

IMPACT OF FOOD SHARING INITIATIVES

Evidence from six case studies
in the Netherlands



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ACT Group 3493 - Healthy and sustainable food for everybody: impact assessment of social food gardens.

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Executive summary

This project assessed the dual impact of food sharing initiatives in the Netherlands. Stichting Fondsenbeheer Landbouw en Zorg was the commissioner for this project and provides money and expertise to community gardens as support (Doneren - Stichting Fondsenbeheer Landbouw en Zorg, 2024). The research was conducted with the aim of gaining more insight into the diversity of food sharing initiatives, gathering lessons learned and showing the wide range of impacts they can have.

We investigated the perceived physical and psychosocial impacts of diverse food sharing initiatives. Food sharing initiatives consist of community gardens (volunteer-based gardens, care farms, and community shared agriculture gardens) and food distribution initiatives (food banks and the VoedselHub). The project's added value lies in its holistic approach, combining health, social inclusion, and sustainable food systems. This is reflected in the background knowledge of the team members, who all have different academic backgrounds. The team's expertise consists of sociological, as well as health-related knowledge. This interdisciplinarity gives the team the opportunity to look at the problem at hand from different perspectives. Through this, the team aims to contribute to the evidence base necessary for increased and more sustainable funding of social food gardens. A central risk includes the potential difficulty in engaging vulnerable groups in interviews, which was mitigated through ethical and sensitive research practices. Ultimately, this project supports the recognition of food sharing initiatives as a critical component of the Dutch food aid network, improving both access to nutritious food and the well-being of marginalised groups.

The research was guided by the following research question: 'What is the role and potential of food sharing initiatives in addressing social and health challenges, and how can they be strengthened?' Data was collected through semi-structured interviews, visual analogue scales, and participant observations. These findings informed a Theory of Change and a final academic consultancy report, offering recommendations to the commissioner.

From the results and discussion, it can be concluded that community gardens have a positive effect on several aspects. The gardens have a direct positive effect on the psychosocial and physical health status of participants, and an indirect positive nutritional effect on food bank consumers through produce distribution, although their impact on participants' nutritional health remains unclear. The impacts of the food sharing initiatives depend on their financial structure. Therefore, financial sustainability is crucial for the effectiveness of their operation. Furthermore, the food sharing initiatives could learn from the different approaches each initiative uses. As summarised in the Theory of Change, the inputs clearly contribute to these outcomes. Focusing on the impacts of food sharing initiatives is important for the

contribution to solving the challenges that the healthcare and social welfare sector faces.

This research concludes that community gardens and food distribution initiatives are effective in addressing multiple dimensions of vulnerability and offer valuable social, health, and educational benefits.

Chapter 1

Introduction

This report was made for Fondsenbeheer Landbouw & Zorg, a non-governmental organisation (NGO) that supports community gardens by providing money and expertise (Doneren - Stichting Fondsenbeheer Landbouw en Zorg, 2024). Food sharing initiatives are initiatives that include community gardens and food distribution initiatives. Community gardens consist of three types of gardens: care farms, community supported agriculture (CSA), and gardens that work on a voluntary basis. In the community gardens, vegetables and fruits are harvested by either volunteers, participants or paid workers. The food distribution initiatives consist of the food banks and the VoedselHub. Many food banks receive fresh produce from community gardens.

Community gardens is an overarching term for gardens that are 'common gardens that bring people together and inspire shared action.' Community gardens differ greatly in size, goal and target group (Firth et al., 2011). Most community gardens produce fruit and vegetables for people in vulnerable positions. Some community gardens combine the cultivation of fruit and vegetables with providing a place to work for people with a distance to the labour market. Some others focus on facilitating daycare. Other projects try to actively produce as much fruit and vegetables for people in vulnerable positions, while at the same time including people with a disability or refugees. In some of these initiatives, a paid worker is employed, but mostly, the gardens are heavily dependent on volunteers. A common characteristic of community gardens is that they provide a two-way impact; they help to combat food insecurity, while also providing a community space where people, including disadvantaged groups, can work in nature.

Community gardens combat food insecurity by providing nutritious food for people in vulnerable positions. Even though the Netherlands is a high-income country, many people in the Netherlands experience food insecurity. Van der Velde et al. (2020) found that in deprived urban areas in the Netherlands, 26% of people experienced food insecurity. Food insecurity is defined as 'limited or uncertain access to nutritional food' (Britannica, 2025). It is therefore not just related to the amount of food that people have access to, but also the type of food. Food insecurity is often characterised by an overreliance on calorie-rich and nutritionally poor food products because of their low prices, and a lack of access to fruits and vegetables, which are more expensive (Oldroyd et al., 2022). Food insecurity is strongly correlated with the likelihood of having chronic diseases (Gregory & Coleman-Jensen, 2017), as well as obesity (Van der Velde et al., 2020).

To combat food insecurity, the Dutch NGO Voedselbank set up food banks all over the Netherlands, which provide free food for people below a certain level of income (van Steen & Pellenbarg, 2014). Even though these food banks provide people with food, they are unable to fully combat food insecurity, as the food packages from food banks are often nutritionally poor (Oldroyd et al., 2022).

Through in-depth interviews with Voedselbank recipients, Neter et al. (2020) found that food parcels received from the Voedselbank often lacked dairy, fruit, meat, fish, coffee and other fresh foods. This is supported by the literature review of research in the Netherlands and Switzerland by Bazerghi et al. (2016), who found that food bank parcels often lack enough dairy, vegetables, and fruit to meet the nutritional needs of the recipients. By providing fresh fruits and vegetables to food banks, community gardens help to combat food insecurity.

On the other hand, community gardens also have an impact on the people working in the garden. Research on the effect of working on a care farm for participants has shown that care farms help to increase self-esteem and empower their participants (Elings, 2012). Next to this, working in a community garden promotes work, consistent eating patterns and increased appetite. It also enhances satisfaction and rest after a workday for the participants (Elings, 2012, Hume et al., 2022). Hume et al. (2022) also found that working in a community garden can reduce stress through the experience of working in nature, and it can promote community engagement and social interactions among its participants.

Since community garden initiatives have such a broad range of impacts on different groups of people, and they are so diverse, it is difficult to measure their impact. Next to this, the gardens are often small projects run by volunteers, slowly expanding through informal networks and alliances. Some care farms receive financial support through government funding, but mostly the community gardens are dependent on sponsors and donations, and the CSA gardens on subscriptions from members. This insecure financial situation may lead to instability and financial problems.

This report aims to assess the effectiveness of community gardens to strengthen the position of these gardens and attract funding. Next to this, the commissioner requires more insight into the different impacts of diverse types of community gardens and how positive effects could be promoted, which will also be discussed in this report. Because of this, a case study approach was chosen for this research.

1.1 Research questions

The long-term goal of the commissioner is to achieve the aforementioned positive effects that community gardens, care farms and CSA gardens can have. In the short term, the commissioner wants to strengthen the (financial) position of food sharing initiatives in the Netherlands. In order to get closer to this goal, an impact assessment will be done to analyse the impacts of volunteer-based gardens, care farms and CSA gardens in different realms, both social and physical health-related perspectives.

To answer this research question, the different academic backgrounds of the ACT group will be used, as well as practical insights from the commissioner and the gardeners. Our ACT group consists of members with various academic backgrounds. Thus, the focus of this study reflects our expertise in nutrition, development studies, health and society, plant sciences and economics. These different backgrounds will allow us to analyse different perspectives of community gardens.

The main research question for this project is:

'What is the role and potential of food sharing initiatives in addressing social and health challenges, and how can they be strengthened?'

In order to answer this main research question, multiple sub-research questions was formulated to come up with a broad answer. The sub-research questions include:

- 1. What organisational models, funding mechanisms, and partnerships support food sharing initiatives, and how do these influence their functioning and sustainability?*
- 2. What are the (perceived) physical impacts of food sharing initiatives on participants and consumers at the six researched initiatives?*
- 3. What are the (perceived) psychosocial impacts of food sharing initiatives on participants and consumers at the six researched initiatives?*
- 4. What are the lessons learned from setting up a food sharing initiative at the six researched initiatives?*

Chapter 2

Theory of Change

To analyse the impacts of community gardens, a Theory of Change (ToC) will be used. A Theory of Change is a model that shows how change is expected to happen or has happened. Such a theory can help to show the impacts of a project, because it can show how change has happened because of the project (Mayne, 2017). One of the assumptions that this theory is based on is that impact is not linear but consists of a web of links and connections (Hivos, 2021). Because of these complicated connections, drawing up a ToC helps to identify the impacts a project makes in a complicated context. The ToC functions as a hypothesis for our research. In this specific case, the ToC will be used to look at how food sharing initiatives make a change in society. By using this ToC, the findings can be structured from the interviews at the gardens and make a coherent story of the findings. Next to this, it helps to guide the research, as it helps us to get the right data and ask the right questions during the interviews. Below, a simple ToC for our project is presented:

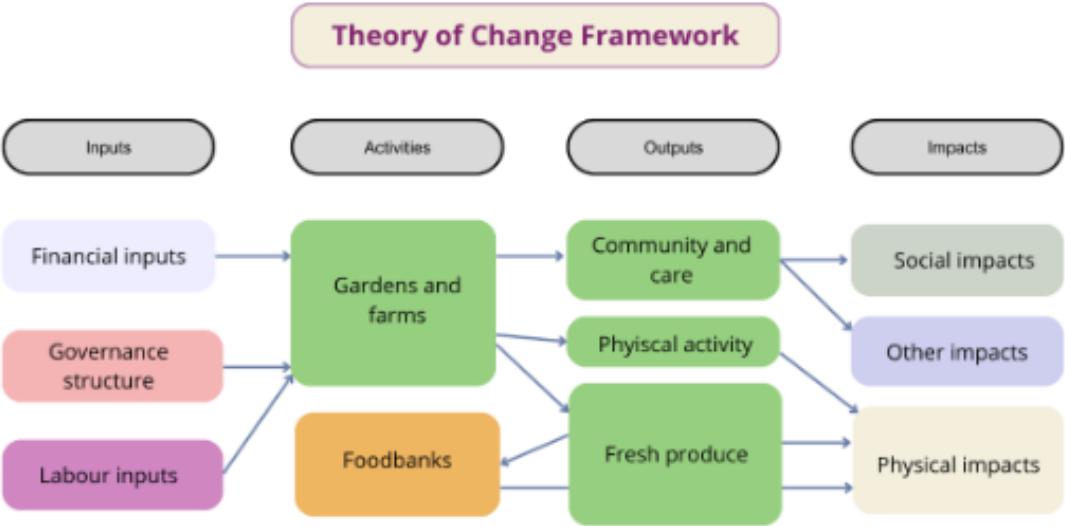


Figure 1. Simplified version of the ToC for our project

The ToC consists of four sections: inputs, activities, outputs and impacts. The inputs are necessary to make the activities happen. In our research, the activities are the gardens, (care)farms and food banks. These activities lead to certain outputs. The outputs are the tangible results from the activities. In our research, one of these tangible results is the fresh produce, the fruits and vegetables that the gardens produce. Next to this, the gardens provide community and care, as well as physical activity, which are the other outputs. These outputs will lead to certain impacts, which is the last part of the ToC. We assume that the gardens and food banks will have social impacts, physical impacts and other impacts.

2.1 Theory of Change based on literature

Before we look at the results from the case study community gardens and food distribution initiatives that we visited, a ToC will be presented based on literature we found on the topic. This will help us in guiding our analysis of the results from the case studies. A new ToC will be presented in the discussion that will contain the information from the case studies. In the discussion, the differences between the literature based framework and the results based on case studies will be elaborated on in detail. In the figure below, the ToC based on literature can be found.

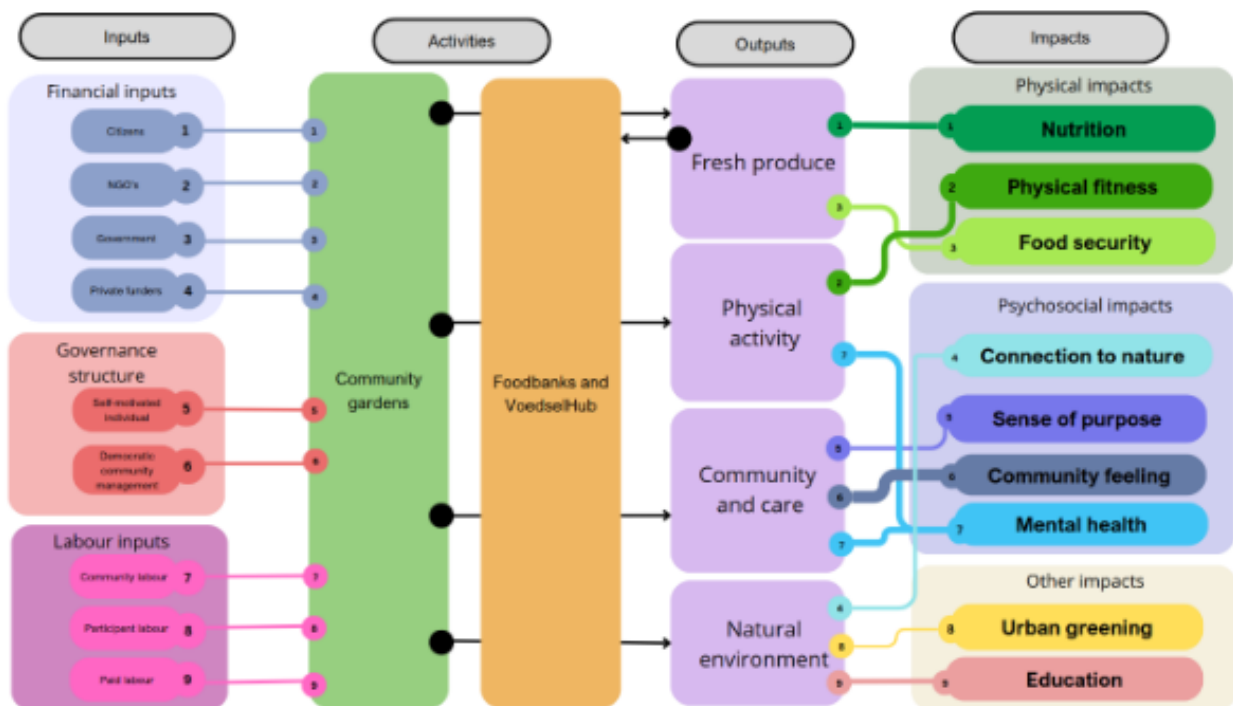


Figure 2. ToC based on literature found on the impacts of food sharing initiatives

The inputs for the framework based on literature include the resources required to establish and maintain a community garden. These have been identified through literature review and informed assumptions. They include financial inputs, governance structure and labour inputs.

In the general framework, community gardens are treated as a single category. However, in our case study-based ToC, each garden will be presented individually. This allows for a more detailed comparison between the unique inputs and impacts associated with each garden. The same approach will be applied to the food distribution initiatives.

The outputs and impacts in this model are arranged based on categories identified in the relevant literature. The outputs are separated into four categories. Fresh produce is harvested directly from the garden and physical activity is achieved by people working in the garden. Community and care are the result of social connections made by people working in the garden and care that is provided by caregivers. The natural environment is created by providing a green area, often in urban areas. These outputs all result in multiple impacts, such as physical impacts and psychosocial impacts. The impacts, outputs and the hypotheses were derived from Lampert et al. (2021), Vitiello et al. (2014), Egli et al. (2016), Hassink et al. (2010), Tharrey & Darmon (2021), Knapp et al. (2016), Cochran & Minaker (2020), Holland (2004), Ghose & Pettigrove (2014) and Hennchen & Pregernig (2020). In the model, the thickness of the arrows from outputs to impacts reflects the number of academic sources supporting each impact.

The outputs and impacts in the ToC show the hypotheses that we compose for our research. The hypotheses are about the link between the activities, outputs and impacts. These hypotheses are linked to our second and third research questions. For the second research question, we look at the physical impacts of participating in a community garden. We hypothesise that participation in a community garden leads to better nutritional status, through higher fruit and vegetable intake. In the ToC, you can see the connection between the community garden, the fresh produce that they generate, and the impact on nutrition. Next to this, we hypothesise that working on or participating in a community garden increases physical strength and resilience, and mental clarity. These hypotheses are based on a number of assumptions. These assumptions are for example that participants and volunteers consume the fruit and vegetables that are produced in the community garden, and that this consumption is an addition to their regular fruit and vegetable intake. Another assumption is that the work in the gardens leads to an increase in physical exercise for volunteers and participants of community gardens. Another hypothesis that we pose is that food sharing initiatives decrease the amount of people who experience food insecurity.

For the psychosocial impacts, there are also some hypotheses that become clear from the ToC. For this research question, the hypothesis is that participation in community gardens leads to higher social support and an increased sense of community compared to non-participants. Next to that, we hypothesise that community gardens have a positive impact on the mental well-being of participants. Lastly, a hypothesis that we pose for this research question is that participants of community gardens have a higher sense of purpose compared to non-participants. Again, these hypotheses are based on assumptions, like community gardens bring together people who would otherwise not have a strong community.

Lastly, the ToC shows other inputs. These include urban greening and education. For these themes, we drew up four hypotheses. Firstly, participants of community gardens have more gardening knowledge and skills compared to non-participants. Secondly, participating in a community garden leads to more environmental awareness. Thirdly, community gardens contribute to the perceived beauty of urban areas. Lastly, community gardens increase biodiversity in urban areas.

Chapter 3

Methodology

To gather the data, we contacted several community gardens of which six have been visited. The case study approach was chosen to match the commissioner's need for grounded, real-world examples to inform funding and policy discussions. The six community gardens we visited were selected from a list of suggestions provided to us by the commissioner, based on their diversity and convenient geographical proximity. The gardens are: Gelukkige groentes, Voedseltuin Groesbeek, Stadsakker Veenendaal, Stadslandbouw Mooieweg Arnhem, 't Paradijs in Barneveld, and Land in Zicht in Amersfoort. We also visited Voedselbank Groesbeek and VoedselHub Nijmegen. The full description of the case studies can be seen in the Appendix 1. We had phone calls with the coordinators of Voedselbank Arnhem and Voedselbank Veenendaal. Our ACT team was split into three groups, each group did interviews with two community gardens and one food sharing initiative

During the visits at the community gardens we used a semi-structured interview style to interview the following three groups: the participants of the community garden, the volunteers of the community garden, and the coordinators of the community garden. Some of these groups at certain community gardens could not be interviewed, therefore we used the Blob Tree model for interviews (see Appendix 2). The Blob Tree Model can be used by individuals that find it difficult to express their feelings and emotions (blobshop, n.d.). The Blob Tree model is a visual presentation of different Blobs (schematic figures) that are positioned in, under or on top of the tree. The Blob figures represent different emotions, social stance, and moods.

The interviews were recorded with a phone and informed consent was asked while recording. Whilst at the community gardens we also noted observations about the participants and/or volunteers and the overall structure.

For visiting the food bank in Groesbeek a different approach we used compared to the community gardens. Interviews were not used, but we made use of a whiteboard with a visual analogue scale (VAS). Three questions were asked (see Appendix 3) on the whiteboard. Consumers of the food bank were asked to indicate where on the scale they were at. Additional clarifying questions were asked when they indicated where they were on the VAS. Observations were made on the quality of the products they received, compared to the products they received from the community gardens. Also, popularity of fruits and vegetables and the difference in popularity were observed.

At the VoedselHub, a semi-structured interview was conducted with the coordinator. Next to that, small open interviews were conducted with some of the people who were having lunch at the VoedselHub, which was prepared with vegetables from one of the community gardens we visited. The interviews during the lunch were informal, as we sat down to have lunch with the people. We also noted down our observations about the VoedselHub after the visit, to use in our research.

After visiting the community gardens and the food sharing initiatives we thanked them for their contribution by gifting them a box with Tiny Tony's Mix.

The recordings that we made were transcribed using Microsoft Word. The file that contained the audio descriptions was manually and neatly prepared to ensure readability. The interview quotes were analysed according to their theme (see Appendix 4). The themes were divided as followed: physical health (nutrition, movement, being outside), social health (mental health, community, sense of purpose), education (educational for the volunteers/participants, educational for the outsiders), organisational structure (garden characteristics, main goal, networks, finance flow, challenges) and the lessons learned (best practices, improvements) (see Appendix 4). The themes used were to identify patterns and trends. This was done with axial coding, selective coding and open coding. The patterns and trends were then analysed to draw a conclusion.

The data was collected in a ToC to give an overview of all the activities, short term outputs and long-term impacts of the different community garden initiatives.

All the data and conclusions were collected in a final presentation, final report and a final poster. The community gardens and the food sharing initiatives received a poster with the outcome of the study, including the ToC.

This research was done under the supervision of an academic advisor and a coach. All of the participants were informed and gave permission so that their answers could be used in this report. The data was anonymised, and they were handled confidentially, they were stored in a secured Teams environment.

AI was only used in the brainstorming phase and to search for sources.

This team's different sets of expertise were employed to tackle various aspects of our research. Group members with expertise on qualitative data collection and analysis oversaw planning and sharing information regarding this study's methods and coding. We also used our background knowledge to offer expert perspectives on assessing and discussing subjects' nutrition and psychosocial state, as well as the gardens' financial flows and their relation to impacts.

3.1 Ethical considerations

An important component of the methodological approach was the ethical sensitivity in engaging with vulnerable groups. Both food bank consumers and participants of community gardens can be considered vulnerable because of their socio-economic circumstances or personal health challenges. We took measures to approach data collection with care and awareness of its potentially sensitive contexts.

Previous research helped to guide ethical considerations. Neter et al. (2020) provided several best practices in interviewing food bank clients that we followed in our own research. Before each interview, we clearly explained the aim of our research and the nature of the questions we would ask. We obtained verbal informed consent from each participant. It was communicated that participation was voluntary and that their data would be anonymised. We asked participants for permission to record the conversation and assured them that the recordings would be stored securely and would only be accessible to our research team. Interviews were conducted in a respectful and empathetic manner, recognising that discussing issues such as food insecurity or personal backgrounds may be emotionally challenging. This was especially relevant in our interactions with care farm participants, who sometimes live with disabilities or mental health conditions.

Following the example of Neter et al. (2020), we ensured privacy during our interactions; at the Voedselbank in Groesbeek, for example, no employees were present during the conversations, allowing participants to speak freely. Additionally, we used tools like the Blob Tree Model to facilitate expression among participants who might find it difficult to verbalise emotions. This was only done in the context of the two care farms.

Chapter 4

Results

In this section, our observations and the results from the interviews that we conducted will be presented. The results of all the different community gardens will be discussed according to the following themes: organisation structure, physical health, social health, education, and lessons learned.

In order to assess the impact of a wide variety of food sharing initiatives, Six community gardens, one food bank, one VoedselHub that we visited and we also conducted interviews with two food banks via telephone. The six garden case studies are described in greater detail in Appendix 1.

4.1 Structure of community gardens

The structural and organisational characteristics of the six community gardens, the three food banks and the VoedselHub interviewed by our group were examined. This included the main goal of the initiatives, how the volunteers are coordinated, whether there are paid workers, the networks the gardens use and the finance flows. Studying and analysing these structures will help to identify inputs and factors that influence community garden outputs and impacts, like the social and physical health impact.

4.1.1 Types of initiatives

During our research, we visited six different community gardens, each with its own structure and mechanisms. The gardens can be categorised into three groups. The first group is volunteer-based gardens, such as Stadslandbouw Mooieweg Arnhem, Stadsakkers Veenendaal and Voedseltuin Groesbeek. They donate almost all of their fruit and vegetables to the food bank. In this type of garden, vegetables, fruits and herbs are produced for personal consumption or social initiatives like food banks. These three initiatives are run completely by volunteers, consisting of, for example retired people, people with a (part-time) job, people with a distance to the labour market and refugees.

The second type of garden is a CSA garden, such as Gelukkige Groentes, where people pay for a subscription and get access to vegetables on the farmer's land. There are some paid workers who maintain the garden and there are workshops organised by the foundation that was started by the owners of Gelukkige Groentes. The third type of garden is the carefarm; 't Paradijs and Land in Zicht are gardens that fall in this category. 't Paradijs is an extensive care farm catering to children, teenagers and the elderly, as well as maintaining a community garden. Land in Zicht is partly a CSA garden, next to a daycare, which means that people with dementia or neurodivergence can come to spend their days being or working in the garden. The food banks included in our project are food banks in Groesbeek, Veenendaal and Arnhem. They get their fruit and vegetables mainly from the aforementioned food gardens and the remainder from supermarkets or other stores. The last food sharing initiative we visited is VoedselHub Nijmegen. This initiative uses leftover vegetables from other organisations including Gelukkige Groentes and distributes this to social kitchens throughout Nijmegen.

4.1.2 Garden characteristics

The plots of the different community gardens have different sizes. The gardens all grow a wide variety of vegetables, fruits, and sometimes herbs and flowers. Some gardens also keep animals. The workers use a variety of agricultural methods, like high-density planting, diversified agriculture and forestry, permaculture and greenhouses. Some gardens have their own land (Gelukkige Groentes), while others rent (Stadslandbouw Mooieweg) or use municipal plots (Voedseltuin Groesbeek).

All of the gardens mention sustainable agricultural practices like avoiding the use of chemical pesticides or synthetic fertilisers. Two gardens specifically emphasise the no-dig or no-till principle. However, some are not officially certified as an organic garden. For CSA gardens, certification is not needed since the customers are involved in the growing process. In other cases, certification is deemed expensive and unnecessary. Only 't Paradijs produces for biological shops and therefore needs to be certified.

4.1.3 Workforce structure

As was mentioned before, three gardens are run exclusively by volunteers, who are organised in a structure of different groups led by coordinators. 't Paradijs and Land in Zicht both provide care and therefore have professional care staff. Both of these gardens, as well as Gelukkige Groentes, employ professional gardeners. Next to professional staff, these gardens also use the labour of volunteers. Some gardens, like Stadslandbouw Mooieweg, have a board of directors.

Generally, the volunteers can flexibly arrange their work, such as adjusting their tasks according to weather/season, abilities and interests, and they can choose their working shifts. The initiatives with professional employees are similarly structured, with the paid workers spending more time on the farm and taking a coordinating role vis-a-vis the volunteers.

The volunteers in most of the gardens have a diverse socio-economic and demographic background. For example, the group of volunteers at Stadslandbouw Mooieweg Arnhem consists of one-third retired people, one-third people with a (part-time) job, and one-third various backgrounds, such as refugees, people with burn-out or people with a distance to the labour market.

See table 1 on the next page for an overview of the workforce structure of all the community gardens.

4.1.4 Network

All of the gardens mentioned their collaboration with the municipalities as vital for setting up their food gardens, for example to get the land for cultivation, subsidies or funding for investments, and using their networks to reach volunteers or care recipients. One of the coordinators explains why:

"The municipality of Veenendaal is very happy to get people here. When you sit at home all day, you get depressed, and then you must pay money for the doctor and all those things. But when you do this work, the people together, there is no problems for the municipality of Veenendaal. Win-win."

Table 1. Overview of workforce structure per community garden

Community gardens	Characteristics of personnel structure
Voedseltuin Groesbeek	Committee + coordinators + 25 volunteers
Stadslandbouw Mooieweg Arnhem	Board of 4 people + coordinators + 100-120 volunteers
Stadsakkers Veenendaal	9 coordinators + 80 volunteers
't Paradijs	20 paid workers (15 full-time) + 60 volunteers + directors
Land in Zicht	18 professionals + 3 interns + 10 care staff + 30 volunteers
Gelukkige Groentes	Professional gardeners and trainees

Some gardens have long-term deals with landowners, who give them the guarantee they can stay there for a long period. Others, like Stadslandbouw Mooieweg, are in a situation of more uncertainty concerning the rights to the grounds, since the private owner is in conflict with the municipality about using the plot for commercial purposes.

Next to the municipalities, the gardens also have ties with other NGOs that are active in the area, such as care farm unions, social care organisations and other food sharing initiatives. The coordinator of Stadsakkers Veenendaal mentioned being part of a so-called Kenniskring ('knowledge circle'), where they meet up with different NGOs from the region to share knowledge and ideas. The gardens are known in the neighbourhood and a lot of people raise money via social events for the farm or sponsor materials, such as solar panels or gardening tools. For promotion, the community gardens also make use of the local or regional newspaper, a monthly newsletter or neighbourhood Facebook groups. Community gardens also help each other; for example, Voedseltuin Groesbeek receives free plants from Gelukkige Groentes.

Many of the community gardens donate their vegetables and fruits to the food bank, ranging from occasional donations in case of excess produce, to other initiatives producing 100% for the food bank. Gelukkige Groentes makes money from CSA memberships but also has a specific plot of 500 m² of which half of the harvest is sent to the food bank and the other half to the VoedselHub. The VoedselHub brings this food to social kitchens that cook meals for people in poverty.

Land in Zicht recently switched from producing for the food bank to bringing people from vulnerable groups to the gardens so that they can harvest themselves; twenty people are now making use of this regularly. For this arrangement, Land in Zicht relies on the network of the food bank. 't Paradijs is currently setting up a similar system.

4.1.5 Finance flows

The economic models and sustainability strategies of the community gardens vary. All gardens operate as an NGO, except for Land in Zicht, which is a B.V., and Gelukkige Groentes, which operates as an independent VOF entity. They can make a profit, which allows for greater expansion and more potential to make a positive impact. The coordinator of Gelukkige Groentes mentioned:

"You often see that people organise these types of gardens in an NGO. We chose a VOF, because we think it's very important to show that these types of initiatives can also exist without subsidies or donations."

The gardens that operate as NGOs are dependent on municipal funding, corporate sponsorships or income from activities and markets. Some of the community gardens supplement their income through commercial activities. For example, 't Paradijs sells eggs and vegetables to organic supermarkets, and sells some produce in its own shop. This allows for a diversified income and enables the initiative to hire paid workers. Land in Zicht provides garden maintenance services and has a tearoom in the garden, which are sources of income. Stadslandbouw Mooieweg invites groups for team-building activities. Some of the gardens depend on external support such as donations and sponsorships to make investments in the garden. Voedseltuin Groesbeek for example is part of a foundation that provides financial support. Fondsenbeheer Landbouw & Zorg, the commissioner of this project, is one of the NGO that supports the community gardens.

None of the community gardens has making a profit as their main goal. The income of most gardens is used exclusively for operations, materials, seeds and garden programs. Most of the gardens face an unstable and unpredictable income flow. A more detailed overview of the financial flows per garden can be found in Table 2.

Table 2. Overview of financial flow per community garden we visited

Community gardens	Key features	Unique source of funds
Voedseltuin Groesbeek	It is run as an independent foundation.	Sponsored by Carnival group
Stadslandbouw Mooieweg Arnhem	Reliance on sponsors, markets, open days. The land is hired from a private owner.	Income from company teambuilding activities
Stadsakkers Veenendaal	Two-way collaboration with food banks (garden receives contribution for the produce). The land belongs to the municipality.	Saturday agricultural product sales
't Paradijs	Municipal subsidies, NGO grants, sponsorships and donations, commercial activities, care budget subsidies	Organic store vegetables and eggs sale
Land in Zicht	50% of income is from care, 25% is from the gardening company, 15% from the tea-room. The self-sufficiency rate is high (90%).	Coordinator investment, renting of venue, subscription system for harvesting.
Gelukkige Groentes	Subscription system (self-picked vegetables and fruits), education and training (courses), corporate outings.	Selling a self-made course on how to set up a CSA garden.

4.2 Physical health

In the next section, we will describe the results of our research concerning physical health in the food sharing initiatives we visited.

4.2.1 Nutrition

Multiple volunteers at different gardens stated that their consumption of vegetables and fruits was not affected by working in the garden; volunteers generally already had a healthy diet. Many volunteers, participants, and consumers noted that they did start experimenting more with different vegetables, because they became familiar with them at the garden. Volunteers and participants perceived a better and stronger taste in the vegetables from the community gardens compared to those in the supermarket. One participant said that the cucumbers taste less like water, and that the carrots are a bit sweeter and tastier. In contrast with the experiences of the volunteers at community gardens, two coordinators of Gelukkige Groentes reported that vegetable consumption did increase among subscribers once they got in touch with the garden.

At the care farms, participants received a lunch that was cooked with vegetables grown from the garden. Volunteers eat fresh fruit, like raspberries, straight from the bushes on the garden. Multiple interviewees mentioned that they find it important that the vegetables and fruits are not sprayed with chemicals and pesticides. All the gardens we visited produce their vegetables and fruits organically.



Figure 3. Vegetables from Stadsakkers Veenendaal

Even though nutritional intake did not increase as much with garden workers, food bank coordinators did mention the nutritional value of the fresh fruit and vegetables for food bank clients. The produce from the garden is generally fresher and more nutritious than food received from other parties. What the fresh produce looks like plays an important role in how popular they are with the food bank clients. The vegetables at the Voedseltuin in Groesbeek and at Stadsakkers Veenendaal going to the food bank were freshly washed before they were transported to the food bank, as can be seen in Figure 3. In contrast, the vegetables that the food bank in Groesbeek receives from parties other than the community garden are often rotten or covered with dirt, as can be seen in Figure 4. The coordinator of the food bank in Groesbeek said that the vegetables from the Voedseltuin in Groesbeek are very fresh, and that people are happy because they look beautiful.

Eight out of the thirteen consumers we spoke to at the food bank perceive the vegetables from the community garden as good. Multiple consumers were very satisfied with the quality of the vegetables. However, one participant stated that the vegetables rotted quickly when packed in plastic bags. Five out of thirteen consumers always consumed all of the vegetables they received, and six out of the thirteen sometimes did. The reasons people gave for not always eating all the vegetables were that they did not like the vegetables available at the food bank, including leek, cabbage, or beetroot. One woman also did not always consume the vegetables because she was not sure if the vegetables were halal.



Figure 4. Vegetables at food bank Groesbeek (not coming from Voedseltuin Groesbeek)

4.2.2 Food insecurity

One of the goals of community gardens is to combat food insecurity through providing fruit and vegetables for people in vulnerable positions. Three initiatives we visited try to do this by producing food primarily for food banks. Both care farms had a system where they brought people from the food bank to their garden to harvest by themselves. Some gardens donate vegetables to social food distribution initiatives like a social kitchen or 'soup bicycle' for homeless people. The coordinator of the VoedselHub told us that the kitchens together supply 2000 meals a week, and the vegetables are an important supplement. At one of these kitchens, a client who didn't have enough money to buy food mentioned that if he had lunch here, he would not have to eat the rest of the day. The coordinator of the VoedselHub mentioned:

"It's so hard to express impact, to make it tangible. We are serving 2000 meals every week, that is the tangible impact we make."

4.2.3 Physical fitness

Some people noticed negative physical effects from the garden work, like back aches and muscle soreness. Activities like raking and digging can be heavy for volunteers that are retired. However, most interviewees mentioned they perceived a positive physical impact from working in the garden. Multiple volunteers noticed that they had become strong and more physically resilient since working in the garden. Some older volunteers also mentioned that the garden worked to help them stay active. Next to becoming stronger, multiple people experienced that the physical work had a mental effect, resulting in a clearer mind and a more relaxed state. One participant stated:

"If you are working outside here, then you have an empty head at the end of the day, and then you sleep better at night."

4.2.4 Being outside

The gardens were surrounded by nature as seen in Figure 5, even though some of the gardens were situated close to the city or in a neighbourhood. The gardens provide green and calm natural areas, with flowers and trees surrounding the vegetable patches, and many birds and insects. 't Paradijs also has different animals, like cows (seen in Figure 6), pigs, chickens, sheep and rabbits, as well as an outside playground for children.

During the interviews, several participants indicated that they liked to work outside and that it is a relaxing, quiet and peaceful experience. One coordinator said that the elderly, some with dementia, like to walk around in the garden. Another coordinator mentioned that many older people are used to sitting inside all day, and that it is nice for them to be outside in this garden. Multiple people mentioned that being in the garden frees their mind of stress. One gardener stated:

"The harvesters tell me they come to the garden every week not only to eat fresh and lovely products, but also to have a moment in the week where nobody wants something from them, and where they can just relax and breathe and enjoy nature, whether it's raining or beautiful and sunny like today."

Being outside has the benefit of fresh air and being in touch with nature. One coordinator mentioned that it is especially nice for the refugees working in the garden, since they live in a small room with a lot of people together in one building. In Table 3, a summary of the results on physical impact as found at the different gardens can be found.



Figure 5. One of the gardens visited, showing the natural surroundings



Figure 6. Cows at 't Paradijs

Table 3. Summary of physical impacts of the different community gardens. Numbers indicate in which garden what impact was found.

1=Voedseltoen Groesbeek; 2=Stadsakkers Veenendaal; 3=Stadslandbouw Arnhem; 4=t Paradijs; 5=Land in Zicht; 6=Gelukkige Groentes

Impacts	Related gardens
Nutrition - Increased exposure to diverse vegetables - Perceived better taste and freshness - Increased vegetable consumption of workers and volunteers - Produced organic and chemical-free produce	1, 2, 3, 4, 5 4, 5 - All
Food insecurity Meals for people in vulnerable positions	All
Physical fitness - Improved physical strength and resilience - Back pain or other injuries - Mental clarity through physical work	1, 2, 3, 5 1, 3 1, 4, 5, 6
Being Outside - Time in nature and fresh air causes stress reduction - Being in touch with nature	All

4.3 Social health

In the next section, the results of our research concerning psychosocial health in the food sharing initiatives we visited will be described.

4.3.1 Mental health

Working in a community garden is perceived by many volunteers as beneficial to their mental health. They mention they are allowed to recharge, focus on the present, feel safe, and enjoy the relaxed atmosphere and natural environment. Many participants mention the easy-going climate of the volunteer-based initiatives, which are not bound to profits or tight schedules. There is a lot of space for individuals to work at their own pace and according to their own abilities. The work is diverse, since keeping a garden or plot requires many different tasks.

Three participants separately indicated feeling like the Blob figure indicated in yellow in Figure 7. The figure seems happy and content, and has reached the top of the Blob Tree. This indicates that people feel satisfied with being at the community garden.

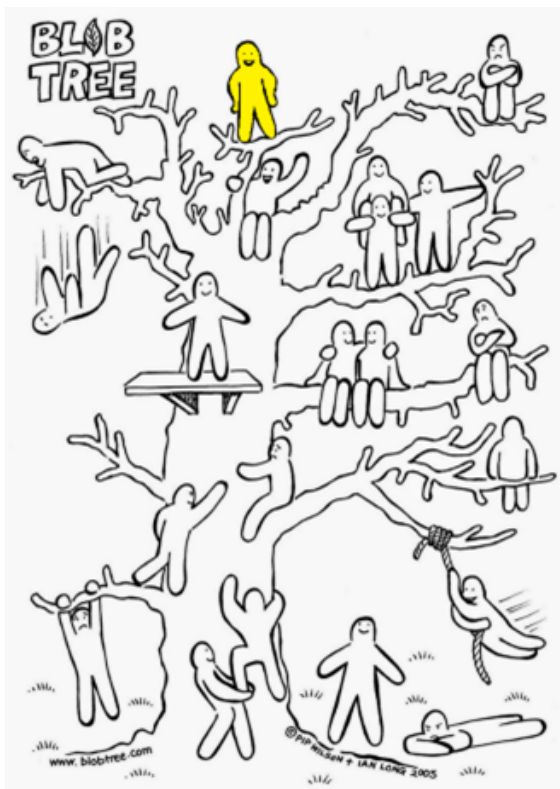


Figure 7. Blob figures chosen by participants

Many different kinds of people report positive effects of the relaxing environment, including retired people, refugees and people without a (fulltime) job. There is no expectation of or pressure on participants to perform well or work hard and the natural environment is experienced as mentally healing. The coordinator from a care farm mentioned that the people receiving care love to come there. The gardens also provide an unstrained environment for people with mental problems, depression or burnout. One coordinator recounts a volunteer in her forties with a burnout who was able to reconnect with nature in a spiritual way, which helped her in the healing process. Both being in nature and working in a community help participants to 'be taken away [from] your not-so-nice thoughts', be 'more serene', 'have a moment in the week where nobody wants something from me', and 'forget yourself'.

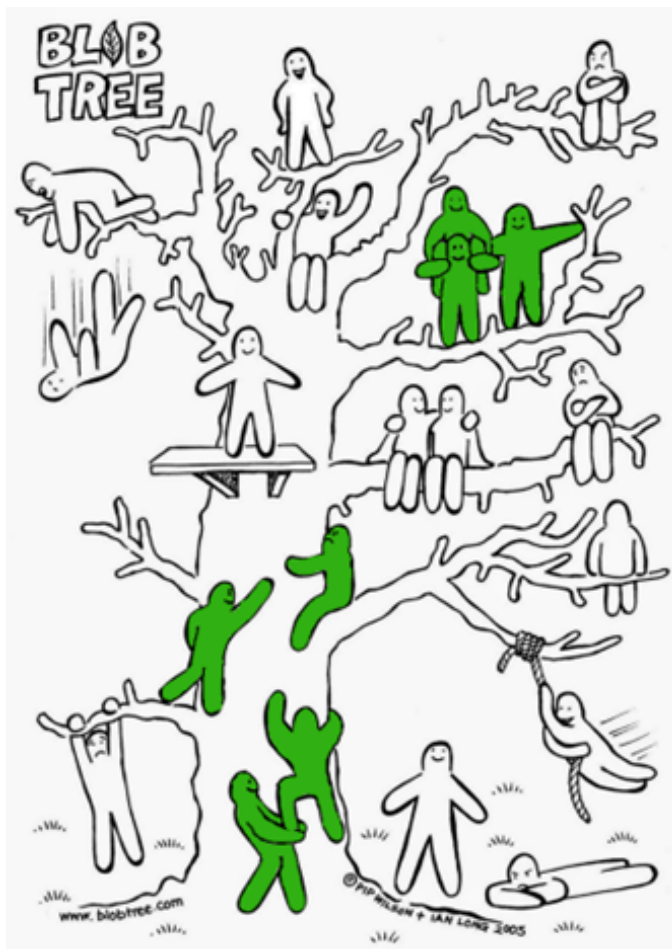
4.3.2 Community/Loneliness

Many of the volunteers working in the garden mention social contacts as an important element that contributes to their enjoyment of the work. The gardens bring diverse individuals together. Even so, one volunteer mentioned: "Here, everyone can just be themselves, everyone respects each other, and you can see that some very beautiful friendships grow here."

For people who cannot participate in the labour market for reasons like illness or lack of citizenship, the garden is an alternative to sitting at home all day and not meeting anyone. Many of the volunteers and coordinators are retired and enjoy the contact, interaction and work with like-minded individuals. A volunteer expresses that she noticed when she stopped working, she really missed her colleagues and working together. Here, she has colleagues again, which she really enjoyed.

All of the volunteer-based community gardens incorporated coffee breaks or collective lunches into the working schedule. These breaks resulted in the feeling of community. A paid worker in one of the gardens said:

"When I started the garden it was all about the plants, about growing sustainably, making people aware of where fruits and vegetables and flowers come from, all about the greens. But after a year or two I kind of discovered that the impact the garden has on the people is way more important than just the things we eat, [...]. People make friendship here."



A supervisor mentioned that helping each other and a sense of community are important factors she recognises in the care groups she works with at the farm. This coordinator indicated that she saw people helping each other, as well as a sense of community. The Blob figures she mentioned she recognised in the group are shown below in green in Figure 8.

Figure 8. Blob figures chosen by participants

Compared to these volunteer-based initiatives, at Gelukkige Groentes we observed less of a community feeling. Among the participants we interviewed, the social benefit from the garden was not one of the reasons for their subscription. Although the participants meet each other while harvesting, there is more focus on having access to fresh produce than on a feeling of togetherness.

On the other hand, at the VoedselHub in Nijmegen, which receives produce from Gelukkige Groentes, community is one of the main goals. At the VoedselHub, people can enjoy meals together. A diverse group of individuals is catered there, from people who cannot afford a meal, to people who experience loneliness. One volunteer explains that the project battles ‘wicked problems’ (complex, layered and multi-faceted problems) through offering both food and a nice place to eat together with others.

4.3.3 Sense of purpose

The majority of the people working at community gardens indicated that they get motivated by doing something good and helpful for a good cause. Different aspects of the work are rewarding; for example, clearing a field of weeds or growing food biologically feels like an accomplishment to a volunteer. Many volunteers consciously choose to use their time for a good cause, a volunteer at Voedseltuin Groesbeek said:

“I think it’s wonderful that we harvest it from the fields on Thursday and that it is with the people [food bank customers] on Friday. [...] I’m glad to be doing something for others in this way.”

Other volunteers associate the work with words like ‘concrete’, ‘grateful’, ‘involved’, ‘to give and not to receive’.

The flexible nature of the work enables many different people to find something that aligns with what they enjoy doing and what they are skilled at, which increases the feeling of satisfaction. People with neurodivergence (like autism) or disabilities experience a sense of purpose and an increase in self-confidence because of the opportunity to do helpful work. A volunteer at t’ Paradijs stated:

“I am a stay-at-home dad because I have a chronic disease, so I was looking for work that has to be done, but that is also needed. And this [initiative] checked all the boxes for a social project, for people in poverty, and also being outside, with lots of improvement for farming, birds and bees and all of that.”

Table 4 shows an overview of the psychosocial impacts of the food sharing initiatives. The related gardens refer to the gardens where this impact was observed or mentioned by one of the interviewees.

Table 4. Summary of the psychosocial impacts of the different community gardens. Numbers indicate in which garden what impact was found. 1=Voedseltuin Groesbeek; 2=Stadsakkers Veenendaal; 3=Stadslandbouw Arnhem; 4=t Paradijs; 5=Land in Zicht; 6=Gelukkige Groentes

Impacts	Related gardens
Mental health - Provides a calming, safe, and natural environment - Helps participants reach a healthy psychological state	1, 2, 3, 4, 5 4, 5
Community - Encourages friendship development - Reduces loneliness - Brings people together from different backgrounds	1, 2, 3, 4, 5 All 2, 3, 4, 5
Sense of purpose - Contribution to meaningful causes - Promotes a sense of accomplishment	All All

4.4 Education

Many of the gardens we visited have an educational function, both for their own volunteers or members and for people outside of the gardens, like schoolchildren or people from the neighbourhood.

When looking at the educational aspect for the volunteers or members from the gardens, many of them mentioned that they have learned a lot of new things about gardening, growing vegetables, the soil and taking care of animals. One volunteer mentioned that he has substantially expanded his knowledge of vegetables after getting involved with the garden. Several people also said that they like the fact that they now know where their food comes from, that it is produced locally, and that they get a better insight into the seasonality of certain fruits and vegetables. One participant said:

"I just like to pass on the fact that the food comes from here to my child. And that it does not come from a supermarket."

Volunteers mention learning things other than growing vegetables, like how to maintain a greenhouse or how a compost pile works. At 't Paradijs, some people are involved in painting or woodwork, while at Land in Zicht, participants could join a bee keeping course or could follow a mosaic workshop. Apart from practical skills, the gardens also play a role in other types of learning. One volunteer mentioned that being a volunteer helps people with a migration background with language acquisition:

"I try to speak Dutch with them. It's very simple sentences, so not really in [depth] you know. I already explained what the meaning is of a kruiwagen [wheelbarrow]."

Many gardens are very open to visitors. Some gardens have schoolchildren that visit the garden to learn about how fruits and vegetables are grown and to pick some fruit themselves. At the Voedseltuin Groesbeek, people make recipes on how to use vegetables they grow and give them to the customers from food bank Groesbeek. Gelukkige Groentes has developed a (paid) course on how to set up a CSA garden and a gardening course that they give at schools.

Table 5 shows a summary of the educational impacts of the gardens.

Table 5. Summary of the educational impacts of the community gardens. Numbers indicate in which garden what impact was found. 1=Voedseltuin Groesbeek; 2=Stadsakkers Veenendaal; 3=Stadslandbouw Arnhem; 4=t Paradijs; 5=Land in Zicht; 6=Gelukkige Groentes

Impacts	Related gardens
Education - Increased Gardening knowledge & Skills - Food Awareness - Cultural & language learning	All All 2, 3, 5
External Education - Courses on gardening / starting a garden - Visits schoolchildren / social service	6 2, 4, 5

4.5 Challenges, best practices and improvements

4.5.1 Challenges

The various initiatives we visited shared some of the challenges that they faced in their projects. There were some main challenges that came back for multiple initiatives: financial sustainability, administration, food quality, workforce, land ownership and climate.

Financial Sustainability

Multiple coordinators mentioned that financial sustainability is a challenge. A paid farmer from Land in Zicht shared that striving to make the garden economically self-sustaining can be stressful and hard work.

"I think people in Holland are not used to pay a fair price for vegetables and fruits, which makes it really difficult to make this garden economically self-sustaining, so that's something that we are struggling with."

She says that people who visit the community garden often compare the prices to the prices of vegetables in the supermarket. That makes having a CSA garden in the Netherlands quite difficult financially. Another coordinator stated that some cities attract people who are willing to spend more money on good quality products, while in other cities there is no demand for more expensive, organic or biological fresh produce.

Gelukkige Groentes mostly have access to people with a willingness to spend money on a subscription fee. The owner stated:

"Ideally, we would want these kinds of initiatives to become more financially sustainable, so that other people can more easily say, 'yes, this is a serious career option for me to pursue.' Right now, it's often still people who have some savings or flexibility, or those who deliberately choose to live more modestly. (..) I think it's a real shame that people who choose to do this, including myself, have to be very aware that they're taking a financial step back."

This coordinator also mentioned that experience in the private sector can help deal with the economic challenges of the community gardens.

Administration

Several coordinators talked about the struggle between the discrepancy between idealism and practice. People start working in a garden with an ideal picture in their mind on what the work looks like and end up doing a lot of administrative work for the business operation. One farmer who is responsible for organising the community garden, confessed:

"(...) there is much going on here that you don't see, or I can be behind my desk the whole day to do all of the stuff that comes with the work... like budgeting, finances, website, flyers, emails."

Another coordinator said his job was actually more about working on his laptop and answering emails, which he did not like.

Food quality and variety

Multiple gardens that produce for food distribution initiatives as food banks say that they sometimes get feedback that people struggle to cook with certain vegetables, or do not like it when the vegetables do not look so pretty. However, the food bank in Groesbeek mentioned that the vegetables that they receive from the garden are always fresh compared to the vegetables they receive from other parties.

Workforce

Some initiatives mentioned having difficulties with finding volunteers. With a lot of the volunteers being relatively old, it was mentioned that finding young volunteers was a challenge.

Landownership

Multiple community gardens experience problems with the landowner. One garden rents its land and experiences tension with the landowner regarding the zoning plans. Other gardens rent their land from the municipality and lack long-term certainty.

Climate

One garden mentioned the changing climate as one of the challenges of cultivating, especially because you have no control over the elements of nature.

4.5.2 Best practices

Plan

Three gardens mentioned that having a plan is one of the most important things when starting a community garden. They all mentioned that it is important to have a good plan of how the garden is going to work and how it will be coordinated, and that you should have thought it through thoroughly. The owner of one of the gardens that has a more commercial view also mentioned that they think it is important to have a business plan and to have a clear view of what is in it for yourself.

Talents

Another thing that was seen as important by several initiatives in setting up community gardens is to look at the different talents people bring when they work there. According to the coordinators of care farms, it is important to look at the potential of the participants. You should look at what they can do instead of what they cannot do.

They mentioned that you should look at the qualities and specialities that people have and that you should use them as effectively as possible. Next to this, one coordinator mentioned the importance of hiring experts for certain aspects:

"We need expertise, because with an expert it's easier to see everything that needs to be done."

Communication

For the gardens, internal communication is important in terms of contact between the volunteers. One of the coordinators mentioned that they have a monthly meeting with the coordinators from that garden to talk about things that go well and things that could be improved, based on the volunteers' input. Good external communication is also an essential element. Two gardens mentioned that they pay attention to their reputation in the neighbourhood, to grow as a garden and to get more volunteers. The importance of good communication was also stated by different food banks.

Community

Three of the community gardens specifically mentioned that the community part of their garden is also a very strong point of the initiative. One coordinator mentioned that it is very important to have a place to be able to sit together during breaks or when the weather is bad. Being open to your people and involving them in the initiative leads to them being more understanding of and even helpful for the garden, according to one owner of a community garden.

4.5.3 Improvements

Planning

In terms of planning, one community garden mentioned that they first struggled with buying too many seeds for the amount of land they had and that they planted seeds in the open when they actually needed to be planted in a greenhouse. According to them, this is all necessary as part of the learning process

Agricultural methods

Some gardens have gradually improved their agricultural methods to cultivate the land. Two gardens mention that they have adjusted the length of the crop rows, to make the work more manageable. Some other gardens started with the no-dig method, in which you do not turn the land over to support a healthy soil ecosystem, which decreases weeds and increases air and moisture storage. According to volunteers at those gardens, this new method is nice, because you spend less time weeding, while the produce improves.

Involving the target group

A volunteer from one garden mentioned that the connection between the initiatives itself and the people that they target can be strengthened and less distant.

With this, he meant that the customers at the food bank should also be involved in the production process of the vegetables.

Table 6 shows the different challenges, best practices and improvements at the different community gardens.

Table 6. Summary of lessons learnt at the different community gardens. Numbers indicate in which garden what impact was found. 1=Voedseltuin Groesbeek; 2=Stadsakkers Veenendaal; 3=Stadslandbouw Arnhem; 4=t Paradijs; 5=Land in Zicht; 6=Gelukkige Groentes

Lessons learnt	Related gardens
Challenges • Difficulty in becoming economically self-sustaining • Heavy administrative load • Resistance to the quality of produce • Difficulty finding workforce • Not being landowners/ lack of long-term certainty • Changing climate	5, 6 4, 5 1, 2, 3 4 1, 3 6
Best practices • Have a well-thought-out plan • Using different expertise • Open and good communication • Create a community feeling	6 1 1, 2 3, 4
Improvements • Initial planning mistakes • Improve spatial planning of the garden • Involving target group	1, 4 1, 4 1

Chapter 5

Discussion

5.1 Theory of Change

The framework of a ToC was introduced in the earlier report. In the figure on the next page, we present the ToC based on our research of the specific case studies. We will elaborate on this ToC in the discussion.

Even though the food sharing initiatives had different structures and focuses, there was much overlap in their methods and impacts. To complement the first ToC based on literature, this ToC is filled in specifically for our six case studies. It clarifies the different inputs and relationships that are essential for the functioning of community gardens and food distribution initiatives, as well as the specific impacts that flow from financial, knowledge and labour inputs. The discussion below will elaborate on and analyse the relationships that are shown in this ToC.

The food sharing initiatives we researched all have one thing in common, which is that they were in some way connected to people in the Netherlands in poverty. In literature, poverty used to be defined solely as a lack of resources. However, poverty has lately been characterised as a so-called multi-faceted wicked problem, including social struggles, political issues and power dynamics (Spicker, 2016). If we look at the different gardens we visited with this wicked problem in mind, it can be seen that all gardens had different networks and approaches of helping people in vulnerable positions. The gardens work together with food banks, the municipality, and other NGOs to provide different perspectives and to help them define the suitable pathways. Crisp et al. (2016) look at the benefits of voluntary action and food banks to alleviate both material and immaterial needs for people in poverty. They concluded that voluntary community action often has an impact on immaterial well-being, while food banks help with immediate material needs. Most of the gardens we visited not only contributed to material needs, but also provided people in vulnerable positions with immaterial benefits in addition to fruits and vegetables, such as a sense of community and mental wellbeing. Based on our observations, fulfilling the immaterial needs of participants is particularly valued by community garden coordinators. This focus on tackling multiple negative outcomes of poverty and food insecurity reinforces the important role of community gardens, the VoedselHub and the food banks in resolving the wicked problem of poverty.

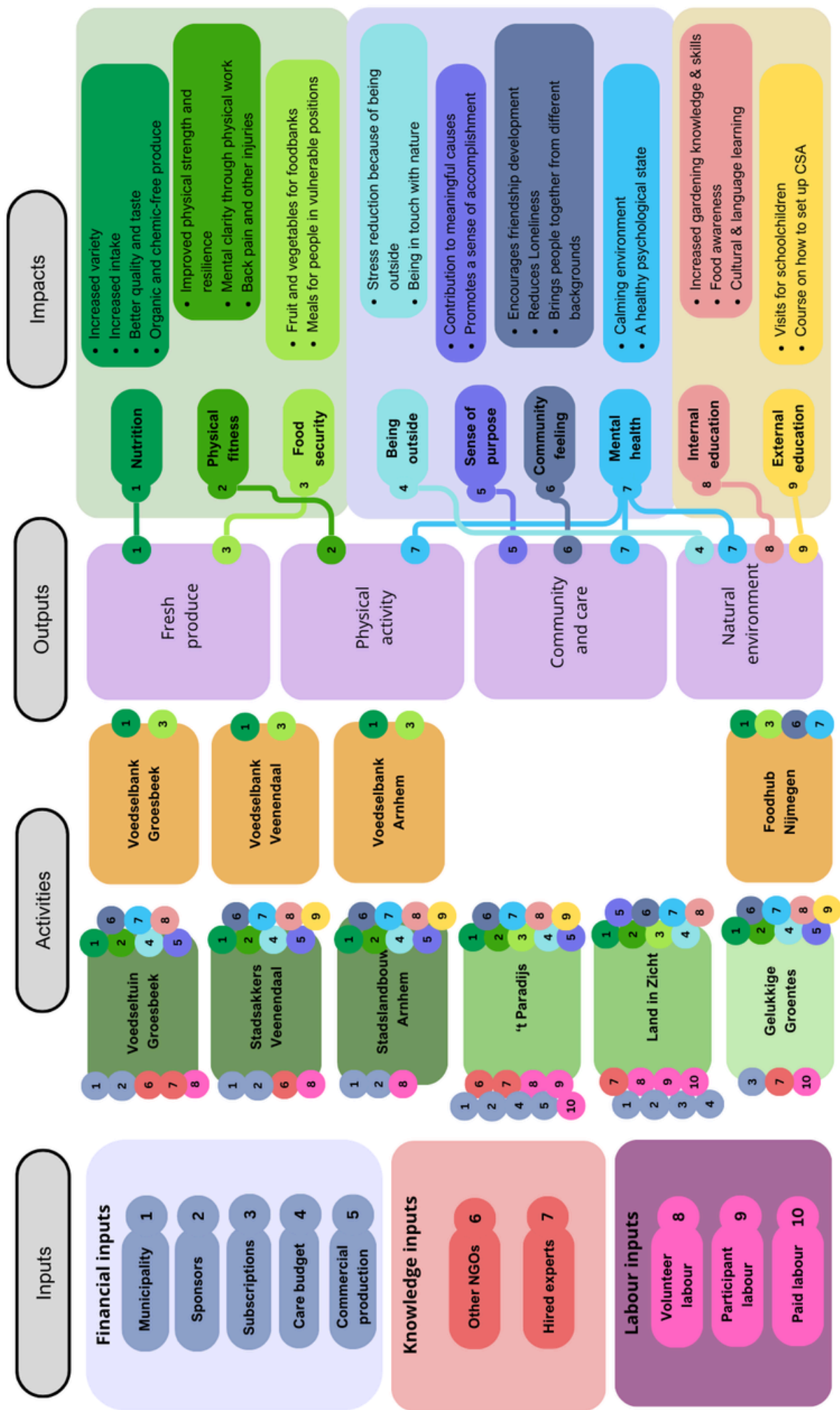


Figure 9. Theory of Change for the social impact assessment, based on our findings from the different case studies.

5.2 Organisational structure

Our first research question was: *What organisational models, funding mechanisms, and partnerships support food sharing initiatives, and how do these influence their functioning and sustainability?*

In the results, the different organisational models, funding mechanisms, and partnerships of the community gardens we visited are described. The community gardens that we categorised into three organisational models: volunteer-based gardens, CSA gardens, and care farms. They all share the goal of increasing access to fresh food while promoting well-being. However, their structures, funding strategies, and networks strongly shape their activities, reach, and long-term viability. By interpreting these findings through the lens of our ToC, we examine how different models facilitate or hinder the transition from inputs to desired impacts.

The organisational model determines access to the different resources (inputs) that enable the initiatives to make an impact. Volunteer-based gardens rely heavily on informal resources like local goodwill, municipal land, and volunteer labour. This can be seen in the ToC. While other organisational models also make use of the informal resources, the volunteer-based gardens are unique in being completely dependent on them. This makes them less flexible and might make it more difficult to hold volunteers over time. Furthermore, this might also make it more difficult to have a clear long-term plan, and it limits their scalability and sustainability. However, this organisational model is also straightforward in their goals, and their volunteer setup makes it easier to attract donors, since the revenue goes to vulnerable groups. The impact is high in terms of vegetable donations, with some of the initiatives producing up to 100% for the food banks.

CSA gardens like Gelukkige Groentes draw resources primarily from subscription fees and commercial activities, as also shown in the ToC. They can make a profit, which allows for greater expansion and more potential to make a positive impact. CSA land and its produce are normally restricted to those who can afford membership, which potentially excludes people from vulnerable groups. However, Gelukkige Groentes has still allocated a portion of land for food bank donations.

Care farms integrate inputs from the care they provide (care subsidies, and professional staff) to support food production and social/healthcare services. This model might be more resilient compared to volunteer gardens, but it also requires substantial coordination and administrative capacity. Next to the care subsidies, the care farms have other financial inputs. Since they have diverse income streams, they can have a paid coordinator to organise everything.

Reliance on informal inputs may thus be a straightforward way of producing food for people in vulnerable positions, without the financial pressure to pay salaries and without the coordination and administration difficulties that, for example, care farms experience. However, volunteer-based initiatives may be more vulnerable, rely more heavily on finding quality volunteers, and lack the strategic planning for scale and sustainability. CSA gardens and care farms are more stable, less dependent on donations for funding, and better coordinated. However, they run the risk of overcomplexity in coordinating and administering the operation and losing the goals out of sight. CSA gardens and care farms may fail to combat food insecurity if they do not explicitly include access strategies for low-income groups or donate produce to food-distribution initiatives.

For both financial and policy support, it is essential that food sharing initiatives, especially those relying on funds and donations, have a good relationship to the municipality and other influential parties. The stronger the connection with other NGOs, local organisations and the local population, the more resources can be tapped (financially, materially and socially). This can be achieved by publicity and repeatedly showing the relevance and impact of these initiatives to those involved.

The financial flows and struggle with financial stability and sustainability will be further discussed in the chapter 'Lessons learned'.

5.3 Physical impacts

Our second research question was: *What are the (perceived) physical impacts of food sharing initiatives on participants and consumers at the six researched initiatives?*

5.3.1 Physical activity in nature

Through our interviews and observations, it was found that working in community gardens has a positive influence on physical health. Volunteers at five of the initiatives reported an increase in physical activity, more time spent outside in the fresh air, and increased physical resilience. This is confirmed by Lampert et al. (2021) and Egli et al. (2016), who mention physical activity and healthy body weight as major impacts of working in community gardens. Being more physically active and being in nature have positive long-term impacts. Warburton, Nicol & Bredin (2006) state that being active is associated with a reduction in cardiovascular disease, hypertension, cancer, and obesity, but also a reduction in the risk of premature mortality.

A large part of the community garden volunteers consisted of retired people, who reported an increase in strength and a consistent opportunity for physical activity. According to the recommendations of the Dutch government, people aged 65+ should do at least 150 minutes per week of moderate intensive exercise distributed over several days (Cijfers en Feiten Sport en Bewegen, n.d.). Moderate intensive exercise in gardening can be described as using both the upper and lower body, for example digging, fertilising, weeding, raking and tying plants to stakes (Park, Lee, & Son, 2011). From this, we can deduce that working in the community gardens contributes to the physical health of retired people in the Netherlands. However, some of the participants indicated that they experienced back aches when raking or digging, which might be a counterproductive impact. This suggests that better guidance is needed for older volunteers to prevent injuries. Gardens could offer short instruction sessions to ensure people are doing safe tasks, especially repetitive movements. Some gardens had incorporated measures to minimise a negative physical impact: in most gardens, volunteers could choose their own specific tasks, so they could avoid tasks that they were less able to cope with. The volunteers at Stadsakkers Veenendaal mentioned that they were very happy with the no-dig or no-till method, which minimised heavy work.

Even those participants who are not directly involved in gardening work still receive the benefits of being outside and enjoying nature. Some gardens, especially the care farms, invited elderly people or groups of schoolchildren to spend time in and experience the community gardens. Being in natural surroundings leads to stress reduction, better mental health and both physical and psychological recovery (Shuda et al., 2020; Wicks et al., 2022). Mental health and physical health are closely connected in the long term (Richmond-Rakerd et al., 2021), which means that working in the gardens has multiple health impacts.

5.3.2 Nutrition and food security

Next to an increase in physical labour, studies find a positive relation between working in a community garden and vegetable intake (Lampert et al., 2021, Tharrey & Darom, 2021). However, compared to our hypothesis, none of the volunteers at the community gardens we visited mentioned that working in the garden increased their intake of fruits and vegetables. As was mentioned in the results, most volunteers indicated that they already had a healthy diet with a lot of vegetables before working in the garden. This suggests that an increased intake of fruits and vegetables, which most literature mentions as an impact, might not be the case for our researched initiatives. Some gardens rewarded the work of volunteers by allowing them to take home fresh produce, and others provided a lunch made with vegetables from the garden. This likely leads to an increased variety of vegetables that the volunteers eat, as confirmed by some of them. So, although the absolute amount of fruit and vegetables the volunteers eat does not increase, they do increase their variety. It can be assumed that this contributes positively to their health, but because the actual intake does not increase, the impact of community gardens on the nutrition of the people working there remains inconclusive from our research.

However, the produce donated to the food banks contributes to greater nutritional health for the clients of the food banks. As was mentioned in the results section, this donation ensures that vulnerable people have more access to fresh food. Other food sharing initiatives like the VoedselHub take it a step further and make meals from the fresh vegetables that are provided by the community gardens. Apart from facilitating a place for vulnerable or lonely people to meet each other, it also makes healthy food even more accessible to individuals who do not have the time or resources to visit the garden or spend money on locally produced food. Next to food bank clients, the community around the gardens also profit from the fresh produce. Many gardens are open to people from the neighbourhood by organising 'self-harvesting' days and small markets. Thus, these kinds of food sharing initiatives are likely to combat food insecurity and increase the nutritional health of external people.

5.4 Psychosocial impacts

Our third research question was: *What are the (perceived) psychosocial impacts of food sharing initiatives on participants and consumers at the six researched initiatives?*

In terms of psychosocial impacts of the researched food initiatives, our study identified an enhanced sense of purpose and community, including social cohesiveness and reduced loneliness, as well as reduced stress, connection to nature and improved mental well-being, thereby confirming the hypotheses that were posed at the start of the report. In the ToC we can see that although the initiatives differ in their inputs, all community gardens have shown to have a psychosocial impact.

5.4.1 Mental health

People who experience poverty often deal with poor mental health (Burns, 2015; Payne, 2006), partly caused by social exclusion, which is linked to discrimination (Madanipour et al., 2015). In turn, poor mental health can further affect one's well-being and livelihood, for example, through an increased inability to perform complex tasks like (paid) labour (Mills, 2015). Community gardens are initiatives that are often aimed at tackling the complexity of food-insecure individuals, partly by addressing negative poverty-related mental and social health consequences. One theme identified in our study is the positive effect on participants' mental health of nature and physical exercise, mainly expressed as satisfaction and reduced stress. Our study's findings regarding psychosocial impacts and social health are largely reflected in existing relevant literature. For instance, a systematic review conducted by Lampert et al. (2021) describes that community gardens have positive effects on elements such as participants' mental health and life satisfaction.

Moreover, studies discussed in Tharrey & Darmon (2021) suggest that community garden participants experience a reduction of stress. This effect could be explained by the positive mental effects of physical exercise (Taylor et al., 1985) and the stress-relieving properties of nature (Kaplan, 1995). Moreover, Lampert et al. (2021) find that community gardening had positive effects on both mental and physical well-being in all eight reviewed studies. Gardeners felt more satisfied with life, felt less lonely, experienced more social support and less stress. Furthermore, people who regularly visited the gardens felt more connected to nature and were overall happier. This outcome is apparent in our data through multiple accounts of people enthusiastically describing their gratitude towards being surrounded by nature as community garden participants.

5.4.2 Sense of purpose

It was found that every food sharing initiative we examined fostered a sense of purpose among its participants. These food sharing initiatives have some elements in common that can explain the results: helping others (feeling needed) and being

physically active when working in the garden. Several individuals explicitly reported the positive effects of feeling needed by others or helping others while working in the garden. Some expressed a sense of responsibility and feeling dependable, given that tasks in the garden must be completed and their presence is viewed as valuable. This is consistent with the literature, including a study by Schwartz et al. (2003), which suggests that acts of altruism and helping others are associated with better mental health. On care farms, participants were often identified as individuals with a distance to the labour market (e.g. retired individuals, people who cannot work due to physical/mental ailments). Community gardens offer them purpose and visible, measurable results, and provide 'satisfying labour' (Hanna & Oh, 2000, p. 209), alongside an opportunity to stay active and contribute to "value formation" (Hanna & Oh, 2000, p. 209). This is what aligns with our observations.

5.4.3 Community

Another highly relevant theme that contributed to the food sharing participants' mental health was the sense of community and combating loneliness. As seen in the ToC, our study identified this element in all food sharing initiatives investigated. This effect was often explained by the initiatives creating an environment that fosters social connection by encouraging participants to work, take breaks, eat or simply relax together. Integration within a community is important, as social cohesion is related to the health status of an individual (Berkman, 2000). These findings are supported by Lampert et al. (2021), who describe how community gardens foster human interaction and contact, which have positive outcomes for health and well-being. In their systematic literature reviews, Tharrey & Darmon (2021) also discuss the positive relationship between community gardening and social health, including community empowerment, found in multiple studies. The review conducted by Lampert et al. (2021) concluded that the community gardens provided a place where people often interact and, therefore, individual social networks were strengthened. Consequently, it is suggested that the studied community gardens had a positive impact on mental health and well-being. This is in line with our findings. Although not seen in the ToC, multiple volunteers at volunteer-based gardens mentioned that they did not benefit from the community aspect of the garden because they already perceived their social life as complete. This showed that it is often socially active people who start volunteering in community gardens. For this reason, it can be assumed that the community impact can be overestimated.

5.4.4 Care Farms: A different kind of care

Hassink (2010), specifically zooms in on the shift from government to community-based care in care farms. These care farms have a different approach than traditional care and focus on detecting and harnessing the potential and abilities of a care receiver, rather than their limitations (Hassink, 2010). This approach was observed in both the care farms we visited, given that the participants reported feeling seen and valued on the care farms, not as clients or sick individuals. The focus is placed on exploring what they can do, thereby creating a health-promoting

environment. However, the downside of this 'relaxed' environment and structure of care farms is the inability to welcome and care for people who struggle with especially serious mental disorders or who find themselves in active addiction. This was shared by the Land in Zicht coordinator during an interview.

5.5 Lessons learned

Our fourth research question was: *What are the lessons learned from setting up a food sharing initiative at the six researched initiatives?*

Despite the various positive outcomes and impacts of community gardens, they often encounter challenges and barriers. In many cases, these allow coordinators to learn from the past and improve their approach. Based on our findings, multiple gardens struggle with achieving a self-sustaining structure and an abundance of administrative tasks, mainly in the case of CSA gardens and care farms. Additionally, multiple gardens struggled with a lack of knowledge on handling harvested food by participants and finding volunteers. Although the lessons learned are not included in the ToC, they have a direct or indirect impact on the earlier discussed impacts.

In a study of 26 different community gardens in the Netherlands and Switzerland, Knapp et al. (2016) found that the biggest challenges of community gardens were creating a group of motivated participants, vandalism, theft of vegetables and knowledge about gardening. These challenges were not central based on our study's findings. Whilst some gardens did struggle to recruit sufficient volunteers, all gardens reported having motivated workers and volunteers. Instead, the biggest challenges we observed were financial stability, administration and dissatisfaction with food. The differences in findings between our study and Knapp et al.'s research (2016) could be explained by the geographical location of the studied gardens. The gardens we visited are mainly located in villages or smaller cities. Knapp et al.'s study (2016), however, mainly focused on big Dutch cities in the Randstad, like Rotterdam and Amsterdam. Some of the gardens we visited, like 't Paradijs, had a significant distance from the city, or were situated in a small village, like Voedseltuin Groesbeek. The rural and urban environments may create different challenges. To further illustrate the importance of geographical location, it may be valuable to highlight 't Paradijs' inspiration taken from Sociaal Vitaal, an NGO that supports community gardens in Friesland. 'T Paradijs' coordinator acknowledged the implications of differences in location and surrounding communities and their possible effects on the garden's success.

5.5.1 Financial sustainability

Financial sustainability emerged from our results as one of the core challenges experienced across the initiatives. Based on our observations, this challenge is most frequently experienced by CSA gardens, given their organisational structure. CSA gardens are mainly driven by non-monetary motivations like community building or producing food in an organic way (Samoggia et al., 2018). However, these CSA gardens are not viable or financially sustainable over time without sufficient income streams. Most of the farms we spoke to have a range of different income streams.

Existing literature also mentions high turnover rates of CSA members, with well-established CSAs only maintaining 50% of their customers (Goland, 2002; Lang, 2010). Because of this, a lot of time is spent on attracting new members instead of long-term engagement. This was also mentioned by one of the CSA gardens, whose coordinator mentioned losing over 25% of the new customers after a year. Multiple coordinators and farmers mentioned their idealistic values as the main driver for choosing the work in the gardens, given that financial benefits are not high. However, this willingness is not scalable or realistic for most people. One coordinator said that it is difficult for people to view running a CSA as a sustainable, long-term career due to the financial instability. Only those with financial flexibility or very modest salary needs can realistically pursue such work. According to him, more financial growth is needed in this sector in order to increase the number of initiatives. The literature also found that financial benefits are essential to long-term CSA viability (Carolan, 2017). CSA studies in both the US and Hungary also found that it proves difficult to hire and retain trained labour, since work is only seasonal, and is often underpaid and reliant on volunteers (Castellano, 2017). Only 't Paradijs explicitly mentioned this as a problem. The availability of volunteers seemed to depend on the location, with more isolated farms possibly having more difficulties with attracting volunteers compared to initiatives closer to a city. 'T Paradijs' coordinator shared their concerns about the ageing volunteer base and the gradual loss of expertise. The importance of location was also noticed by two other coordinators in terms of willingness to pay for higher-quality produce. It was mentioned that farms close to progressive cities like Nijmegen or Utrecht might have an easier time attracting customers who are willing to pay more for quality products. For volunteer-based gardens, the challenge is mainly in finding and retaining sponsors, as most sponsorships consist of a one-time donation.

A best practice that helps address potential financial vulnerability is thorough planning. Three gardens specifically highlighted the importance of developing a clear vision for the garden, as well as a business plan that includes revenue models and roles.

5.5.2 Administration and communication

Working in a community garden is often associated with being outdoors and connecting with nature. However, multiple coordinators emphasised that a large portion of their work is administrative, like budgeting, planning, emailing, or reporting. A farmer notices that people romanticise her job without realising the amount of time spent behind a desk. Another coordinator also said that his main job is behind his laptop, emailing or logistical tasks. For example, to organise open days, which can be helpful with attracting new volunteers, and raising financial support and donors. According to some literature, CSA managers need to evolve beyond traditional farming skills. A successful CSA garden requires strong communication and organisational capacities (Samoggia et al., 2018). One commercially oriented coordinator said that people who dislike entrepreneurial

aspects like sales, marketing, or digital communication are not fit to run a community garden. According to him, even a very nice garden would not survive without a properly organised foundation. This aligns with the literature's emphasis on the need for a professionalised, hybrid skillset in CSA management (Samoggia et al., 2018).

Some gardens have found success in distributing responsibilities based on people's talents and expertise. Multiple coordinators mentioned the value of mapping the skills of volunteers and staff. This talent-based approach not only increases efficiency but also creates engagement and a sense of ownership among participants. Additionally, holding regular meetings where volunteers and staff can give feedback was also mentioned as a helpful way to increase clarity and motivation.

5.5.3 Dissatisfaction with food

According to literature, members of CSA gardens can become frustrated with the limited variety of products, with unfamiliar vegetables, or with receiving too much of one item (Lang, 2010). This can lead to food waste or members not renewing their membership. This did not really come back in our interviews with the CSA garden, as their members had the possibility to choose the vegetables to their liking and were also informed about all of the possible downsides. However, it is possible that some of these reasons were still the cause of high turnover rates. In the context of food banks, some recipients struggled with cooking unfamiliar vegetables or those that look different from vegetables from the supermarkets. To overcome the problem of having leftover vegetables that are still good to eat, some initiatives started using them. The VoedselHub Nijmegen collects surplus produce from multiple gardens and delivers it to social restaurants. Since chefs cook meals with the food in large batches, it becomes easier to integrate unfamiliar or surplus vegetables into meals. VoedselHub has plans to make a recipe book to support chefs in working with such unfamiliar produce, because this can also be a challenge for them. The literature also mentioned that providing cooking advice can help CSA members manage their shares (Lang, 2010). Surplus food could be preserved or processed to reduce waste and improve year-round food availability (Samoggia et al., 2018).

5.5.4 Connection with vulnerable groups

A key challenge that could still be improved is the limited connection with vulnerable populations who might benefit most from affordable or donated produce. Both VoedselHub Nijmegen and VoedselHub Groesbeek acknowledged that barriers such as health issues or inflexible work hours might prevent some people from fully participating. This would be especially true for participating in harvesting on location, as suggested by Land in Zicht and 't Paradijs. They used to produce for food banks but noticed that this only has a limited impact, since people merely receive the food packages without the educational and social aspect. Instead, they are setting up a system where they organise trips for people in need to come to harvest themselves. This would also potentially lead to less food being thrown away

because of unfamiliarity. By providing meals instead of only vegetables, and a place to eat these meals, VoedselHub also tries to make this connection with vulnerable people.

5.5.5 Incidental Findings – Education

Based on our observations and interviews, most community gardens contribute to increasing participants' knowledge on aspects like gardening, food aid initiatives, and fruits and vegetables. Although outside the original scope of our research, we found that the educational value of community gardens is stronger than initially hypothesised. This finding is also in line with research conducted by Ncanywa et al., 2025, which suggests that "hands-on agricultural education" can contribute to "knowledge of food systems" (Ncanywa et al., 2025; p. 3). For volunteer gardeners, learning new gardening knowledge can not only increase work efficiency, but can also increase crop yields and provide more food to the food bank. Community gardens provide their participants with specific knowledge about growing vegetables and fruits and their seasonality, and also about composting and greenhouse maintenance. This is a valuable impact of these initiatives.

For customers participating in community garden's self-service picking activities, they can also learn a lot of crop knowledge. In an interview with a volunteer, they stated that they are also learning about the use of various harvesting tools and how to safely carry out harvesting activities. When communicating with other pickers in the farm, they can also share their picking experiences and insights. This is not only an opportunity to get fresh agricultural products, but also an experience of learning and growth. This way of increasing knowledge among volunteers and participants was introduced to us by multiple people we interviewed. This way of learning allows participants to deepen their understanding of sustainable agriculture while practising.

Additionally, it was found that some community gardens also provide a place for those with immigrant backgrounds to learn Dutch. For families of immigrant students, they easily feel isolated because the immigration process has resulted in them losing important social networks (Bathum, 2007). When volunteering in community gardens, they can share their planting experience with others or seek advice from others. The cross-cultural events sometimes held by community gardens provide opportunities for immigrants or refugees to establish a sense of belonging in foreign lands (Datta, 2019).

Multiple gardens told us about the external education activities they organise for schoolchildren. These gardens invited schoolchildren over to help in the garden. We expect this to have an impact on the knowledge of food origin and harvesting among these children. Gardening is more effective for improving nutrition compared to other educational programs, according to the meta-analysis of Langelotto et al. (2012). This literature suggests that this way of education also increases vegetable consumption among these children.

Chapter 6

Research Limitations

The research we performed has multiple limitations. The first limitation is that a lot of the literature we used is from research performed in other parts of the world. It is possible that other articles received their data from gardens that are not comparable to our case studies. Although Samoggia et al. (2018) concludes that CSA gardens around the world have significant similarities across countries, this conclusion is only for CSA gardens. It is possible that in other areas in the world, the other gardens have a different impact because of differences in environment, culture, and soil type. Another limitation, also mentioned in the article from Tharry & Darmon (2012), is that food-insecure households do not have the time or interest to visit a community garden. For this reason, our research does not apply to everyone who belongs to this group. However, this can be mitigated because we also spoke to some people at the VoedselHub and a food bank, which is a more accessible alternative. Another limitation of the research is that during the performed interviews, some of the interviewees were asked if they could speak English. This was because some of our group members do not speak Dutch. This could have impacted the results because interviewees could have had a limited English vocabulary and therefore not been able to make themselves clear. The last but probably the largest limitation is that we collected qualitative data in our research. Qualitative data has multiple shortcomings; it can have low flexibility in the response choices, it can have multiple biases, and the data is not generalizable (Queirós, A., et al., 2017). Some biases that could have occurred in our research were selection, researcher and recall bias. These biases might have impacted the validity and reliability of the research. Some of the instruments we used, such as the whiteboard and the interview guide, could have influenced answers and therefore, caused inconsistent interpretations across respondents. Another limiting factor was the duration of the research; we did not have a lot of time to interview a large group of people. An example of how this limited our research was that at one CSA garden, we only interviewed 2 participants, while in that garden, there are about 270 participants. This makes it hard to make representative conclusions. The difference in the number of interviewed people per garden and group (volunteers, coordinators, etc.) can also give imbalanced insights into the gardens. The fact that we visited the gardens at a specific point in time makes it questionable whether conclusions based on our observations are generalizable to a larger scale or just specific for that moment.

Future Research Suggestions

Given that most of the limitations of our research are caused by a shortage of time, there are some suggestions for future research that is less limited in time and materials. With more time and materials, quantitative data can be collected from the gardens, which will improve the reliability of the research. A larger study should assess a larger number of participants to increase generalisability, and we suggest assessing change over time by visiting multiple times or following participants for a longer period. For ethical reasons, future research has to think of the burden on the participants as the research will possibly be more intense and over a longer period.

Chapter 7

Conclusion

This research investigated the impact that food sharing initiatives have on social and health challenges and how these initiatives can be strengthened. To answer the main research question, we conducted qualitative research and answered the four sub-research questions.

From our research, it can be concluded that all the gardens we visited have a large network and are connected to other parties like the municipality, NGOs and sponsors (SRQ1). A large network and good relationships with influential actors are essential for care farms and volunteer-based gardens to operate effectively. The three types of gardens (care farms, volunteer-based gardens, and CSA gardens) face different challenges that flow from their main goals, workforce structure, and financial dependencies, and each needs to strategise according to its specific needs.

In terms of the (perceived) impact of physical activity on physical health (SRQ2), we conclude that community gardens have a positive effect on participants. We found that working in community gardens contributes to an improved physical health of volunteers and participants. However, it is important that participants have a choice in which tasks they do. Regarding nutritional health, it was found that participating in a community garden led to only a small increase in fruit and vegetable intake, but the impact seems to be stronger among food bank consumers. However, the variety of fruits and vegetables consumed did increase when participants started working in the gardens. In summary, our findings do not fully support the hypothesis that participation in a community garden leads to better nutrition, but an indirect positive effect is observable in food bank produce receivers, which highlights the nutritional value of community gardens on vulnerable groups in the Netherlands.

Regarding the (perceived) psychosocial impact (SRQ3), we conclude, in line with our hypothesis, that community gardens contribute to an improved perceived social health of the people involved in the gardens. This was expressed as an enhanced sense of purpose when working or volunteering in the garden, a sense of community that the gardens foster and the improved mental health due to working in nature without the pressures of a 'traditional' working environment. These psychosocial impacts were not found for food bank clients.

An incidental finding in this research is the educational value that community gardens have, both for volunteers and participants as well as for external groups, like schoolchildren.

We conclude that setting up a community garden reveals a range of challenges and learning opportunities (SRQ4). Financial sustainability is a key challenge for all the initiatives. Only one of the gardens that we visited was completely self-sufficient and did not rely on any government funding or sponsorship. Many initiatives rely on diverse income sources and emphasise the importance of clear visions and structured business planning. Most gardens manage to engage motivated

volunteers, but this can be a bigger challenge in remote locations. Food sharing initiatives have different approaches to providing vulnerable groups with more healthy food. Reaching those people, increasing their food security and improving their dietary quality remains a challenge.

Finally, assessing the impact of community gardens in the Netherlands is a complex task that requires attention to a multitude of facets and implications, due to the large variety of garden types. Quantifying the intensity of impacts and identifying which ones should be prioritised was not the focus of this study. However, our research highlights that the diversity of the initiatives strengthens the impacts they have on vulnerable groups, each aim and structure complementing the others.

Chapter 8

Advice for the commissioner

Based on the analysis of successful community gardens, there are some following recommendations we made for the commissioner.

8.1 Further research

Our first recommendation is to continue conducting research on the educational impact of community gardens and promote educational activities in community gardens. The large educational aspect we found is not emphasized in literature so far. Community gardens can take a more active role in connecting citizens to nature, teaching people how to cultivate plants, and showing both children and adults where their food comes from. In the long term, gaining more knowledge about food and agriculture might increase the likelihood for people to eat healthier or buy more sustainable produce. Showcasing this important aspect of community gardens might also help with receiving more funding or subsidies.

8.2 Social inclusion

Additionally, we advise further exploration into how community gardens can target vulnerable groups more effectively. Our report found a large variation in how community gardens engage with people in vulnerable positions. While some gardens focus on producing for the food bank, others bring people to the gardens to harvest the fresh produce by themselves. While both elements are valuable, we observed some challenges in terms of reaching those most affected by poverty and food insecurity. Simply providing vegetables is sometimes insufficient, since some people do not have the time, energy or resources to make a healthy meal using them. Furthermore, they miss out on the physical and mental benefits of working in a community garden. However, this activity is time-consuming and not feasible for everyone. In order to achieve more inclusion, community gardens need to think about approaches to reach vulnerable people. Some possible options are to maintain donations to food banks, offer harvesting opportunities when feasible, and collaborate with social kitchens to deliver ready-made meals. Local networks and municipalities can be especially instrumental in facilitating these activities, which may also increase the social impact of community gardens.

8.3 Financial sustainability

Concerning the financial structure of the food sharing initiatives, our advice to the commissioner is to support them in becoming as self-sustaining as possible. This can be achieved through a diversified income. Examples of different kinds of garden income sources we observed are markets, open days, a tea house, team building activities, gardening courses and other creative activities. These kinds of activities can be an important supplementary and more stable form of income.

On the other hand, municipal funding is still an important financial source. The impact analysis we conducted can be used to showcase the gardens' impacts, in order to attract the attention and appreciation of municipalities or other donators. We also encourage local sponsorship for the gardens, since this increases local publicity, interest and involvement.

8.4 Network

An important consideration that influence the success of community gardens is networking. Fondsenbeheer Landbouw & Zorg can directly influence this process. An example that illustrates the possibility for the project's commissioner to stimulate networking is the organisation of an event where gardeners and farmers of different community gardens can meet. Some of the gardeners indicated they would like to see other gardens, but did not have time for it. This type of event could provide an opportunity for the gardeners to speak to like-minded individuals who share the same ideals and challenges. Alongside connections to other gardeners, ties with the local government are important. Multiple gardeners indicated the importance of working closely with the municipality. As an organisation that oversees multiple initiatives, Fondsenbeheer Landbouw & Zorg could play a role in enhancing the visibility of the gardens' impacts, especially in terms on municipalities. Whilst the institutionalization of community gardens in each municipality would increase their reach and consequently, their impacts, this would also likely increase administrative labour and may remove some of the valued flexibility and informality of community gardens.

8.5 Professional staff

Lastly, we think that the efficiency and smooth operation of the community gardens could be enhanced by employing professional or paid workers. From an agricultural perspective, using certain methods for tilling the ground can significantly increase the harvest and make the work lighter for volunteers. Some gardens were lucky to have volunteers to have this knowledge and experience, or were already run by a professional farmer, but not all gardens have access to these resources. From a societal perspective, having professional (health)care personnel or paid social workers can greatly enhance the social impact of the gardens, by facilitating people with neurodivergence, mental problems or a distance to the labour market to work, grow and flourish at the gardens.

Chapter 9

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Chapter 10

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Appendices

Appendix 1: Case studies

Main goals

The community gardens share a mission to address food insecurity and promote community well-being but have different priorities and approaches. The main goals are separated for the three types of gardens: care farms, volunteer-based gardens, CSA (Community Supported Agriculture) gardens and food sharing initiatives as Food bank.

Volunteer-based gardens we visited are Voedseltuin Groesbeek, Stadlandbouw Arnhem and Stadsakkers Veenendaal. They focus more on community participation and volunteer management, engaging in agricultural production through volunteer activities. Its goal is focused on agricultural production itself and promoting community integration. They often focus on providing food for food banks and supporting vulnerable groups in the labour market.

Care farms we visited are 't Paradijs and Land in Zicht. They providing care to both elderly and young people with mental disorders or other struggles. The people providing this care are trained professionals and earn a wage from this work. Next to that they also work with volunteers to take care of the garden. Paid farmers can help organise the work that needs to be done in the garden and make tasks for both the volunteers and participants receiving care. Land in Zicht had more of a selection process in choosing the participants that went there and focused more on growth for participants to go from participant, to volunteer, to paid worker. For both care farms, the goal is to build a symbiotic relationship between humans and nature, and in this way, reshape the social value of vulnerable groups.

CSA gardens, such as Gelukkige Groentes, have a broader range of goals. It not only focuses on agricultural production, but also on the fairness of food prices, environmental sustainability, and social impact. It makes comprehensive contributions to the health of humanity, society, and the planet through localised and organic vegetable production methods, as well as community education and cooperation. Land in Zicht also has a CSA garden.

Food sharing initiatives we visited are the Voedselbank Groesbeek, VoedselHub in Nijmegen and we called with the food banks in Arnhem and Veenendaal. They work on two main goals: to help people with a low standard of living by giving free food and to fight food waste. Volunteers of the food bank collect food to help people with low incomes and rely on donations from businesses and social organisations. This food is divided into crates and collected by people for free. Food sharing initiatives like VoedselHub also promote social connectivity through food by organising communal dining. They collect food from social farms, and bring that to social kitchens, who cook the food for people from vulnerable groups. They do not need to show proof of low salary.

(1) Stadslandbouw Mooieweg Arnhem

Stadslandbouw Mooieweg is a volunteer-project that started up in 2014. Starting with only around 15 volunteers, it is now a large-scale project with 100-120 volunteers, coordinators and a board. This community garden in the middle of a neighbourhood in Arnhem covers about 1.5 hectares of ground and is carpeted with rows of vegetable beds and fruit trees. The plot is divided into three main fields with a variety of planted goods, a permaculture garden, a herb and flower garden and a few greenhouses. The soil is being worked by different groups of volunteers who each come around two mornings a week. The volunteers are allowed to take some of the harvest home. Around 80% of the produce goes to Voedselbank Arnhem, and some of it is sold through the organization of 'self-harvest afternoons', where people can come and harvest their own fruit and vegetables. Sometimes they also sell seeds and seedlings.

The social center of the garden is a community building with a veranda, a space with a long table and chairs, and a roof covered with grape vines. Dried onions line the walls on both sides. This is a space for all the volunteers to gather as they enjoy their morning cup of coffee in the breaks between working in the garden. About a third of the volunteers is retired, a third is people with a (part-time) job, and a third is a group consisting of refugees, people with a burn-out, people without a job, etc.

The goal of the project is both to produce food for less resourceful groups in society, and to provide a place for (vulnerable) individuals to work and enjoy nature. Everyone is welcome to visit the garden for 'ontspanning en ontmoeting' (relaxation and encounters) en 'rust en zingeving' (rest and purpose), including people who cannot be part of the labour market for different reasons, elderly people, families and schoolchildren. All of the food is being produced biologically, and the



Figure 10. Community place for volunteers at Stadslandbouw Mooieweg

grounds are used for experiments with new techniques and crops that enhance biodiversity. Several activities are regularly organised in the community garden, like an open day with children's activities, tour guides, tasting opportunities, flower picking, and collaborations with sheep herders and beekeepers. The project is focused not only on the produce, but also on providing a green place where people can come into contact with nature, create community with people from the neighbourhood, educate youth on growing greens, and offering a flexible and low-pressure working space for individuals with a distance to the labour market.

Stadslandbouw Mooieweg is a foundation and has been financed by the municipality of Arnhem, different social initiatives in the area, some proceeds from selling the harvest in the neighbourhood, crowdfunding initiatives and donations. The foundation has a lot of publicity through a three-monthly newsletter, open days, neighbourhood initiatives and attention from media.

2) Stadsakkers Veenendaal

Stadsakkers Veenendaal is a volunteer initiative that grows vegetables and fruits primarily for the food bank in Veenendaal, but also for food banks in Wageningen, Rhenen and Renswoude. The initiative is part of the foundation 'Stichting Missie 0318' and started in 2017. After 5 years, the initiative had to find a new place for their garden, because houses were going to be built on the place where they had their garden. Luckily, Stadsakkers Veenendaal could continue their work on a field at the edge of Veenendaal, a place that was donated to them by the municipality of Veenendaal. They now grow fruit, vegetables and even some herbs in their garden of 1,5 hectares, which is run completely by volunteers. This is made possible by the many sponsors they have, from whom they receive money. Another source of income is the money they earn from the selling of their leftovers on their own market, which happens every other week during summer.

Stadsakkers' garden is divided into several fields with different kinds of fruit trees, areas with vegetables and also an area where some herbs grow. In the middle, right between the fields is 't Akkerhuis, a small building where materials are stored, but which also serves as a meeting place for the volunteers before and after a day of working in the gardens to have a cup of tea or coffee with a cookie. In 't Akkerhuis, groups of children from primary schools are sometimes welcomed for a tour around the garden and meetings to discuss the work during the season also take place in this community building.

In principle, all fruits and vegetables that are grown go to the food banks, but this always goes in consultation with them. When there are leftovers that cannot go to the food banks, these are sold on a market that is organised every other week by Stadsakkers. Then, people from the neighbourhood can come and buy these products for a small price.



Figure 11. Lanes with vegetables at Stadsakkers Veenendaal

Although everyone is welcome to join and help in the garden, most of the volunteers are retired people who enjoy working in the garden and being outside. There are also some people who work part-time and help in the garden the rest of their time and there are some refugees who live in the refugee centre in Veenendaal that come and help in the garden sometimes. The group of volunteers consists of approximately 80 volunteers in total.

As mentioned before, most of the produce goes to Voedselbank Veenendaal, but when there are leftovers, these also go to other food banks in the region. Stadsakkers can provide fruit and vegetables to the food banks starting from April/May until October/November. The food bank has contact with Stadsakkers to discuss what they can get from the garden, and then, some people from the food bank get there two or three times per week to pick up the food. At Voedselbank Veenendaal, customers can go there and choose the fruits and vegetables they want themselves.

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3) Voedseltuin Groesbeek

The community garden in Groesbeek runs on volunteers; there are 25 volunteers who work on Monday morning and Thursday morning. On Thursday morning, they harvest vegetables for the food bank.

They are a foundation, and they get their money from local companies and associations that sometimes raise money or donate a gift. They got the plot in 2021 as a gift from the municipality. They took some time to start up and started in 2022 with their first planting. They were helped by a woman who had experience in food gardens. Currently, they are in their fourth year of harvesting. All the food goes to the food banks, occasionally, the misfits go to the volunteers.

They have a plot of 2000 m², half of which is used for growing the vegetables. The other half is used for washing the vegetables, there are some raised planting beds and the clubhouse (a second-hand caravan). The clubhouse was bought and in the second year they decorated it with wooden sticks. The caravan is used as a place where they come together to discuss things, but also to have a nice coffee break. During our visit we also joined a coffee break, and it shows that the group of volunteers use this time to exchange information and have a nice conversation. The social cohesion in this group is high. We also noticed that the people who were working on the community garden were mostly retired. The volunteers were in a good shape and the people interviewed mostly had an idealistic drive to work there as a volunteer. Most of the volunteers were retired.



Figure 12. Garden sights at Voedseltuinen Groesbeek

During our visit we saw that some people coordinate the harvest. Others are harvesting on land, washing the fruits, collecting the vegetables in the crates and working on the compost. The food beds were labelled, and they are aligned neatly. There were 23 beds of 20 cm by 1.40 m. There was one greenhouse in which they grew tomatoes, cucumbers and paprika. One woman was in charge of this greenhouse, as it was quite difficult to manage.

The community garden in Groesbeek harvests vegetables for the food bank. This happens from April until November weekly. Vegetables are collected on Thursday morning. They are washed and collected in crates, after which they are collected by a van of the food bank. Once at the food bank, the vegetables are distributed over the crates for the consumers of the food bank. This is all done on Thursday. The food bank tries to give every crate (and therefore every family) fresh vegetables from the food bank. On Friday, the consumers of the food bank come to collect their crates. This happens once per week.

(4) Gelukkige Groentes

Gelukkige Groentes is a so-called picking garden. They have two locations, one in Malden and one in Ooij, where farmers produce vegetables and fruits. Both gardens consist of approximately 0.9 hectares of land from which about 5 to 6000 square meters are really intensively used to grow vegetables, flowers and fruits. Per garden, there are two full-time farmers and one trainee farmer who produce the vegetables for around 550 members in total. The season in which they produce the vegetables is from May to December, during this time they grow more than 60 types of vegetables, 15 types of herbs, 18 types of flowers and 5 types of small fruits.

(Gelukkige groentes started in 2019 in Malden and are now 6 seasons into producing vegetables. Next to producing food for the subscribers, Gelukkige Groentes also organises workshops and training about gardening, and there is even a training program about starting your own picking garden. Both gardens are their own VOF. Next to Gelukkige Groentes, a foundation was founded, called Gelukkige Groentes voor iedereen. This foundation has been separated from the company Gelukkige Groentes since 2022 and focuses on educating children on gardening and collecting vegetables for food banks. The foundation is sponsored by multiple sponsors. The vegetables that they receive for the food bank at this moment come from the Gelukkige Groentes garden in Ooij, where they have reserved about 500 square meters of land to produce vegetables for food banks.



Figure 13. View of the garden at Voedseltuin Groesbeek

Since 2025, they not only produce vegetables for food banks but also for the Voedselhub in Nijmegen.

(5) Land in Zicht

Land in Zicht is a care farm and picking garden located just outside of Amersfoort, right next to a new neighbourhood. The garden is situated on Tuinpark Laakzijde, which they share with the Moestuinvereniging and an agroforest.

Land in Zicht has two target groups. On one hand people can get a subscription to harvest vegetables at Land in Zicht. The target group for this is mostly families with young kids and older couples. Next to this, Land in Zicht provides a place for people with neurodivergence or distance to the labour market to spend their days and work in the garden. All kinds of people are welcome to spend their time in the

garden, from 18 to 80, with mental or physical struggles. Land in Zicht also has a group of gardeners, who maintain and construct gardens elsewhere. The team of gardeners consists of people who struggle with having or finding a job. These people get paid for their garden work, and they are accompanied to develop themselves further by the enthusiastic employees of Land in Zicht. Through this structure, Land in Zicht is able to help people in vulnerable positions, while also providing healthy food for the people that live in the area, that take a subscription. One of the important goals of Land in Zicht is to help the people that receive care there to develop, and to create new possibilities for them.

Land in Zicht is a social company, which is different from an NGO. They get money from care budgets from the municipality and Zorg Kantoor, because they provide day care. They also earn money from the harvesting subscriptions they sell. Next to this, the gardening company that they have earns money, as well as a tearoom that they have on site. The municipality helped with making the initial investments in the garden, like necessary equipment. Eighteen people are employed at Land in Zicht, about half of them are care workers and the other half are gardeners, and there is a cook for the tearoom. Next to that, there are around 30 volunteers that visit the garden regularly to help.



Figure 14. View of the garden at Land in Zicht

When you enter Land in Zicht, you first see the tearoom and the workplace where people can do crafts. When you enter the garden, you see a flower garden, and many playing tractors for children. Further in the garden, there are rows of vegetables and fruits. Everything is labeled clearly, to make the harvesting clear for the subscribers. On the right, there are greenhouses where food is grown. In one of them, there is a coffeeplace with couches and tables and a little kitchen.

(6) Boerderij 't Paradijs

't Paradijs in Barneveld is a care farm located in rural Barneveld. It has vegetable gardens, greenhouses, and orchards. They used to produce for the food bank, but since this year they are setting up a system where people with lack of access to vegetables come to the garden themselves to harvest and learn about the fresh produce. Everyone who joins in, from young people with learning disabilities, elderly people with dementia, to children with behavioral challenges, contributes in a way that suits their abilities. Activities include animal care, gardening, simple chores, or

creative tasks, like painting. Some of the paintings made by participants hang on the side of the house. 't Paradijs is home to various animals, including cows, pigs, chickens, sheep, horses, and rabbits which are taken care of with the help of the participants, paid workers and volunteers. They have 9000 chickens, which produces 2.5 million eggs for the biological supermarket chain 'Odin'. This makes up about 40% of their structural income. The other 60% comes from the care they give. These numbers can fluctuate. Part of the food that they produce in the gardens gets sold to biological shops, another part gets used in the places that they rent out, and a part gets used to make meals for the participants. They get some money to provide these people with healthy meals. Another income stream comes from renting out one of the buildings for parties, or to companies. They also make money from their shop where they sell their products. They rent 8 hectares of land from an NGO, which guarantees a long-term stay, and another 24 hectares from the neighbours and from another party, which is used for the cows.

The farm works together with 20 colleagues who are paid workers, of whom around 15 are fulltime jobs. There are about 60 volunteers, of whom most are drivers to bring and return the participants, as well as the products. 't Paradijs maintains strong connections with local schools, social work organisations, and the Barneveld municipality. Regular open days and seasonal events offer the broader community a chance to visit the farm, buy local produce, and learn about care farming. The community is quite involved with the farm, which helps them with attracting and raising funds.

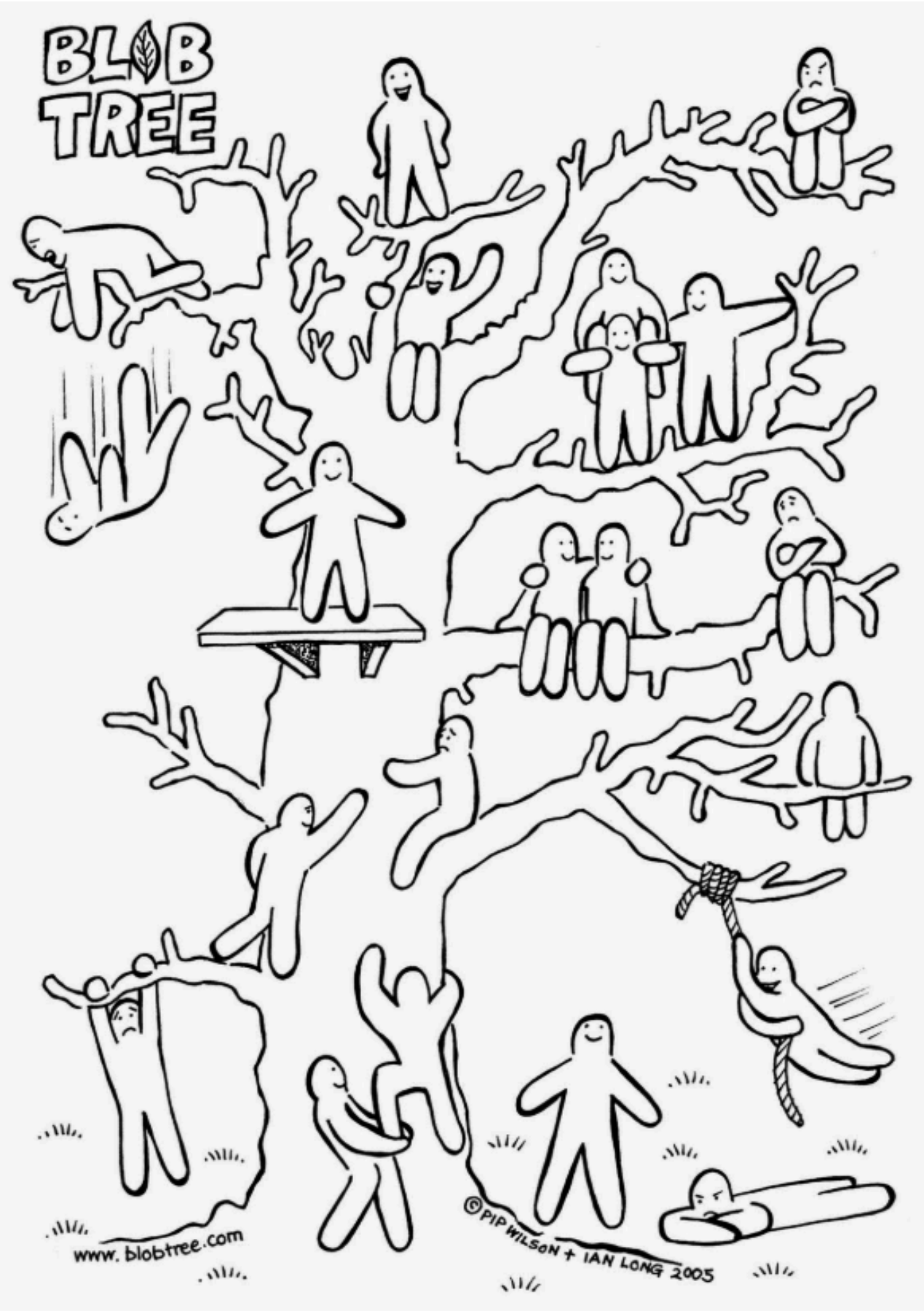
They make an effort in making the work in the garden as enjoyable as possible for the participants. They changed the design of the garden so that there are more lanes of grass in the middle of the vegetables, so that there are smaller patches which are easier to finish. The same counts for weeding, they have made the rows a bit smaller, which enables people to finish something. They are also working on a flower garden to make the area look even more beautiful for the participants that are going for a walk.



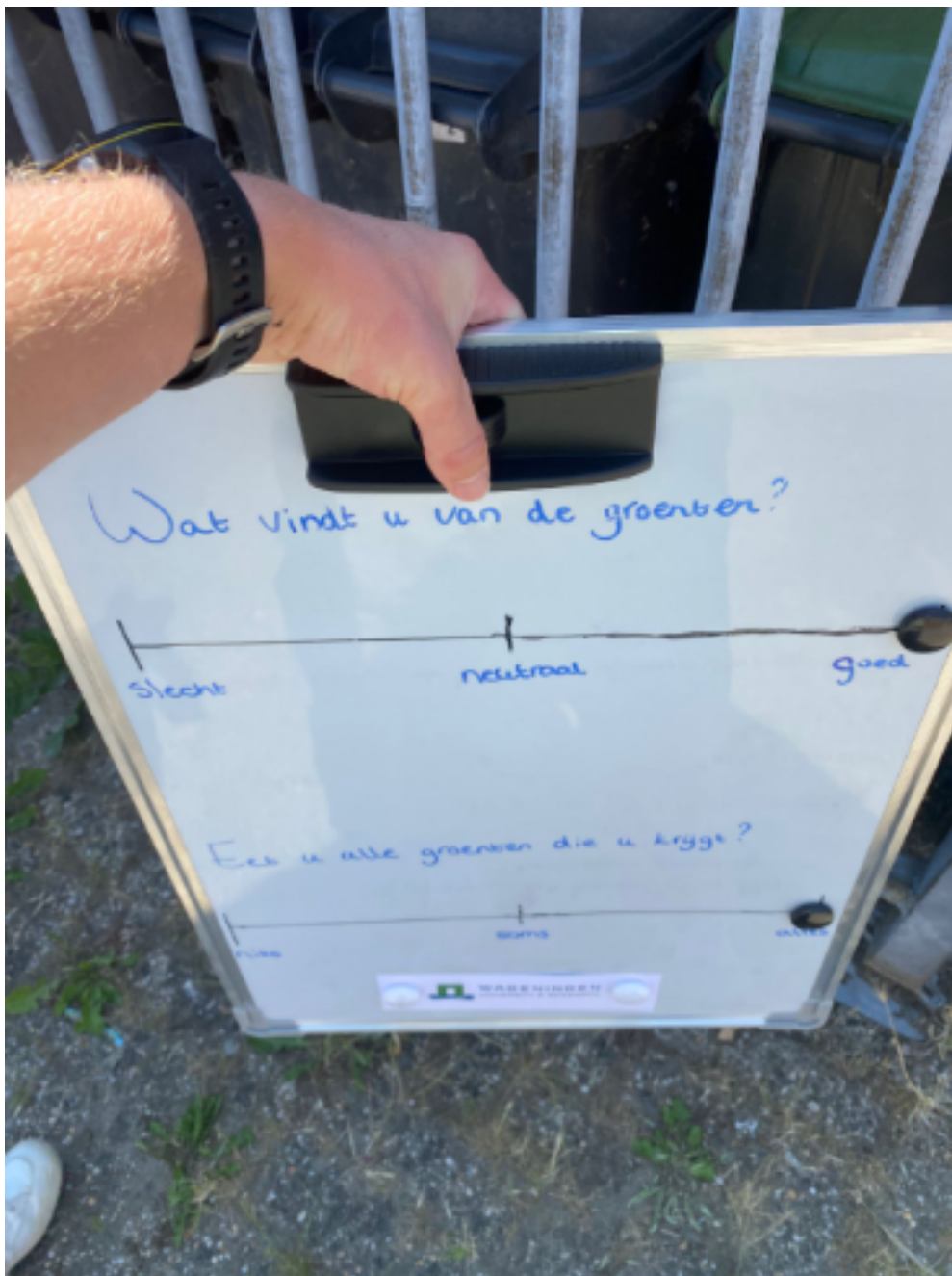
Figure 15. Greenhouse at 't Paradijs

The farm is supported by the NGO Stichting Vrienden van zorgboerderij 't Paradijs, who raise funds to support and increase the wellbeing of elderly and young people that receive care at the farm. Thanks to donations and support from the community, the foundation helps finance extras that go beyond basic care, like excursions or celebrations that bring joy and connection to participants.

Appendix 2: Blob Tree model



Appendix 3: VAS scale Voedselbank Groesbeek



Vragen

Wat vindt u van de groenten?

Slecht – Neutraal – Goed

Eet u alle groenten die u krijgt?

Nooit – Soms – Altijd

Appendix 4: Coding themes

1. Physical health

Nutrition

Movement / being in good shape

Being outside / in nature / around animals

2. Social health

Mental health / stress relief

Community / loneliness

Sense of purpose

3. Education

Educational for the volunteers / participants

Educational for outsiders (schoolchildren, neighbours, etc.)

4. Organisational structure

Garden characteristics

Main goal of initiative / long term vision

Structure of volunteers / coordinators / paid workers / etc.

Networks / allies / adversaries

Finance flow

Challenges

5. Lessons learnt

Best practices

Improvements