume with Makro

As a consortium partner Makro has the infrastructure to handle larger volumes, granted producers can supply them. The lack of volume is a bottleneck for many aspects of successful scaling of SFSCs and working in collaboration with a wholesaler who is also committed to increasing the range of local food provides a serious opportunity for creating a scalable business model for supplying food from Flevoland to Amsterdam.

Optimization with IT

“The real disruption is the digitalization” (Kees-Willem). There are negative bio effects, Amazon and Uber are taking over the world, small companies pushed out of the market, they don’t have money to invest in IT. The question is: “How can we use IT to help smaller companies/farmers? How do we make IT work for small farmers and small suppliers?”

Digital platforms can be used for: i) Connecting product demand and supply; ii) Connecting Logistical demand and supply; iii) Tracking and tracing products from farm to fork. All this data combined and shared through the supply chain could radically optimize collection and delivery. Digitalizing transactional information would also nullify transaction costs, which can be the secret killer of SFSC economic viability. This has to be done while making sure all data is safe and secure, that it stays in the possession of its owner and that only the data that needs to be shared is being shared. And if you have such a system, creating a high adoption rate of digitalization is an important task all by itself.

Local2Local has developed many IT solutions including Food Distribution Software (FDS) for the digital support of their food chain. Integrated FDS supplies customer management, logistics, distribution and online sales. The strength of FDS lies in the integral management of the entire chain, this system is available for and deployable in any food market-oriented company. With the use of this FDS software Flevofood was able to onboard their farmers within other food distribution systems, making it able to sell their products online and link it to other wholesaler systems.

Leveraging power along the supply chain

In an interview with a project leader of the supply hub project carried out by the UvA and HvA, we gained some insight into the success factors of the project. Of particular interest was to know how they managed this large-scale collaboration, how they were able to bring so many people on board. The answer was quite simple: the universities are major clients of the logistics companies giving them a lot of power to determine their logistics criteria. They also worked with several logistical partners who were very eager to be in the group of front runners testing the limits of logistical sustainability. Notable is a paper company from Sweden which already does a lot to source their produce in a sustainable fashion. From this we can see that it is good to grab the low hanging fruit first; do not spend too much time convincing skeptical actors, work with those who already believe in your idea. Actions speak louder than words, let the others follow.

What their experience shows is that it is very useful to have large dedicated customers to be the early adopters. It would be interesting to explore the role the municipality of Amsterdam and Rabobank could play as consumers in the supply chain bringing local produce from Flevoland.

Conclusions

While the urgency of having a radical new logistical system for smart city logistics is increasing, the complexity of logistics makes it difficult to envision a holistic approach. Solutions are generally fragmented and reactionary seeking to make the current situation better without the necessary system overhaul. Providing the material needs of a growing city population while ensuring a livable environment with ambitious circular and carbon-neutrality targets is a very challenging goal, and solutions must consist of one integrated approach: clean energy sources and technologies, new logistics models, electric and low-emissions vehicles and changes in consumer behavior.

Dutch farmers' strategy is based on cost minimization in production and logistics, achieved by producing ever greater volumes while maintaining basic product quality. When the product is picked up by buyers or sent to auction houses, the farmers' role in the supply chain ends giving them little interest in post-harvest in commercial activities or product differentiation as it is largely out of their control. However when they get involved with local food supply chains, all of this changes. Farmers get more direct contact with customers for whom food is not just an interchangeable product but rather an experience of joy, health, respect, and sustainability. As a result, the quality of their products become more important. Having to pay attention to quality and several these post-production variables such as packaging is time consuming and not all farmers are in a position individually take control of a greater part of the supply chain. It is critical that costs are reduced, all the while maintaining quality to achieve an operational excellence on par with the conventional supply chains: process and move goods in the most efficient and cost-effective way possible.

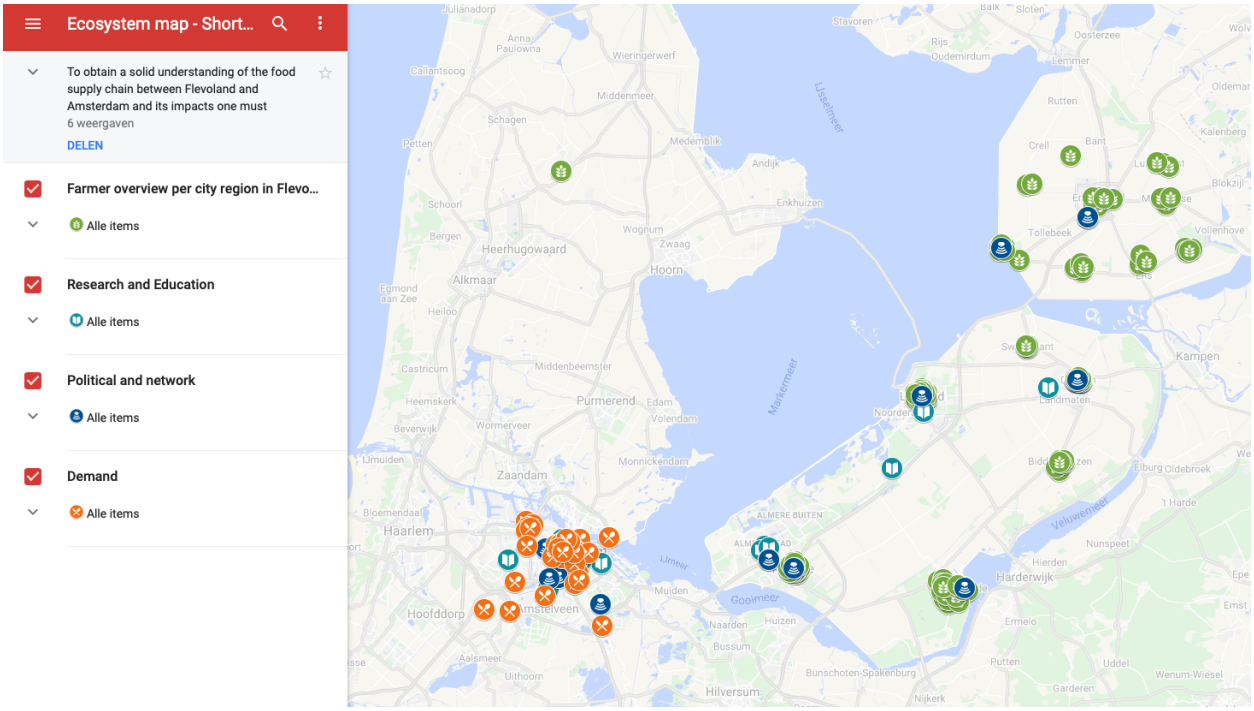
Taking a step back we can say that there are two problems to solve: i) to create a commercial ecosystem for short-food supply chains; ii) to create a logistical system which makes the businesses for all supply chain parties in this new ecosystem viable. Solving problem (2) will inadvertently solve problem (1) since it is logistics that are often the bottleneck to business viability of short-food supply chain actors.

First, we needed to understand the practical lessons of the existing short chains. This has been done, all the while recognizing that none are currently scalable or even viable in the long run because the supporting structures needed to make them currently viable are too cumbersome and too expensive. Second, we need to identify synergies to jump-start the transition to a new system with smart, cheap and efficient logistical solutions. This will be the task of the coming weeks.

Appendix

Appendix 1 – Ecosystem Map

Image with Hyperlink:



Link:
www.google.com/maps/d/u/0/viewer?usp=sharing&mid=1zEloKJVwgLAmympxydMjtwSWlzUgiqye

Appendix 2 - Regional Initiatives and Policies

Research:

- Taskforce Korte Keten
- Voedsel Verbindt: A platform that provides an overview of relevant agri-food initiatives, developments, projects and parties from the Amsterdam Metropolitan Area and surroundings.

Farmers Cooperatives:

- Lelystadse Boer: A group of roughly 70 farmers around the Lelystad Airport who decided to be a part of the development of this region, not its victims. They want to continue producing food in coordination with the municipality and its development plans. The group has also set up an online shop.
- Almeerse Weelde: An initiative of farmers and citizens of Almere which includes a label for small-scale production of jams, sausages, beers, etc. These products can be found at a weekly farmers market, in Ekoplaza and other smaller shops.
- Vereniging Flevofood

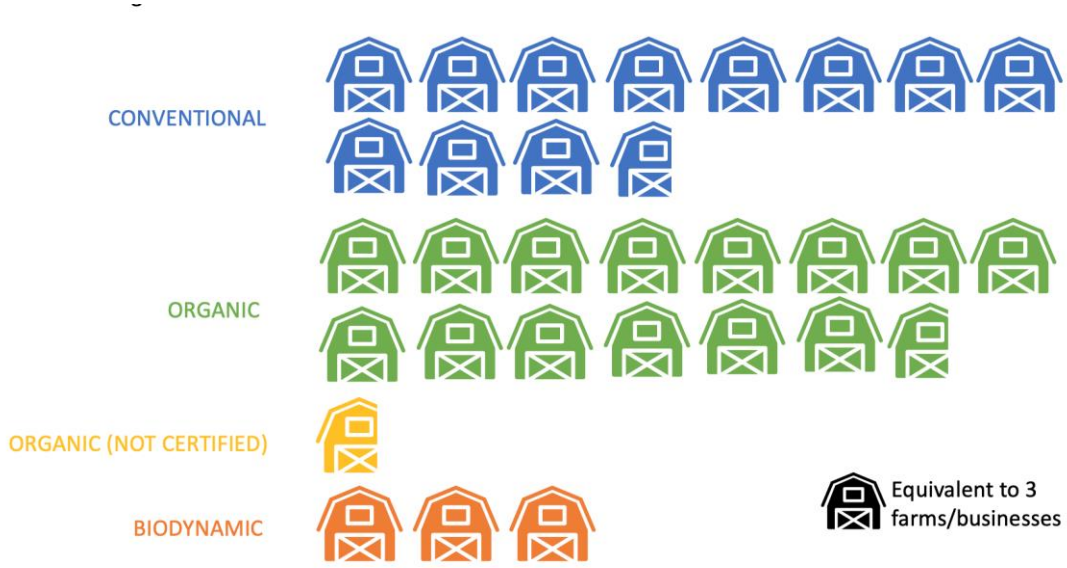
Retail:

- Local2Local
- Ekomenu
- De Stadsboerderij: an organic farm has organized itself into a foundation (Vrienden van de stadsboerderij) to get more support from the municipality. Through the foundation they can mobilize support from many stakeholders.

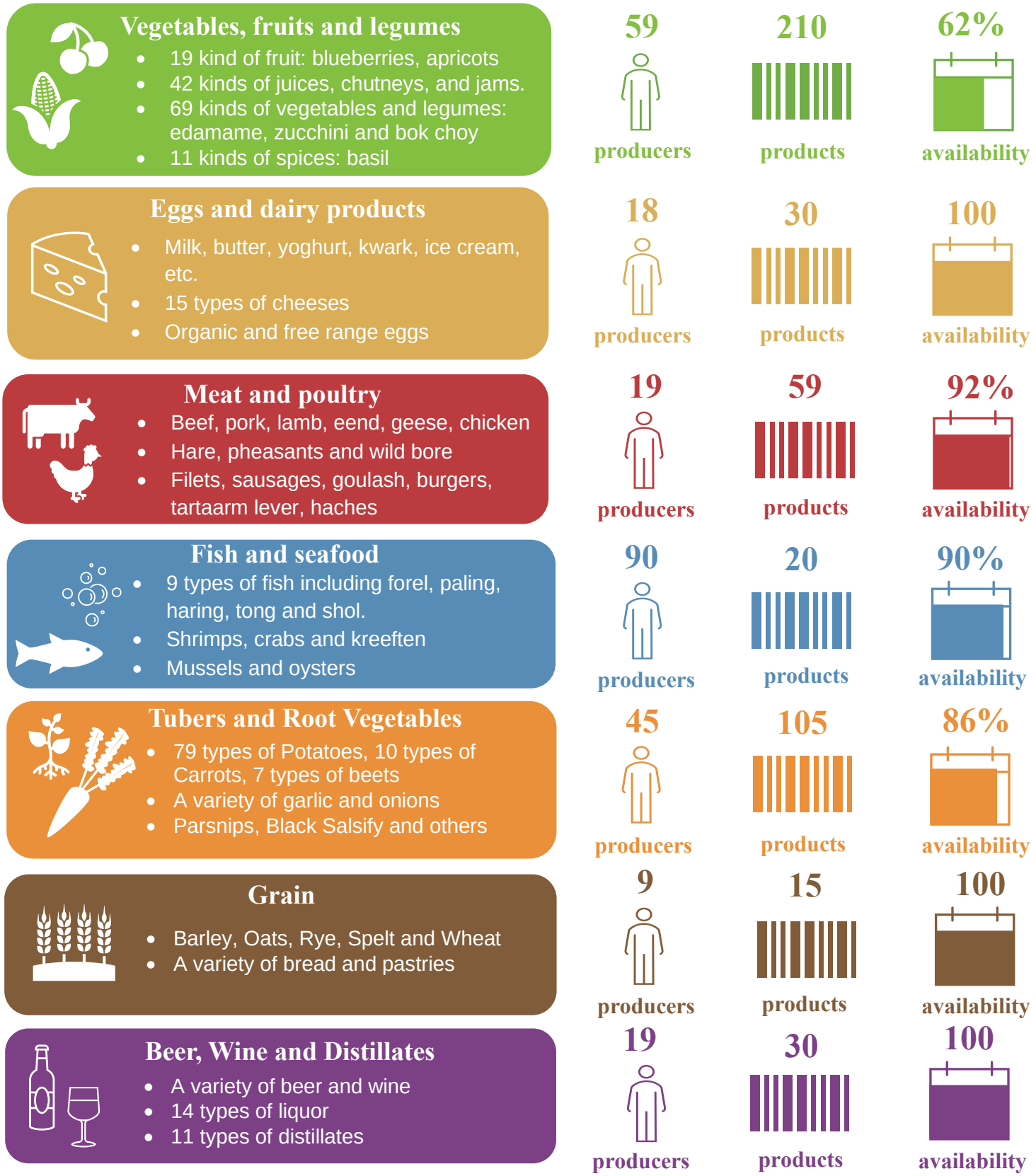
Policy:

- Carbon Neutral Amsterdam aims to reduce carbon emission by 95% in 2050. The municipality wants to lead by example in the energy transition, achieving zero emissions within their own organization.
- Doughnut economy
- Food Policy 2019-2020 Amsterdam
- Food Strategy (Voedselstrategie + later uitvoeringsprogramma)
- Programma luchtkwaliteit- Actieplan Schone Lucht: The municipality of Amsterdam wants to surpass the WHO objectives for air quality by requiring emission free traffic by 2030. Restrictions will increase rapidly from 2020 on, especially targeting commercial traffic around the most frequented parts of the city. Businesses that invest in electric mobility will be supported.
- Action Plan on Kademuren en bruggen: Investments in hundreds of bridges and quays will take place. New regulations will be introduced to lower the allowed weight for trucks to pass bridges and increase the space for pedestrian and bike traffic, which also favours electric lightweight mobility.
- Amsterdam Autoluw: aims to reduce car traffic and parking, while increasing cycling lanes and investing in the efficiency of commercial logistics, hub strategies and electric mobility.
- Uitvoeringsprogramma A&G: In collaboration with businesses, waste collection will be more effective and sustainable by focusing on cooperation to use shared waste transport and processing, ultimately reducing traffic.
- Amsterdam Circulair 2020-2025: Within their mission to be a circular city by 2050 the municipality of Amsterdam aims to stimulate sustainable short food supply chain parties from the areas around Amsterdam.
- Omgevingsvisie Amsterdam 2050: encourages participation in creating a vision for the city for 2050. It is a living document which presents different scenarios for Amsterdam's development including shared values towards regional food production.
- Visie Openbare Ruimte: aims to design multifunctional and smart public spaces that allow for diverse and intensive use. Obstacles caused by traffic should be prevented through flexible solutions ensuring a continuous flow.
- Smart Mobility Program 2019-2025: Achieving smarter and cleaner mobility in the city by utilizing technology, data and digitalization. Starting with small-scale testing, this program focuses on proactive design and instruments and on strengthening partnerships on a regional, national and international level.
- Last Mile Fresh Amsterdam: A food supply chain project that allows Amsterdam's gastronomy to order directly and for free at their usual suppliers. Last Mile Fresh pools the orders in their hubs and delivers them via small electrical trucks or special cargo bikes. As a result, they reduce traffic and food miles.

Appendix 3 - Number of farms divided by production methods



Appendix 4 - Visualization of Flevofood Food Supply in 2020



Other products include: 29 types of mushrooms, pesto, walnuts, hazelnuts, honey a.o.