Harvest Club: Creating a bridge between local private food producers and their customers

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Abstract

Title: Harvest Club: Creating a bridge between local private food producers and their customers

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The food commodity that is wasted most worldwide are vegetables and fruit. Most food waste takes place at the household level. While urban gardening and farming trends pick up, small, private producers cannot consume everything they produce contributing again to food waste. In advanced economies people are looking to consume low-emission products, from local sources. In this context, this dissertation will aim to find a way to reduce food waste by bridging the gap between private food producers and local consumers. The methods include a competitor analysis based on secondary data, and qualitative interviews based on hypotheses formed and tested through a quantitative survey to derive a business model canvas of a digital platform to be applied in different European countries. The research proved that people are aware and pained by food waste and have the intention to act. People who have a surplus of fresh products sometimes throw it away. Thus, society is interested in the idea of a food sharing platform, would use it, and is likely to spread the idea by word-of-mouth, especially among consumers who already buy local and in-season foods. The business plan for the platform Harvest Club was created to help disrupt unsustainable consumption patterns. Based on a regional and inclusive community-oriented approach it is a well-suited way to connect a neighborhood through the exchange of home-grown and homemade products and harvest, ultimately contributing to local and in-season consumption while reducing food waste.

Key Words: sharing economy; sustainable consumption; food waste; social community; business model; digital platform

Abstrato

Título: Harvest Club: Criar uma ponte entre os produtores locais de alimentos privados e os seus clientes

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O produto alimentar mais desperdiçado a nível mundial são os vegetais e a fruta. A maioria de todo o desperdício alimentar ocorre a nível doméstico. Enquanto a jardinagem urbana e as tendências agrícolas se acentuam, os produtores privados não podem consumir tudo o que produzem, contribuindo para o desperdício alimentar. Nas economias avançadas, procura-se consumir produtos com baixas emissões, de fontes locais. Neste contexto, esta dissertação terá como objetivo encontrar uma forma de reduzir o desperdício alimentar, colmatando o fosso entre os produtores privados de alimentos e os consumidores locais. Os métodos incluíram uma análise da concorrência baseada em dados secundários, e entrevistas qualitativas, com base nas quais foram formadas e testadas hipóteses com um inquérito quantitativo para derivar uma tela de modelo de negócio de uma plataforma digital a ser aplicada em diferentes países europeus. A investigação provou que as pessoas estão conscientes do desperdício alimentar e pretendem agir. Pessoas com um excedente de produtos frescos, por vezes passam a descartá-los. Assim, a sociedade está interessada na ideia de uma plataforma de partilha de alimentos, utilizá-la-ia, e divulgaria a ideia, especialmente entre os consumidores que já compram alimentos locais e sazonais. O plano de negócios para a plataforma Harvest Club foi criado para ajudar a perturbar padrões de consumo insustentáveis. Baseado numa abordagem regional e comunitária inclusiva, é uma abordagem apropriada de conectar um bairro através da troca de produtos caseiros, contribuindo, em última análise, para um consumo local e sazonal, ao mesmo tempo que reduz o desperdício alimentar.

Palavras-chaves: economia colaborativa; consumo sustentável; desperdício alimentar; comunidade social; modelo de negócio; plataforma digital

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List of Acronyms

B2B	Business to Business
B2C	Business to Consumer
BMC	Business Model Canvas
CAGR	Compound Annual Growth Rate
CO2	Carbon-Dioxide equivalents
EU	European Union
EUFIC	European Food Information Council
FAO	Food and Agriculture Organization (of the United Nations)
FPI	Food Price Index
MVP	Minimum Viable Product
NGO	Non-Governmental Organization
QC	Quality Control
SDG	Sustainable Development Goals
SEA	Search Engine Advertising
SEO	Search Engine Optimization
UN	United Nations
USP	Unique Selling Proposition
UX	User Experience
WHO	World Health Organization
WOM	Word-of-mouth

1. Introduction

1.1. Context and Background

We live in times of resource scarcity combined with a growing worldwide population and the pressing matter of climate change. The February 2022 conflict in Ukraine has exposed how our global food system is not as reliable nor as efficient as consumers had expected it to be. The disruption of the supply chains is evident in countries such as Egypt where bread is now heavily subsidized. The EU is even looking to prepare for the case of food scarcity as the FAO Food Price index has increased by 29.8% compared to 2021 (FAO FPI, 2022).

In advanced economies such as the EU, the current level of food waste is not economically, socially, or environmentally sustainable. Food waste is an increasing issue today with almost one third of all produce and edible food being wasted worldwide (Gustavsson, 2011). Percentage wise fruits, vegetables, roots, and crops are squandered the most, accounting for 60% of the world's food waste (FAO, 2022). This contradicts their critical importance in a nutritious diet for human health (WHO, 2020). Currently, almost 50% of food is wasted by households (De Laurentiis et al., 2018). New ideas and concepts must be found to ensure structural changes not only along the supply chain but in consumers' attitudes and behaviors. How can a sharing economy approach strengthen awareness of food waste, and therefore prevent and decrease it? This paper strives to answer this question by creating *Harvest Club*, a sharing economy platform that has the potential to play a vital role in achieving sustainable consumption patterns within society.

People in advanced economies already strive to support a more natural growing process and shorten supply chains by buying local from surrounding farmers or profit from sharing food within the neighborhood (Feldmann & Hamm, 2015). In Germany during 2021, over 40% of the population had access to a garden (VuMA, 2021) leading to urban farming and gardening (Benis & Ferrão, 2018) – a trend that has boomed throughout the COVID-19 pandemic.

1.2. Research question

These private, local growers and producers are looking for buyers to consume their harvest as they cannot consume their produce by themselves. Yet, the consumer demand for more local and sustainable products cannot be met with the current structure (Feldmann & Hamm, 2015).

As of now there is no bridge between small scale producers and their customers to enable the exchange of home-grown and homemade products and harvest.

This thesis dissertation works to find an answer to the following research question: *How to reduce food waste by bridging the gap between private food producers and potential local consumers?* To truly understand this problem and find an effective solution, sub-questions and underlying hypotheses will be answered and tested, throughout the paper. This includes the preparation, design and execution of the idea and an outlook into scalability potential and business model add-ons. The thesis strives to thoroughly research the topic in a way that provides the option of widening scope and applying the discoveries in other places and to different cultures.

1.3. Managerial Contributions

The fresh produce industry not only plays a vital role within the global food system but is also imperative for global health.

The industry is steadily increasing by 4.81% CAGR each year at a size of 658.77 billion USD in 2022 (Statista, 2022). Compared to its production costs, fruit and vegetables have a relatively high price. Fresh produce can even be perceived as a luxurious good as it is highly perishable and not always available due to its seasonality (FAO, 2020).

It is crucial for human health because of the nutritional value and positive influence on mental health (Tort et al., 2022; Głąbska et al., 2020). It is recommended that every person should eat 400g of fresh produce a day by the World Health Organization (WHO, 2020). Still, in 2017 around 2 million deaths were directly attributable to not eating enough fresh produce (Afshin et al., 2019). The EU even exhibits inadequate levels of fruit and vegetable consumption. 2021 was declared the International Year of Fruits and Vegetables by the UN to raise awareness of their importance in achieving the Sustainable Development Goals (SDGs) highlighting how food loss and waste must decrease (FAO, 2020). The wastage in the industry amounts to around 45%. Together with the trend to urban gardening and farming in cities, the market presents potential for innovation.

This potential can be uncovered through business opportunities. Throughout the course of the paper, the market segment, the matching value proposition as well as relevant cost and revenue structures will be discussed. This will contribute to the research in this area, adding relevancy for other businesses that strive to enter this market. Especially sharing economies will be studied for their potential ability to disrupt consumer behavior.

1.4. Thesis Organization

The following established literature about food waste will also explore the fresh produce industry as well as sharing communities and their potential sustainable impact. Afterwards, the methodology consisting of primary and secondary data will be presented. Based on the findings of the secondary research in form of a SWOT analysis, and qualitative interviews conducted, hypotheses have been developed which are tested through the help of a customer survey. Combining all the research presented then results in a business model development where possible implications and steps for the future are investigated. Limitations are then summarized in the conclusion.

2. Literature Review

2.1. Food Waste at the Household Level

Almost a third of the total food produced is wasted globally (Gustavsson, 2011). This happens the most frequently at the household stage (De Laurentiis et al., 2018; Schmidt et al., 2018; Stenmarck et al., 2016). Food waste is created through inefficient supply chains. Edible food goes uneaten mainly because of decisions made by consumers or other stakeholders along the supply chain. (Cicatiello et al., 2016).

In the EU, 90 million tons of food waste are produced in total amounting to 175kg per capita (Stenmarck et al., 2016). The commodity with the highest waste ratio is fruit and vegetables with over 44% (FAO, 2018). At the household level this amounts to 35.3kg per person per year, half of which would have been avoidable (De Laurentiis et al., 2018).

At the consumer level, it is a lack of knowledge that contributes most to why food is being wasted. This knowledge may be divided into supply awareness, location knowledge and food literacy. Other factors are consumers awareness of what food they have at home, how best to store that food, and the individual knowledge and experience which influences food consumption and wastage practices (Farr-Wharton, Foth, et. al, 2014). Today, mobile apps already try to bridge these three consumer knowledge gaps (Farr-Wharton, Choi et al., 2014).

The problem of food waste may be tackled in different ways, such as through monitoring (Xue et al. 2017), prevention (Priefer et al., 2016), reduction (Leverenz et al., 2021), or transformation (Sodiq et al., 2019; Tsui & Wong, 2019).

2.2. Fresh Produce Industry

The term fresh produce covers fruit and vegetables that have not been processed in any manner. Following the definition of FAO, 2020, this paper considers fruit and vegetables edible parts of plants, that may be cultivated, harvested wild, either in their raw state or minimally processed (FAO, 2020). The seasonality of fresh produce means that the type of fresh produce and the time of harvesting, varies largely between different European countries (EUFIC, 2022). Especially fruit production is rather limited to the months of May to October, posing a challenge to steady revenues.

The fresh produce industries market size will amount to 658.77 billion USD in 2022 (Statista, 2022). One of the recent trends is automation (Cortés et al., 2019). Quality control is rapidly changing, ultimately preventing food waste by reducing price negotiations and human error through using cameras and ultrasound that assessing for color, form, ripeness etc. digitally (Awad et al., 2012). While showing potential of reducing food waste, this development may further support European marketing standards of external appearance criteria of fruits and vegetables that need to be replaced to focus on quality for consumption instead (Priefer et al. 2016; FAO, 2018). This creates a problem for small-scale producers in terms of quality due to their low volumes which has already put a handful of them out of business. Yet most producers are small-scale farmers (FAO, 2020). Also in Germany, the farmer development has seen a decrease in number of farms by 40% over the last 10 years due to decreasing prices that can only be withstood by large firms (Statistisches Bundesamt, 2021).

A trend helping small scale farmers is shortening the supply chain by eliminating one or more supply chain actors (Tort et al., 2022). One example of this is crowd farming. Crowd farming means consumers buy almost straight from the farmer and offer a reliable yearly income by paying annual fees for a partnership or buying in larger quantities than they would in the supermarket (Fanzo et al., 2020). This practice contributes to the transaction being less anonymous, establishing a relationship between famer and household increasing the consumers' willingness to pay (Polackova & Poto, 2017).

Additionally, there are trends towards a more sustainable and local consumption among consumers in wealthy nations (Vargas et al., 2021). Consumers are willing to pay a premium price for local food even though it is not recognized as expensive (Feldmann & Hamm, 2015). Regarding fresh produce, the EU has yet to adapt this trend since it is still among the biggest importers of fresh produce today (FAO, 2020). New models of urban agricultural production

such as urban farms in Northern cities might help accelerate this development (Benis & Ferrão, 2018).

Urban producers' importance has been especially stressed during the COVID-19 pandemic as they significantly increased the availability and access to fruit and vegetables in their areas (FAO, 2020). In Germany during 2021, over 37 million people, 44% of the total population, had access to a garden, not including people with a balcony or indoor growers (VuMA, 2021). The trends of urban farms and gardening are emerging rapidly due to environmental and health concerns (Puigdueta et al., 2021; Benis & Ferrão, 2018).

2.3. Sharing Economy and Food Sharing Platforms

The sharing economy is defined as: "a web of markets in which individuals use various forms of compensation to transact the redistribution of and access to resources, mediated by a digital platform operated by an organization" (Mair and Reischauer, 2017). Traditional economies have been based on the ownership of goods. While the idea of sharing of resources is not new, recent business models have evolved around peer-to-peer transactions driven by increased connectivity while simultaneously driving lower transaction costs (Puschmann & Alt, 2016). This infrastructure enables the individual to become a supplier, a consumer or both (Mair and Reischauer, 2017). A hybrid economy is thus taking advantage of linking the commercial and the social economy (Lessig, 2009).

For the individual the sharing economy provides an opportunity to take part in building the market as to fit the communities' ideals by profiting not only from personalized exchanges but also from creative and financial autonomy (Fitzmaurice et al., 2018). The individual connections that the economic exchanges are built on merely happen between strangers. Resulting uncertainties can be partly mitigated via ratings and user review systems monitored by the platform (Diekmann et al., 2014).

Schanes & Stagl, 2019, investigated the main drivers of success for food sharing aimed at reducing food waste. Food sharing was found to be a behavioral response to environmental sustainability and social equality concerns as commitments to those improved consumer perception of the platform. Other research suggests that individuals using food sharing platforms look for "more than mere personal connections; they want to establish supportive communities" and "regain some sense of control in domains that have been outsourced to professionals and thus estranged from their lives, such as food production" (Fitzmaurice et al., 2018). Thus, food sharing platforms take the role of forming relationships in the network

(Harvey et al., 2020), presenting the solution for issues such as waste reduction, social inclusion, food security and community engagement (Schanes & Stagl, 2019).

2.4. Sustainable Impact and the Sharing Economy

Food sharing stems from sustainability (Schanes & Stagl, 2019). Being an ambiguous term in today's societies, it is important to define sustainability for the use of it in this paper. Next to various definitions one widespread concept that is being used are the three interconnected dimensions of sustainability with the dimensions being: environmental, social, and economic (Figure 1) (Purvis et al., 2018). The concept emphasizes that sustainable development may only be achieved once all three dimensions are met individually and in accordance with the other two.

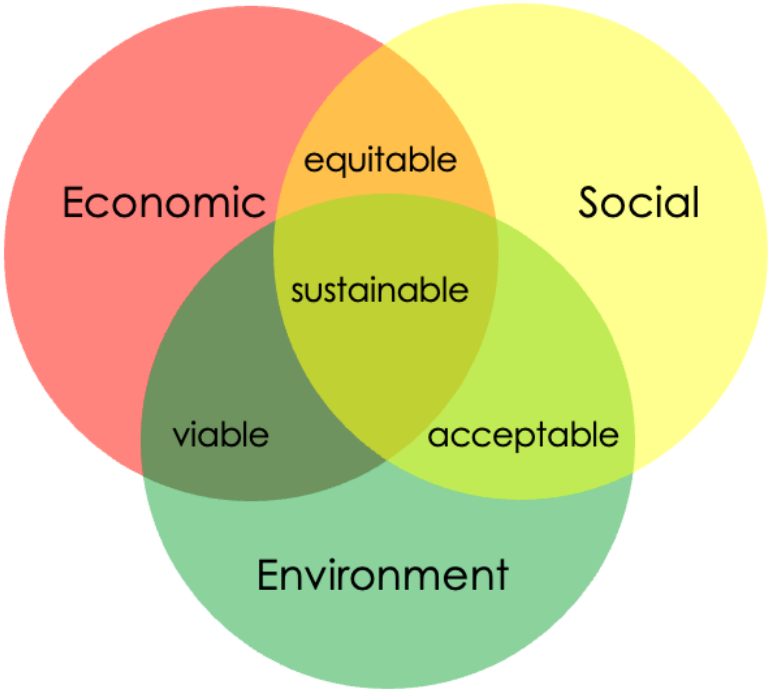

Figure 1: Three pillars of sustainable development (Adapted from Brundtland Commission, 1987)

This definition also serves as the basis for the 17 Sustainable Development Goals (SDGs) declared by the United Nations in 2015 (UN, 2012). The SDGs were designed to be at the core of the 2030 Agenda for Sustainable Development adopted by all UN member states that aims at achieving "peace and prosperity for people and the planet" (UN, 2015) (Figure 2).

The sharing economy is perceived to have the potential of disrupting unsustainable consumption patterns (Curtis & Lehner, 2019). And may therefore support new, more

sustainable patterns within the food industry (Falcone & Imbert, 2017; Mazzucchelli et al., 2021).

Figure 2: The Sustainable Development Goals (UN General Assembly, 2015)

2.5. Business Model Canvas

This chapter introduces the core model used to structure the analysis of *Harvest Club* in form of a business model canvas. The concept was first introduced by Osterwalder and Pigneur in 2010. Creating a business model entails extensive research into all aspects of a venture. The business model details how a business is creating value, as well as delivering and capturing it. The canvas has the purpose of being intuitive and easy to understand while still capturing the organizational complexities.

The canvas consists of 9 building blocks. The left side of it specifies the efficiency of a business while the right side describes the captured value (Figure 3). The most intuitive approach is to start with the customer segments. Knowing your customers and their needs, thus understanding the demand, and efficiently dividing the market is imperative to attain sustainable growth. Then, the value proposition for the specific market segment is described including the products and services while the specific channels communicate this value to the customers. It is then

important to define the customer relationships with each segment that need to be created and sustained to enable the establishment of sustainable revenue streams with each segment. Lastly, the canvas moves to key resources, activities and partners describing the input of assets and actions required to fulfill the value proposition, while partners define which of these elements are outsourced or taking place outside of the company. All the elements of the canvas then result in the cost structure of the operations.

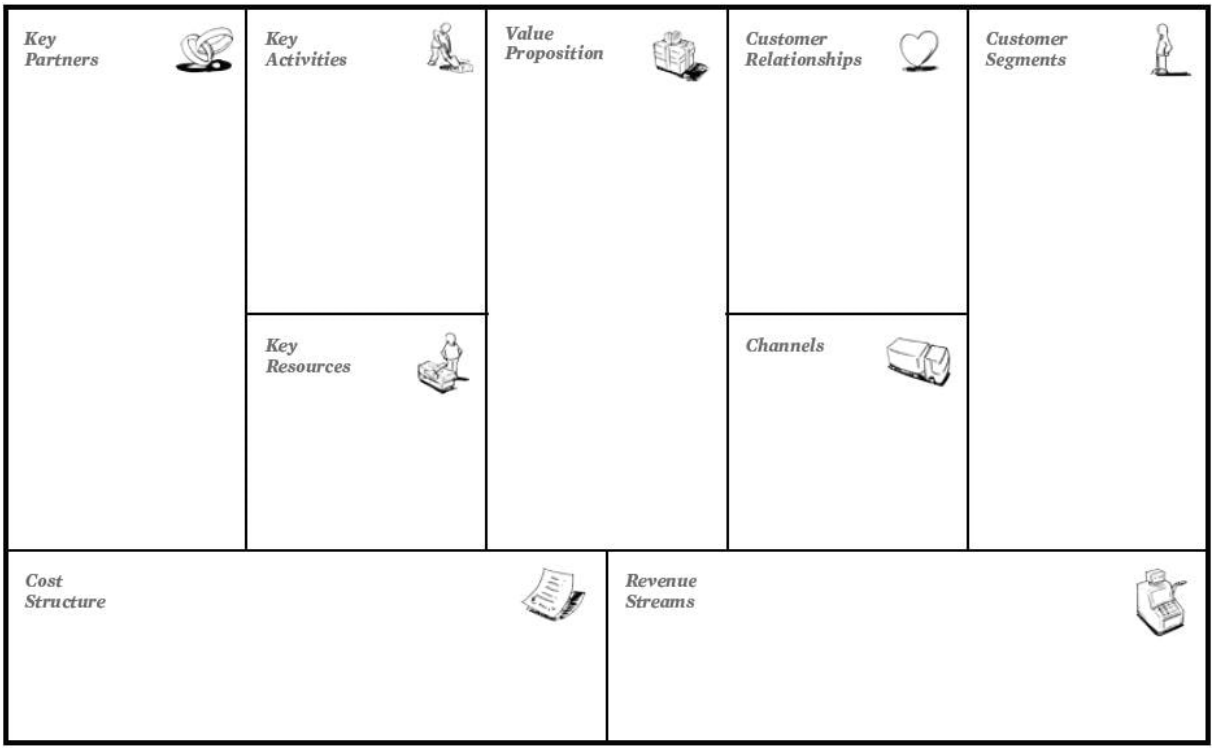

Figure 3: The Business Model Canvas (source: Osterwalder & Pigneur, 2010)

This relevant and yet simple structure lets the canvas serve as a tool to describe, discuss, manipulate as well as help implement a business. It thus includes all the important characteristics of a venture being: customer, offer, infrastructure, and financial viability clearly defining the USP and thus the competitive advantage of the organization.

2.6. Competitive Analysis Framework

To build and sustain a relevant business model throughout the lifetime of a business, successful strategic planning as a part of strategic management is necessary. A competitive market environment analysis plays a key role in strategic planning. Thus, a theoretical framework for strategic forecasting will be introduced.

The most relevant tool for strategic planning is the SWOT Analysis that has been in use for more than 50 years (Leigh, 2010). It captures internal as well as external effects in a dynamic

market environment in the form of strengths, weaknesses, opportunities, and threats involved in an organization's activities (Gürel & Tat, 2017). Based on the analysis the strategic choices of a business can be made that need to be in line with the companies' vision and mission, achieving a competitive advantage.

3. Case Study

3.1. Harvest Club Offer

Harvest Club will leverage on the market trends of urban farming and gardening, combined with an urge for local consumption and empower small-scale private producers allowing them to share their produce with the neighborhood though a new specific channel, *Harvest Clubs* platform. The relatively high price of fresh produce will play into this business idea while seasonality of especially fruit could pose a challenge to steady growth and revenue throughout the year. Therefore, processed fruits and vegetables such as jams, marmalades, chutneys etc., or other produces such as kombucha mushrooms, yeast, etc. as well as plants will also be optional for upload and purchase as part of *Harvest Clubs* offer.

3.2. Harvest Club as a Food Sharing Platform

Harvest Club will be the bridge for people that produce and others that consume local, making independent food production easier, encouraging knowledge exchange between gardeners, and giving the opportunity to build a local community around food. Implemented as a sharing economy platform, ratings and reviews will be essential for establishing trust within the *Harvest Club* community. *Harvest Club* may contribute to food waste prevention by educating and inspiring customers to explore fresh foods enhancing knowledge exchange and creativity and increasing consciousness on what food there is at home (Borelli et al., 2020). Reduction of food waste will be achieved through redistribution and exchange between members aiming for collaborative consumption (Mazzucchelli et al., 2021). However, food sharing practices might not be directly correlated with reducing food waste (Falcone & Imbert, 2017). Research from Lim, 2017, found that while the idea is "expected to influence creativity and surprise, connectedness, coordination and knowledge" it was not perceived as effective in reducing food waste (Lim et al., 2017). *Harvest Club* will need to set specific targets determining the platforms effect on reducing food waste.

3.3. Harvest Clubs Sustainable Impact

The *Harvest Club* may contribute to several of the SDGs (Figure 4).

Figure 4: Sustainable development goals supported by Harvest Club

The health benefits of fresh produce that are at the core of *Harvest Clubs* business model contribute to *SDG 3 Good Health and Well-being* by promoting the sharing and thus increased, more regular, and diversified consumption of vegetables and fruit, contributing to a healthy diet, working against obesity trends thus preventing illnesses, ultimately relieving the health care systems and improving people's lives (Borelli et al., 2020; Tort et al., 2022). Not only the consumption but also the production side plays into *SDG 3* by incentivizing gardening activities that support well-being and reduce stress (Puigdueta et al., 2021). By bringing awareness to the value of fresh produce and increasing food knowledge on the household side, reducing food waste *Harvest Club* may contribute to *SDG 12 Responsible Consumption and Production* (Farr-Wharton, Foth, et. al, 2014). By being inclusive and enhancing an inter-generational exchange *Harvest Club* may contribute to *SDG 11 Sustainable Cities and Communities* while increasing agrobiodiversity in and around cities making *SDG 15 Life on Land* better and more sustainable (Sodiq et al., 2019; FAO, 2021). While shorter supply chains promoted with *Harvest Club* may not necessarily be more sustainable, its focus on seasonality combined with the local aspect and encouragement of less consumption of high emission products such as meat may contribute to *SDG 13 Climate Action* (Vargas et al., 2021). Furthermore, negative effects on the climate may be reduced by lowering the amount of rotting food producing greenhouse gases.

4. Methodology

To investigate the idea of *Harvest Club* further, the business model canvas will be applied. Through the help of stakeholders, resources, sources of revenue, activities, etc. can be explored and shaped. To gain valuable insights on all these aspects, primary and secondary data was collected. The methodological approach includes firstly creating a competitive analysis using secondary data. After that, primary data in form of qualitative interviews was collected using

the Empathy map. With insights provided from the interviews and secondary data, a quantitative customer survey was created to test the established hypotheses. Together with the secondary data findings a business model canvas was built.

4.1. Secondary Data

The secondary data sources, as illustrated in Appendix 3, include a synthesis of the competitive market research, also considering macro- and micro-trends in the industry.

4.2. Primary Qualitative Data

To investigate the potential problems of consumers and find solutions for them, a deeper understanding of consumers is critical. This was achieved in form of qualitative interviews with experts and potential users. The focus here was to collect customer insights, a technique to design business models. The purpose is to approach from the customer perspective to avoid building a product or service that is unappealing to the customer. Understanding the customer can be done with the help of an Empathy Map as suggested by Osterwalder & Pigneur, 2010 (Figure 5).

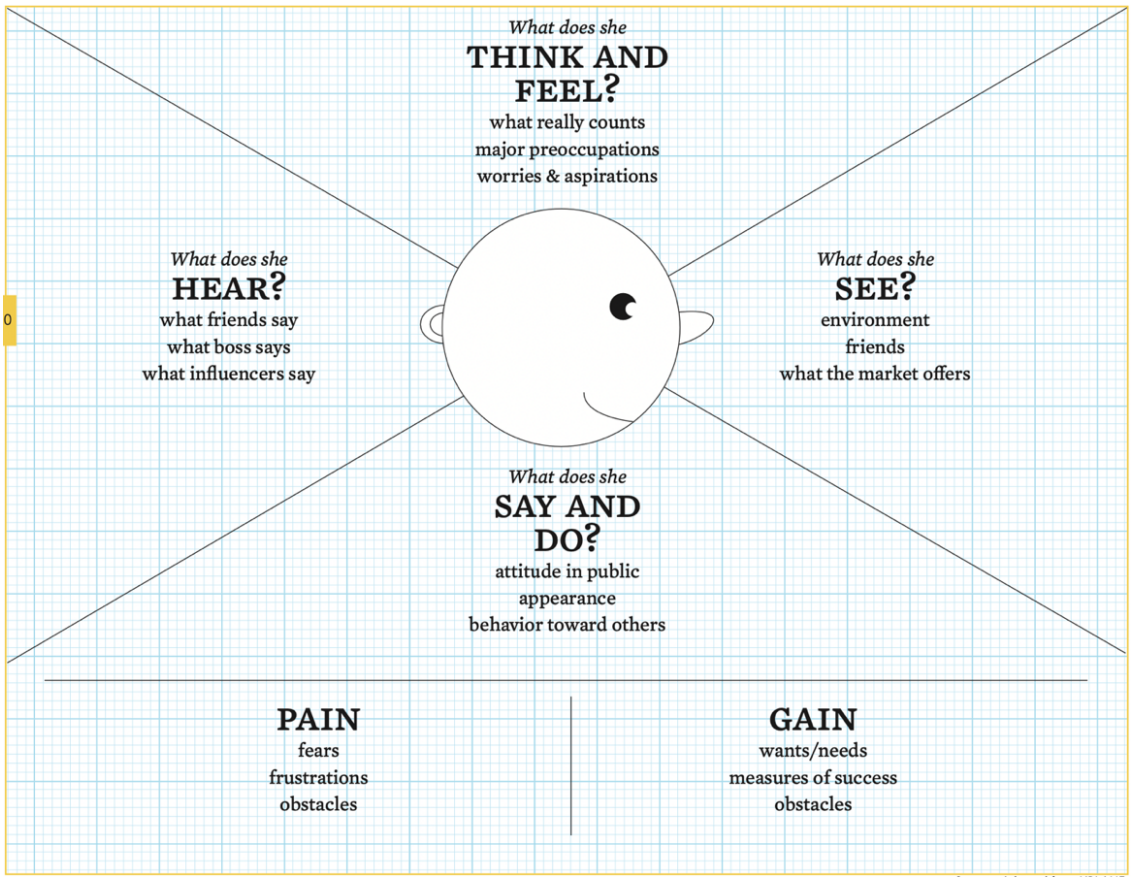

Figure 5: The Empathy Map as adapted from XPLANE (source: Osterwalder & Pigneur, 2010)

Design thinking approaches such as the empathy map have been known to help solve managerial problems (Elsbach & Stigliani, 2018). Instead of merely asking what the customer's needs are, the researcher is looking into what customers see, say, do, hear, and most importantly think and feel. This collection of data results in customer pains and gains that can serve as a basis to shape hypotheses about the potential problems and the corresponding solutions.

4.3. Primary Quantitative Data

Based on the explorative interviews and secondary data, hypotheses were created that define the important assumptions needed to be evaluated to discover valuable customer insights. The survey was intended to help shape the business model in more detail by understanding what kind of customers are on either side of the platform.

For this purpose, a quantitative survey was created with the software Qualtrics. A pilot test was performed with 10 participants. The survey was prepared in English, but the testing showed that a German translation was necessary to ensure respondents would understand it without problem. It went live on 9th of May and was accessible through WhatsApp, Instagram, and Facebook until 13th of May. In total 239 respondents were reached of which 211 were useful to be analyzed.

The participants were asked the same 6 introductory questions trying to confirm their pains. The 6th question divided them into suppliers, buyers, both or not interested (see Appendix 4). Most participants (161) chose to be buyers, while only 4 chose to be sellers and 29 chose to be both. 17 (8.06%) were not interested in joining. For the analysis, the respondents that chose both will be considered sellers when compared with the non-sellers. Respondents were asked various demographic questions, to obtain the segmenting information. Questions were aimed to better understand the problem and views of the recommended solution. The data was then analyzed in SPSS statistics and presented with the use of Excel.

All findings of primary and secondary research were then used to create a business model canvas.

5. Results

5.1. Competitive Market Analysis

This chapter covers the most essential information on the competitive market environment of *Harvest Club* as well as the most relevant market trends. The findings are summarized in the form of a SWOT analysis.

Looking at the European market there are several organizations reducing food waste through different business models. The competitor chart below shows *Harvest Clubs* position in comparison to direct and indirect competitors looking at the community and flexibility aspect (see Figure 6).

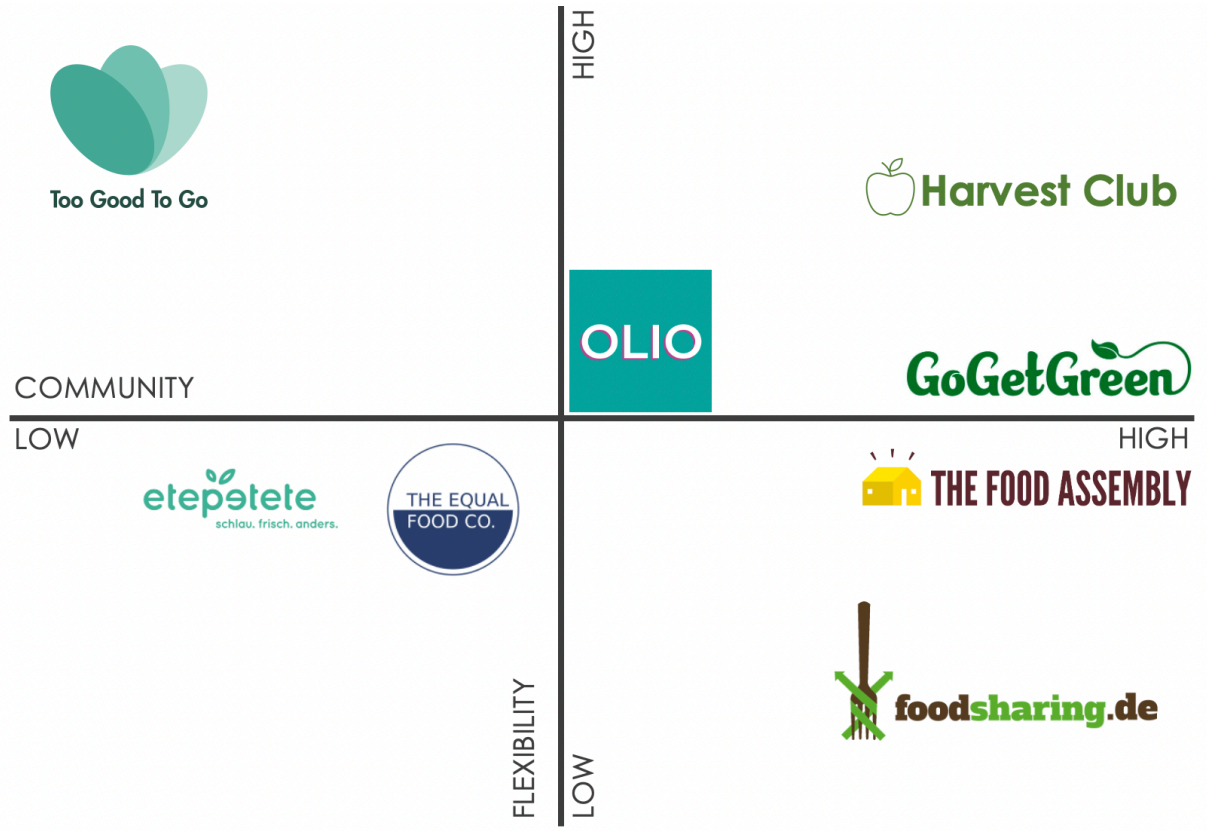

Figure 6: Competitive landscape of the Harvest Club

One possible solution in the market is a B2C business model. **Too Good To Go**, a Danish company focuses on connecting users with restaurants, bakeries and lately supermarkets by providing a cheaper option to acquire fresh or prepared food while offering extra profit for companies and aiming to reduce food waste.

Foodsharing.de is a political and educational movement from Germany that has already spread to neighboring countries. Like *Too Good To Go* it connects volunteer Foodsaver with businesses with food that would otherwise go to waste. The difference is that the pick-up is

free, meaning no wrong incentives are given to businesses. It is managed by the association foodsharing e.V. and fully based on volunteer work. However, more commitment from volunteers is required than *Too Good To Go*, which is more convenient. An application approval to become a Foodsaver takes time and requires a test and consenting to several rules and then requires regular time commitment. It is catering to business needs which impacts volunteer satisfaction. It is a closed and less dynamic network.
These organizations could decrease prices of food drastically, posing a threat to *Harvest Clubs* profitability.

Looking at convenience there are already various delivery services of organic fruit and vegetable boxes on the market. Farmers provide it directly to the home as in the case of **Gut Wulgsfelde** in Hamburg or a third party collects products from different farmers, repacks it and delivers it straight to the customers door as in the case of **etepetete**, from Munich or the **equal food co.** from Lisbon presenting another B2C solution. While decreasing food waste through selling products that do not fulfill the appearance standards, these solutions cater to all-time availability and do not necessarily contribute to disruption of consumption behavior.

Next discussed is competitors preventing and reducing food waste by connecting consumers with each other through peer-to-peer business models. The **Food Assembly**, a French startup, matches local food makers and farmers with consumers by encouraging individuals to start a centrally located weekly market where everyone from the region may meet. The franchise character includes C2C as well as B2C transactions.
Olio Exchange ltd., a UK company is connecting consumers with each other to share, exchange, borrow and lend food as well as non-food products. It is all about reducing waste and includes a reward system and a tracker on how many resources you saved. Some features may only be unlocked with a premium account, paid yearly or monthly.
Go Get Green from Denmark is also taking a C2C approach, connecting small private producers with each other to share products and plants to grow your own produce and then share it with people in your area. However, they have only started in Denmark with no further expansion.

After this deep dive into the competitors and their influence on the European market and other market dynamics, a SWOT was created to serve as an overview of *Harvest Clubs* positioning in the market with its unique selling proposition (Figure 7).

Figure 7: SWOT Analysis of Harvest Club

The strengths of *Harvest Club* are offering an action-oriented solution to food waste that builds upon the sharing economy with low up-front costs and promotion through word-of-mouth. The weaknesses are the seasonality aspect of fresh produce (merely fruit) in northern European countries, the dependency on consumers to use the platform and the convenience aspect. Market trends such as urban gardening and farming, and emphasis on more sustainable consumption favor the *Harvest Clubs* approach. The biggest threat to *Harvest Club* would be a competitor such as *Olio* or *Gogetgreen* entering the German market as these businesses are more advanced in operations. However, *Gogetgreen* is not available in English yet and *OLIO* is available in Germany but would need to adapt their strategy to the specifics of the German market and culture to achieve success.

The SWOT analysis shows significant potential for the implementation of *Harvest Club*, as a community approach to reducing food waste. The unique selling proposition combined with the market trends will outweigh the threat of other providers entering the market successfully.

5.2. Data Analysis of Explorative Interviews

Before creating a quantitative survey 6 qualitative and explorative interviews were conducted to gain a better understanding of the potential customers (see Table 1). To ensure that customers were entirely understood, the empathy map was used during the interviews as well as to synthesize the interviews for the paper (see Figure 8).

Interviewee	**Age**	**Producing**	**Occupation**
Heike	53	Honey	Doctor
Enno	23	Various vegetables and fruit	Family father, rented piece of land doing guided farming
Lars	42	Established community farm	Professional farmer
Alice	26	-	Student
Dennis	26	Honey	Cook
Corry	56	Herbs	Employed, lives plastic free

Table 1: Overview of qualitative interview participant

Interviewees were observed in relation to what they see in their environment, what they say and do in public, what they hear from friends, colleagues, and influencers and what they think and feel, including worries and aspirations. Afterwards, the pains (fears, frustrations and obstacles) and gains (wants, needs) were surveyed.

Some already produce homegrown vegetables or other homemade products, like Heike, Enno, or Dennis. Heike feels connected with her products and wants them to be appreciated while Dennis is eagerly looking to sell for an extra profit. Enno describes how everything was ripe at the same time and he needed to find ways to redistribute his produce. Others even question the possibility of growing or producing such quantities in urban cities like Alice due to space limitations. Lars suggested *Harvest Club* to approach the people renting a field from him that overproduce while Corry is acting ahead of her community in reducing waste at home drastically.

These findings served as a basis for the hypotheses introduced in the next section.

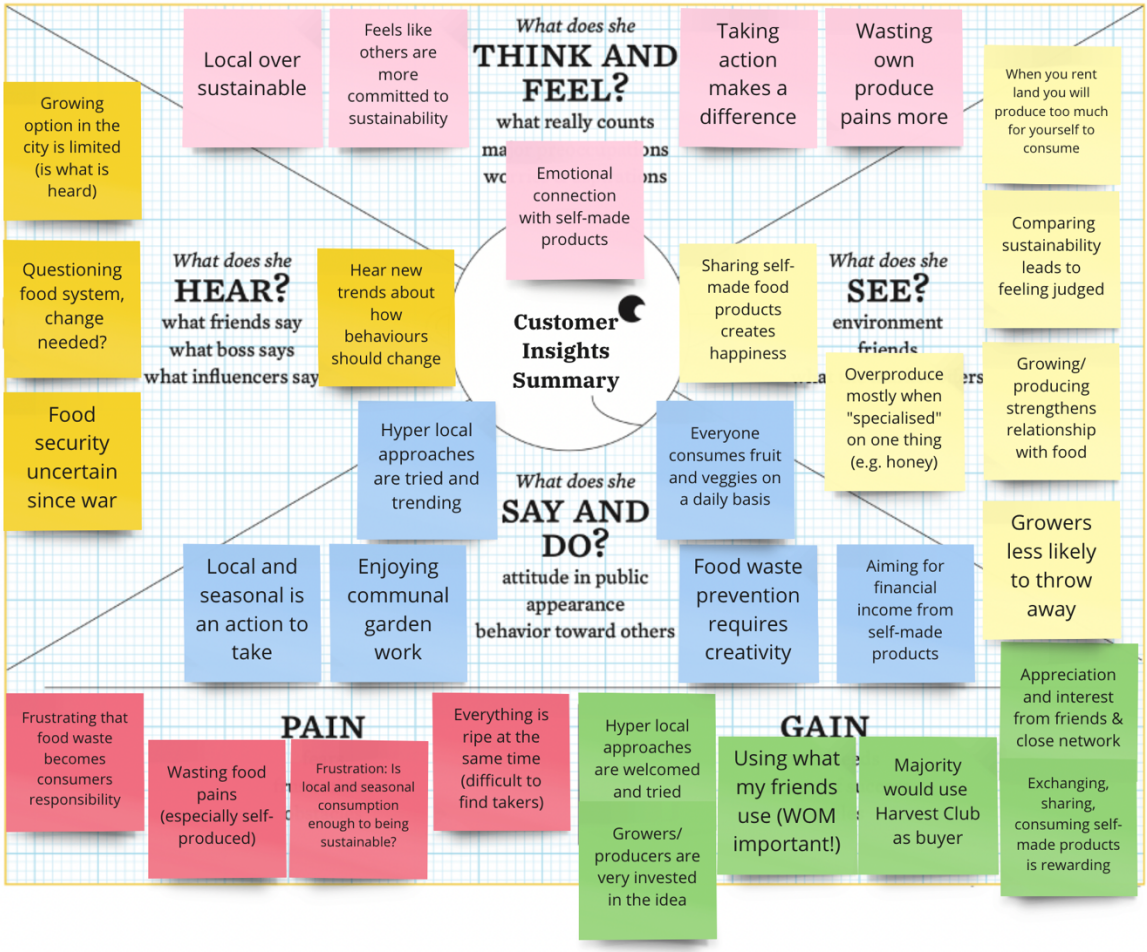

Figure 8: Empathy Map synthesis of qualitative interviews

5.3. Hypotheses

Based on the literature review, the competitive analysis, and findings from the exploratory research, six hypotheses were created to test the problem and solution assumed and presented by Harvest Club.

Problem:

H1: Females are more in pain by food waste than males.

H2: There is a positive correlation between people having too much food more often and them throwing it away more.

Solution:

H3: People who already buy based on season are intending to use the platform more.

H4: More people are interested in buying than selling on the platform.

H5: People who are planning to sell have a higher intention to us the app than people who only buy.

H6: Buyers are prepared to spend more time picking up the food than the sellers.

These hypotheses will in turn be rejected or confirmed through the quantitative survey which will provide understanding of consumers and enable the building of a relevant business model.

5.4. Data Analysis based on Customer Insights

The underlying hypotheses around the problem need to be validated based on customer insights collected through the customer survey. Business models built on the customer insights define every block of the canvas from the customers perspective, meaning a deep understanding of the customer is imperative.

5.4.1. Demographics

Since the sample is biased by the means of distribution (see chapter 4.3.) it is important to first understand who the respondents are.

The average age of survey respondents is 35, varying from 21 to a maximum age of 68. 124 (59.3%) of respondents are female, 81 (38.8%) are male and 4 (1.9%) prefer not to say. 74.2% of respondents live in Germany, 13 (6.7%) in Slovenia, 12 (5.8%) in Portugal and the remaining 29 (13.3%) in 13 other countries. 104 (49.8%) respondents live in Hamburg.

- Highest level of education: Most respondents are well educated as 69.7% have a bachelor or master's degree.

	Frequency	Valid Percent
Secondary School	7	3.4%
High School	51	24.5%
Bachelor's Degree	69	33.2%
Master's Degree	76	36.5%
PhD	5	2.4%

Table 2: Respondents highest level of education

- Current occupation: Most people (51.2%) are employed, while 33% of respondents are students.

	Frequency	Percent
Student	69	33.0%
Employed	107	51.2%
Self-employed	19	9.1%
Retired	3	1.4%
Unemployed	5	2.4%

Other	6	2.9%

Table 3: Respondents current occupation

- Income distribution: Most respondents earn less than 1000€ per month. While the median lies between 2000-3000€ a month, 8.1% earn more than 7000€ per month.

In €	Frequency	Percent
Less than 1000	51	24.4%
1000 - 2000	44	21.1%
2000 - 3000	47	22.5%
3000 - 4000	29	13.9%
4000 - 5000	13	6.2%
5000 - 6000	4	1.9%
6000 - 7000	4	1.9%
More than 7000	17	8.1%

Table 4: Respondents income distribution

5.4.2. Customer Pain

The survey participants were asked about their attitudes and understanding of food waste in the beginning of the survey to better understand their perception of the problem and pain points. As seen in Table 5, all 7 statements received significantly positive responses. Three statements can be made from the data:

People are aware of the problem of food waste

- I understand the problem of food waste ($M = 6.24$, $SD = 1.19$, $t(208) = 27.32$, $p < .001$)

People are in pain because of food waste

- Wasting food pains me ($M = 5.98$, $SD = 1.31$, $t(208) = 21.87$, $p < .001$)
- Food waste concerns me ($M = 5.89$, $SD = 1.12$, $t(208) = 23.95$, $p < .001$)

People are trying to solve the problem of food waste and believe it helps environment and community

- I buy products based on season ($M = 4.59$, $SD = 1.30$, $t(208) = 6.61$, $p < 0.001$)
- Buying food that is in season helps the environment ($M = 6.26$, $SD = 1.16$, $t(208) = 28.27$, $p < .001$)
- Buying local products helps my community ($M = 6.10$, $SD = 1.13$, $t(208) = 26.81$, $p < .001$)

	M
Buying food that is in season helps the environment	6,26
I understand the problem of food waste	6,24
I value local products	6,13
Buying local products helps my community	6,10
Wasting food pains me	5,98
Food waste concerns me	5,89
I buy products based on season	4,59

Table 5: Respondents understanding of the problem

Based on this, it is possible to claim that the problem not only exists but is experienced by most respondents. To understand this more in depth it is important to acknowledge three related findings:

First, the action-oriented statement ("I buy products based on season") received a significantly lower result (its upper border of the 95% confidence level is 4.77, while the lowest border of the second worse performing statements is 5.73) than the others, which measure the attitudes and views of respondents. One explanation is that respondents only feel this way but do not act on it. Either because they do not want to change their habits or because they do not know how. *Harvest Club* may help to change behaviors and teach ways to act.

Second, to further understand the people who are concerned with food waste, a correlation with age and gender was performed. As seen in Table 6, older people believe they understand the problem of food waste better $f(207) = 0.296$, $p < .001$; they buy products to a greater extent based on season $f(207) = 0.248$, $p < .001$ and they believe more in buying local products helping their community $f(207) = 0.200$, $p = .004$. Females felt like they understand food waste better $f(203) = 0.152$, $p = .030$, they are also more concerned with food waste $f(203) = 0.138$, $p = .048$, and wasting food pains them more $f(203) = 0.159$, $p = .023$. At this point the independent sample t-test was performed to test the first hypothesis.

H1: Females are more in pain by food waste than males. – confirmed

- Since there is a significant difference between how much females ($M = 6.13$, $SD = 0.996$) and males ($M = 5.70$, $SD = 1.662$) feel in pain by food waste it is possible to confirm the hypothesis $t(117.71) = -2.073$, $p = .020$ (one-sided).

To conclude, females would be a more appropriate target group since they are significantly pained by the problem.

		age	Gender (1=male, 2=female)
I understand the problem of food waste	Pearson Correlation	.296**	.152*
	Sig. (2-tailed)	<.001	.030
	N	209	205
Food waste concerns me	Pearson Correlation	.122	.138*
	Sig. (2-tailed)	.078	.048
	N	209	205
Wasting food pains me	Pearson Correlation	.077	.159*
	Sig. (2-tailed)	.265	.023
	N	209	209
I buy products based on season	Pearson Correlation	.248**	.001
	Sig. (2-tailed)	<.001	.985
	N	209	205
Buying local products helps my community	Pearson Correlation	.200**	.086
	Sig. (2-tailed)	.004	.223
	N	209	205

Table 6: Correlation of problems with age and gender

To understand the need Harvest Club is solving for producers, understanding how frequently people have excess food and to know where it goes is imperative. Respondents were asked how often they have too much food. As seen in Table 7, 51.5% of them answered that they have a surplus at least once a month. Which shows that there should be enough supply:

People sometimes produce too much fresh food.

There is a significant difference from 0 of producers having a surplus of fresh food at least once a month ($M = 0.32$, $SD = 0.48$, $t(24) = 3.361$, $p = .001$).

	Frequency	Percentage
daily to weekly	3	9.1

2-3 times a month	8	24.2
once a month	6	18.2
every 2 - 6 months	8	24.2
once a year	5	15.2
less than once a year	1	3.0
never	1	3.0
other:	1	3.0
Total	33	100.0

Table 7: Frequency of food surplus

Two funnels were created to understand how people are currently behaving and how large the problem of discarding the fresh food is. Looking into all participants, 15.8% of them would be willing to sell fresh products and out of these people 36.4% are now sometimes throwing the food away. This category includes people who answered either “throw it away”, “leave it in the garden” or “compost it” (Figure 9).

People have too much fresh food which they sometimes throw away.

- There is a significant number of people compared to all sellers, who sometimes throw fresh food away $M = 0.36$, $SD = 0.489$, $t(32) = 4.276$, $p < .001$.

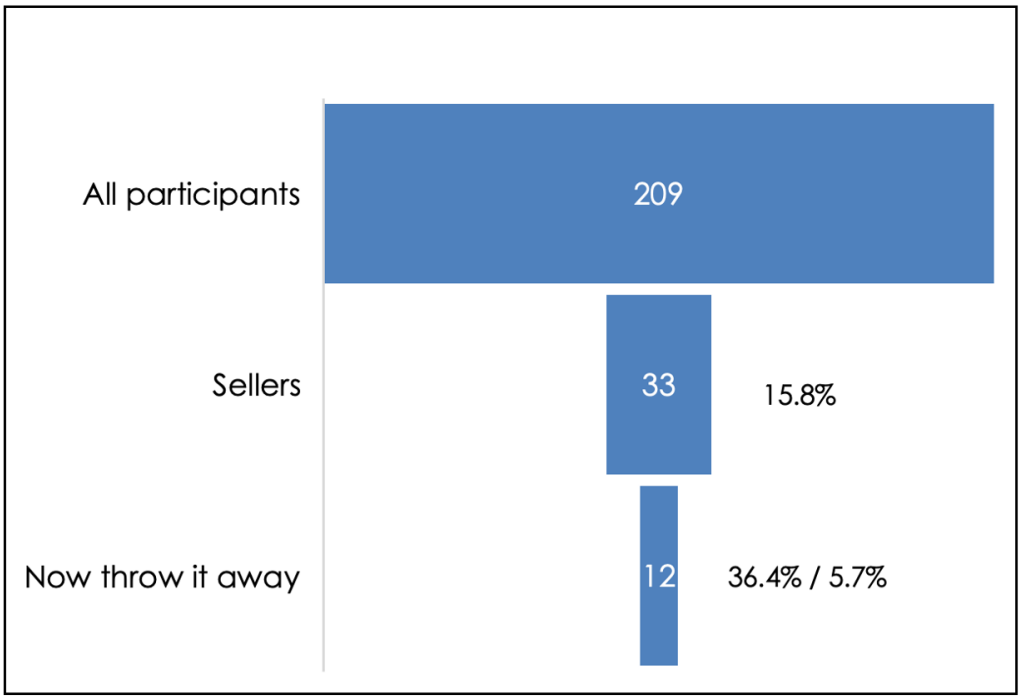

Figure 9: Funnel of sellers throwing food away

Another funnel was created trying to understand the size of the market and the need. Out of the 209 participants, 48.3% have a garden or access to one and out of those 66.3% are producing, which represents 33.1% of the whole sample. Focused on small growers or producers, around a third of the population could be on the selling side. However, not everyone has excess and is willing to sell. Figure 10 indicates 31.3% of producers would be willing to sell on the platform, which is 10% of the whole sample. Therefore, *Harvest Club* would be an extra income or a rewarding way to share food. However, for 38% Harvest Club helps throwing away less.

To test hypothesis two, Pearson's Coefficient was calculated.

H2: There is a positive correlation between people having too much food more often and them throwing it away more. – not confirmed

- The hypothesis could not be accepted, because although the coefficient is positive $f(31) = 0.145$, the difference is not significant $p = 0.419$, likely due to the small sample size, since this question was asked only to sellers.
- It could also be that some of the people who are left with fresh food more often, have solutions in place to throw away less.

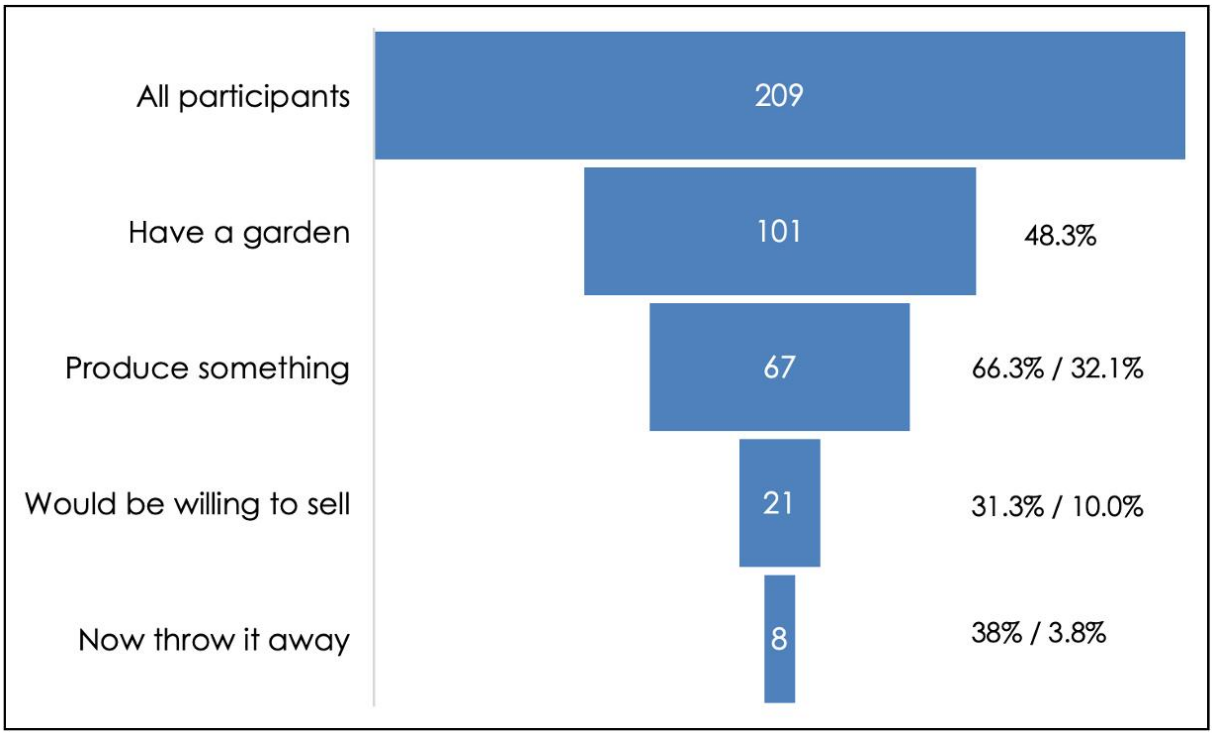

Figure 10: Funnel from respondents with a garden who are currently throwing food away

To conclude, even though a third sellers do not produce something by themselves they would be willing to give away fresh food. This leads to the assumption that Harvest Club is also solving a problem for people who are getting too much from someone else, because of inefficient grocery planning or because they must leave home unexpectedly. Future research will be necessary to figure out the exact problems *Harvest Club* is solving for that could provide different reasons for joining.

5.4.3. Customer Gain

5 statements	Mean
I have every intention of using this service in the future.	4.71
A network like this is missing in my area or community.	5.34
I am likely to tell my friends about this service in the future.	5.22
I want my local farmer to join this service.	5.48
I want to reach farmers digitally.	5.47

Table 8: View of respondents on the solution

In the second part of the survey and before assigning respondents to groups, all participants were introduced to the idea of *Harvest Club* and asked how much they agree with 5 statements (Table 8). The statements were measuring the intention to use the service and views on the platform. Running a T-test and comparing the means to the middle value of 4, we see that participants are significantly agreeing with all statements, resulting in the following conclusions:

People are intending to use the platform.

- Confirmed by participants agreeing with "I have every intention of using this service in the future." ($M = 4.71$, $SD = 1.466$) above the neutral average of 4, $t(208) = 6.982$, $p < .001$.

Diving deeper into understanding the participants, Figure 11 was created to see how many people are interested in the project. For better representation they were divided into 3 groups (1-3 as "negative intention", 4 as "neutral intention" and 5-7 as "positive intention"). 55% of participants picked the answer 5, 6, or 7 and have an intention to use the service in the future.

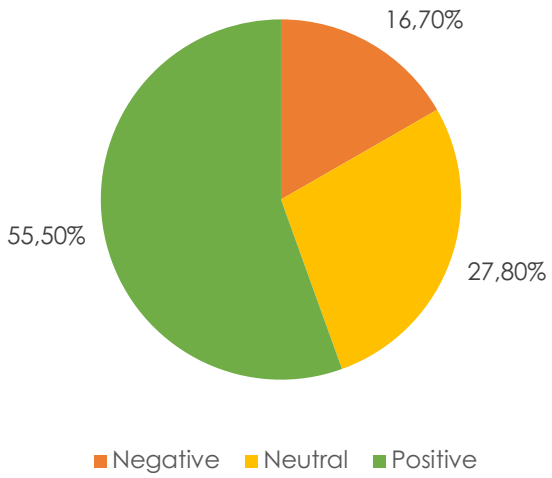

Figure 11: Respondents intention to use Harvest Club

People feel that a platform like this is missing in their community.

- Confirmed by participants agreeing with "A network like this is missing in my area or community" ($M = 5.34$, $SD = 1.549$ $t(208) = 12.506$, $p < .001$).

The information about the community will be spread by WOM.

- Confirmed by participants agreeing with "I am likely to tell my friends about this service in the future" ($M = 5.22$, $SD = 1.566$, $t(208) = 11.266$, $p < .001$)

Again, it is observed that all statements have a significant positive correlation with each other suggesting that if people are intending to use the service, they do so because they feel like it is missing and are happy to tell their friends about it.

To understand which problem encourages use of the platform, a correlation Table between problem and solution was developed (Table 9). Most of the combinations are positive. Focused on the intent to use, we see that people who find buying in-season, local food more important believe that this can help the community and environment. This should be the main message used to convince consumers to join the platform, confirming hypothesis three.

H3: People who already buy based on season are intending to use the platform more. - confirmed

It is possible to confirm this hypothesis because there is a positive correlation between people buying seasonal food and their intention to use the platform $f(207) = 0.190$, $p = .006$.

		I have every intention of using this service in the future.	A network like this is missing in my area or community.	I am likely to tell my friends about this service in the future.	I want my local farmer to join this service.	I want to reach farmers digitally.
I understand the problem of food waste	Pearson Correlation	.107	.126	.205**	.188**	.163*
	Sig. (2-tailed)	.124	.070	.003	.006	.018
	N	209	209	209	209	209
Food waste concerns me	Pearson Correlation	.135	.123	.157*	.242**	.187**
	Sig. (2-tailed)	.051	.076	.023	<.001	.007
	N	209	209	209	209	209
Wasting food pains me	Pearson Correlation	.127	.149*	.158*	.203**	.148*
	Sig. (2-tailed)	.067	.031	.023	.003	.033
	N	209	209	209	209	209
Buying food that is in season helps the environment	Pearson Correlation	.201**	.215**	.265**	.253**	.233**
	Sig. (2-tailed)	.003	.002	<.001	<.001	<.001
	N	209	209	209	209	209
I buy products based on season	Pearson Correlation	.190**	.119	.155*	.119	.129
	Sig. (2-tailed)	.006	.085	.025	.087	.064
	N	209	209	209	209	209
Buying local products helps my community	Pearson Correlation	.174*	.211**	.226**	.280**	.207**
	Sig. (2-tailed)	.012	.002	<.001	<.001	.003
	N	209	209	209	209	209
I value local products	Pearson Correlation	.186**	.210**	.293**	.330**	.301**
	Sig. (2-tailed)	.007	.002	<.001	<.001	<.001
	N	209	209	209	209	209

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 9: Correlation table between problem and solution

To understand who the buyers and sellers are, two more hypotheses were tested:

H4: More people are interested in buying than selling on the platform. - confirmed

- The hypothesis is confirmed, since there are significantly more users interested in buying (M = 0.90, SD = 0.301) than selling (M = 0.16, SD = 0.366) on the platform $t(208) = -22.308$, $p < .001$.

H5: People who are planning to sell have a higher intention to us the app than people who only buy. - confirmed

- The hypothesis is confirmed since people who are planning to sell (M = 5.33, SD = 1.451) have a significantly higher intention to use the app than people who are planning to only buy (M = 4.59, SD = 1.433) on the app, $t(207) = -2.710$, $p = .007$.
- It was also observed that people who are planning to sell (M = 5.73, SD = 1.398) are more likely to tell their friends about the platform than people who are planning to only buy (M = 5.13, SD = 1.581) on the app, $t(207) = -2.043$, $p = 0.042$.

This leads to the assumption that it might be harder to find people who want to sell, because there are fewer of them. However, once they learn about the platform, they would be the ones more interested and invested, and more likely to promote *Harvest Club* and find new people to join. This suggests that if enough people are reached it would be possible to create a sustainable community of sellers who would invest enough in uploading the offers to keep the platform interesting and alive.

To conclude, a look into how much time sellers and buyers are planning to invest in the pick-ups / drop-offs and which way they prefer to organize them is crucial to decide how to structure the logistics.

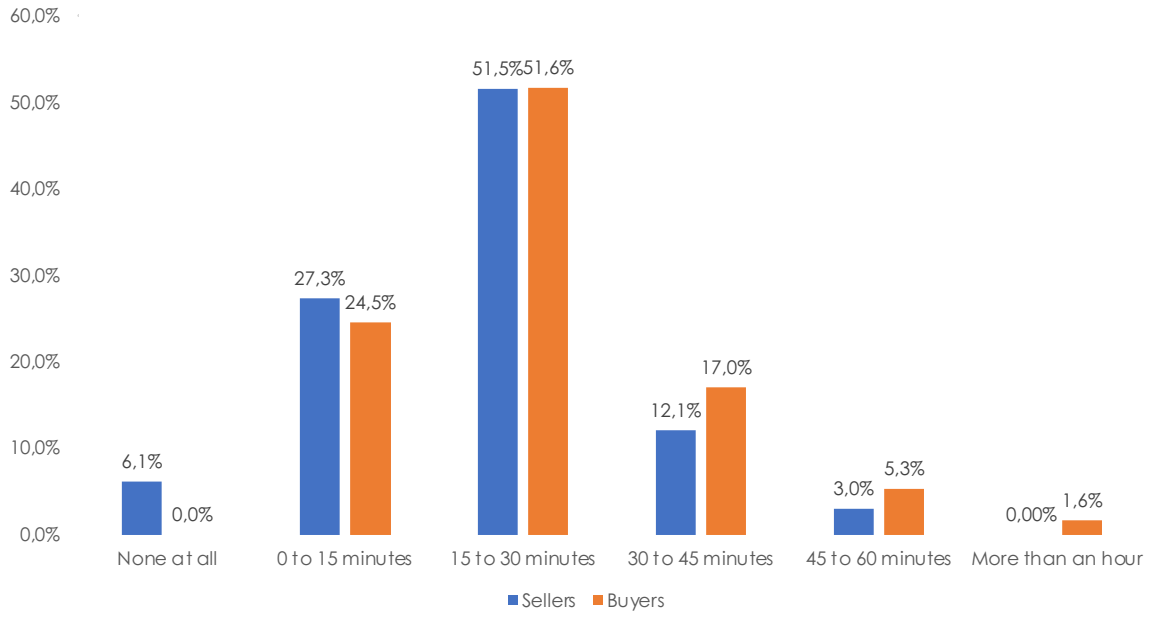

Figure 12: Time invest into one pick-up/drop-off comparing sellers and buyers

Figure 12 indicates that, in both categories (sellers and buyers) most respondents are prepared to dedicate 15 to 30 minutes. To understand if there is significant difference the last hypothesis was tested.

H6: Buyers are prepared to spend more time on picking up the food than the sellers. – confirmed

- With a significant difference between the time invested by people buying ($M = 3.08$, $SD = 0.877$) and people selling ($M = 2.79$, $SD = 0{,}857$) it is possible to confirm the hypothesis $t\,(219) = -1.769$, $p = 0.039$ (one sided).

Exploring how sellers and buyers expect logistics to work, Figure 13 was created. 85% prefer the buyer to come directly to their home for the pick-up, even more than the 67% that would want a certified collector. This is interesting to see because it is implying that people are looking for personal contact with their community. It shows that *Harvest Club* can be more than a sharing platform, it can also be a community building tool.

Another category was created to summarizing how many sellers would be prepared to travel to deliver their products. 45% of sellers would do so, underlining their dedication to the idea. This illustrates that for each buyer, there could be a seller - matching each other's preferences.

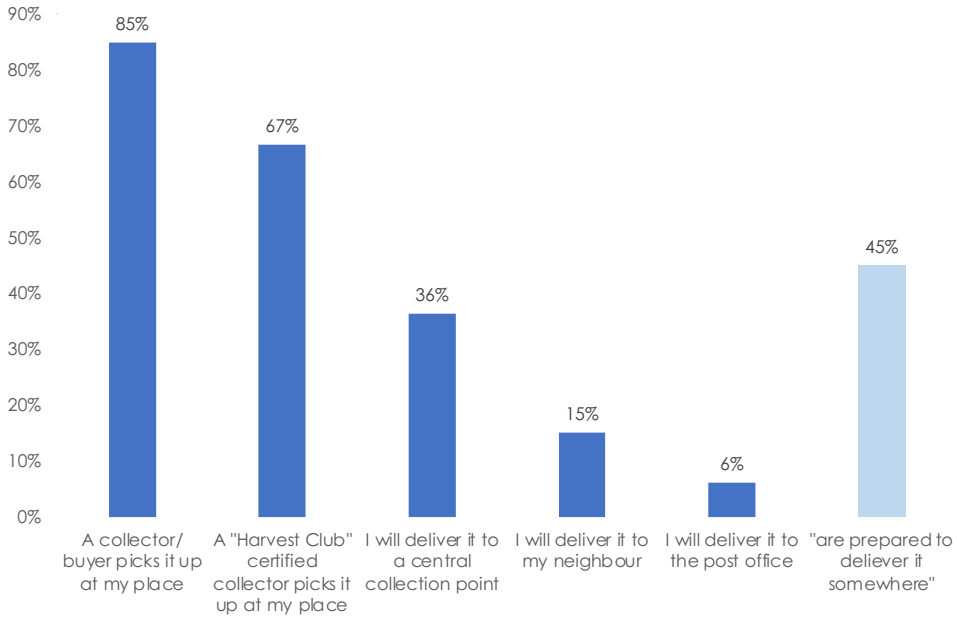

Figure 13: Preferred logistics on the seller side

When asking buyers about their preferences, the answers divided in three. 35% would prefer to go to the seller themselves. Yet 65% would like it to be delivered somewhere, either to a collection point or to their door (Figure 14).

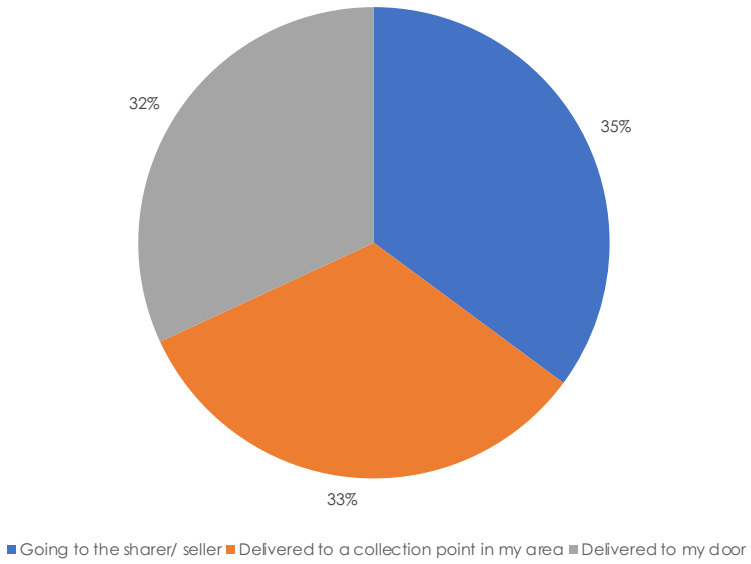

Figure 14: Preferred logistics on the buyer side

Based on this analysis, providing sellers with different options based on their preferences seems favorable and encourages buyers to pick-up themselves or meet somewhere to support the community aspect.

5.4.4. Customer Insights Summary

People are mindful of food waste. They are in pain because of it, have a desire to solve it and believe in the positive impact. Through the demographic analysis performed, it was observed that these feelings are stronger in women and older people. Tests were also performed to prove the specific need for what *Harvest Club* could provide. The findings showed that people do grow, produce or have excess fresh products that they waste, and therefore they would be interested in putting them on the platform. It was also proven that the market exists and that there are enough people with these needs.

The solution was tested in form of gains for the customers. People are intending to use this platform (55% of them), and they feel that they are missing something like this in their community. They agree the idea will spread through WOM. For communication purposes, it was established that people who are more interested in the platform are also people who find buying in-season and local food more important.

In conclusion, a distinction between sellers and buyers was performed to determine that more people are interested in buying, while the sellers have a higher intention to use and are more likely to spread the idea by WOM. It was also observed that sellers are prepared to spend less

time on pick up than buyers, however, almost half of them would be prepared to deliver the products. The analysis of logistics showed that users (especially sellers) are striving to meet other people, which implies that *Harvest Club* can become a community tool, providing a solid ground on which to create a sustainable community, a crucial reason to create a platform such as *Harvest Club*.

5.5. Business Model Canvas

5.5.1. Customer Segment

The first step in creating a business model is to understand the target customer since a customer-centric approach has proven to be most successful in building products and services. How is value created? And who is primarily affected by the problem?

While research has shown that more than 50% of food waste is happening at the household level, and that 60% of food waste worldwide consist of fresh produce such as fruit, vegetable, roots and crops the consumers awareness that their food consumption behavior needs to change has also increased (De Laurentiis et al. 2018; FAO, 2022).

Harvest Club draws on this development, offering people a way to act in line with their intentions and become more conscious of local and in-season food. Through the survey, two distinct customer segments were identified that share the perception of the problem while having different needs, making them use the platform as a solution for different reasons. These two groups are typical for a multi-sided platform, buyers, and sellers (Figure 15). The more significant customer segment to focus on in the short-term are sellers. On the one hand, users that provide offers are more essential for the practical reason of getting the platform started by uploading products. On the other hand, quantitative data has proven that people who are planning to sell have a significantly higher intention to use the app than people who are planning to only buy and are more likely to promote it through WOM.

While preventing and decreasing food waste is reason behind Harvest Club, the qualitative interviews with small and larger producers have shown that the more urgent problem they face is an overage in harvest or produce. Almost 35% of survey respondents give it away and 6% exchange with someone. Most participants agree that a network like Harvest Club is missing in their area or community. This is potentially because of the lack of appreciation for their products

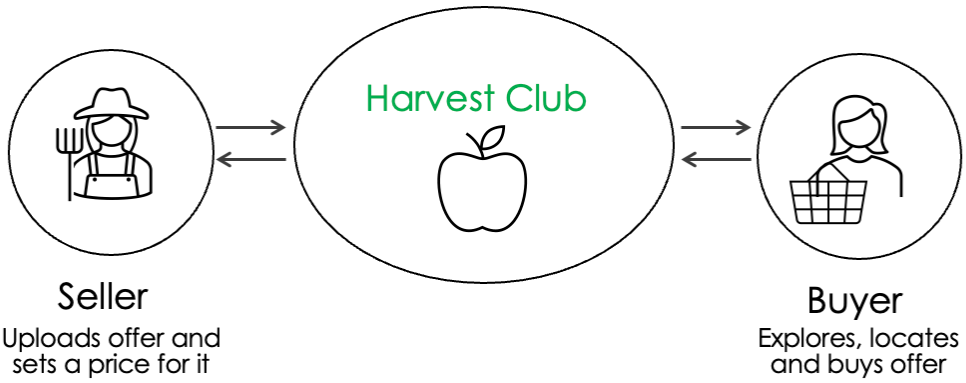

Figure 15: Harvest Club users

and the work they put into them, expressed by qualitative interview participants such as Heike, or Dennis who tried other platforms for selling but has not been satisfied.

Research by Feldmann & Hamm, 2015 has shown that the reason to purchase local food was related to product quality, including freshness and taste, as well as health, food safety, environmental benefits, as well as support of the local economy. To further uncover what is important to buyers when buying fresh food. Based on the answers the following Table 10 was created.

Important aspects when buying	M	Lower Border	Upper Border
Taste	6.21	6.08	6.33
Quality	6.19	6.07	6.31
Sustainability	5.14	4.96	5.32
Local origin	5.07	4.89	5.25
Information about the origin	5.05	4.84	5.25
Durability	4.98	4.81	5.16
Price	4.84	4.65	5.03
Seasonality	4.77	4.59	4.95
Bio or other certificates	4.65	4.43	4.87
Appearance/ look	4.51	4.30	4.71
CO2 footprint	4.46	4.23	4.68
Information about packaging recycling	4.32	4.08	4.56
Detailed information about the transport	3.64	3.41	3.88
Storing advice	3.48	3.23	3.73
Recipe ideas	3.26	3.01	3.51

Table 10: Buyers important aspects when buying fresh food

Taste and quality are significantly more important than anything else. However, also sustainability ($M = 5.14$) and local origin ($M = 5.07$) are more important than most other aspects.

Seasonality, which is also quite important for Harvest Club, performed a bit lower ($M = 4.77$), but still more than the neutral value of 4.

To see if there is a connection to the intention to use, correlations were calculated. The significant correlations were found with quality $f(186) = 0.152$, $p = .038$ and sustainability $f(186) = 0.151$, $p = .039$. Based on this, the assumption is that quality and sustainability would be the right topics to focus on when communicating with consumers. However, also taste, local origin and seasonality are important to people.

To determine where buyers purchase their fresh food now, it was found that most buy in supermarkets, and farmers markets (Figure 16). Their intention to use the platform shows a positive correlation with getting the food from the farmers market $f(207) = 0.212$, $p = .002$ and from the supermarket $f(207) = 0.202$, $p = .003$. Supermarkets and farmers markets could thus present an option where to acquire people interested in using *Harvest Club*. Furthermore, 20% of people are already eating fresh food from their or someone else's garden, which indicates the wish to eat food from this origin. Since there is no significant correlation with the intent to use, it is likely that more people wish to consume this way who do not know how or where to find it, and here Harvest Club can help.

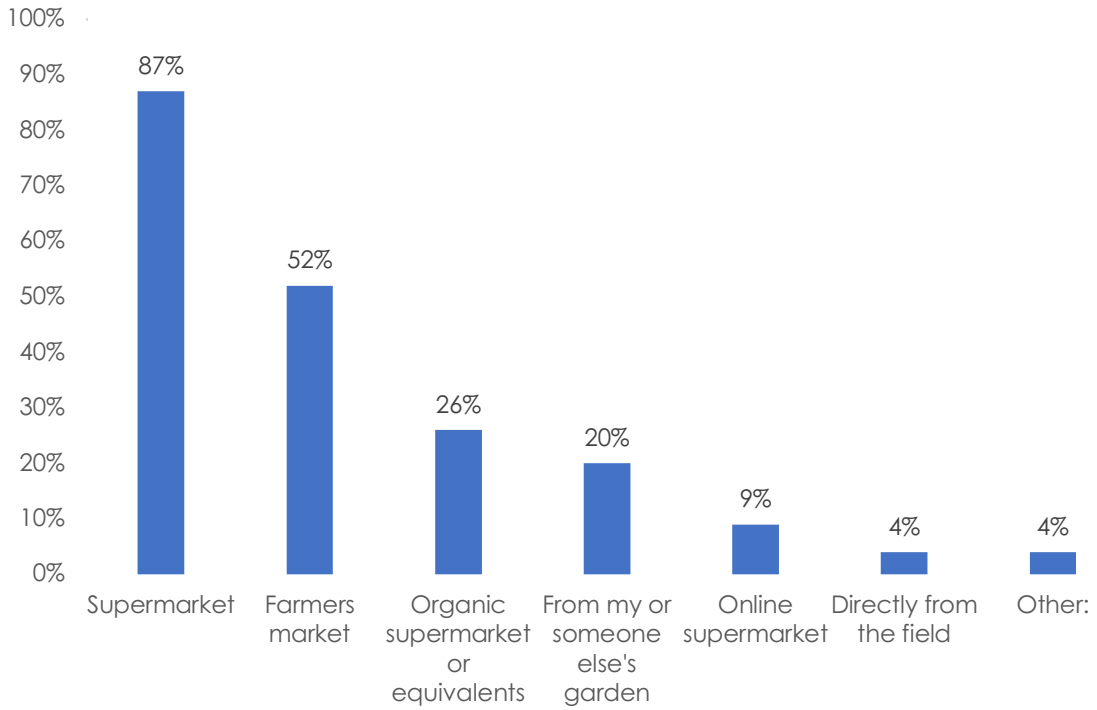

Figure 16: Buying behavior of fresh food

5.5.2. Value Proposition

Harvest Clubs core value is how it will match users who overproduce with those who value local, seasonal, and sustainable products from small scale producers. Short-term food waste is decreased, leading to an increase in knowledge around food exchanged between users. Long-term, micro-communities are established, with the potential of not only improving people's relationship with food but also with each other (Figure 17).

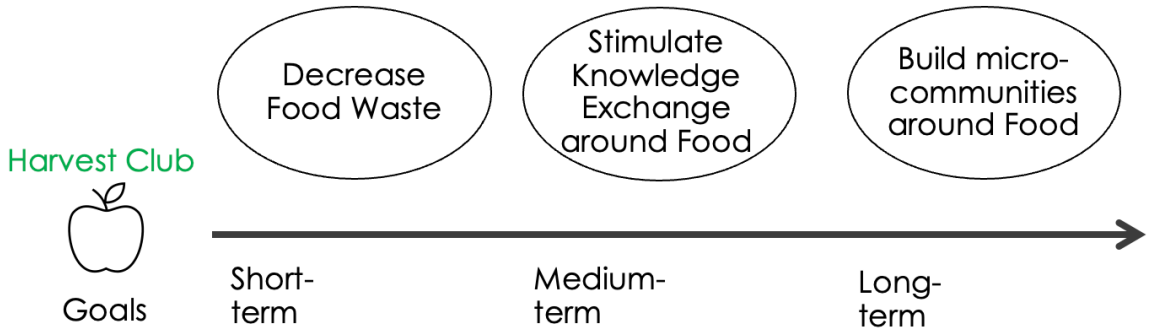

Figure 17: Goals of Harvest Club from short- to long- term

The methodological approach to the value proposition was to design the customer journey. Before creating the survey, the customer journey was designed for either side – buyer and seller. The most essential features of *Harvest Club* were extracted from this journey.
Participants were then asked how interested they would be in different features of *Harvest Club*, and with a T-test comparing to the middle value of 4, it was possible to significantly prove that respondents agreed with the basic parts of the concept (see Table 11).

Features for Buyers	Mean	Ranking
Map to see offers near me	6.39	1
Filter for possible pick-up time	5.89	2
Pictures of the offers	5.85	2
Offer description	5.72	2
User reviews of the sharer/ seller	5.32	3
In-app payment	5.10	3
Chat function	4.48	4

Table 11: Preferred features for buyers

Adding the ranking column based on the lower and upper borders of the confidence intervals (with 95% significance) proved which features are significantly more important than others. Having the map is by far the most important feature, followed by a filter for pick up times, pictures of the offer and offer description tied on the second place. Surprisingly, user reviews only achieved third place, together with in-app payment, both before chat-function, which is not the most crucial feature.

Regarding sellers, all features were significantly accepted and supported. However, the differences between the features are too small to be able to detect significant differences between them. Only looking at the means for general orientation do we notice that the same two features are at the bottom of the Table (as for buyers), suggesting that they might be less crucial in the first step of the project or the prototype (see Table 12).

Features for Sellers	Mean
Upload of pictures of my offer	5.76
Offer description	5.76
User reviews of people requesting my offer	5.67
Filter for my preferred pick-up time	5.55
Chat function	5.52
In-app payment	5.06

Table 12: Preferred features for sellers

The connection of users through the platform and the developing exchange of goods describes the core value proposition of *Harvest Club* - local, seasonal, personal – as illustrated in Figure 18.

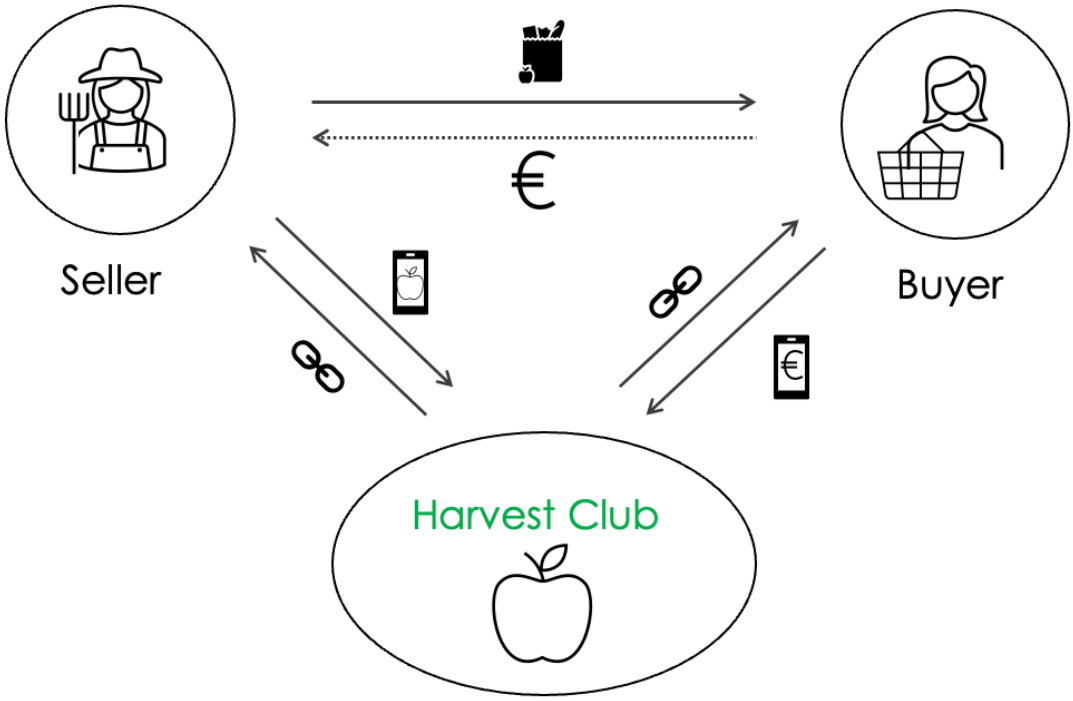

Figure 18: Business Model graphic illustrating the user interaction with Harvest Club

As a hybrid business, it is crucial that the three dimensions of sustainability are being met to ensure a sustainable development. The dimensions definition as for *Harvest Club* can be seen in Figure 19. As for the economic side, empowerment of users is at the center of the sustainable revenue model, accounting for seasonality. Combined with the community aspect and decreasing food waste targets may be formulated on this basis to tackle the five SDGs introduced earlier.

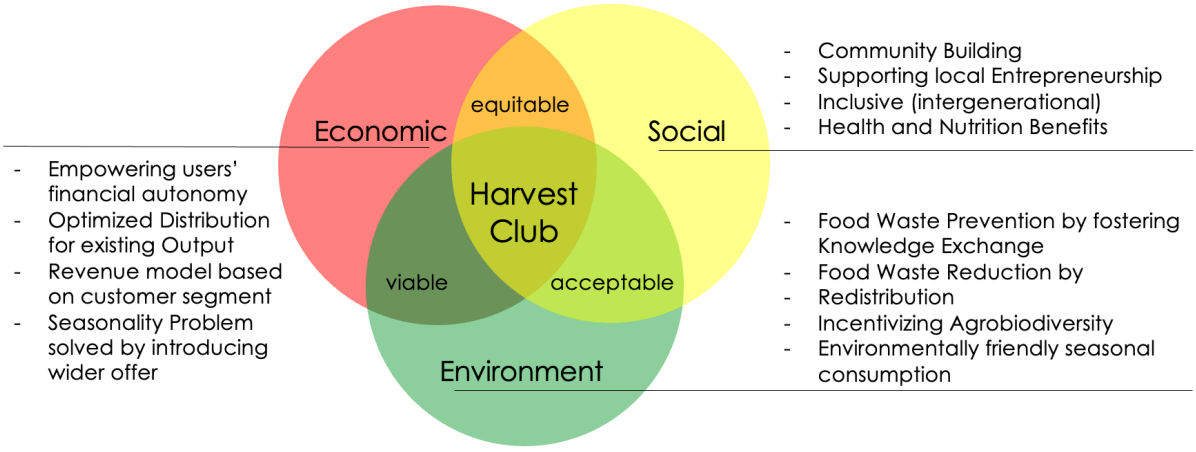

Figure 19: Sustainable development through Harvest Club

To determine the future of *Harvest Club* beyond the basic business model, participants were asked about extra features (Figure 20). Most decided to add the "What's in season in my region

calendar" and the "Option to filter by food categories", allowing them to discover new foods, fruits, vegetables, and homemade products. The calendar had a significant correlation with intention to use $f(207) = 0.190$, $p = .006$, confirming that it should be the soon implemented. To target this, data for the calendar will be collected through the sellers' uploads helping to improve it. It was also the only feature that was showed a significant difference between buyers ($M = 0.59$, $SD = 0.49$) and sellers ($M = 0.76$, $SD = 0.44$), $t(48.82) = 2.042$, $p = .047$. Since finding enough sellers to participate will be challenging at first, the calendar could be a most important feature to add with providing sellers with education or inspiration around gardening.

Other options to explore are: "Dashboards to track impact", "Reward system for reducing food waste" and "Inspirational blog on the topics of food waste, seasonality etc." with the last one significantly correlating with intention to use $f(207) = 0.158$, $p = .022$. The measured impact is interesting but not as important to respondents while an inspirational blog is important to keep customers on the platform and also would contributes to a successful SEO & SEA. Here, community members can be co-authors and form relationships with gardening bloggers such as *KptnCook* which successfully does this with food bloggers.

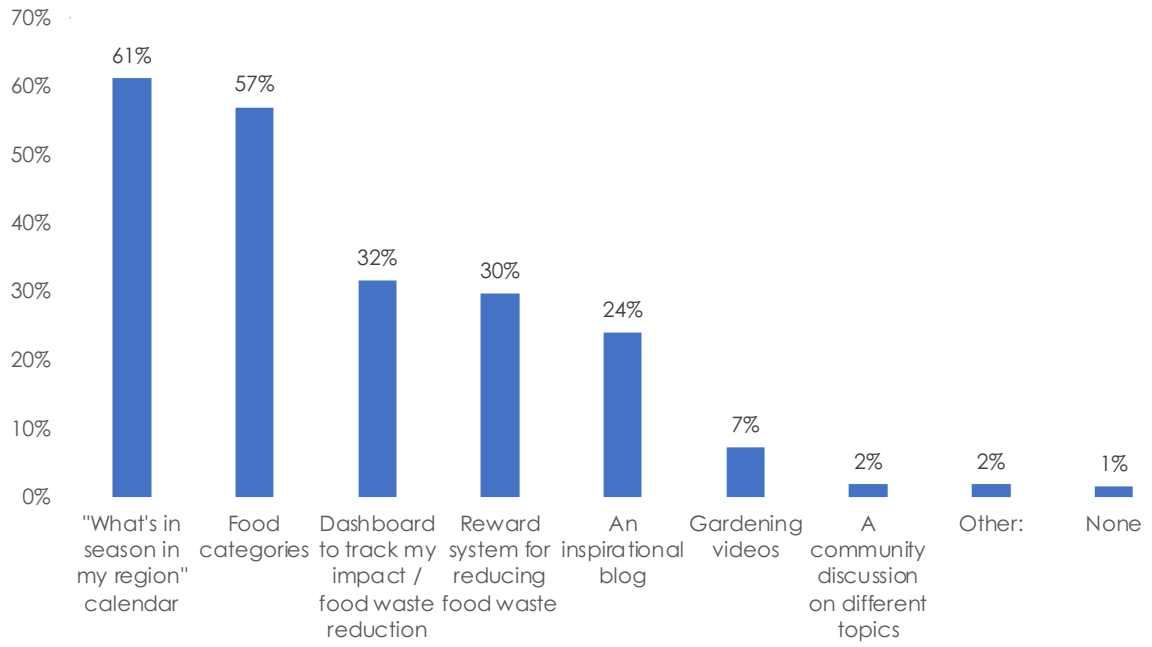

Figure 20: Respondents extra feature preferences

The findings illustrate how people identify that eating with the season is benefiting the environment. For potential customers, the biggest value is discovering new foods that are locally in season, simultaneously aiding the environment and enriching their nutrition at the

same time (Vargas et al., 2021). They also expect the product description to help them explore and discover new foods.

The *Harvest Clubs* core values are to support products as well as knowledge exchange in communities around nutritional, sustainable food. To further develop the simple business model in the future, we must ensure that the add-ons also support these core values, designing and thinking customer centric.

5.5.3. Customer Channels

The next step of the business model canvas is defining the marketing and sales channels of how to reach customers. According to Osterwalder and Pigneur (2010), channels include the integrative communication between business and customer segment. The channels range from raising awareness for the product or service, promoting the value-proposition for customers to evaluate it, enlarging purchase opportunities, delivering the offered value to fulfill the customer expectations, as well as creating an after-sales support channel for customers.

One important way to raise awareness and persuade consumers of *Harvest Club* will be WOM as previously proven. The qualitative interviews have shown that sellers may be reached by approaching farmers that rent part of their land out to people as suggested by Lars, or projects such as the one Enno took part in where a piece of land is rented for guided farming. Here, cooperating with farmers and projects to spread the word will be essential to kick-off the platform. Once sellers are convinced of *Harvest Club,* they will function as brand ambassadors as people who are planning to sell are more likely tell their friends about *Harvest Club* than people who are planning to only buy on the app.

Harvest Club will rely on network-effects, meaning the value of the service and positive user experience will increase with the number of users. Due to the hyper-local approach, the value will increase if users are located close together. The essential channel will be the platform itself, creating a recurring effect of regular application usage. The challenge will be the seasonality of the fruits and vegetables. Of the sellers, no one would upload daily but 13.02% would have over production daily to weekly, 24.24% have it 2-3 times a month, 18.18% once a month and 24.24% only every 2-6 months. 21.21% would only supply once a year or less. This aspect of seasonality may partly be tackled by introducing other homemade products that are independent of the seasons as stated in chapter 3.1., as well as gradual extensions of the business model at a later stage discussed in the value proposition.

Participants were asked how *Harvest Club* be promoted (Figure 21). The channels performing best were strategies such as social media (68%) and influencer marketing (32%), also positively correlated with the intention to use *Harvest Club*, $f(207) = 0.227$, $p < .001$ and $f(207) = 0.157$, $p = .023$ respectively. However, besides these channels, the participants confirmed that approaching them at local farmers markets (47%) could also be a good option.

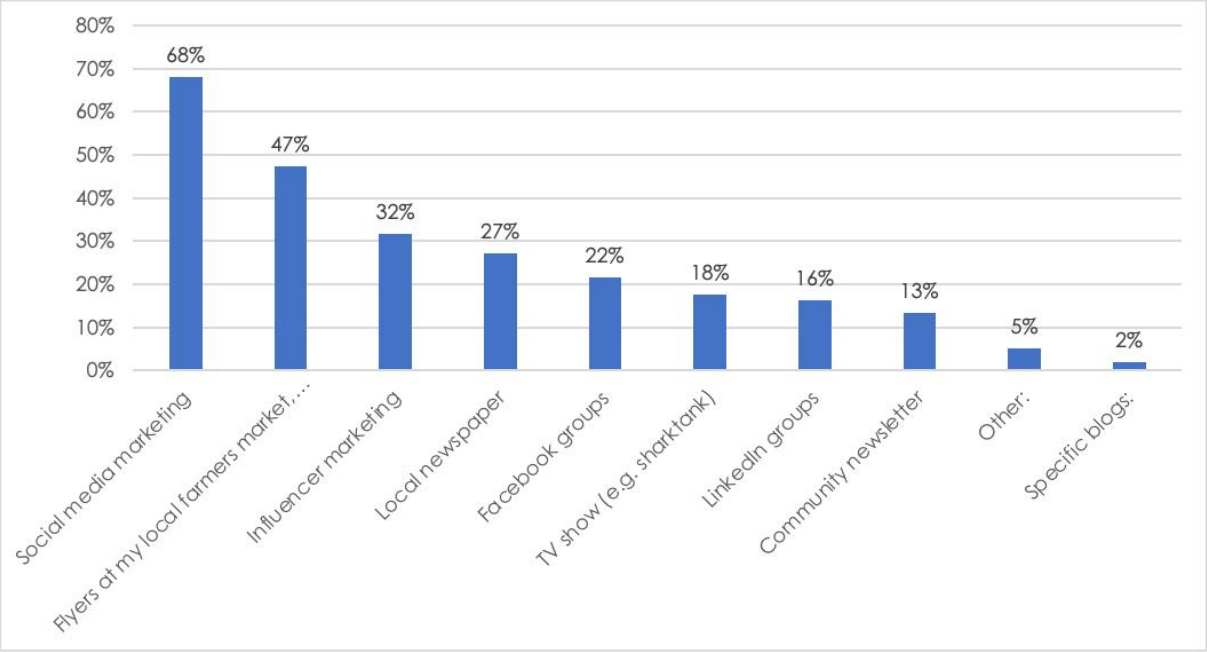

Figure 21: Respondents channel preferences

5.5.4. Customer Relationships

Customer relationships are about finding, keeping, and growing the customer base. Relationships with each segment need to be created and sustained to establish sustainable revenue streams (Osterwalder & Pigneur, 2010).

Looking for the main customer relationships we need to consider *Harvest Club* as a two-sided market that will host at least two user-types – buyers and sellers. The sellers provide the offer at a price of their choosing, while the buyer drives the demand. As a sharing economy platform *Harvest Club* is selling or providing locally grown and produced products without owning them. Instead, it serves as a connector between users offering and buying it independently through an intuitive map of the local community. The role of *Harvest Club* is the community development. The seller is looking to find an additional income and or someone to value their produce while the buyer is looking to discover and consume local food that are in season or to find food at a discount. To ensure that likeminded people come together, user profiles and user reviews of one another will be key to a successful customer relationship with the platform and

each other. Achieving trust and customer loyalty will be attained by a rating and review system where customers give each other feedback in different dimensions (Farr-Wharton, Foth, et. al, 2014).

The hyper-local approach will ensure the right people are connected through the app. Nevertheless, a rating of Karma points for platform users or a similar system like the *Harvest Club* ambassadors will be the core relationship and bind them to *Harvest Club* (Diekmann et al., 2014). The more reviews users have the more and the faster they sell and the more they are bound to the platform (Diekmann et al., 2014; Farr-Wharton, Foth, et. al, 2014). Communicating the brand through local power-users would be a favorable approach, especially as 46% of respondents are already willing to support with the logistics as illustrated in Figure 22.

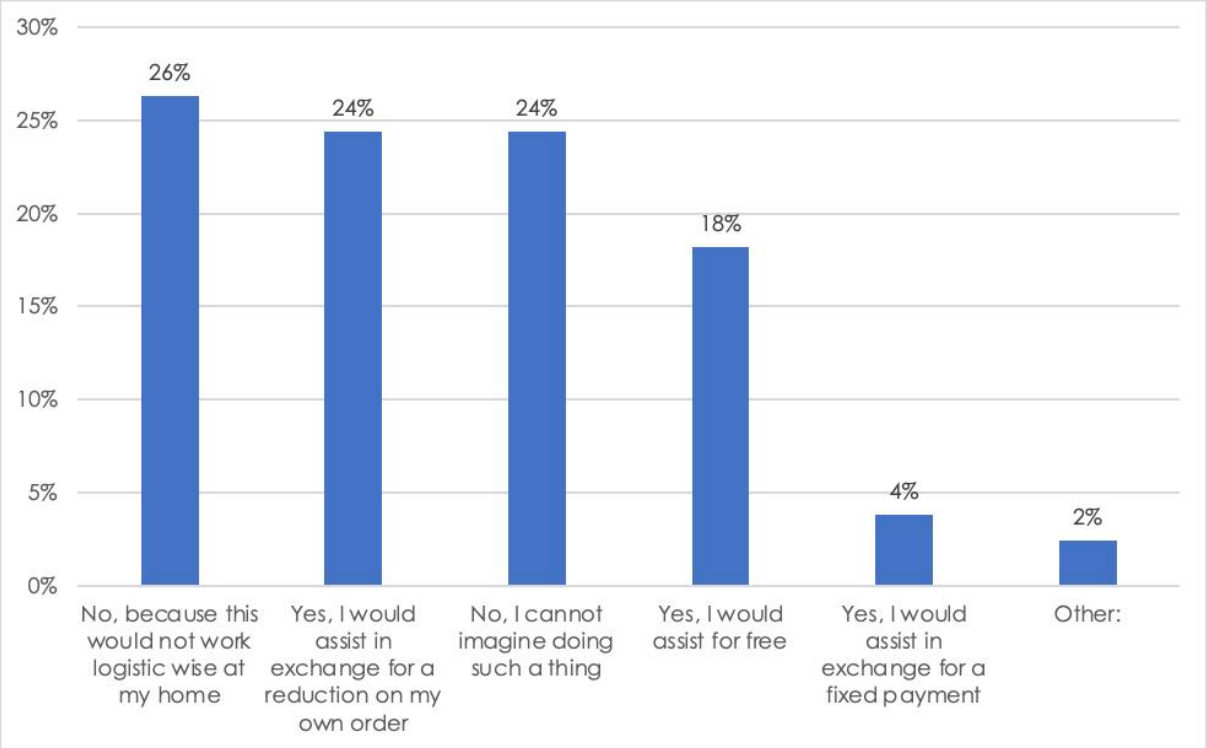

Figure 22: Respondents view on serving as a collection point

5.5.5. Revenue Streams

A hybrid business is not only looking to create impact, fulfilling the first two dimensions of sustainability, social and environmental, also proving profitable to reach economic sustainment in operations with the opportunity to expand.

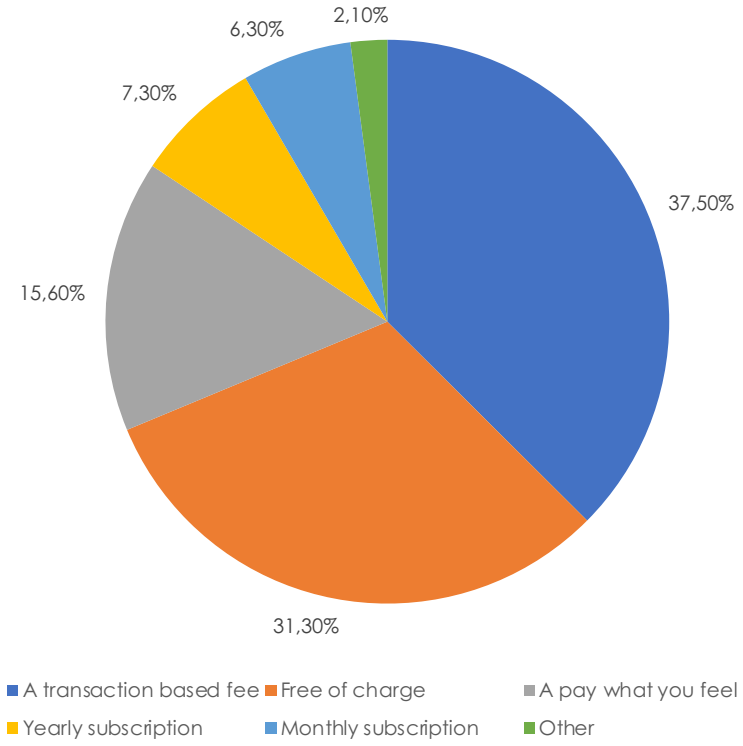

Figure 23: Payment preferences of respondents

The survey shows that 36.4% of sellers believe the app should be free compared to 30.2% of non-sellers. 24.2% would favor a donation-based approach compared to 13.8% of non-sellers, while 18.2% would be willing to pay a transaction-based fee compared to 41.5% of non-sellers and 21.2% are willing to pay for a subscription compared to only 11.9% of non-sellers (Table 13).

The willingness to a subscription suggests again that sellers are comparably more committed to the idea of *Harvest Club*. However, the difference is not significant.

Looking at transactions as a pricing model, we notice a significant difference between sellers ($M = 0.18$, $SD = 0.39$) and non-sellers ($M = 0.42$, $SD = 0.49$) who are more interested $t(55.425) = 2.966$, $p = .004$.

		not sellers	sellers	Total
A transaction-based fee	Count	66	6	72
	Percentage	41.5%	18.2%	37.5%
Free of charge	Count	48	12	60
	Percentage	30.2%	36.4%	31.3%
A pay what you feel	Count	22	8	30
	Percentage	13.8%	24.2%	15.6%
Yearly subscription	Count	8	6	14
	Percentage	5.0%	18.2%	7.3%
Monthly subscription	Count	11	1	12
	Percentage	6.9%	3.0%	6.3%
Other	Count	4	0	4
	Percentage	2.5%	0.0%	2.1%
Total	Count	159	33	192
	Percentage	100.0%	100.0%	100.0%

Table 13: Payment preferences of sellers vs. buyers

The data is implying that the two sides of the platform – buyers and sellers – require separate pricing. It seems the optimal model for buyers would be a freemium with a transaction-based cost, e.g., a percentage of the price set by the seller is paid by the buyer. This fee needs to be kept low to not incentivize the buyer going around *Harvest Club* and directly to the seller. The sellers mostly believe it should be free or pay how you feel. Since sellers must be incentivized to join, charging them for an option to sell might turn them away. To understand the problem better, sellers were asked how they would like to charge the buyers (Figure 24). The three options that performed best are pay what you feel (58%), free of charge (48%) and them determining the price on the app (42%). Based on this, sellers should have all three options, to provide them with the freedom they need. However, this presents a problem for *Harvest Club* revenue since transactions might be done in person and with no determined price. Based on that a middle ground approach might be best in which when the pricing is determined in advance, *Harvest Club* takes a small percentage. When the product is free, buyers should be charged a small fee (e.g., 1 Euro) to get the contacts of the seller or pay for a subscription to be able to profit from free offers. Additional payments could be charged once more features are available, such as home delivery or to a collection point.

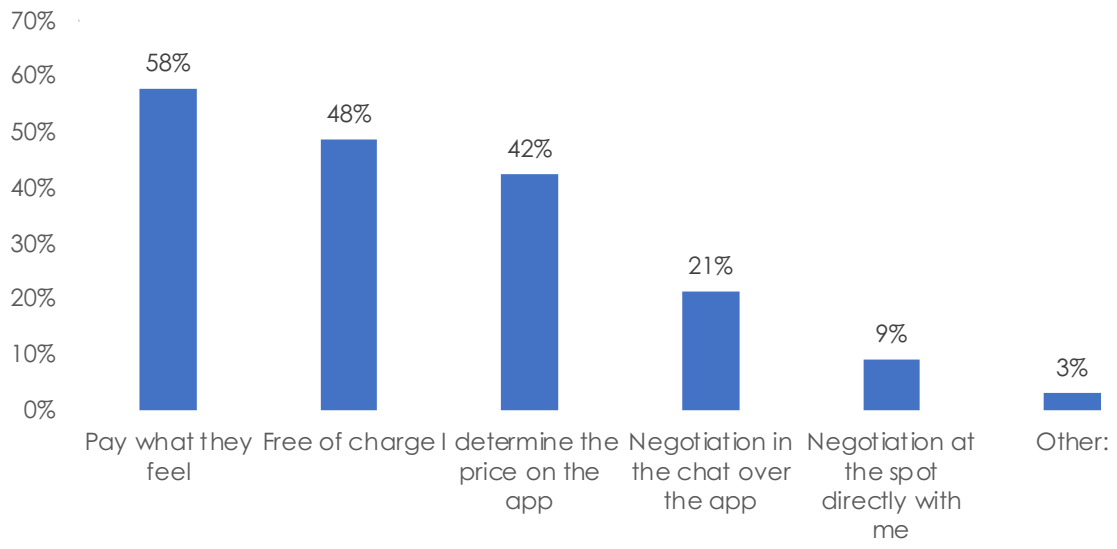

Figure 24: Payment preferences of sellers

5.5.6. Key Resources

What assets are required to bring the business model to life? What is required by the building blocks that we have defined so far such as the value proposition? These assets may range from physical, intellectual, to human or financial (Osterwalder & Pigneur, 2010).

Harvest Club is an integrative application software bringing two parties together on a platform. The physical asset offered on *Harvest Club* is grown, produced, and owned by the seller who independently offers it. *Harvest Club* does not own physical food products. The seller may upload his products at a certain price while the buyer can see it directly on an intuitive map interface of the local community (Figure 25). In the future a logistics system might be introduced. In the meantime, a solution could be using the established infrastructure of the business Food Assembly or the postal services.

The platform will provide an extensive customer database while the interactive part will be reviewing the ratings and feedback of users. There will also be an engaging, inspirational blog managed by *Harvest Club* with input from users.

Figure 25: Harvest Club app mock-up

5.5.7. Key Activities

What activities are required to make the business model work? Building on the principal resources, the key activities ensure that processes between the key resources are efficient (Osterwalder & Pigneur, 2010).

As a platform that builds on network effects, customer acquisition and retainment is important. The challenge here will be building a wide-reaching brand while promoting the hyper-local aspect aimed at creating a community. Therefore, marketing activities will engage local communities in-person to gain customer trust and empower users who might turn into brand ambassadors to promote the app.

Furthermore, business models designed with a platform as the key resource are dominated by platform- or network- related activities. *Harvest Club*s business model requires the ongoing development and maintenance of the platform as well continuous investment and monetizing the business model to reach economic profitability.

The main activities will be platform enhancement, management, and promotion.

5.5.8. Key Partners

Partnerships play a vital role in the growth of any organization. Key partners present an essential piece of the venture development and offer added value through additional resources, support

and activities to the product or service. Therefore, partnerships should aim to interlink all aspects of the business model to make it more efficient and attain sustainable growth (Osterwalder & Pigneur, 2010).

An effective way to find sellers, the first corporate partners, is to cooperate with farmers renting part of their fields to people like Lars or similar projects around growing are doing. Those partners may in return promote *Harvest Club* while being promoted on the platform. Farmers that would like to engage as a C2C entity for the first time might be interested in *Harvest Clubs* customer base and know-how, saving them from investment into logistics and communication channels. Lastly, alternative projects such as Wir:Markt, a democratic supermarket, might be partners to engage with, building upon a shared vision of disrupting the current system and profiting from a similar customer base.

Regarding the entrepreneurial perspective, *Harvest Club* offers an added value for sellers of extra income, taking a step toward financial autonomy. This can drive users to turn into so-called ambassadors to spread the word and provide a human touch to the platform. There will also be garden influencers who could contribute and be featured in the blog, in turn promoting *Harvest Club* within their network.

Lastly, the decentralized approach brings local communities closer together and contributes to the economy of neighborhoods and villages, thus governmental and institutional partnerships might also present a partnership option in the future (Feldmann & Hamm, 2015).

The strategic cooperation with the above-mentioned partners will support not only the inclusiveness of the platform but offer an actionable path to a more sustainable consumption allowing the individual to act, thus empowering the user (Polackova & Poto, 2017).

5.5.9. Cost Structure

Once key resources, activities and partners have been identified the resulting costs of delivering the value to the customer can be determined. How much costs are caused by the operations? What investments will need to be made into key resources, activities, and partners? A strategic approach to the cost-structure is crucial for the long-term performance of the business (Osterwalder & Pigneur, 2010).

As a value driven business, the value delivered to the customer is at the heart of *Harvest Club*. More important is the users access to and interaction with the platform.

Variable costs will be driven by customer acquisition activities such as building partnerships to promote the platform once an initial user base has been established. Here, costs of creating and

maintaining the partnerships will mainly be human interaction. Creating an event combined with a crowdfunding campaign to start off the platform would support the customer acquisition phase. Local social media partners or farmers can be invited to talk and share their experiences with potential customers. Also, events like Lars open farm day can be used to talk with potential customers and promote the platform.

The fixed costs will be in form of platform operations, such as development, maintenance and continuous UX design to ensure a smooth operation without bugs that competes in the application world. Furthermore, data related activities such as protection and storing are long-term costs, as well as Apple and Android store fees. However, these fixed costs should shrink relatively due to the advantage of economies in scope, meaning that the cost per user will decrease through an increase of usage of the platform.

To conclude, the business model canvas can be completed (Figure 26).

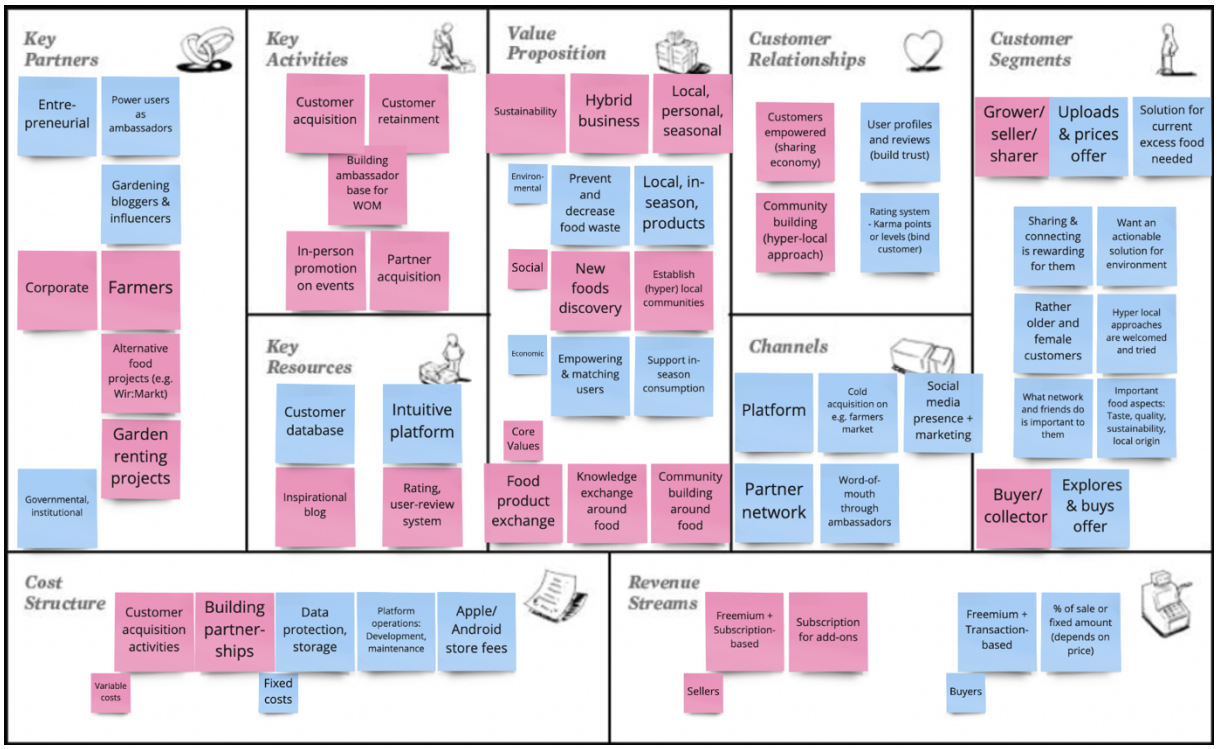

Figure 26: Harvest Clubs Business Model Canvas

5.6. Risks and Concerns

5.6.1. Risks for Sharing Business Models

Sharing economies may evolve from a sustainable idea to increased consumption (Martin, 2016). Take Airbnb, which was thought to be a home exchange, but has instead become a profitable real estate business driving up rent prices in cities, as holiday apartments offer a

higher revenue. Or *Too Good To Go,* which incentivizes businesses to produce more food portions to sell them to users instead of adapting their production to produce less waste. Or *OLIO,* a food exchange platform, where users now share everything such as furniture along with food.

For *Harvest Club,* a challenge could be smaller supermarkets selling non-local and non-seasonal foods, or app users collecting free food from sellers all over their region and then selling it on instead of consuming it. These uses of *Harvest Club* would lie outside the focus of the business and need to be kept in mind while developing app and community.

Another point is the trust basis. A sharing economy is based on trust, and little can be controlled by the platform. Fraud schemes have happened on platforms such as *Vinted*. It is on the user to evaluate the trustworthiness of a profile. *Harvest Club* will play a role in blocking users and detecting false profiles. However, through the hyper-local approach, this risk might be mitigated as people are sharing a neighborhood and have personal exchanges. It is less anonymous than other platforms.

5.6.2. Legal concerns

As food products are being exchanged on *Harvest Club*, there is the question of legal liability and implications. Food products are already offered on platforms such as *ebay Kleinanzeigen* or *OLIO*. *Harvest Clubs* offer is not certified, as the sellers are foremost private users. As other platforms *Harvest Club* will not be liable for products dealt on the platform. Typically sharing economy platforms empower the user, but the user also must take responsibility for what he or she buys from whom (Polackova & Poto, 2017). *Harvest Club* can only refer to user reviews and prior experiences with a seller and suggests the user to take these into account. By going to the seller to pick up products, users will function as agents to confirm that sellers are growing or producing in a way they advertised before. In the industry blockchain adoption might mitigate food safety risk in the future (Duan et al., 2020). Eventually new technologies may help *Harvest Club* to improve food safety for customers as well decrease food waste (Yiannas, 2018).

6. Conclusion

The theory combined with the practical findings provide a holistic picture of the market, the problem, and the respective solution. The food price index has experienced a big increase with a growing worldwide demand for food and uncertainties in the supply chains while the fresh

produce market experiences steady growth. Fruit and vegetables have a relatively high price compared to their costs and are increasingly added into diets nowadays. Urban gardening and farming are on the rise. Yet, food waste and sustainable options remain a problem yet to be solved.

The research question, *How to reduce food waste by bridging the gap between private food producers and potential local consumers?,* can now be answered:

After the underlying assumptions were explored, it was proven that people are in pain because of food waste, that food is thrown away often and people are aware of it, and that they feel the need to change this. Also, people are producing a surplus in food and are looking for a way to make an extra profit or find someone to appreciate their work.

This will be leveraged by empowering small-scale private producers to share their produce with the neighborhood through a new channel, *Harvest Club. Harvest Club* will be a platform that presents an action-oriented solution to reduce waste. There are two distinct user groups of the platform – buyers and sellers. Crucial platform features were discovered and confirmed based on the different problems the platform solves. Establishing enough sellers is critical. Approaching sellers is more efficient and effective, targeting older and female. The channels to reach them will be influencers, word-of-mouth, and the local farmer's market. As for the communication aspects such as quality and sustainability - seasonality and regional will be the focus. A problem in this industry is the seasonality of fresh produce and vegetables, posing a risk to steady revenues as well as the issue of quality control of the produce which lies outside of the scope as of now since the produce is not owned by the platform.

Harvest Club is more than a platform. It is a network and a community builder striving for expanded knowledge as well as produce exchange while bringing people together in an inclusive approach.

Harvest Club shows the potential of tackling 5 SDGs: *3 Good Health and Well-being*, *11 Sustainable Cities and Communities*, *12 Responsible Consumption and Production*, *13 Climate Action* and *15 Life on Land* for which concrete targets will be defined in the future. It was discovered that *Harvest Clubs* MVP can grow with time. The platform can help people eat more seasonal while educating them through a calendar that shows what is in season in their region.

Harvest Club can help bridge the gap between private food producers and their local customers. For producers that discard fresh food, the amount may be reduced through selling it on the platform. However, the scale at which food waste is reduced remains uncertain.

6.1. Limitations and Recommendations

The meaningfulness of a survey may suffer due to different reasons, such as survey design, distribution channels or participants.

Judging from the conversations with participants after taking the survey, some only realized which homemade or homegrown products they already receive after discussion. Thus, some survey participants were not aware of it. Particularities such as this might influence survey results. A more efficient design could have collected more accurate feedback. Distribution channels were limited to unpaid ones and relied heavily upon participants to forward the survey. Thus, the reach is limited, and the participants are not representative of the population compared to a paid, targeted market research. The question about surplus in food was only asked to sellers. However, it would have been interesting to ask everyone instead to crosscheck the awareness of people and be able to compare the dataset with the literature data on food waste in households. Concerning participants two biases are important to mention: social desirability and non-response. The first bias relates to participants giving answers that may not be correct but may be desirable from a social standpoint, which might be the case with honesty about throwing away food. The second bias results as actual participants differ from those who refuse to participate, which was accounted for by having the option to choose not to join *Harvest Club*.

The creation of a business model is not fully complete with the approaches taken in this paper. To create a profound basis for a pre-seed business implementation, financial forecasts, prototyping, and other approaches are required. Due to the restricted length of this paper, only the most relevant factors were included, which were a competitive market analysis, collecting and analyzing customer insights as well as building the canvas.

6.2. Managerial Contributions

Throughout the course of the paper, the pains and needs of different market segments were identified to provide the business with different problems to solve. Different assumptions were tested to confirm these needs and get a deeper understanding. Insights included a deep dive into how small producers grow their own food and how they feel about sharing it, how and from which source consumers prefer their fresh produce, and how much they already consume from the garden.

The value proposition was then built for these specific target segments to solve their problems. Different potential ways of market entry were found and recommended. Relevant cost and

revenue structures were discussed providing potential businesses or other types of organizations an easier way to achieve not just environmental and social, but also economic sustainability. The thesis is contributing to the research in the general area of food waste and sharing economies, aiming on relevancy for other business that strive to enter this market.

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Appendices

Appendix 1 – Interview Guide Explorative Interviews

Harvesting/Working in the garden

- "Tell me about the last time you harvested" (Do people want the experience? How much work is it? How much time do you invest?)
- "What activity of yours would be the closest substitute to harvesting or working in the garden? What do you like/dislike about it?"

Exchanging

- "Tell me about the last time you exchanged something (homegrown)", "What would have made it easier? What was missing? What did you enjoy most about it?"
- "How many times did you sell/offer/exchange/donate/give away/receive homegrown fruits or veggies other products last year? How many times did you exchange something in the last 12 months, and what?"

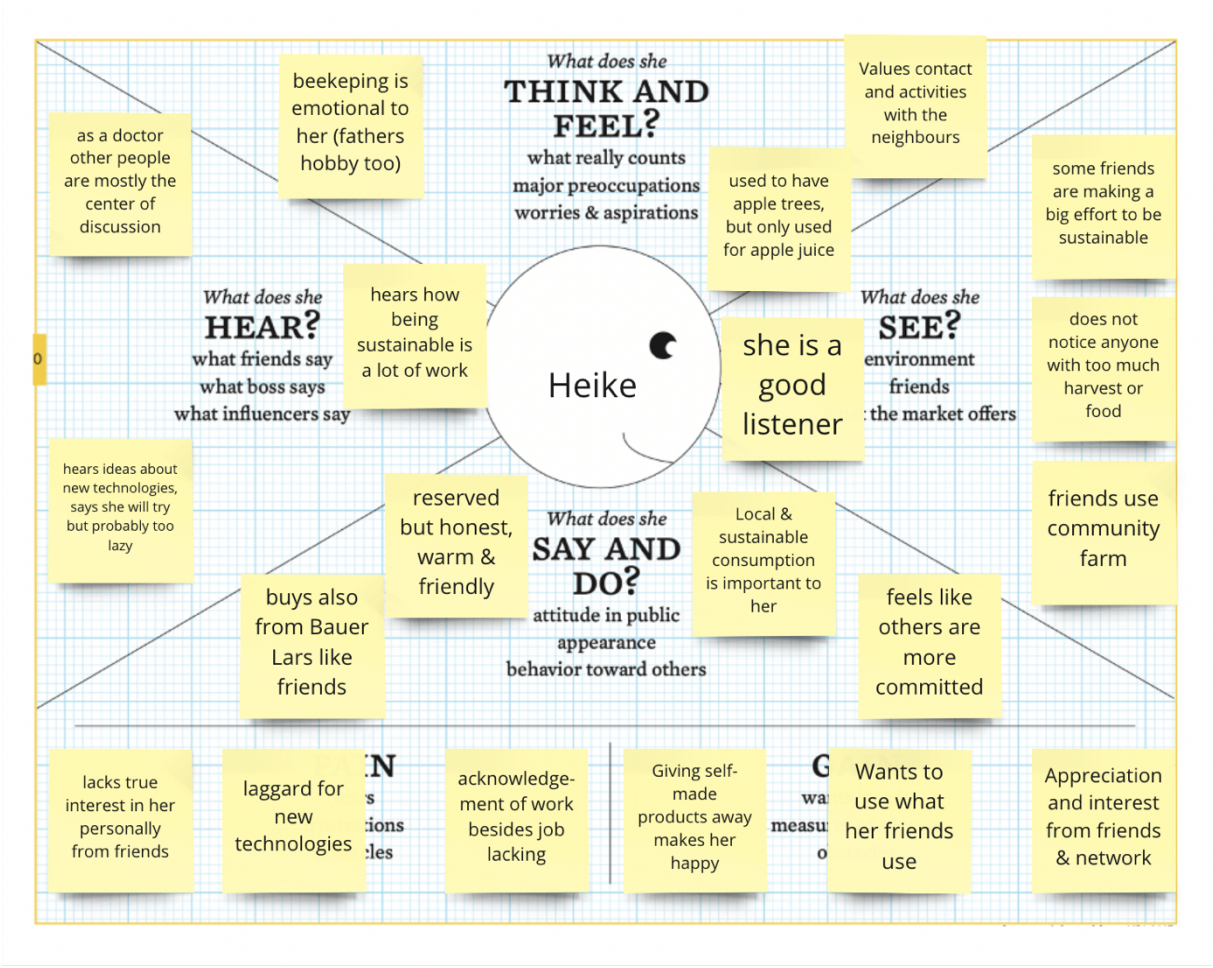
Neighborhood

- "Tell me about the last time you spent time with a neighbour… What did you like about it? What is a good relationship with neighbors for you?"
- "How much time have you spent with your neighbors in the last six months?"

Competitors/ Sharing Economy

- "Tell me about the last time you used eBay or eBay Kleinanzeigen?"
- "What can you tell me about the app TooGoodToGo?"; "What are strengths and weaknesses?" What is the most important aspect or feature? What are you missing?"

Appendix 2 – Exemplary empathy map (Heike)



Appendix 3 – Secondary Data Sources

Type of Source	**Publisher**	**Author**	**Publishing Date**	**URL**	**Date of Access**
Website	n.a.	n.a.	n.a.	https://www.ackergemuese.de/	25.05.2022
Website	n.a.	n.a.	n.a.	https://toogoodtogo.de/de	25.05.2022
Website	n.a.	n.a.	n.a.	https://www.clarifruit.com/	25.05.2022
Website	n.a.	n.a.	n.a.	https://olioex.com/	25.05.2022
Website	n.a.	n.a.	n.a.	https://etepetete-bio.de/	25.05.2022
Website	n.a.	n.a.	n.a.	https://www.equalfood.co/	25.05.2022
Website	n.a.	n.a.	n.a.	https://laruchequiditoui.fr/en	25.05.2022
Website	n.a.	n.a.	n.a.	https://www.gogetgreen.dk/	25.05.2022
Website	n.a.	n.a.	n.a.	https://foodsharing.de/	25.05.2022
Website	n.a.	n.a.	n.a.	https://www.geev.com/en	25.05.2022
Website	n.a.	n.a.	n.a.	https://nebenan.de/	25.05.2022
Website	n.a.	n.a.	n.a.	https://www.ebay-kleinanzeigen.de/	25.05.2022
Website	n.a.	n.a.	n.a.	https://wirmarkt.de/	25.05.2022
Website	n.a.	n.a.	n.a.	https://www.gut-wulksfelde.de/	25.05.2022
Website	n.a.	n.a.	n.a.	https://www.kptncook.com/en/faqs	25.05.2022
Website	n.a.	n.a.	n.a.	https://www.vinted.de/	25.05.2022

Appendix 4 – Survey Script & Results

The survey development started on the 6th of April 2022 and was refined over the next 4 weeks.

Underlying problems - To which extent do you disagree or agree with the following statements?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I understand the problem of food waste	1.00	7.00	6.23	1.19	1.41	211
2	Food waste concerns me	1.00	7.00	5.87	1.14	1.30	211
3	Wasting food pains me	1.00	7.00	5.96	1.33	1.76	211
4	Buying food that is in season helps the environment	1.00	7.00	6.24	1.17	1.37	211
5	I buy products based on season	1.00	7.00	4.59	1.29	1.66	211
6	Buying local products helps my community	1.00	7.00	6.09	1.14	1.29	211
7	I value local products	1.00	7.00	6.12	1.14	1.29	211

Garden - Do you have access to a garden where you currently live?

#	Answer	%	Count
1	Yes	45.97%	97
2	No	51.66%	109
3	Other:	2.37%	5
	Total	100%	211

Growing experience - Are you growing or producing any fresh food? (choose all that apply)

#	Answer	%	Count

1	No	51.78%	131
2	I am growing vegetables	21.34%	54
3	I am growing fruits	16.60%	42
4	I am growing/ producing other foods (yeast, mushrooms, honey, herbs, kombucha, beer, etc.):	10.28%	26
	Total	100%	253

Growing experience - I am growing/ producing other foods (yeast, mushrooms, honey, herbs, kombucha, beer, etc.)

Herbs
Herbs
Herbs and fermented foods
Honey
Herbs
Herbs and vegetables
Herbs, salad
vegetables
Tomato, cucumber, peppers
herbs
herbs

Growing spending - How much are you spending on a yearly basis for producing or growing in €? (e.g. soil, new plants, equipment, etc.)

#	Answer	%	Count
1	0 - 25	24.68%	19
2	25 - 50	23.38%	18
3	50 - 75	18.18%	14
4	75 - 100	12.99%	10
5	More than 100	20.78%	16

Total	100%	77

Idea perception - We are launching "Harvest Club", an app where you can share fruit, vegetables, and other homemade and homegrown foods. You simply take a picture and upload it online when you have a surplus (= too much for your own consumption), so your friends, neighbours and people in your area can pick-it up. Your local farmers will also join this app so you can buy what is in season in your region, allowing you to enjoy more local, seasonal, and sustainable food from private as well as professional farmers - all while reducing food waste. Keeping this idea in mind, to which extent do you disagree or agree with the following statements?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I have every intention of using this service in the future	1.00	7.00	4.73	1.47	2.15	211
2	A network like this is missing in my area or community	1.00	7.00	5.35	1.54	2.38	211
3	I am likely to tell my friends about this service in the future	1.00	7.00	5.22	1.56	2.42	211
4	I want my local farmer to join this service	1.00	7.00	5.48	1.42	2.02	211
5	I want to reach farmers digitally	1.00	7.00	5.48	1.47	2.16	211

Splitting - If you joined the platform "Harvest Club" would you rather be...

#	Answer	%	Count
1	A sharer/ seller	1.90%	4
2	A collector/ buyer	76.30%	161
3	Both	13.74%	29
4	I would not join this platform	8.06%	17
	Total	100%	211

Seller food - What food do you produce, make or have too much of? Please list all that come to mind.

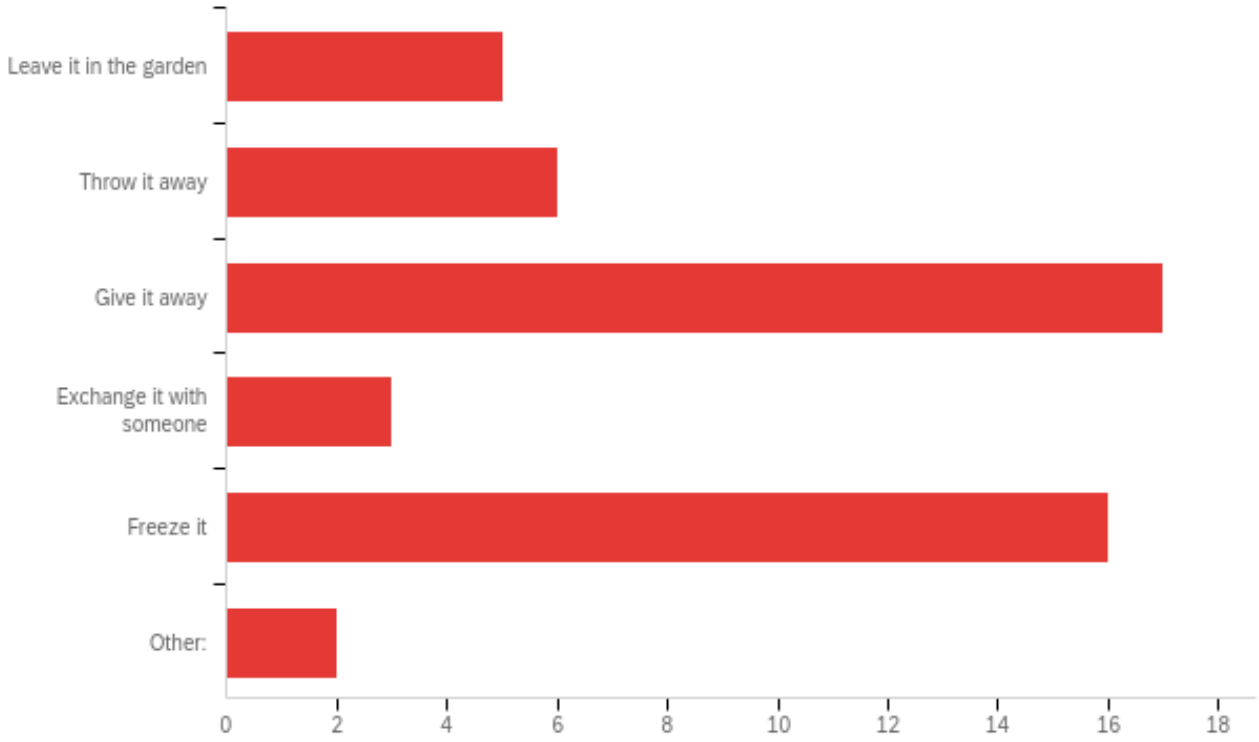
Vegetables I often have over. The quantity is often too much for a single person.
Chilis, Tomatoes, Herbs
Honey
Raspberries, strawberries, blueberries, peppers, spinach, kale, herbs
Things that I cook or buy, but cannot finish myself. And mushrooms are planned in the future
apples potatoes bread onions
honey, apples, pears
bread, vegetables
Fruit
watermelon
Tomato’s, zucchini, cucumber
Salat, apples, leek, herbs
Pumpkin, salad, apples
herbs, vegetables (carrots, tomato, potato,..)
Apples
slipper, beans, lettuce, figs, cucumbers
Herbs
Fruit
bread, diary

onions, spring onions
carrots, spinach, cherries, apples, potatoes, grapes
apples, pears, plums, tomatoes, beans, strawberries, raspberries, pumpkin, zucchini, cucumbers
pears, sometimes cherries, soon apples will join them
various vegetables
potatoes, leeks, herbs
Vegetables fresh and cooked
chili, tomatoes, parsley, paprika, lovage, garlic, potatoes
zucchini, peppers, honey, apples, currants, cucumber, cherries
herbs
Herbs
none
Strawberries, zucchini, lettuce, kombucha mushroom, Siegfried dough,
zucchini, herbs, kombucha mushroom, bread, or cake dough

Seller surplus quantity - How often do you have a surplus in food?

#	Answer	%	Count
1	daily	0.00%	0
2	daily to weekly	9.09%	3
3	2-3 times a month	24.24%	8
4	once a month	18.18%	6
5	every 2 - 6 months	24.24%	8
6	once a year	15.15%	5
7	less than once a year	3.03%	1
8	never	3.03%	1
9	other:	3.03%	1
	Total	100%	33

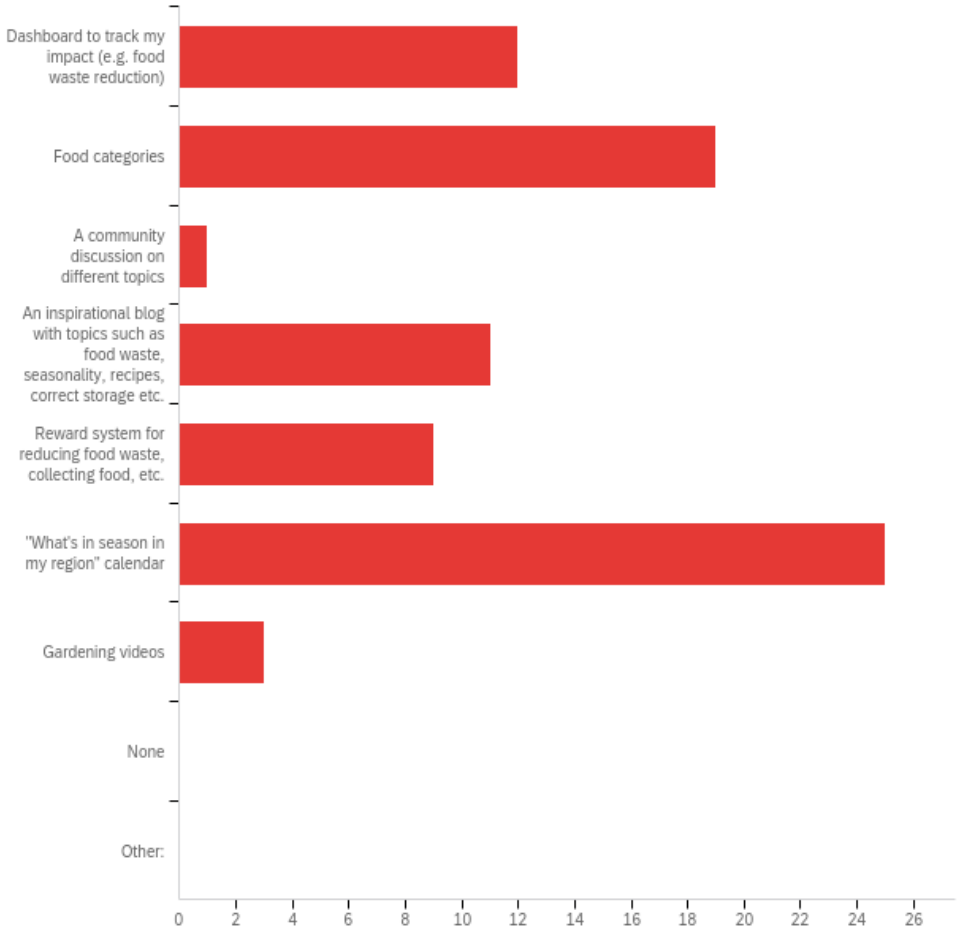
Sellers actions - What are you currently doing when you have a surplus of any food? (choose all that apply)



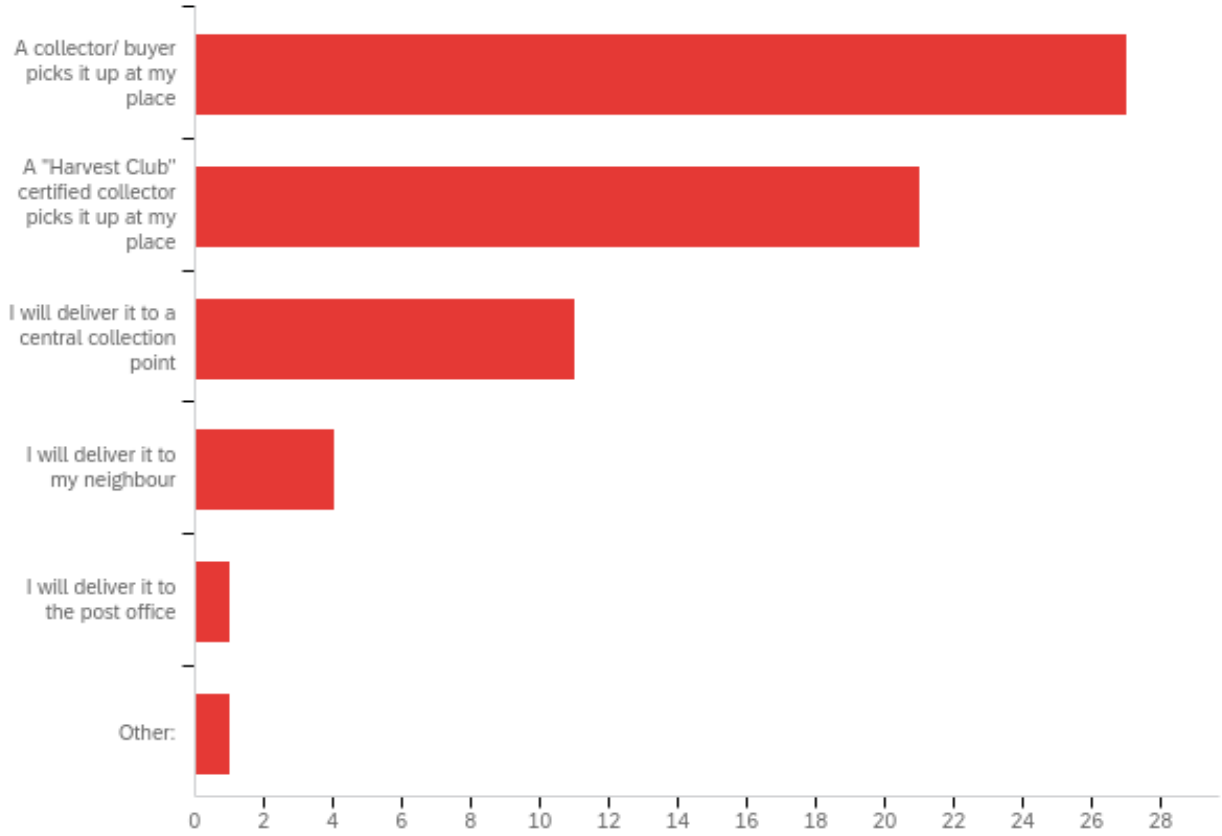
Seller features - Imagine you are downloading the app and joining "Harvest Club" as a sharer or seller. How unimportant or important are the following features for you?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Upload of pictures of my offer	1.00	7.00	5.76	1.48	2.18	33
2	Offer description	3.00	7.00	5.76	1.02	1.03	33
3	Chat function	2.00	7.00	5.52	1.28	1.64	33
4	In-app payment	1.00	7.00	5.06	1.43	2.06	33
5	User reviews of people that request my offer	3.00	7.00	5.67	0.94	0.89	33
6	Filter for my preferred pick-up time	2.00	7.00	5.55	1.30	1.70	33

S extra features - Imagine you as a sharer or seller can customise "Harvest Club". Which of the following features would you choose? (choose maximum of 3)



Seller logistics - How would you as a sharer or seller prefer the pick-up/ drop-off to take place? (choose all that apply)

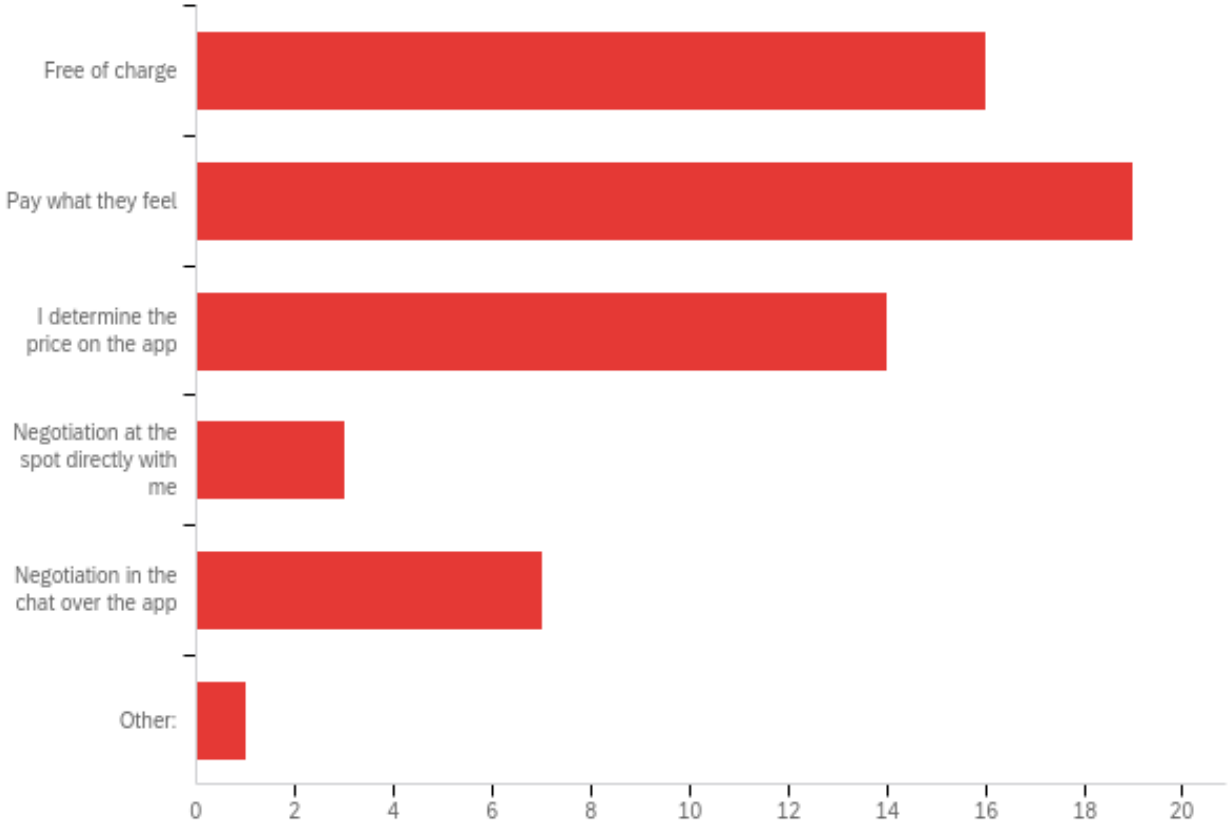


Other:
Any of these are okay with me, I would try to adapt to the buyer/seller

Seller time invest - How much time would you as a sharer or seller be willing to invest into one pick-up/ drop-off?

#	Answer	%	Count
1	None	6.06%	2
2	0 to 15 minutes	27.27%	9
3	15 to 30 minutes	51.52%	17
4	30 to 45 minutes	12.12%	4
5	45 to 60 minutes	3.03%	1
6	More than an hour	0.00%	0
	Total	100%	33

Seller payment ways- How would you as a sharer or seller prefer to charge for your products? (choose all that apply)



Other: - Text

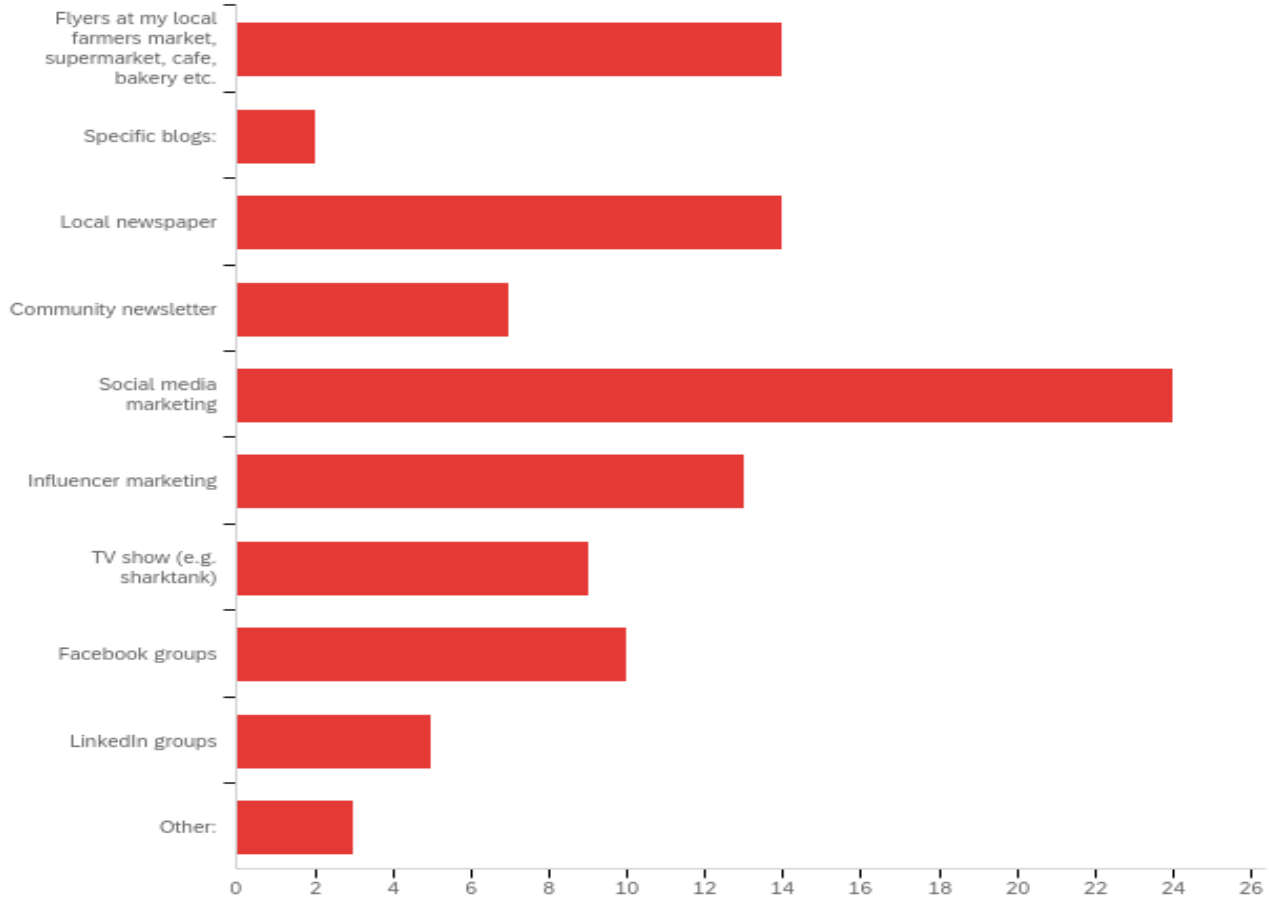
it depends a bit on what it is

Seller payment for app - What would you be willing to pay for using "Harvest Club"?

#	Answer	%	Count
1	A monthly fee	3.03%	1
2	A transaction-based fee (% of a sale)	18.18%	6
3	A pay-what-you-feel/ donation-based approach	24.24%	8
4	This app should be free of charge	33.33%	11
5	Other:	3.03%	1
6	A yearly fee	18.18%	6
	Total	100%	33

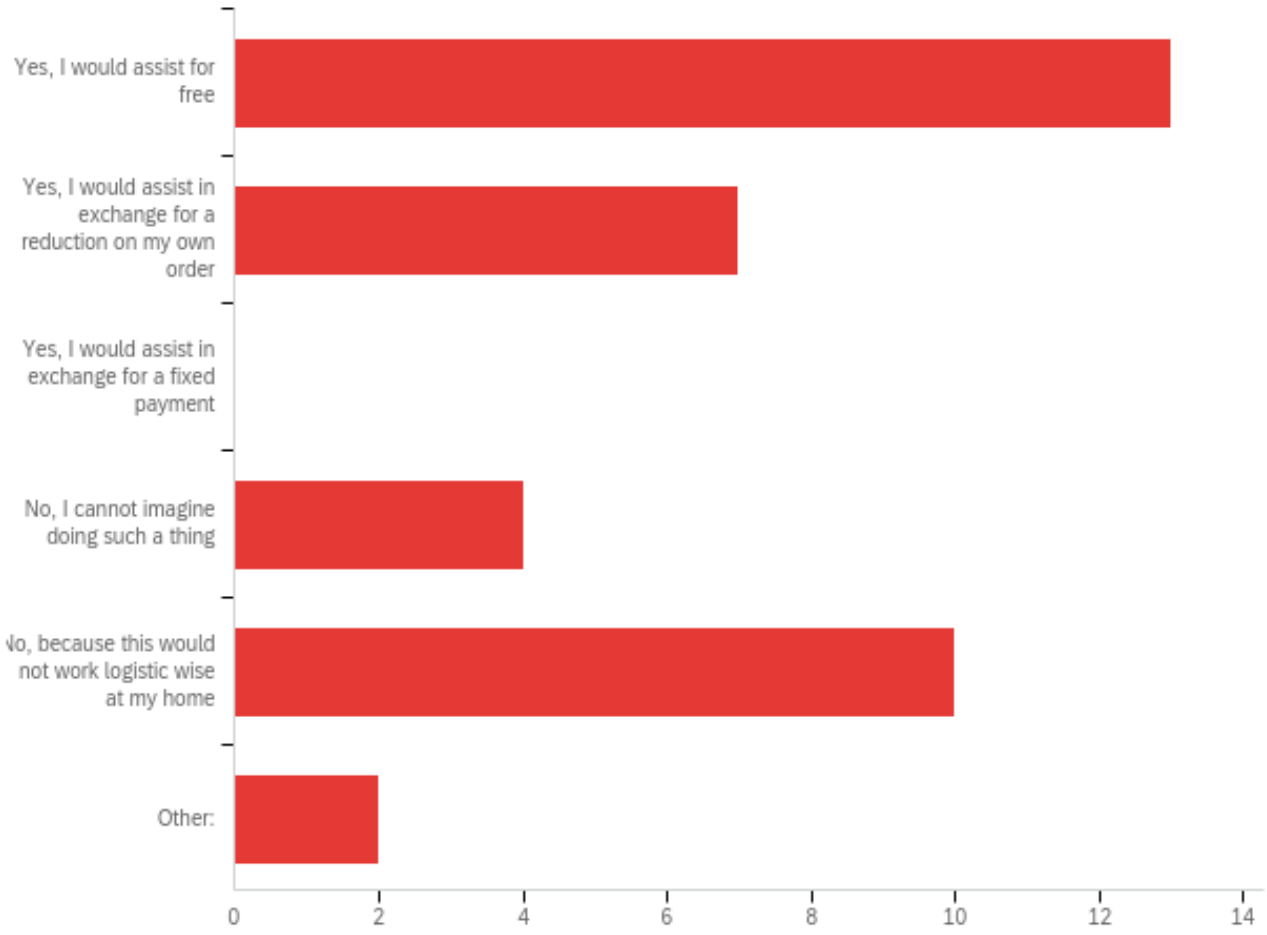
Other: - Text
Maybe a price when you download it

S reach - How do you suggest us, "Harvest Club", to reach you or like-minded people? (choose all that apply)



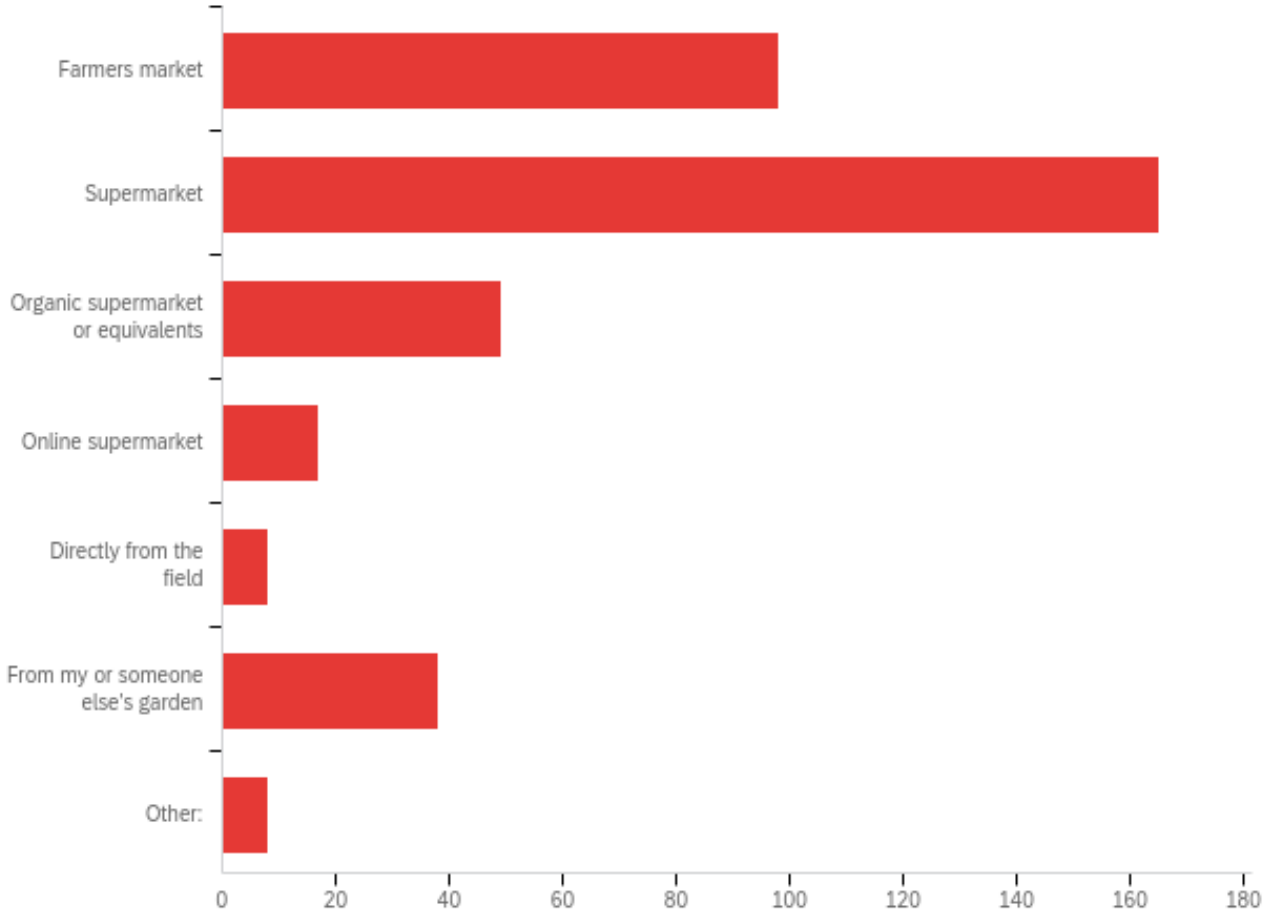
Other: - Text
Kptn Cook
TV
WOM

Seller group collection - Can you imagine serving as a collection point for people in your area to pick-up a group order from a farmer? (choose all that apply)



Other: - Text
I would assist for free if the orders wouldn't have to be kept in the fridge (it would be too small for that)
Sometimes

Buyers behaviour - Where are you mostly getting your fresh food? (choose all that apply)



Other: - Text
Bio box
Weekend market
Crowd farming
too good too go
Crowd farming App
Online-specialist
From farmer
Organic delivery service

Buyer normal logistics - How are you mostly collecting your fresh food?

#	Answer	%	Count
1	Walking	43.16%	82
2	By bicycle	23.68%	45
3	By car	26.32%	50
4	Home delivery	3.68%	7
5	Someone else does it for me	2.63%	5
6	Other:	0.53%	1
	Total	100%	190

Other:
Public transport

Buyer time invest now - How much time do you invest weekly into getting fresh food?

#	Answer	%	Count
1	None	1.05%	2
2	Less than an hour	24.21%	46
3	1-2 hours	53.68%	102
4	2-3 hours	17.37%	33
5	More than 3 hours	3.68%	7
	Total	100%	190

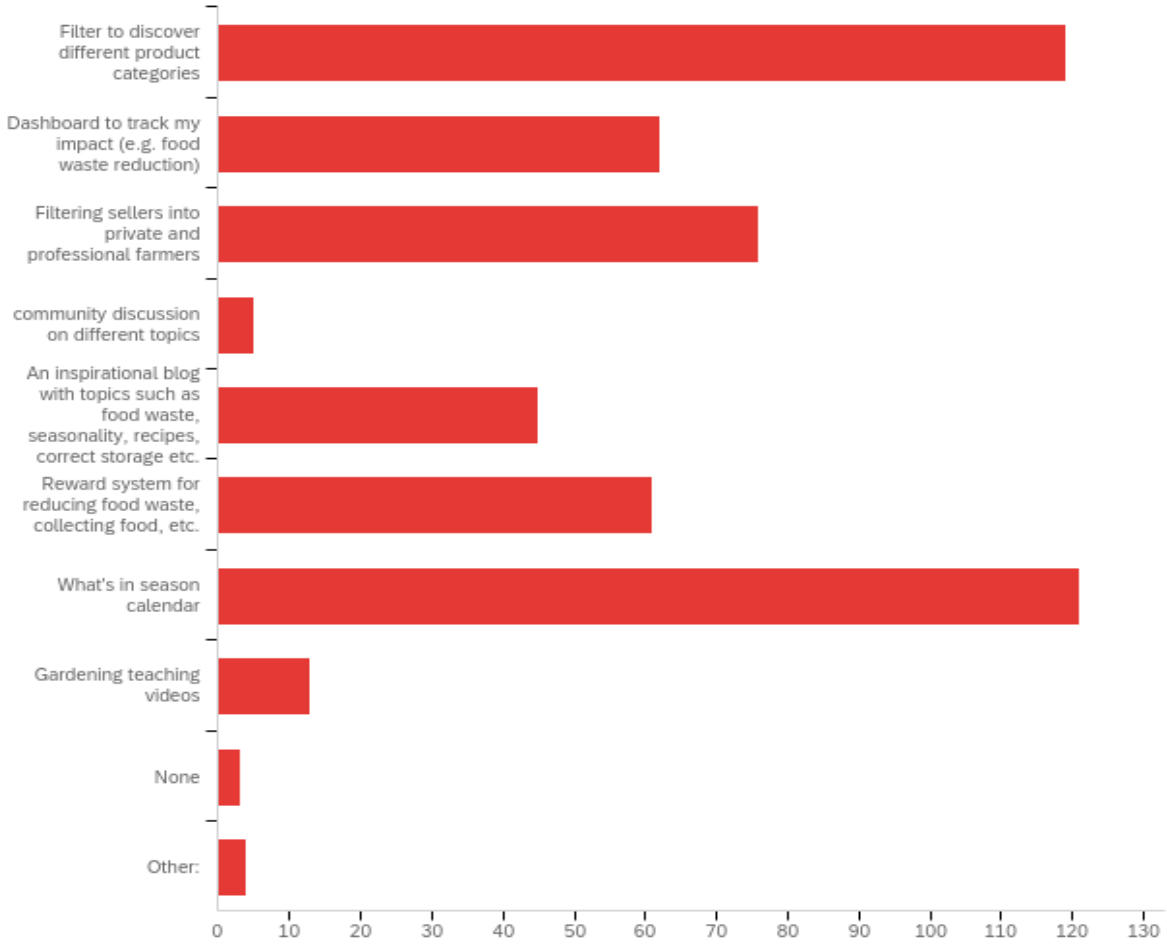
B attribute importance - When getting fresh food how unimportant or important are these things for you?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Price	2.00	7.00	4.84	1.32	1.75	190
2	Quality	3.00	7.00	6.18	0.83	0.69	190
3	Taste	2.00	7.00	6.22	0.85	0.73	190
4	Seasonality	2.00	7.00	4.76	1.25	1.55	190
5	Local origin	2.00	7.00	5.06	1.25	1.56	190
6	Sustainability	1.00	7.00	5.13	1.26	1.58	190
7	Appearance/ look	1.00	7.00	4.52	1.41	2.00	190
8	Durability	2.00	7.00	4.99	1.23	1.51	190
9	Bio or other certificates	1.00	7.00	4.65	1.51	2.27	190
10	Recipe ideas	1.00	7.00	3.29	1.75	3.08	190
11	Storing advice	1.00	7.00	3.47	1.72	2.98	190
12	Information about the origin	1.00	7.00	5.02	1.44	2.08	190
13	CO2 footprint	1.00	7.00	4.45	1.56	2.44	190
14	Detailed information about the transport	1.00	7.00	3.63	1.63	2.64	190
15	Information about packaging recycling	1.00	7.00	4.31	1.70	2.89	190

Buyers features - Imagine you as a collector or buyer are downloading the app and joining "Harvest Club". How unimportant or important are the following features for you?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Map to see offers near me	3.00	7.00	6.38	0.90	0.81	190
2	Pictures of the offers	1.00	7.00	5.85	1.23	1.52	190
3	Offer description	1.00	7.00	5.72	1.05	1.11	190
4	Filter for possible pick-up time	2.00	7.00	5.89	0.96	0.93	190
5	Chat function	1.00	7.00	4.47	1.63	2.66	190
6	In-app payment	1.00	7.00	5.12	1.65	2.73	190
7	User reviews of the sharer/ seller	1.00	7.00	5.32	1.25	1.57	190

Buyers extra features - Imagine you as a collector or buyer can customise "Harvest Club" with extra features. Which of the following would you choose (choose maximum of 3)?



Buyers time invest - How much time would you as a collector or buyer be willing to invest into one pick-up/ drop-off?

#	Answer	%	Count
1	None	0.00%	0
2	0 to 15 minutes	24.74%	47
3	15 to 30 minutes	51.05%	97
4	30 to 45 minutes	16.84%	32
5	45 to 60 minutes	5.79%	11
6	More than an hour	1.58%	3
	Total	100%	190

Buyers logistics - How would you as a collector or buyer prefer the pick-up/ drop-off to take place?

#	Answer	%	Count

1	Delivered to my door	31.05%	59
2	Delivered to a collection point in my area	32.63%	62
3	Going to the sharer/ seller	34.74%	66
4	Other:	1.58%	3
	Total	100%	190

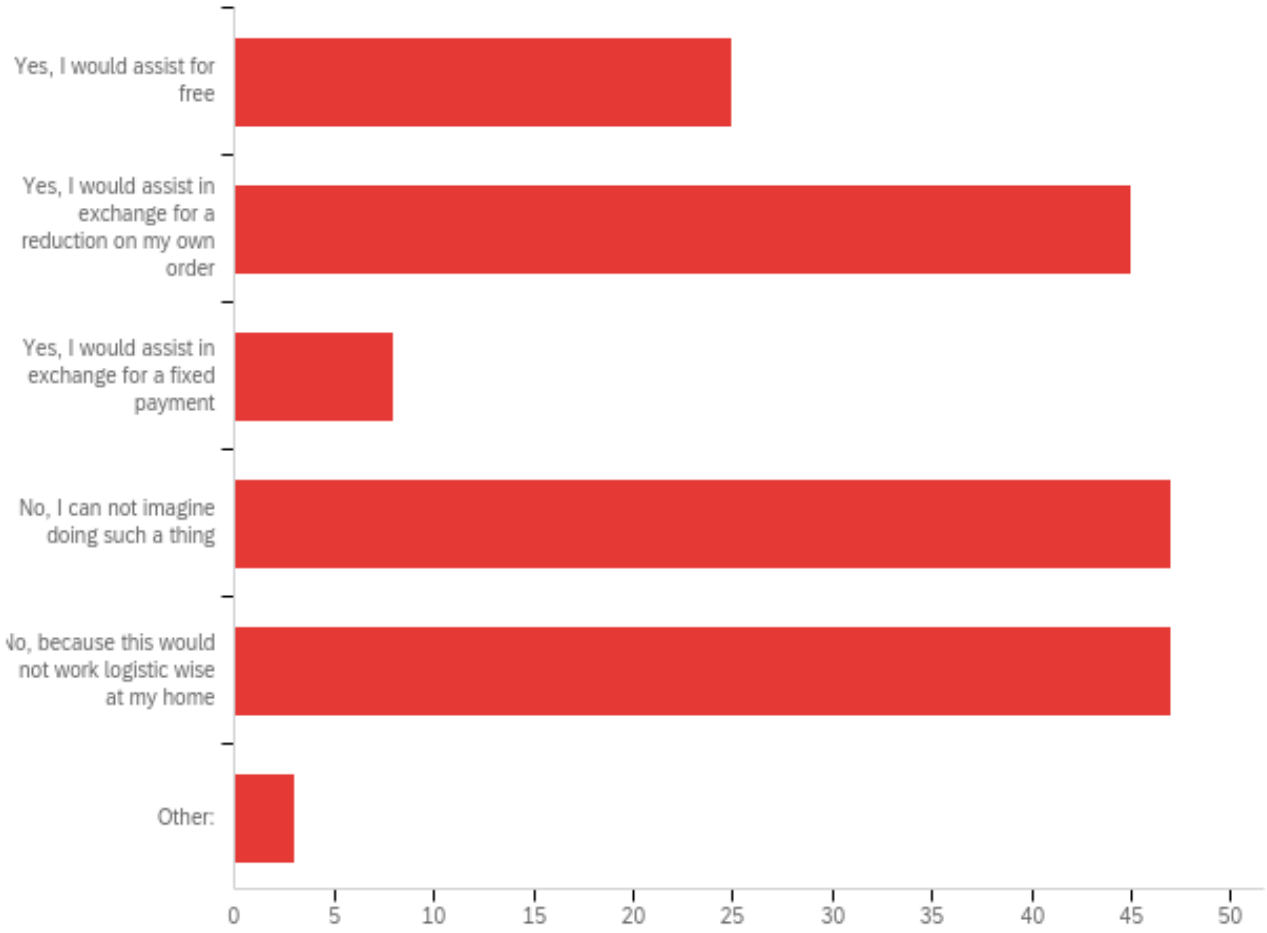
Other:
All three options
Would pick up only if close
I would do all of them, depends

Buyer payment - What would you be willing to pay for using "Harvest Club"?

#	Answer	%	Count
1	A monthly subscription	6.79%	11
2	A yearly subscription	4.94%	8
3	A transaction-based fee (% of a sale)	40.74%	66
4	A pay-what-you-feel/ donation-based approach	14.20%	23
5	Harvest Club should be free of charge	30.86%	50
6	Other:	2.47%	4
	Total	100%	162

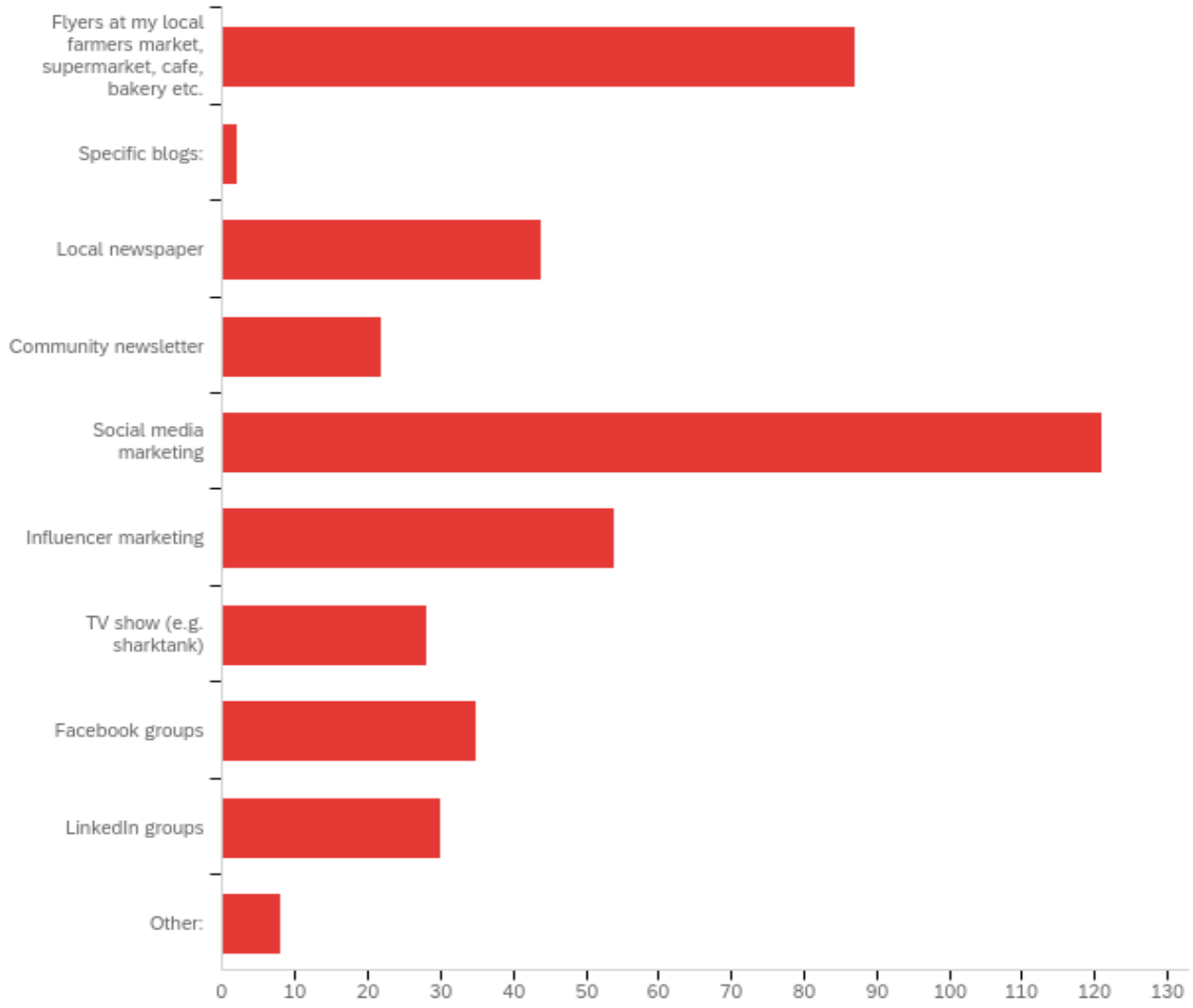
Other:
Seller should pay % of transaction
Seller should pay transaction fee
Should be a fix Price per transaction but need to be careful because the next time I could just go to the seller directly without using the app
Pay when downloading the app

Buyer group collection - Can you imagine serving as a collection point for people in your area to pick-up a group order from a farmer? (choose all that apply)



Other:
Don’t produce enough
Only food that doesn’t need to go to the fridge
Working schedule makes it hard

Buyer reach - How do you suggest us, "Harvest Club", to reach you or like-minded people? (choose all that apply)



Other:
Subject and area specific Reddit channels; creating a discord channel to connect people, communicate and post news.
Word of mouth
Instagram
Magazines
Recommendations
Instagram
Recommendation by users
Advertising at universities

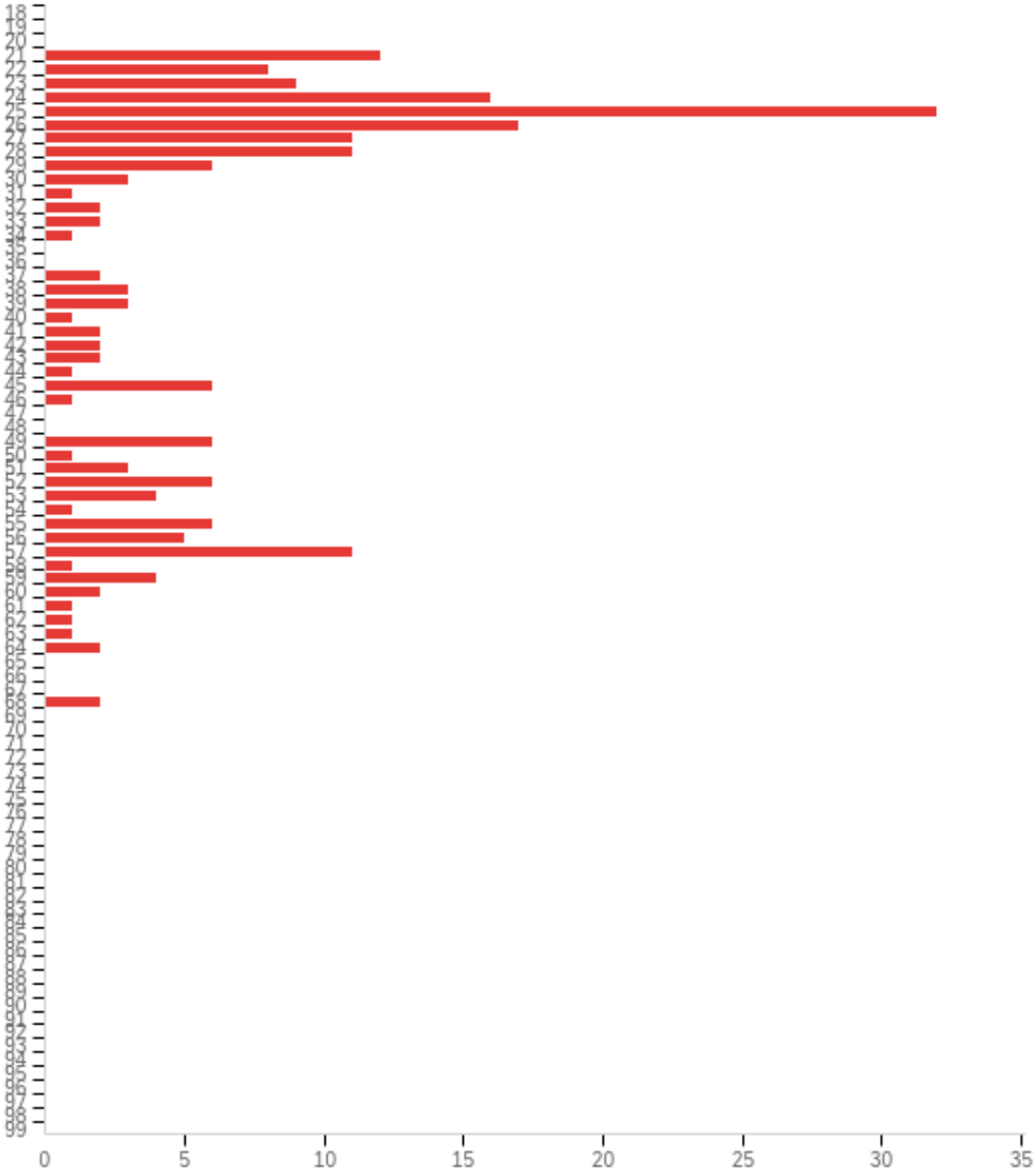
Not interested in platform - What would be needed for you to join "Harvest Club"?

What would be needed for you to join "Harvest Club"?
Only buy leftover produce from farmers at a lower price
I live very central in a big city and don't want to eat anything that grows in my immediate vicinity. (too many exhaust fumes)
Because of my current situation (student) I prefer to buy the products on sale
The guarantee that the products have organic quality.
I don’t see the value for me, I am estimating my consumption relatively good on those products so I would not have surplus. New place to shop from extra hassle.
Convenience, incentive (apart from reducing food waste), knowledge about cultivation (when do I know if a fruit/vegetable is good?, process behind cultivation).
Sorry, no idea. Outside my scope.
more information about pricing, logistics, standards and ensuring compliance with them, etc., i.e. the overall concept.
Guarantee that food produced is not full of pesticides
Maybe a delivery or a central point where I can pick up my food? I'm living alone. Therefore it's too much work/not worth it to drive around and pick up only small amounts of food
Can I not say?
I buy on the farmer market
Information and transparency about the farming methods people use
I do not want to get food through an app.
For me it is not worth it, because I am single.
Quantity of my products is not enough for sale
No relevance for me

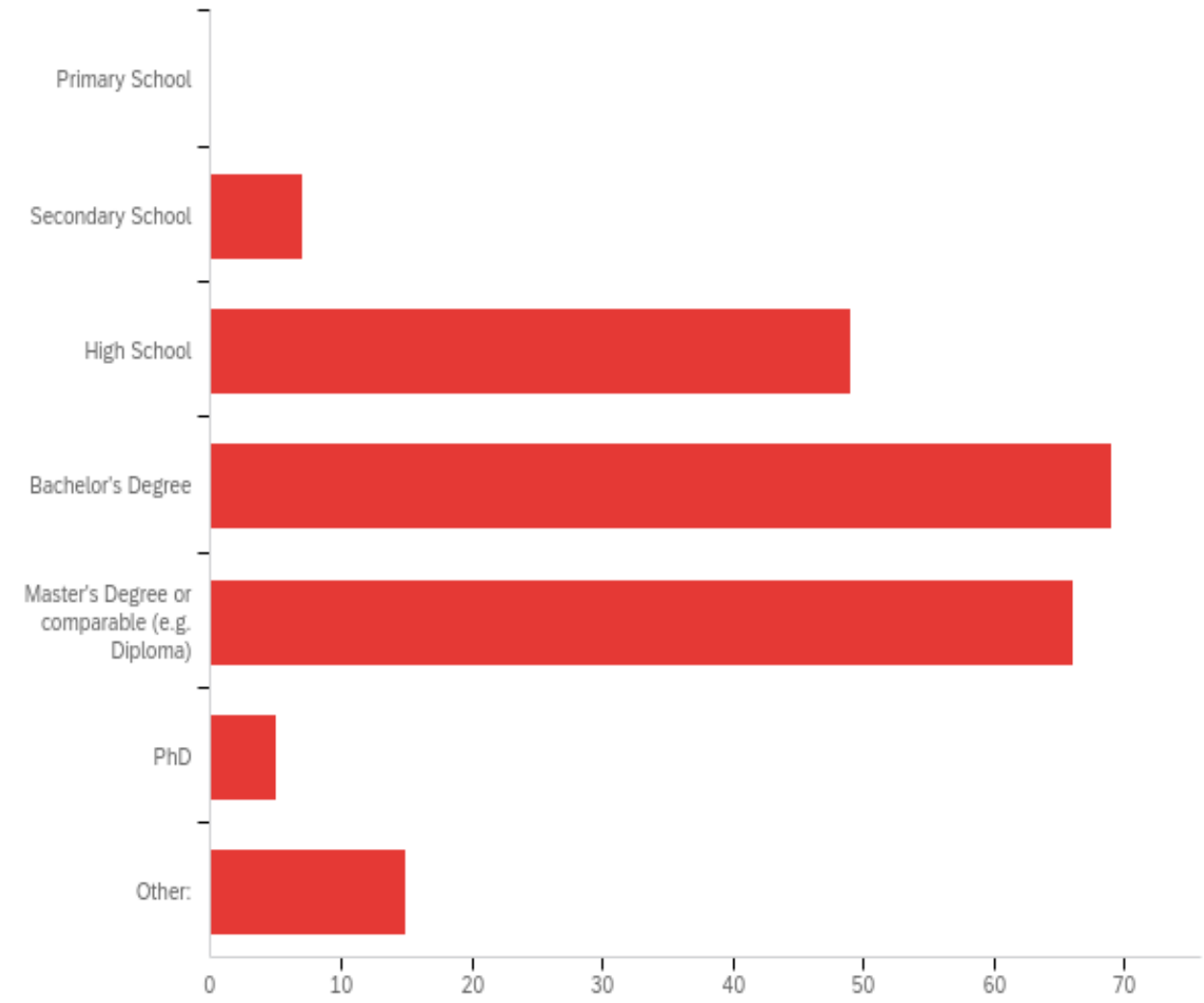
Gender - Which gender do you identify with?

#	Answer	%	Count
1	Male	38.86%	82
2	Female	59.24%	125
3	Non-binary / third gender	0.00%	0
4	Prefer not to say	1.90%	4
	Total	100%	211

Age - What is your age?



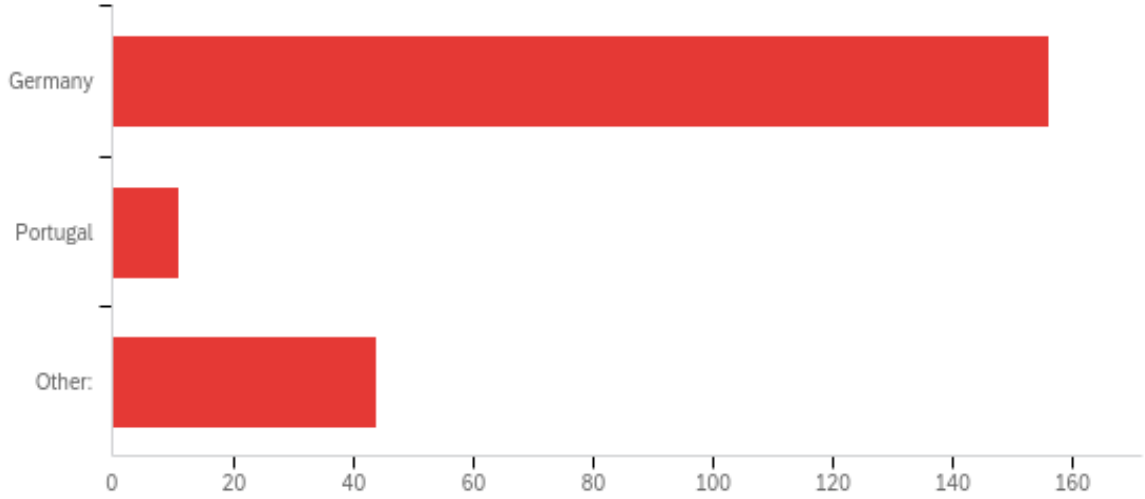
Education - What is the highest degree or level of education that you have completed?



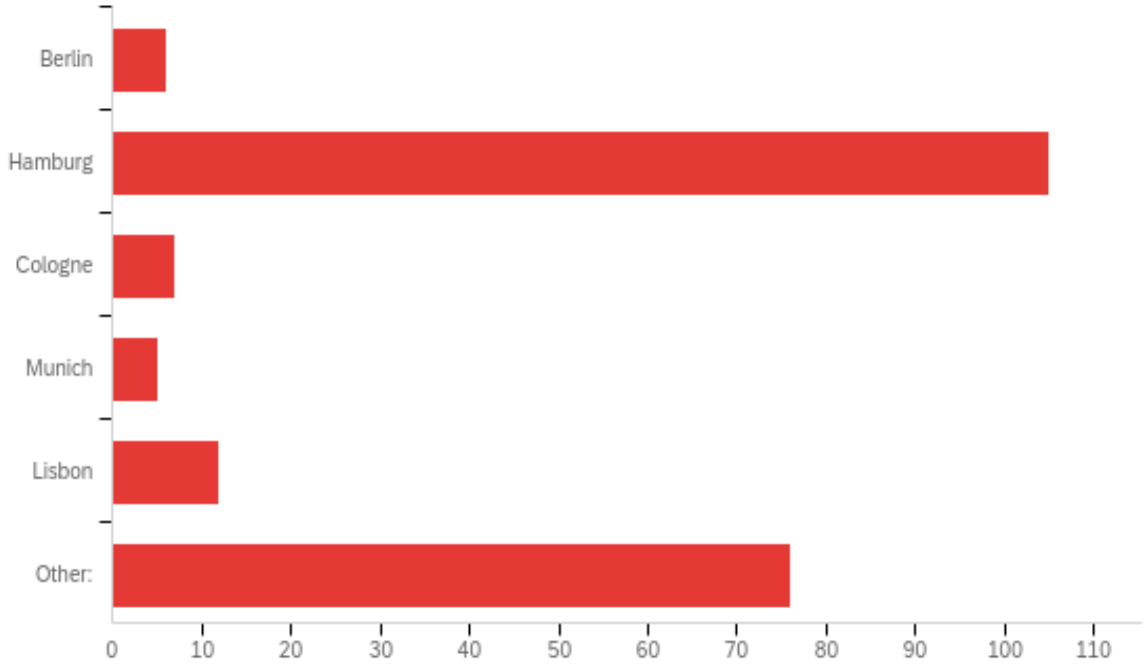
Occupation - Please indicate your current occupation.

#	Answer	%	Count
1	Student	33.18%	70
2	Employed	50.71%	107
3	Self-employed	9.48%	20
4	Retired	1.42%	3
5	Unemployed	2.37%	5
6	Other	2.84%	6
	Total	100%	211

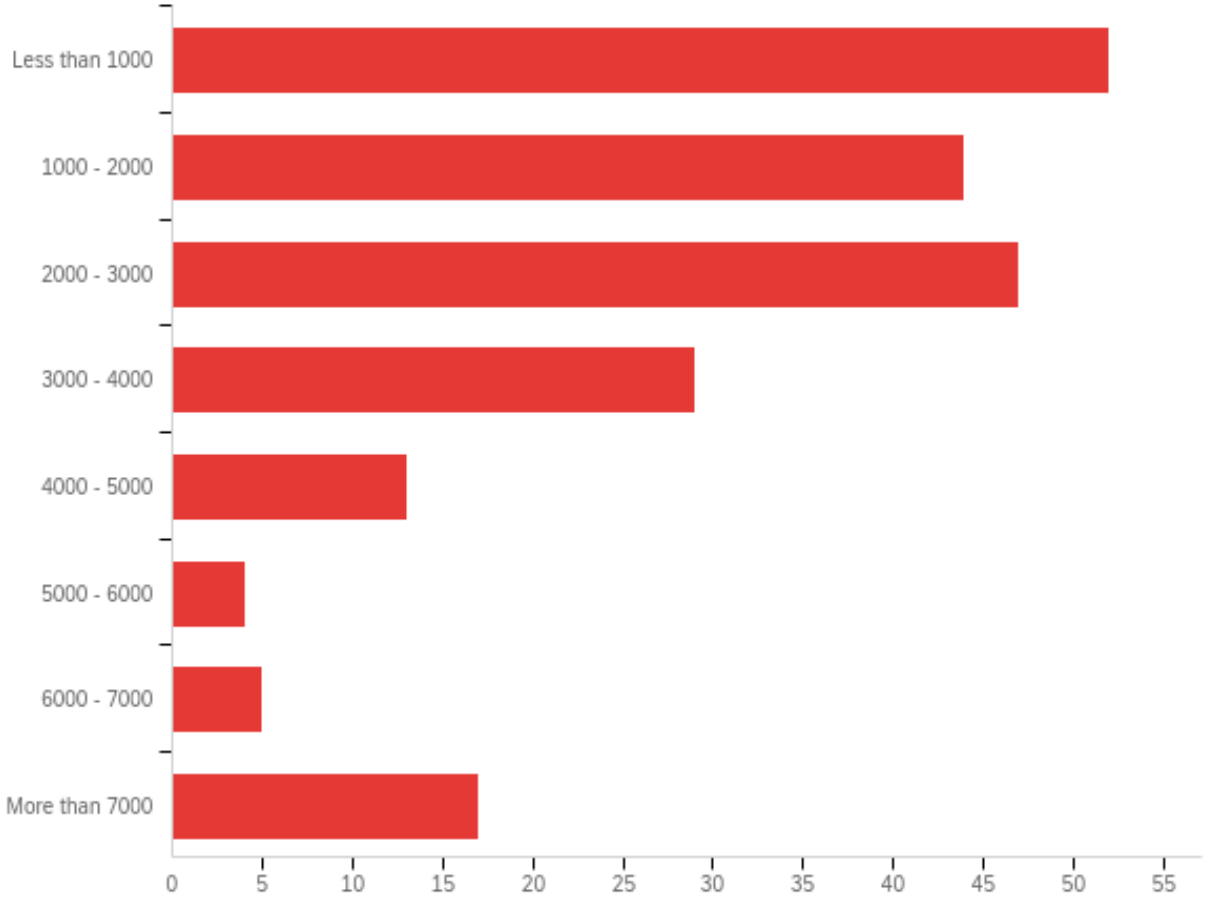
Country - In which country do you currently live?



City - In which city do you currently live?



Income - What is your individual monthly net income in €?


Less than 1000
1000 - 2000
2000 - 3000
3000 - 4000
4000 - 5000
5000 - 6000
6000 - 7000
More than 7000
0
5
10
15
20
25
30
35
40
45
50
55