# FLOURISHING COMMUNITIES

A case study approach to determine the influence of Community Garden Initiatives on food-related practices in the Netherlands

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# PREFACE

This master's thesis marks the final chapter of the master's programme Environment and Society Studies with a specialization in "Local Environmental Change and Sustainable Cities". This research was conducted over the past six months by studying literature and relevant theories, conducting interviews and observation, analysing data and writing this thesis. Doing qualitative research has been a completely new, but educational and rewarding experience for me and I would like to thank a number of people for their help and support.

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I hope you enjoy reading my thesis!

Wanyta van Son
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# EXECUTIVE SUMMARY

Current food systems are highly unsustainable and have a variety of social, environmental and economic impacts, increasing the urgency for new, more sustainable food systems. This thesis first of all aims to determine the potential and challenges of community garden initiatives. Secondly, the goal is to determine the influence of community garden initiatives on food-related practices among participants and non-participants. The food-related practices studied in this research included (1) gardening practices, (2) selecting and buying food products and (3) preparing meals. Two community garden initiatives were chosen as cases to study this influence on food-related practices, namely the *Plukroute* in Hank and *Wereldtuin Verdeliet* in Cuijk. For this research, a multimethod approach was used, combining desk research, semi-structured interviews and participant observation to obtain data. Data analysis was conducted using Atlas.ti. The findings show that community garden initiatives yield a variety of social, economic and environmental benefits. However, there are also some barriers and challenges that should be considered, including environmental challenges, physical challenges and individual or community level challenges. Furthermore, the findings showed that participation in community garden initiatives had an influence on meanings, materials and competences of the food-related practices. The interaction between these elements led to the development of new, more sustainable gardening and other food-related practices, such as reclaiming and reusing seeds, adopting more ecological ways of gardening, selecting more sustainable food products (local, organic, seasonal, unpackaged), using weeds or other edible plants from nature to prepare meals or wasting less food. Participants also developed other non-food related practices, such as reusing or recycling waste products or separating waste. The findings furthermore showed that new, more sustainable food-related practices are shared with non-participants – though only with a limited circle of friends, family and neighbours – through informal conversations, social media, and workshops or by sharing something in the local newspaper. Ultimately, it can be stated that community garden initiatives have great potential in contributing to a transition towards more sustainable food systems of provision and consumption if their influence would expand to a larger scale.

**Keywords**: Community Garden Initiatives, Sustainability, Food Consumption, Social Practice Theory, Transitions

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# 1. Introduction

## 1.1 The challenges of current food systems

Currently, unsustainable patterns of food production and consumption are resulting in environmental, social and economic impacts (Sala et al., 2017). The global population is increasing, especially in areas already facing food insecurity. This also means that more people are starting to suffer from chronic hunger (more than 800 million in 2016) and food supply has to increase (Van Berkum et al., 2018). However, increasing food supply is not enough to address other issues, such as concerns with regards to the environment, equity and power, trade, diet and health (Béné et al., 2019).

Ritchie and Roser (2020) have summarised the main global environmental impacts of food and agriculture, arguing that the sector is responsible for 26% of global greenhouse gas (GHG) emissions, 50% of global habitable (ice and desert-free) land use, 70% of global freshwater use, 78% of global ocean and freshwater pollution and 94% of mammal biomass, meaning livestock. Global patterns of food production and consumption furthermore cause major loss of biodiversity through large-scale land use changes (Berners-Lee et al., 2018). In addition, the emission of GHGs from the food and agriculture sector contributes to the climate crisis. Climate change impacts and environmental degradation caused by a variety of factors, including pressures from the agriculture sector, can also be seen in the Netherlands. Over the period between 1907 – 2019, the annual average increase in temperature in the Netherlands was 2.1 °C, which was two times higher than the world average increase of 1.0 °C each year (CBS et al., 2020a). There is also a trend towards an increase in the annual precipitation in the Netherlands, especially in the winter. Over the period between 1890 – 2019, the sea level at the Dutch coast has risen by an average of 24 centimetres (CBS et al., 2020b). These are just a few examples of trends in the Netherlands which trigger great concern about the environment, human health and wellbeing.

Our dietary habits are also influencing animal welfare in a negative manner, pressing the need for a reduction of our consumption of meat and other animal products (Scherer et al., 2019). By (partially) replacing animal-based foods with more plant-based alternatives, our diets would have a significantly smaller impact on animal welfare as well as on the environment (Fanzo, 2019). Next to the environmental impacts, current food systems also pose social and economic challenges, such as inequalities, leading to "excesses and insufficiencies in supply, distribution and availability" (Berners-Lee et al., 2018, p. 1). There is also a growing concern of food security as well as health and nutrition-related problems, which furthermore complicate the sustainability challenge (Garnett, 2013; Béné et al., 2019). Finally, food waste, which can be defined as "wastages generated during late stages of food supply chains, namely during marketing and consumption" (Borrello et al., 2017, p.2), is becoming a large concern. While consumers in underdeveloped or insecure countries are often very conscious about not wasting any food, consumers in Western countries are throwing away huge amounts of perfectly edible food (Borrello et al., 2017). Overall, it is estimated that almost 90 million tonnes of food are wasted every year in the European Union alone. This amount is divided between different stages in the food chain as follows: "11% from primary production, 19% from processing, 5% from wholesale and retail, 53% from households, and 14% from food services outside the home" (Kliaugaite & Kruopiene, 2017, p. 8). All these problems give rise to the question of how to ensure food security while making food production more environmentally, socially and economically sustainable (Garnett, 2013).

According to Garnett (2013), the problem can be perceived from three different angles, depending on one's viewpoint. First, it can be seen as a production challenge, which can also be called the 'production efficiency' perspective (Garnett, 2013). In this case, food production systems need to change by increasing the unit efficiency of food production. Second, it can be perceived as a consumption challenge, which requires that drivers of consumption patterns that influence food

production are changed and restraints should be demanded. Third, it can be perceived as a socio-economic challenge, which requires systemic reforms of current food systems (Garnett, 2013). As such, the sustainability challenges around food production and consumption could be tackled from different angles that involve different parties, such as companies, governments or consumers. This thesis will focus on the individual level (the consumption challenge) and will adopt a Social Practice Theory approach, focusing on three elements of practices and their interactions: materials, meanings and competences (see section 2.3 for further elaboration; Shove et al., 2012). As such, a shift towards more sustainable food-related practices will be considered as a partial solution to the sustainability challenge around food.

The problems related to current food systems emphasise the need for a shift towards more sustainable patterns of food consumption by changing individual perceptions and current practices. However, while the urgency is there, the shift towards more sustainable food consumption and food-related practices is often challenged by path dependencies and lock-ins to unsustainable development trajectories (Seyfan & Haxeltine, 2012). On the individual level, this can better be referred to as the reproduction of unsustainable practices. Individuals often unconsciously rely on values and preferences that are familiar to them when practising a certain habit or routine, without considering their motives and actions every single time (Warde, 2016). This has various reasons and advantages, such as it being time efficient since an individual does not have to consider every choice that has to be made or what practices must be conducted. Stability in everyday practices furthermore enables smooth social interaction, since one knows what to expect from one another, and it gives a certain feeling of being safe and sure (Giddens, 1991; Keller et al., 2015). These are some of the reasons that may result in the reproduction of social practices. In addition, the value-action gap or attitude-behaviour gap should be considered (Welch, 2017). While people may have certain values and preferences, such as being more self-sufficient through gardening, they may not act accordingly due to certain barriers, such as time restrictions or not having a garden (Krom et al., 2020).

The question that remains is how a shift towards more sustainable food-related practices can be achieved at the consumer level. Academic literature has pointed out the important role community garden initiatives can play here. According to Seyfang and Smith (2007), community gardens can be regarded as grassroots innovations, which can be defined as "networks of activists and organisations generating novel bottom-up solutions for sustainable development; solutions that respond to the local situation and the interests and values of the communities involved" (p. 585). Various authors argue that community gardening and local food production can be used as a strategy to increase urban sustainability, both environmentally and socially (Holland, 2004; Oda et al., 2018; Turner, 2011). However, little research has been done on the influence of community gardening on food-related practices. This research will address this gap within the academic literature by conducting a case study analysis among two cases: the "*Plukroute*" in Hank and "*Wereldtuin Verdeliet*" in Cuijk (see section 3.4). This thesis was established in collaboration with "De Waardenmakers", which translates to "The Value Creators", based in Den Bosch in The Netherlands. This organisation aims to stimulate innovations and out-of-the-box thinking concerning sustainability, the climate crisis, and societal changes, focusing on solutions that create values for all parties involved. To learn more about the organisation and their vision, various publications can be found on their website[1].

## 1.2 Knowledge Gap

Extensive academic literature can be found on community gardens, which can be defined as open, organised sections of land developed and maintained by members of a local community for the cultivation of food and/or flowers, benefiting both individuals and communities within urban, peri-urban or rural areas (Ohmer et al., 2009; Sanchez & Liamputton, 2017; see section 2.2.1). However, this literature mainly focuses on the benefits of community gardens for the environment, society and economy and how they have potential for increasing urban sustainability (e.g., Al-Delaimy & Webb,

[1] home - de waardenmakers

2017; Dubová & Macháčh, 2019; Guitart et al., 2012; Holland, 2004; Maćkiewicz et al., 2018). Other studies emphasise the social aspects related to community gardens, such as social capital, gender roles and quality of life (e.g., Firth et al., 2011; Parry et al., 2005; Waliczek et al., 1996; Alaimo et al., 2010) or the organisational structures (planning processes, design, political conditions) of community gardens (e.g., Cohen & Reynolds, 2014; Hou, 2020; Lawson, 2004). A few studies furthermore focus on the challenges and barriers of community gardens and their implementation (e.g., Al-Delaimy & Webb, 2017; Dewaelheyns et al., 2013; Diaz et al., 2018; Dubová & Macháčh, 2019; Rateike, 2015). Finally, some studies (e.g., Seyfang & Haxeltine, 2012; Ferguson & Lovell, 2015; Roysen & Mertens, 2019) emphasise the important role grassroots initiatives can play in changing social practices and how they can act as "incubators, protected spaces in which groups of people from civil society experiment with new systems of provisions and new social practices" (Roysen & Mertens, 2019, p. 1). However, little research actually exists on the influence of community garden initiatives on social practices.

When considering the environmental, social and economic impacts related to current food systems described in section 1.1, there is a pressing need to consider alternative ways of food provision that are more sustainable and fairer (Sala et al., 2017). This is especially important since current systems of food provision are highly unsustainable (Ritchie & Roser, 2020). Community gardens have potential to serve as a partial solution, since they provide opportunities in creating just, local, sustainable food systems (Turner, 2011). However, to fully understand their potential, it is important to look at the underlying practices and how these are influenced by community garden initiatives.

## 1.3 Research Objectives and Questions

Based on the problem statement and knowledge gap in existing academic literature, the research objectives are formulated. This research first aims to determine the opportunities and challenges of community garden initiatives. The second and overarching aim of this research is to determine how certain elements of food-related practices are influenced by participation in community garden initiatives and how new, more sustainable practices are shared among individuals. The three food-related practices that will be researched are **gardening practices**, **selecting and buying food products**, and **preparing meals**. These practices are selected because they are directly related to food consumption and thus allow for investigation of whether participation in community garden initiatives has initiated a change in food-related practices.

In order to reach the first objective, the following research question (#1) is formulated:

"What are the opportunities and challenges of community garden initiatives?"

In order to reach the second and overarching objective, the second research question (#2) is formulated:

"How do community garden initiatives influence elements of food-related practices among participants and non-participants?"

To help answering the second research question, three additional sub-questions are developed, which are:

1. How are meanings, materials and competences of food-related practices influenced by community garden initiatives?
2. How do new, more sustainable elements of food-related practices interact and create new, more sustainable practices?
3. How are new, more sustainable (elements of) practices shared with non-participants?

## 1.4 Research Steps

The objective of this research as mentioned in the previous section will be realized by following and executing six consecutive research steps as presented in Figure 1.
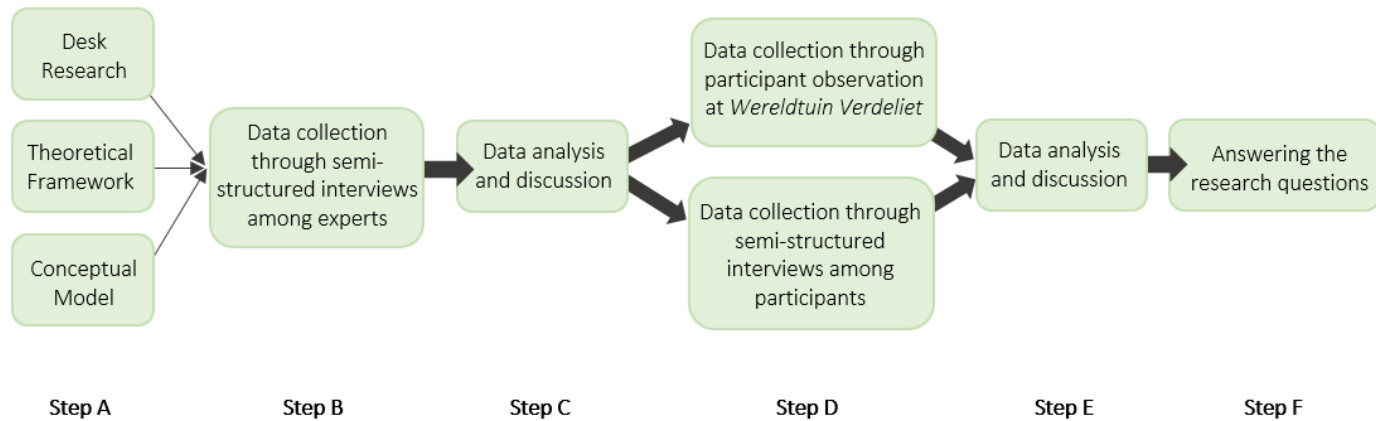


**Figure 1** | Research steps.

First, an extensive review of the existent academic literature and relevant documents for the case studies will be conducted, relevant theories will be introduced in the theoretical framework, and the conceptual model will be presented to analytically support this thesis [A]. Based on the insights gained in the first research step, semi-structured interviews will be conducted among professionals with great expertise on the field of community initiatives [B]. In addition to the available information in academic literature, information gained from the expert interviews will be analysed to understand the potential and challenges of community garden initiatives [C]. Furthermore, semi-structured interviews will be conducted among participants of the *Plukroute* in Hank and among participants of *Wereldtuin Verdeliet* in Cuijk and participant observation will be done at *Wereldtuin Verdeliet* in Cuijk [D] to gain further insight into food-related practices. Information gained from the interviews with participants and from participant observation will be analysed to find out how these community garden initiatives have influenced food-related practices among participants and how new, more sustainable elements of such practices are shared among individuals [E]. By combining insights from the perspective of experts as well as participants, an answer to the research questions will be formulated [F].

## 1.5 Societal and Scientific Relevance

Unsustainable food production and consumption patterns largely contribute to environmental and sustainability impacts, such as climate change, biodiversity loss, and water pollution. This is due to human induced emissions of greenhouse gases, eutrophication due to pesticide use, land use changes, and more (Ritchie & Roser, 2020; Sala et al., 2017; Berners-Lee et al., 2018). Furthermore, it contributes to social and economic challenges, such as social inequalities, food security, nutrition security, health, trade and social justice (Béné et al., 2019). In addition, it decreases animal welfare (Scherer et al., 2019) and on top of everything, a huge amount of food is wasted, especially in Western countries (Borrello et al., 2017). By enabling the development of new, more sustainable food-related practices, community garden initiatives could potentially reduce the impact of human activities on the environment. They could also serve as a partial solution for some of the social and economic challenges. For example, by increasing food security through the provision of local food in poorer regions. The societal relevance here is that this research may lead to new perceptions of behaviour and food consumption practices within communities. If successful upscaling of community garden initiatives occurs, they may play a potential role in the transition towards more sustainable, just, and local food systems. Moreover, this research may contribute to achieving certain Sustainable

Development Goals (SDGs) and urban food policy development. According to Ilieva (2017) there is a significant overlap between local food systems and the SDGs focusing on "hunger (SDG 2), public health (SDG 3), innovation and infrastructure (SDG9), sustainable cities (SDG 11), and responsible consumption and production (SDG 12)" (p. 5). The outcomes of this research could stress the importance of connecting governments and urban food policy development with local communities due to the potential of community garden initiatives in achieving a transition regarding food systems.

As explained in section 1.2, extensive research has been done on community garden initiatives, their benefits, their influence on socio-technical systems, their relatedness to sustainability transitions, their influence on social aspects and organisational structures, and their successes and failures (e.g., Al-Delaimy & Webb, 2017; Firth et al., 2011; Cohen & Reynolds, 2014; Diaz et al., 2018). However, it remains unclear how community garden initiatives may influence individual behaviour and everyday practices related to food consumption in the Netherlands. This research aims to close this research gap by trying to find out how community garden initiatives can transform current unsustainable food-related practices towards more sustainable practices. It therefore contributes to the existing literature by defining how barriers towards achieving sustainable behaviour among citizens can be dealt with through the development of community garden initiatives. Also, by looking at case studies in the Netherlands, this research tries to provide insights into food-related practices embedded in the Dutch context.

# 2. Theory and Concepts

This section will first discuss sustainable food consumption by elaborating on a definition, challenges and food production and consumption trends in the Netherlands. Thereafter, the concept and emergence of community garden initiatives will shortly be explained and will be put in the broader perspective of grassroots innovations to gain more insight in their potential for changing social practices. The concept of community garden initiatives and their potential and challenges will ultimately be discussed in section 4.1. Finally, the theory that will be applied in this research, namely Social Practice Theory, will be elaborated on as well as the conceptual framework underlying this research.

## 2.1 Sustainable Food Consumption

### 2.1.1 Definitions and challenges

Current systems of food production and consumption are regarded unsustainable. Due to demographic change and an increasing global population, problems related to this unsustainability of current food systems are likely to become more severe in the future. Some of the environmental and social impacts related to current food systems include climate change – more than 25% of greenhouse gas emissions can be subscribed to the food sector (Ahmad et al., 2019), water pollution, eutrophication of water bodies, soil degradation, water scarcity, land-use conflicts, loss of habitats and biodiversity, increasing health and social costs and animal welfare (Reisch et al., 2013; Gorgitano & Sodano, 2014). According to Reisch et al. (2013), the unsustainability of current food systems is related to "the industrialization and globalization of agriculture and food processing, the shift of consumption patterns toward more dietary animal protein, the emergence of modern food styles that entail heavily processed products, the growing gap on a global scale between rich and poor, and the paradoxical lack of food security amid an abundance of food" (p. 7). Therefore, transitions towards more sustainable food systems are necessary. Since the focus of this thesis is on food consumption on the individual level, the partial solution that will be discussed here is more sustainable food consumption. Non-alcoholic and alcoholic drinks are excluded in this thesis.

While there is not a globally accepted definition of sustainable food consumption, various academic articles provide their definitions of the concept. Whereas one study argues the consumption of organic food as a way to improve the sustainability of current food systems (Azzura et al., 2019), other studies provide a broader definition of sustainable food consumption. According to the UK Sustainable Development Commission, sustainable food and drinks can be defined as "that which is safe, healthy and nutritious for consumers in shops, restaurants, schools, hospitals, and so forth; can meet the needs of the less well of at a global scale; provides a viable livelihood for farmers, processors, and retailers whose employees enjoy a safe and hygienic working environment; respects biophysical and environmental limits in its production and processing while reducing energy consumption and improving the wider environment; respects the highest standards of animal health and welfare compatible with the production of affordable food for all sectors of society; and supports rural economies and the diversity of rural cultures, in particular by emphasising local products that minimize food miles" (Reisch et al., 2013, p. 8).

The focus of this research is on community gardens as an approach to more sustainable, local food systems. Since some community garden initiatives may keep animals, such as chickens, animal health and welfare should also be considered. This thesis will therefore adopt the following definition of sustainable consumption: "the use of goods and services that respond to basic needs and bring a better quality of life, while minimising the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardise the needs of future generations" (Gorgitano & Sodano, 2014, p. 207), while at the same time protecting and improving animal health and welfare (Alonso et al., 2020). This definition is based on the concept of needs and the concept of

restrictions. These concepts are defined by nature's ability to meet current and future needs (Maciejewski, 2020).

While public interest in sustainable production and consumption is increasing, certain barriers are inhibiting the transition towards more sustainable consumption practices (Vermeir & Verbeke, 2006). At the individual level, these barriers often revolve around the so-called attitude-behaviour gap, meaning that individuals may have certain values and preferences around sustainable food consumption or responsible behaviour in general, but do not act accordingly due to certain restrictions (Welch, 2017). These restrictions include, among others, price, quality, or brand familiarity (Vermeir & Verbeke, 2006). Personal and contextual factors, such as lack of availability, inconvenience and income, may furthermore inhibit the purchase of sustainable food products (Vermeir & Verbeke, 2006). However, as Vermeir and Verbeke (2006) argue in one of their studies, "the diversity and complexity of the motivations involved means that in reality there is a considerable scope for change" (pp. 2-3).

### 2.1.2 Food production and consumption trends in the Netherlands

Food consumption patterns in the Netherlands have changed over the past decades due to "demographic, economic, social, technological, ecological, and political factors" (RIVM, 2017, p. 46). Due to increased prosperity and a shift in dietary preferences (Godde et al., 2018), food consumption has shifted towards more animal-based diets since the 1950s and 1960s (RIVM, 2017). This increase in consumption of animal products can be explained by an increase in food availability due to industrialisation and intensification of the agricultural sector, large-scale subsidies, and increasing work-productivity and produce (RIVM, 2017; Godde et al., 2018). Furthermore, there has been an increased availability of animal feed, such as (genetically modified) soy or corn, enabling an increase in livestock density (Wang et al., 2018). Nowadays, the Netherlands belongs to the top of countries with the highest livestock density (measured in Livestock Units per hectare (LU/ha)), which has increased from "a mean of 2.0 LU/ha in 1961 – 1965 to 4.9 LU/ha in 2007 – 2011" (Wang et al., 2018, p. 201). An overview of the number of animals in the Netherlands from the year 1990 to 2015 is presented in Table 1 (Coenen et al., 2017).

Table 1 | Number of animals in the Netherlands in 1990 – 2015 (x 1,000) (adapted from Coenen et al., 2017).

| Animal type | 1990 | 1995 | 2000 | 2005 | 2010 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Cattle | 4,926 | 4,654 | 4,069 | 3,797 | 3,975 | 3,999 | 4,068 | 4,134 |
| Sheep | 1,702 | 1,674 | 1,305 | 1,361 | 1,130 | 1,034 | 959 | 946 |
| Swine | 13,915 | 14,397 | 13,118 | 11,312 | 12,255 | 12,212 | 12,238 | 12,603 |
| Goats | 61 | 76 | 179 | 292 | 353 | 413 | 431 | 470 |
| Horses | 370 | 400 | 417 | 433 | 441 | 429 | 426 | 417 |
| Poultry | 94,902 | 91,637 | 106,517 | 95,190 | 103,371 | 99,370 | 104,685 | 108,558 |
| Other livestock | 1,340 | 951 | 981 | 1,058 | 1,261 | 1,342 | 1,324 | 1,404 |

Increased globalization has furthermore led to an increased availability of non-native foods, such as exotic fruits, rice and pasta (RIVM, 2017). The purchase of food products has also shifted. Whereas in the 1990s, 60% of the household food-budget was spent in specialised shops, such as bakeries, markets, and butchers, 66% of is now spent in supermarkets (RIVM, 2017). This is also related to a decrease in time availability to prepare food and the increased offer as well as convenience of ready-to-eat meals and processed foods in supermarkets (RIVM, 2017; Zantinge, 2017). Furthermore, in 2018 every individual in the Netherlands wasted between 96 to 149 kilograms of food. In total, this adds up to 1,649 – 2,568 kiloton of food waste in 2018 (Soethoudt & Vollebregt, 2020). These food consumption and production trends are responsible for the increasing environmental and social impacts mentioned in the previous section.

Nevertheless, positive trends in the Dutch food sector towards more sustainability are also visible. Since the 1970s, there has been an increase in environmental regulation in the food and beverage industry. The release of the Brundtland report during the late 1980s has furthermore increased "engagement with eco-efficiency and resource conservation" in this industry in the Netherlands (Long et al., 2018, p. 84). These shifts are initiated by market- and ecosystem failures, such as global warming, which increase the urgency for change towards more sustainable production patterns (Long et al., 2018). Changes can also be seen in the Dutch agricultural sector, where the greenhouse gas emissions have decreased by about 24% over the period between 1990 until 2015 (Gil et al., 2019). This reduction can mainly be subscribed to increased production efficiency. However, more ambitious policy targets as well as systemic changes, including a reduced intake of animal products, are required to further reduce emissions (Gil et al., 2019).

Next to the examples above of trends towards more sustainable food production in the Netherlands, trends towards more sustainable food consumption at the individual level can also be seen. An increase in demand for more sustainable food can be seen in response to industrialisation and globalisation of food production (RIVM, 2017). Moreover, consumers are willing to pay more for sustainable foods – an increase from 7% of total food spending in the period of 2013 to 2014 to 8.2% in 2015 (RIVM, 2017). Consumers have also become more conscious about animal welfare and the environmental impact of their food products (Zantinge et al., 2017). There has been an increase in the purchase of products with a certain quality label that informs the consumer about a product's sustainability. These increases are mainly seen among products with an organic production label, an animal welfare label, and a Marine Stewardship Council (MSC) label (RIVM, 2017). The MSC label can be defined as a "private third-party certification system that sets a global standard by which the sustainability of a fishery can be assessed regardless of its size, geography or the fishing method used" (Le Manach et al., 2020, p. 2). Also, an increase in the number of flexitarians – people who do not consume meat and fish on a daily basis – can be seen. Estimates show that in 2015, "55% of the Dutch population can be considered as a flexitarian" (RIVM, 2017, p. 58). Another study revealed that over "50% of a general population sample from The Netherlands reported to have "one meat-free day a week" and "smaller meat portions" at least once a month" (Sanchez-Sabate & Sabaté, 2019, p. 6). However, the higher price of more sustainable food products is often a barrier for consumers to purchase such products (Zantinge et al., 2017).

These trends all influence production patterns and may even drive production. This is also emphasised in a study of Gil et al. (2019). According to this study, reduction in production should be driven by reductions in consumption. If there are no changes in, for example, the demand for meat and dairy products, "a reduction in the Dutch production would have to be compensated by an increase in the supply of these products elsewhere (possibly where livestock production is associated with even higher GHG emissions)" (Gil et al., 2019, p. 9). However, exporting should be reduced significantly for this to work. Also, all responsibility is given to consumers here, which is unfair and unrealistic. Many other possible approaches and (partial) solutions towards more sustainable agriculture or more sustainable food systems are described in the academic literature. These include, among others, technological innovations, sustainable agricultural intensification, agroecology, governance reforms and policy development, and new, sustainable business models (Dobermann & Nelson, 2013; Ching, 2018; Hoes et al., 2019; Serbuvola et al., 2019; De Schutter et al., 2020). A study of Serbuvola et al. (2019), for example, argues that "the transition to sustainable agriculture and food systems requires innovative solutions and appropriate technologies, such as ICT [Information and Communication technology]" (p. 2). The article emphasises how ICT can play a role in increasing productivity and resource efficiency, reducing the use of agricultural resources, such as pesticides, fertilizers, energy and water, and reducing "external environmental externalities" (Serbuvola et al., 2019, p. 2). However, more research should be conducted to determine the barriers and possible threats of such technological innovations.

## 2.2 Community Garden Initiatives

### 2.2.1 Definition

It is important to determine a definition of a "community" before diving into the concept of community gardens. Moseley (2003) argues that people with a common purpose share ideas and interact with each other. Communities are therefore socially constructed (Mosely, 2003). This means that different types of communities can be formed, and Moseley (2003) distinguishes between interest communities and territorial communities. While in interest communities physical proximity is not a requirement, in territorial communities individuals of an (peri-)urban or rural environment strongly identify with the place they live in (Moseley, 2003). Strong communities can be defined as "those endowed with social, economic and environmental assets, supported also by organisational structures that work towards their use over the long term in an equitable manner" (Firth et al., 2011, p. 557). The Federation of City Farms and Community Gardens, which operates within the United Kingdom, argues that a community functions well when:

- "It allows self-development through training, skills acquisition, knowledge gained through community activity.
- There is equality of opportunity.
- There is involvement in diverse local structures.
- There is consultation and participation in decision-making.
- The community is aware of the differing needs of its members and attempts to meet those needs.
- There is environmental awareness and responsibility.
- People feel safe.
- People feel part of the community and want to belong to it.
- It is established and has a feeling of longevity." (Holland, 2004, p. 288)

Community gardening and conservation have recently become important concepts for strategies for sustainable community development, integrating social, environmental, and economic concerns (Ohmer et al., 2009). A community garden is a type of urban agriculture, which can be defined as "agriculture embedded in – and interacting with – the urban ecosystem. Such linkages include the use of urban residents as labourers, use of typical urban resources (like organic waste as compost and urban wastewater for irrigation), direct links with urban consumers, direct impacts on urban ecology (positive and negative), being part of the urban food system, competing for land with other urban functions, being influenced by urban policies and plans, etc." (Dubová & Macháč, 2019, p. 69). A more specific definition of a community garden is that of an open, "organized section of land located in an urban environment that is used to produce food and/or flowers and benefits both individuals and communities" (Ohmer et al., 2009, p. 379). It should be a collaborative project which brings people together and inspires shared action among participants (Firth et al., 2011). However, community gardening can also occur within peri-urban or rural areas and is thus not restricted to urban environments (Sanchez & Liamputton, 2017). Furthermore, such initiatives are generally developed and maintained by members of the local community (Guitart et al., 2012). Therefore, a slightly adapted version of the definition of a community garden above will be adopted in this thesis: An open, organised section of land developed and maintained by members of the local community within an **urban, peri-urban or rural area** where food and/or flowers are cultivated, benefiting both individuals and communities (Ohmer et al., 2009; Sanchez & Liamputton, 2017).

### 2.2.2 Emergence of Community Garden Initiatives

The emergence of community garden initiatives can be traced as far back as the Industrial Revolution (Walter, 2013). Turner et al. (2011) also argue that community gardens have been present from the mid-1800s, originating from the allotment gardens of Europe. Originally, they were developed with a focus on "urban and social reform, poverty relief and the construction of model citizens, and later on serving national war efforts" (Walter, 2013, p. 524). Over time, community gardens have evolved as a grassroots movement for the organisation and empowerment of communities. More recently, from the 1990s onwards, they have started to play a role in urban greening policies and the urban food movement (Walter, 2013).

Nowadays, community gardens are gaining in popularity around the world due to social interests and the generation of different benefits. These include, among others, environmental education, restorative or therapeutic qualities, social cohesion and social and environmental sustainability (Corkery, 2004; van Holstein, 2017). An extensive description of the benefits can be found in section 4.1.1. The National Gardening Association (2014), which operates within the United States (US), argues that the number of community gardens in the US has increased by 2 million from 2008 to 2013. This is a 200% increase in five years. Further literature on the exact numbers of community gardens in other continents is limited. However, many authors argue that the popularity of community garden initiatives has increased over time and have investigated increases of community gardens in specific cities or regions (e.g., Rogge & Theesfel, 2018; Trendov, 2018; Shimpo et al., 2019). Moreover, according to Trendov (2018), it is estimated that 15-20% of the world's food comes from urban farming, mainly in the shape of community gardens.

### 2.2.3 Community Garden Initiatives as Grassroots Innovations

With the increasing evidence of the impact of human activity on the Earth's climate and the natural and social environment, more attention has been given to climate change adaptation and mitigation responses at the local level. Such research often focuses on top-down measures and programmes and behavioural change towards less carbon intensive practices through pressures from local authorities (Feola & Nunes, 2014). However, recently more attention has been given to another phenomenon, namely "grassroots innovations" (Feola & Nunes, 2014). Grassroots innovations emerge as "networks of activists and organisations generating bottom-up solutions for sustainable development; solutions that respond to the local situation and the interests and values of the communities involved" (Seyfang & Smith, 207, p. 585).

Since with grassroots initiatives, less powerful non-business actors are involved, policy makers do not always see or support them, leaving their potential largely underdeveloped (Bergman et al., 2010). However, various benefits can be subscribed to certain grassroots initiatives and such initiatives are often seen as "niches of experimentation of new social, cultural, economic, technological arrangements" (Feola & Nunes, 2014, p. 233). Grassroots initiatives are especially focused on finding new ways of doing things and as such can also be referred to as social innovations (Roysen & Mertens, 2019). Some examples include "community energy, sustainable housing, community currency, Transition Towns and ecovillages" (Roysen & Mertens, 2019, p. 2). Some benefits of grassroots initiatives mentioned by Feola and Nunes (2014) are that they can act as incubators of the social change needed for responding to and minimizing future environmental change, they challenge the status quo (i.e., technologies, values, practices), they promote new forms of social and economic organisation, and they promote alternative systems of provision (for example, local food systems or community energy). Since community garden initiatives have a bottom-up character, a network-based form of organisation, and can potentially contribute to solutions for sustainable development, such initiatives can be classified as grassroots innovations. It has increasingly been acknowledged that grassroots innovations can play an important role in the societal transition to sustainability (Ferguson & Lovell, 2015).

## 2.3 Social Practice Theory

Social practice theory will be used for this research to gain insight into the reproduction of current unsustainable practices and how to break this pattern.

### 2.3.1 Origins of Social Practice Theory

The roots of theories of practice can be traced as far back as Wittgenstein, in Schatzki's exposition of a Wittgensteinian theory (1996), and Heidegger in *Being and Time* (1962). Wittgenstein argues that practices result in both social order and individuality, whereas Heidegger refers to practice as language, as a source of meaning (Shove et al., 2012). Taylor (1973) emphasised that "the meanings and norms implicit in [...] practices are not just in the minds of the actors but are out there in the practices themselves, practices which cannot be conceived as a set of individual actions, but which are essentially modes of social relation, of mutual action" (p. 27). While each theorist may emphasise different aspects concerning practices, they all position practice as a primary unit of analysis (Shove et al., 2012). Other theorists conceptualizing practices include Bourdieu (e.g., 1977; 1990), Schatzki (e.g., 2012; 2016), Reckwitz (2002), and Shove (e.g., 2017; Shove et al., 2012).

### 2.3.2 What are practices?

Reckwitz (2002) defines a practice as "a routinized type of behaviour" (p. 249). However, this phrase of Reckwitz, when taken in isolation, is potentially misleading, since it risks "equating practices with the habits of individuals" and "such an interpretation would miss the point in that it would overlook the recursive character of practice" (Shove et al., 2012, pp. 6-7). The definition of practice as formulated by Reckwitz suggests that a practice would remain the same between and across certain moments of enactment (Shove et al., 2012). Schatzki (1996) argues that a practice is "a temporally unfolding and spatially dispersed nexus of doings and sayings" (p. 89). Reckwitz (2002) builds on this definition by suggesting that a practice "consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge" (p. 249). Shove et al. (2012) then see practices as performances; as patterns which are filled out and reproduced by individuals. The interdependencies between the elements of a practice are sustained over time through the reproduction of practices. Individuals are therefore seen as carriers or hosts of practices (Shove et al., 2012). The definition of practices by Shove et al. (2012) will be used for this research, since it clearly connects practices to individual behaviour and the reproduction of certain practices over time, indicating the existence of path dependencies. It furthermore includes an understanding of social practices beyond individual behaviour.

Shove et al. (2012) identify three elements that practices consist of: meanings, materials and competences (Figure 2). The first element, meanings, includes "symbolic meanings, ideas and aspirations" (Shove et al., 2012, p. 19). The second element, materials, includes "things, technologies, tangible physical entities, and the stuff of which objects are made" (Shove et al., 2012, p. 19). The last element, competences, "encompasses skills, know-how and technique" (Shove et al., 2012, p. 19). Based on these three elements, two propositions can be developed. First, elements that are integrated through the enactment of practices constitute social practices. Second, as links between defining elements of practices are made and broken, practices emerge, persist and disappear. Thus, social practices alter when connections between the elements, whether in meanings, materials, or competences, change (Roysen & Mertens, 2019).

Meanings: cultural conventions, expectations and socially shared meanings
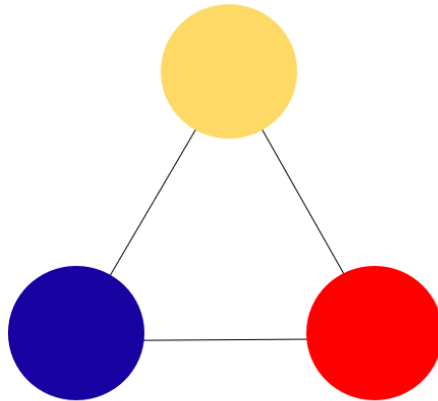
Materials: objects, tools and infrastructures

Competences: knowledge and embodied skills

**Figure 2** | Elements of practice. Adapted from Shove et al., 2012.

Schatzki has made a distinction between practices as entities and practices as performances. Practice-as-entity refers to "a temporally unfolding and spatially dispersed nexus of doings and sayings" (Schatzki, 1996, p. 89) linked together by "understandings, explicit rules and teleoaffective structures" (Higginson et al., 2015, p. 953). Whereas practice-as-performance refers to "specific moments of integration between elements that occur when practices are enacted in a particular local situation" (Higginson et al., 2015, p. 953). Practices-as-entities always exist without the need for them to be currently enacted (Higginson et al., 2015).

### 2.3.3 Changing Social Practices

This section will start by discussing unsustainable practices and how and why they are being reproduced. Daily practices of individuals, such as cooking, gardening, providing food, cleaning, purchasing, travelling, or heating or cooling of homes and offices are reproduced by millions of people, resulting in environmental impacts (Roysen & Mertens, 2019). Estimates suggest that approximately 40 per cent of carbon emissions can be subscribed to energy use within households and transport and mobility practices (Fudge et al., 2013). People often do not recognize this environmental impact related to routine and habit. The reproduction of daily practices is furthermore intrinsically related to the socio-technical systems: "people organize their lives around the institutionalized systems of transportation, waste removal, electricity supply, and food distribution. They adapt their houses and their lifestyles to these sociotechnical systems, tending to reproduce practices considered 'normal' and valued by the society in which they live" (Roysen & Mertens, 2019, p. 2). Thus, individuals are likely to reproduce 'dominant' social practices (Shove et al., 2012).

From a social practice theory position, transitioning from unsustainable towards sustainable behaviour ultimately depends upon transforming everyday practices, which is influenced by education or persuasion of individuals to make different decisions (Hargreaves, 2011; Roysen & Mertens, 2019). Warde (2005) supports this notion and argues that "the principal implication of a theory of practice is that the sources of changed behaviour lie in the development of practices themselves" (p. 140). A transformation of policy making practices or commercial practices can furthermore stimulate sustainable behaviour among individuals. Ester et al. (2004) furthermore state that while there is a growing concern about the environment and a growing willingness to support environmental action among the public, energy consumption levels and the use of scarce resources are simultaneously increasing.

This lack of action towards environmental problems can be explained by the fact that everyday practices are not a series of separated intentions, but are carried out as a habitual flow in a routinized manner, connected to the available materials, symbolic meanings and embodied competences (Roysen & Mertens, 2019). By taking a social practice theory approach, sustainability transitions can be understood as the "transition of existing social practices into corresponding future practices which bring along substantially reduced environmental and climate impacts" (Spaargaren, 2011, p. 816). In order to break through existing everyday practices that are unsustainable, the links and elements of those practices must be challenged and broken, so that they can be replaced and redeveloped in more sustainable ways (Hargraeves, 2011).

## 2.4 Conceptual Model

Based on the theoretical framework, the conceptual model that will be applied to this research was developed (Figure 3). The conceptual model only applies to research question #2 and the corresponding sub-questions. For research question #1, which is a broad exploration of the potential and challenges of community garden initiatives, the development of a conceptual model was not necessary.

Research question #2 and the corresponding sub-questions, which are integrated into the conceptual model, aim to determine how community garden initiatives influence and change certain meanings, materials and competences [A] to enable the development of new, more sustainable food-related practices. When new meanings, materials and competences are created and integration occurs between the newly created elements, practices are enacted at specific moments in time and in particular local situations (Higginson et al., 2015). It is at that moment in time and space when new practices-as-performances are created and reproduced [B]. This will ultimately result in the development of new practices-as-entities [C]. A practice-as-entity refers to "a temporally unfolding and spatially dispersed nexus of doings and sayings linked together through understandings, explicit rules and teleoaffective structures" and "exists across time and space, even if they are not currently being enacted" (Higginson et al., 2015, p. 953). Besides investigating the influence of the community garden initiatives on food-related practices, this research will also investigate how new and more sustainable (elements of) practices are shared with non-participants [D and E]. This will be researched to reveal whether new, more sustainable (elements of) practices can reach a broader group of society than just the participants of community garden initiatives.
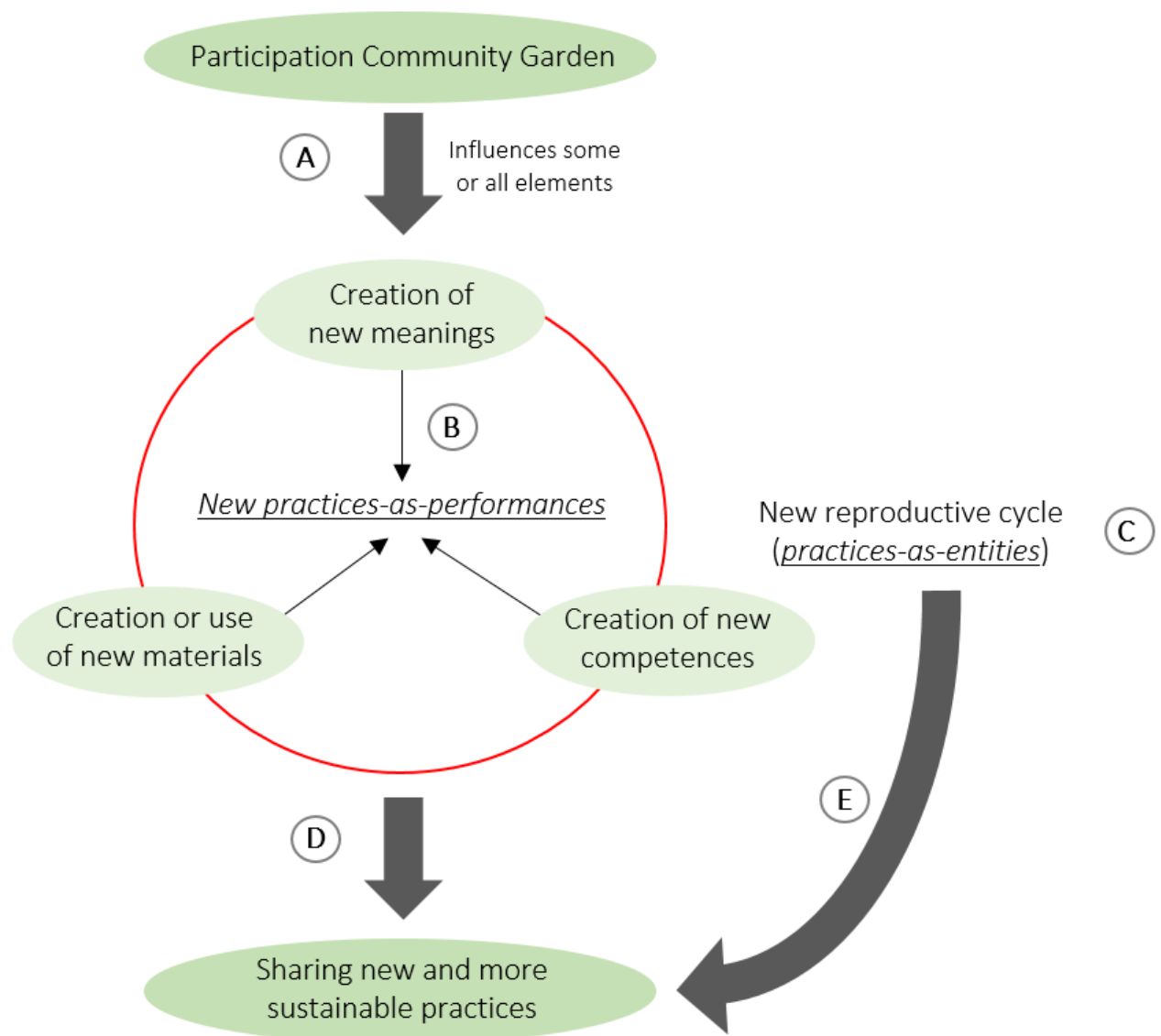
**Figure 3** | The Conceptual Model.

# 3. Methodology

The so-called "research onion" from a study of Saunders and Tosey (2013) will be used in this section to work out the methodology (Figure 4). First, the research philosophy underlying this thesis will be explained, followed by a description and argumentation of the methodical choice. This section will then shortly elaborate on the time horizon before moving on to the techniques and procedures for data collection and data analysis. Lastly, this section will elaborate on the consideration of ethics during the research process and how the validity and reliability of the research are ensured during the research process.
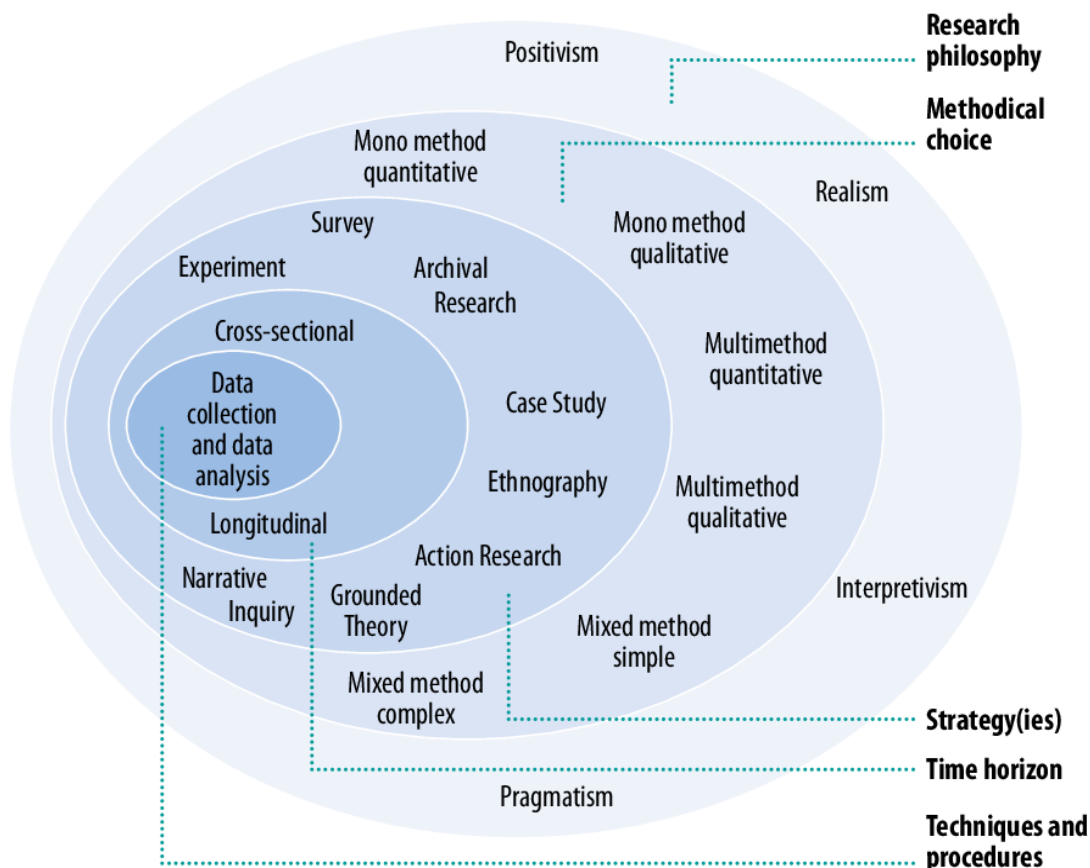


**Figure 4** | Research onion (Saunders & Tosey, 2013, p. 59).

## 3.1 Research Philosophy

According to the first layer of the research onion, every research is defined by an underlying research philosophy (Saunders et al., 2019). The underlying research philosophy or research paradigm can be defined as "the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways" (Guba & Lincoln, 1994, p. 105). As such, the research philosophy influences the choice of methods, the interpretation of findings and the conclusions that are drawn.

According to Guba and Lincoln (1994), three fundamental questions, based on the concepts of ontology, epistemology and methodology, can be followed to determine the underlying philosophy of the research. The ontological question is about the "form and nature of reality" (Guba & Lincoln, 1994, p. 108), whereas the epistemological question is about the "nature of the relationship between the knower or would-be knower and what can be known" (Guba & Lincoln, 1994, p. 108). The methodological question then describes how the researcher can "go about finding out whatever he or she believes can be known" (Guba & Lincoln, 1994, p. 108). From these three fundamental questions,

Guba and Lincoln (1994) distinguish four paradigms with positivism as one extreme and constructivism as the other. These two extremes differ in their ontology. Whereas positivism implies that there is one reality driven by "immutable natural laws and mechanisms" (Guba & Lincoln, 1994, p. 109) and therefore visualized by quantifying reality, constructivism implies that multiple realities exist. These are constructed by individuals and their subjective values (Guba & Lincoln, 1994).

Sustainability is an ethically driven and dynamic process, which can be defined by a variety of ethical dimensions, such as social justice, economic welfare or animal welfare (Amantova-Salmane, 2015). These ethical dimensions are framed, perceived and acted upon differently from individual to individual (Bonnett, 2002). Equally, according to Peano et al. (2019), sustainable food consumption can be defined by environmental, economic, socio-cultural and policy dimensions and is furthermore based on subjective perceptions and thus the values and beliefs individuals attach to it. There is not one ultimate truth (Guba & Lincoln, 1994) with regards to sustainable food consumption. Food consumption patterns are shaped by social practices, which are socially constructed, developed and influenced by individual values, preferences and beliefs (Jaeger-Erben & Offenberger, 2014). Next to personal values, food consumption is also influenced by cultural norms and values embedded in an individual's social environment. Such norms emerge from cultural standards embedded within a country or a certain group of individuals and are less susceptible to change (Minton et al., 2018).

Sustainable food consumption and its related practices therefore fits best within Guba and Lincoln's (1994) constructivist ontology. For the epistemology, it is then implied that the researcher, respondents and findings are interactively linked and influence each other throughout the whole research process (Guba & Lincoln, 1994). For the methodology, this means that the varying social constructions "are interpreted using conventional hermeneutical techniques, and are compared and contrasted through a dialectical interchange" in order to achieve "a consensus construction" of reality that is shared among the involved actors (Guba & Lincoln, 1994, p. 111).

## 3.2 Methodological Choice

The second layer of the research onion deals with the methodological choice of the researcher (Saunders et al., 2019). According to the research onion, six approaches can be chosen. A monomethod approach implies the use of just one method, either qualitative or quantitative, whereas a multimethod approach allows for the use of more than one method but from the same category, so only qualitative or only quantitative. A mixed method approach applies when collecting data both quantitatively and qualitatively (Saunders et al., 2019).

For this thesis, a multimethod approach was chosen, since three different qualitative methods will be used to obtain data: desk research, semi-structured interviews and participant observation. Desk research, including an extensive review of the existing academic literature, combined with the results from semi-structured interviews with professionals in the area of community initiatives will provide an answer to research question #1. Then, semi-structured interviews with participants of the community garden initiatives that will be used as case studies – the *Plukroute* in Hank and *Wereldtuin Verdeliet* in Cuijk – combined with participant observation at the *Wereldtuin Verdeliet* in Cuijk will be done to answer sub-questions 1, 2 and 3, as well as to the overarching research question #2.

## 3.3 Research Strategy: Case Study Research

Moving on from the research philosophy, which elaborates on the role of the researcher during the research process, the research strategy can be defined as "a plan of how a researcher will go about answering her or his research questions" (Saunders et al., 2019, p. 189). A variety of research strategies exists, such as, among others, experiment, survey, case study or action research (Saunders et al., 2019). A study can furthermore use either a deductive or inductive approach, or both, which is the case for this research. Whereas this research starts off deductively with general ideas, analysing

and evaluating existing theories to find an explanation for the research problem, this research also has inductive elements, since the information gained in the deductive phase will be connected to two specific cases to transfer it into a broader context again (van Thiel, 2014).

For this research, a case study analysis will be conducted to identify how community garden initiatives may influence food-related practices among individuals of a community. Gerring (2004) defines a case study as "an intensive study of a single unit for the purpose of understanding a larger class of (similar) units" (p. 342). Yin (2009) has developed a twofold, technical definition of case studies. First, he argues that "a case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009, p. 18). Second, he argues that "the case study inquiry copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result benefits from the prior development of theoretical propositions to guide data collection and analysis" (Yin, 2009, p. 18).

The case study method can be used for different situations, "to contribute to our knowledge of individual, group, organizational, social, political, and related phenomena" (Yin, 2009, p. 4). Case studies are often conducted to understand complex social phenomena and they allow researchers to grasp the "holistic and meaningful characteristics of real-life events – such as individual life cycles, small group behaviour, organizational and managerial processes, neighbourhood change, school performance, international relations, and the maturation of industries" (Yin, 2009, p. 4). Three situations in which this method can be chosen over other methods are when "how" or "why" research questions are developed, when control of behavioural events is not required and when the focus is on contemporary events (Yin, 2009). Harrison et al. (2017) furthermore argue that case study research has the fundamental goal of conducting "an in-depth analysis of an issue, within its context with a view to understand the issue from the perspective of participants" (p. 19). Therefore, a case study method fits well within this research, since it aims to study individual behaviour and food-related practices from the perspective of participants. It furthermore fits well within in this research because of its experimental character and since participant observation will be conducted at the case study site: the *Wereldtuin Verdeliet* in Cuijk (van Thiel, 2014). Finally, case study analysis is well-suited in terms of the constructivist paradigm applied to this study (Saunders et al., 2019). To allow for comparison among different community garden initiatives and their influence on food-related practices and individual behaviour, a multiple case study approach will be adopted in this research.

While the case study method has been widely used, especially within the social sciences, some concerns must be taken into account when using this particular method. In addition, general concerns when conducting research should also be considered. These concerns include lack of rigor, ethics, trustworthiness, researcher's bias, provision of little basis for scientific generalization, long time horizon and enormous, unreadable documents, and the renewed emphasis on randomized field trials or "true experiments" (Yin, 2009; Galdas, 2017). While these concerns need to be carefully considered, a multiple case study approach is well-suited for this research as it allows studying issues in a real-life context as well as comparing between different initiatives to get a broader perspective. Furthermore, a case study approach is also favourable due to the cross-sectional time horizon, which involves "the study of a particular phenomenon (or phenomena) at a particular time" and suggests the use of "strategies such as a survey or case study" (Saunders et al., 2019, p. 212).

## 3.4 Case Study Selection

Two cases, namely the *Plukroute* in Hank and *Wereldtuin Verdeliet* in Cuijk (Figure 5), were selected for this research based on the following criteria:

- The initiatives are set up from a bottom-up approach and maintained by inhabitants of the corresponding town on voluntary basis, possibly in collaboration with higher institutions or the municipality.
- The initiatives have been around for at least four years.
- The products that are cultivated at the site must include different species of fruit, vegetables and herbs, but may also include other products, such as flowers. These products may be available to the volunteers of the initiatives without costs or against a reasonable price.
- The initiatives are accessible for all groups of society, regardless of age, class, gender, and so on.
- Workshops or activities are organised at least a few times per year at the site.

These criteria are based on the results from the literature review regarding definitions of community garden initiatives and their orientation. The choice for a comparative case study was first of all made due to a lack of results from only one case. This was also partially caused by regulations around the COVID-19 pandemic, which will be further explained below. Furthermore, a comparative case study can help to avoid that the results become very case-specific, since such an approach allows for comparing and testing results across cases (Yin, 2009). Doing this allows to substantiate the results found and can improve their generalizability. As such, adopting a comparative, multiple-case study approach can help to create more reliable results (Gustafsson, 2017).

Figure 5 | Locations of the two community garden initiatives, the *Plukroute* in Hank and *Wereldtuin Verdeliet* in Cuijk, that were selected as case studies.



## 3.4.1 Case 1: The "*Plukroute*" in Hank

This first case was selected in collaboration with the internship company, first of all out of their interest in the municipality of Altena, where Hank is located. This led to some preliminary work being done on community garden initiatives in this area by collecting and reading information online and by having face-to-face online conversations with people working within the municipality. The initiative of the *Plukroute* in Hank came forward during those conversations and more information about the initiative was sought on the internet. When reflecting on the initiative and the previously set criteria for case selection, the initiative turned out to be a good match. The initiative is set up in 2016 and

maintained by citizens of Hank on a voluntary basis with help of the municipality and a few organisations through funding. At the site, different species of vegetables, fruits, nuts, herbs and flowers are cultivated and may be freely picked by the volunteers, but also by others that are visiting the initiative.

Subsequently, an email was sent to the initiator of the *Plukroute* in Hank to see if they were willing to participate in the research. Initially, no reaction was received, but sending a reminder resulted in a positive reaction with an invitation to come and visit the initiative. Unfortunately, due to the restrictions around the COVID-19 pandemic, there were no activities and workshops at the time. However, since the initiative had been actively organising workshops and activities before the pandemic, especially for children, it was decided that the initiative was still suitable for this research. Also, even though volunteers were less involved due to the pandemic, seven respondents were willing to participate in online or face-to-face interviews. One barrier that was experienced with this case study was the distance, which made it difficult to regularly visit the initiative. However, most participants were willing to do an online interview, also due to the pandemic, and there were no activities or workshops and only few volunteers working on the site. This made participant observation not relevant at this case and as such, it was not necessary to regularly visit the initiative.



**Images 1 and 2** | One of the signs of the hiking path through the *Plukroute* (Left) and chives in the herb garden (Right).

### 3.4.2 Case 2: *"Wereldtuin Verdeliet"* in Cuijk

The second case was recommended by an interviewee after discussing that a new case study was sought for this research before the start of the interview. Some research was done on the initiative by studying the website of the initiative to see whether the initiative fit within the previously set criteria for case selection. The initiative was set up in 2013 and maintained by citizens of Cuijk on a voluntary basis with the help of organisations. At the site, different species of vegetables, fruits, herbs and flowers are cultivated. The products are sold in the shop that is also on the site and participants that work or volunteer at *Wereldtuin Verdeliet* get a 20% discount. The initiative is furthermore accessible for visitors. Moreover, activities and workshops are organised on the site. However, due to the COVID-19 pandemic, this was limited. Based on this information, it was decided that the initiative was a good match for a second case study. As such, the interviewee was emailed an extensive description of the

case study criteria, what kind of research would be conducted at the case study site and the purpose of the research. This was then sent forward to the coordinator of *Wereldtuin Verdeliet*. The proposal was received with much enthusiasm and the coordinator called to become acquainted with the research and researcher. Since the initiative was not at a great distance, it was possible to regularly visit the site to meet the participants, perform participant observation and conduct the semi-structured interviews face-to-face.



**Images 2 and 3** | Gardening plots (Left) and plants growing in the greenhouse (Right) at *Wereldtuin Verdeliet*.

## 3.5 Research Methods and Data Collection

Besides conducting an extensive review of the existing academic literature which summarizes the relevant theories and concepts, which can be regarded as secondary data, this research is furthermore based on primary data (Saunders et al., 2019). Following the multimethod approach, three different qualitative data collection techniques are used: document analysis, semi-structured interviews, and participant observation. This section will describe these particular methods, taking into account the processes of data collection as well as the process of data analysis. By using different data collection techniques, triangulation of the data could be achieved, hereby filling up empirical gaps and cross-checking the collected data to provide a comprehensive understanding of the influence of community garden initiatives on individual behaviour and food-related practices. A multimethod approach has also been selected to establish validity and trustworthiness of the research.

### 3.5.1 Document analysis

The document analysis entails documents related to the case studies – the *Plukroute* in Hank and *Wereldtuin Verdeliet* in Cuijk. As such, these documents include local newspaper articles, reports written for the municipality, websites, and online publications regarding the cases (e.g., Wereldtuin Verdeliet, 2018, 2019, n.d.; Plukroute, n.d.; Oostra, 2016). These documents were analysed to gain more insight into the reasons and criteria that were followed for the development of the community garden initiatives. Based on the criteria formulated in section 3.3.1, it was determined whether the initiatives are suited for the case study analysis. Furthermore, the papers were analysed to understand the perspectives on sustainability and local food production as well as if and how this might have changed over time. However, since there were only few documents available, information gained here was limited. Some of the information gained from this document analysis was used to help develop the interview guide with questions for the participants of the two cases.

### 3.5.2 Semi-structured expert interviews

Semi-structured expert interviews were conducted alongside an extensive review of the academic literature to gain more insight into building blocks of community initiatives and the potential as well as the challenges of local community (garden) initiatives at the local scale for altering individual practices. The data obtained therefore contributes to answering research question #1 and also provides more background and contextual knowledge. The data was also used to validate results found in academic literature.

Respondents were selected using the expert sampling method, which is a non-probability, and thus non-random selection technique. When using the expert sampling method, respondents are selected based on their expertise in the area of study (Etikan & Bala, 2017). In this case, respondents were selected based on their knowledge about local community (garden) initiatives and behavioural change. Respondents were found through a search process on Google, using search terms such as community initiatives, community gardens, professionals, etc., and through the network of the internship company. Before officially inviting respondents for an interview, more information on their expertise was sought by examining information about the respondents' fields of expertise on engines such as LinkedIn. Eventually, three semi-structured expert interviews were conducted, two of which included individuals with expertise specifically on community garden initiatives as well as some broader expertise on behavioural change. The third interview included an individual with expertise on community energy initiatives to see whether additional insights could be gained for a broader perspective (Table 2). Respondents were contacted by email, in which it was asked whether they would agree to an interview. The emails also contained a summary about the thesis, in which the topic and purpose of the thesis were explained, information was given about how the data would be handled and consent was asked for recording the interview.

The interviews were semi-structured, meaning that a topic list with pre-set questions was used as a guideline, while also allowing for probing questions to dive deeper into particular questions and ensuring flexibility (van Thiel, 2014). This implies that the researcher has to stay open-minded with regards to possible outcomes of the dialogue as well as being aware that answers, which are subjective perceptions, might contradict information found in the literature. The interviews all started with an introductory section to make the respondents feel comfortable and to provide some information about how the interview would be conducted (van Thiel, 2014). All interviews lasted for approximately 30 to 45 minutes and were recorded via the online platform that was used to conduct the interviews, which was Zoom, after asking the respondents' consent. The video material was deleted directly after the interviews were finished, while safely storing the audio recordings on a personal laptop.

**Table 2** | Overview of expert respondents, organisation and date of semi-structured interviews conducted.

| Respondent | Organisation | Date |
|---|---|---|
| Respondent #1 | Groenkracht | 02-04-2021 |
| Respondent #2 | Veluwe Duurzaam | 12-04-2021 |
| Respondent #3 | Groen Verbindt | 21-04-2021 |

### 3.5.3 Semi-structured interviews with participants

Next, semi-structured interviews were conducted among participants of the two selected case studies, the *Plukroute* and *Wereldtuin Verdeliet*, to gain deeper insight into the influence of participation in such a community garden initiative on individual behaviour and food-related practices. Furthermore, the interviews were conducted to gain more insight into the way practices are shared among other people in the community. The data obtained in this part of the research therefore contributes to answering the sub-questions as well as research question #2.

Respondents were selected using the self-selection sampling method and the snowball sampling method, which are both also non-probability and thus non-random selection techniques. The target group, which is based on the research aim and questions, was the same for both sampling techniques. As such, the target group consists of participants of a community garden initiative which is set up and maintained according to the criteria mentioned in section 3.4.

The self-selection sampling method implies that respondents can volunteer to participate in the research rather than being directly approached by the researcher (Sharma, 2017). An advert explaining the topic and purpose of the thesis and asking consent for recording the interviews was sent forward to the participants of both community garden initiatives. The participants were then free to respond to the advert if they were willing to take part in the research. To increase the number of respondents, especially for the first case study (the Plukroute), the snowball sampling method was applied in addition to the self-selection sampling method. This technique is useful when the questions address a specific and limited target group (Etikan & Bala, 2017). Using this technique entails that "existing study subjects recruit future subjects from among their acquaintances" (Sharma, 2017, p. 752).

The interviews were semi-structured, meaning that a topic list with pre-set questions was used as a guideline, while also allowing for probing questions to dive deeper into particular questions and ensuring flexibility (van Thiel, 2014). This implies that the researcher has to stay open-minded with regards to possible outcomes of the dialogue as well as being aware that answers are subjective perceptions. The interviews all started with an introductory section to make the respondents feel comfortable and to provide some information about how the interview would be conducted (van Thiel, 2014). All interviews lasted for approximately 30 minutes and were recorded either via the online platform that was used to conduct the interviews, which was Zoom, or by phone recording after asking the respondents' consent. Video material was deleted directly after the interviews were finished, while audio recordings were safely stored on a personal laptop. Ultimately, seven participants of the *Plukroute* and 8 participants of *Wereldtuin Verdeliet* were interviewed (Tables 3 and 4).

| Respondent | Age range | Date |
|---|---|---|
| Respondent 1 (RP1) | 40-50 | 31-03-2021 |
| Respondent 2 (RP2) | 50-60 | 13-04-2021 |
| Respondent 3 (RP3) | 60-70 | 14-04-2021 |
| Respondent 4 (RP4) | 60-70 | 14-04-2021 |
| Respondent 5 (RP5) | 80-90 | 20-04-2021 |
| Respondent 6 (RP6) | 30-40 | 28-04-2021 |
| Respondent 7 (RP7) | 40-50 | 03-05-2021 |

Table 3 | Overview of respondents, age range and date of semi-structured interviews conducted among participants at the *Plukroute*.

| Respondent | Age range | Date |
|---|---|---|
| Respondent 1 (RW1) | 30-40 | 12-05-2021 |
| Respondent 2 (RW2) | 60-70 | 12-05-2021 |
| Respondent 3 (RW3) | 60-70 | 18-05-2021 |
| Respondent 4 (RW4) | 30-40 | 18-05-2021 |
| Respondent 5 (RW5) | 60-70 | 18-05-2021 |
| Respondent 6 (RW6) | 60-70 | 26-05-2021 |
| Respondent 7 (RW7) | 30-40 | 26-05-2021 |
| Respondent 8 (RW8) | 40-50 | 26-05-2021 |

**Table 4** | Overview of respondents, age range and date of semi-structured interviews conducted among participants at *Wereldtuin Verdeliet*.

### 3.5.4 Participant observation

Initially, the idea was to conduct participant observation at both case studies. However, due to restrictions around the COVID-19 pandemic, there were no activities or workshops at the *Plukroute* at the time that the research was conducted there in April 2021. There were also less volunteers on the site than usual. After visiting the *Plukroute* once, it was decided that participant observation would not yield new insights in this case study. At the second case study site, *Wereldtuin Verdeliet*, participant observation was possible and adds to the data gathered through conducting semi-structured interviews with the participants. Gardening sessions were joined at the case study site on various days to enable the observation of a wide variety of participants. Consent for observation and written notes on the behaviour and interactions of the participants was asked beforehand for ethical considerations. The participants were furthermore ensured their anonymity during the whole research process.

Participatory research allows the researcher to observe individual behaviour in a particular context. As such, this method allows the researcher to gain knowledge about interactions between individuals and how they communicate, react and handle in particular situations (Guest et al., 2013). The researcher can adopt one of four roles in the field corresponding to varying levels of involvement between researcher and participants (Figure 6). The four roles available are: complete observer, observer as participant, participant as observer, and complete participant (Ribeiro & Foemmel, 2012). As such, the researcher may decide to "exclusively observe, taking no part in what is going on; or he may participate to a small extent; he may also choose to participate to a greater degree; or lastly, the researcher may become a complete participant and thus virtually indistinguishable from those he seeks to study" (Ribeiro & Foemmel, 2012, p. 379). For this research, the role of participant as observer was adopted to enable observing the participants from a distance, while also building trust through participating in meetings and having informal conversations with participants.

**Figure 6** | The participation observation continuum (Ribeiro & Foemmel, 2012).



*Complete Observer* ⟶ *Observer as Participant* ⟶ *Participant as Observer* ⟶ *Complete Participant*

The four main aspects researched here are: who is participating or involved, how are gardening practices performed, what interactions are visible, and what are the underlying values or motivations for certain actions and interactions. To gather data, the initiative was visited twice a week for four consecutive weeks, until no new insights were gained during observations (Table 5). Next to observations and joining meetings during the gardening sessions, informal conversations were performed at the case study site, which helped in answering the questions. All data was gathered by making field notes of the observations and the informal conversations.

| Date | Duration |
|---|---|
| May 11, 2021 | ± 2 hours |
| May 12, 2021 | ± 1.5 hours |
| May 17, 2021 | ± 2 hours |
| May 18, 2021 | ± 1.5 hours |
| May 25, 2021 | ± 2 hours |
| May 26, 2021 | ± 1 hours |
| May 31, 2021 | ± 2 hours |
| June 1, 2021 | ± 2 hours |

**Table 5** | Data and durations of participant observation on the field (*Wereldtuin Verdeliet*).

## 3.6 Data Analysis

The semi-structured interviews conducted among experts and participants of the two case studies were first transcribed. The field notes gathered during participant observation on the field were written out in Word. All these documents were then coded and analysed with the qualitative data analysis software Atlas.ti. Coding allows the research to connect the empirical data collected during the research process with the academic literature and theoretical framework developed. The process of coding involves "labelling each unit of data within a data item (such as a transcript or document) with a code that symbolises or summarises that extract's meaning" (Saunders et al., 2019, p. 653). A code refers to a unit of data which "may be a number of words, a line of a transcript, a sentence, a number of sentences, a complete paragraph, other chunk of textual data, or visual image" (Saunders et al., 2019, p. 653). Three steps can be identified during the coding process, namely open coding, axial coding and selective coding.

During the first step of open coding, fragments in the transcript were labelled to identify certain categories. During the second step, axial coding, the aim was to identify links between the open codes, in order to distinguish overarching themes at a higher level of abstraction. Axial codes were taken from the theoretical framework and, among others, included "meanings", "materials" and "competences".  Finally, fragments with similar themes were compared during selective coding to identify similarities and differences by highlighting them with a colour. Ultimately, the empirical data was connected to the theoretical framework in order to answer the research questions.

## 3.7 Ethics

Qualitative research is situated in "consciously value-laden territory in which human relationships and critical self-reflection loom prominently" (Mertens, 2014, p. 510). The researcher should be reflective of the whole research process, since dealing with primary qualitative data can evoke ethical questions and dilemmas (Mertens, 2014). For this thesis, it is therefore necessary to consider ethics to prove that the research was conducted morally correct. Ethical questions and dilemmas do not only arise during data collection, but can emerge during the whole process of conducting research (Creswell & Poth, 2016). Therefore, ethics were taken into account in this thesis during data collection, data analysis and interpretation of the data.

Ethical considerations were first of all taken when conducting the semi-structured interviews. All respondents were specifically asked for their consent before conducting the interviews. To make sure that the research was conducted as transparent as possible, respondents were extensively informed about the topic of the thesis, the purpose of data collection and the processing of the data collected. The professionals in the area of community garden initiatives were asked for their consent for potential quoting with a name reference. Furthermore, anonymity was ensured to participants of the case studies. For differentiation, their ages were asked, which will be made confidential by referring to age groups. Participants were also asked permission for potential quoting without name reference to

ensure their anonymity. All respondents were avoided of any harm by ensuring them that they could skip or reject any questions if they would not feel comfortable to answer them as well as ask their own questions at any time. Ethical considerations were also taken during participant observation. The participants were verbally asked for their consent before starting participant observation at the case study site. They were furthermore ensured their anonymity during the whole time of observation and were given the opportunity to ask questions.

Ethical considerations were also taken during data analysis and interpretation by being aware that my own values, beliefs and prejudices impact my perspective on the data as well as the way data was handled (Creswell & Poth, 2016). By acknowledging this, it enabled me to reflect critically on the data collected during the whole process of data analysis and interpretation.

## 3.8 Validity and Reliability

When conducting scientific research, validity and reliability must be demonstrated. Generally, this requires the researcher to be open about potential biases, constraints related to personal values, and the circumstances under which data is obtained (Noble & Smith, 2015).

Validity refers to the "precision in which the findings accurately reflect the data" (Noble & Smith, 2015, p. 2). Two types of validity can be identified: internal and external validity. Internal validity refers to "the cogency of the study itself: has the researcher really measured the effect they intended to measure?" (van Thiel, 2014, p. 49). To enhance internal validity, the same interview guide was applied when conducting the semi-structured interviews and a structured approach to participant observation was followed, focusing on the same variables during each observation. Furthermore, the interview questions were recorded to maximize data collection. After conducting the interviews, the questions were reflected upon and adapted when necessary to ensure that all relevant topics were covered.

External validity describes "the extent to which a study can be generalized" (van Thiel, 2014, p. 49). Case study research is often criticized for its inability of generalizability, especially when adopting a single case approach (Yin, 2009). Whereas internal validity is generally high when adopting a case study approach, external validity is often limited due to the in-depth character (van Thiel, 2014). However, choosing a multiple case study approach enhances the external validity of this research by offering more robust analytical conclusions (Yin, 2003). This is referred to by Yin (2009) as analytical generalization.

Reliability refers to the accuracy and consistency of the measurements (van Thiel, 2014). To enhance reliability of the data, all semi-structured interviews and field notes of participant observation were transcribed and coded in detail to limit the subjectivity of interpretation. Also, the steps of the research process, decisions made, and potential uncertainties were documented, increasing the replicability of the research. Nobel and Smith (2015) furthermore state that argumentation should be kept as transparent as possible to make sure that the researcher's decisions are comprehensive. This transparency of the research process was ensured by developing an interview guide for the semi-structured interviews with participants and experts (Appendix A and B). Moreover, a multimethod approach was chosen to verify the results, increase trustworthiness and provide an in-depth understanding of the cases through triangulation of the data.

# 4. Results

This section will reveal the findings of this research. It will start by explaining the potential and challenges of community garden initiatives by combining findings from an extensive literature review with findings from semi-structured interviews with experts. Thereafter, the influence of the community garden initiatives on the elements of food-related practices will be elaborated on. Finally, this section will elaborate on how new, more sustainable food-related practices are created and shared with non-participants.

## 4.1 Community Garden Initiatives: Potential and challenges

### 4.1.1 The benefits and potential of community garden initiatives

Community gardens that adopt sustainable ways of farming can promote sustainability in three different ways. First, community gardens can promote physical and ecological sustainability through the growing of food. Second, community gardens can promote social sustainability through communal interaction. Third, community gardens can promote economic sustainability by using gardens for training, research and skills development (Holland, 2004). As such, community gardens have the potential to yield a variety of benefits for both individuals and communities as well as for the environment. The most common benefits of community gardening are "social development or cohesion, enhanced health, access to fresh foods, saving or making money, and education" (Guitart et al., 2012, p. 367). Other potential benefits that can be related to community gardening are "environmental sustainability, enhancing cultural heritage, life satisfaction, environmental equity and increased biodiversity" (Guitart et al., 2012, p. 367).

*Social benefits*

Human health benefits from community gardening have been widely studied. Community garden development has gained popularity as an environmental intervention to improve the health of the community as well as the individual. Community gardens can encourage citizens to walk, to physically engage in gardening activities, to learn about healthy food, and to consume healthy food. These changes can simultaneously address risk factors for chronic diseases, such as diabetes, cardiovascular diseases, and cancer. Furthermore, a variety of studies has found that community gardening has positive physiological impacts (Al-Delaimy & Webb, 2017). Another benefit is improved wellbeing among individuals, such as cognitive improvements, stress relief or decreased negativity (Dubová & Macháč, 2019). Health and wellbeing benefits of participating in community garden initiatives were also confirmed by expert respondent #3, as she mentioned:

*"There are also people who live nearby and struggle with mental issues or who, for example, have lost their partner and are in a grieving process and who find it incredibly healing to just be in such a garden and to water the flowers and drink coffee on a bench and talk to someone there."*

On the individual and community level, community gardening can lead to changing lifestyles and behaviour. According to Dubová and Macháč (2019, p. 70), "it is possible to identify trends in people's behaviour and shifting values towards more responsibility and activity in shopping and consuming". Also, through educational practices, community gardens can improve knowledge and enhance skills among individuals (Dubová & Macháč, 2019). Such learning can be uni- or multidirectional, where people learn from each other. Moreover, it can be intergenerational, where adults share their knowledge with children (Maćkiewicz et al., 2018). Furthermore, community gardening has the potential of achieving (partial) food self-sufficiency as well as an increase in food security of the region (Dubová & Macháč, 2019).

Community gardens can furthermore serve a mobilizing and empowering function for residents within a community, enabling an increased sense of pride and motivation to change the aesthetics of the urban environment. Since community gardens enable different ethnic groups to interact, they give different groups the opportunity to overcome potential barriers between them. Ultimately, this provides opportunities for enhancing social capital, promoting interactions and social inclusion (Firth et al., 2011). Social capital can be defined as "the connections among individuals or social networks and the norms of reciprocity and trustworthiness that arise from those connections" (Firth et al., 2011, p. 558). Firth et al. (2011) argue that there are four main ways in which community gardens can generate social capital:

1. By uniting people with a common purpose to participate in a joint activity or venture.
2. By creating a meeting place where people can interact and contribute to the creation of communities.
3. By the type of activities taking place. Different activities, such as growing, cooking and eating, promote informal interaction between people of different ages, ethnicities and socio-economic backgrounds.
4. By helping to build links with institutions and authorities, which enables access to resources.

Expert respondents #1 and #3 also confirmed how community garden initiatives can enhance social cohesion by serving as a place where people can meet and as such connecting different kinds of people. Expert respondent #1 furthermore stated that friendships were created and participants sometimes started a new initiative or participated in another initiative together.

*Environmental benefits*

A variety of environmental benefits has also been found in relation to community gardening. A community garden can be seen as a type of green infrastructure and therefore provides a variety of benefits for city residents through the provision of ecosystem services. Ecosystem services can be divided into four groups, namely regulating services, provisioning services, cultural services, and supporting services and biodiversity, as illustrated in Figure 7 (Dubová & Macháč, 2019). Furthermore, community gardens can reduce heat island effects and the ecological footprint and "support the ecological balance of natural cycles of water and soil (Maćkiewicz et al., 2018, p. 135). In theory, if sustainable community garden initiatives would expand to a larger scale, there could be an increase in the production of more sustainable, local and just food. This would mean that the demand for unsustainably produced food could decrease (Specht et al., 2014).

*Economic benefits*

From an economic perspective, community gardens can result in an increase in property value in the urban environment (Dubová & Macháč, 2019). Furthermore, in cities with high unemployment rates, community gardens can serve as training centres where young unemployed people can participate in learning about ecological gardening (Maćkiewicz et al., 2018). As such, community gardens could potentially reduce unemployment rates through educational practices, giving residents the opportunity to work. Community gardens therefore also play a role in the "fight against poverty". Finally, food self-sufficiency created by community garden development can reduce people's monthly expenses on fruit and vegetables (Duchemin et al., 2008).

Overall, community garden initiatives have great potential since they provide a wide variety of social, environmental and economic benefits as explained above. Such initiatives furthermore promote the development of local, just and sustainable food systems and can serve as an educational place for children as well as for adults. Expert respondent #3 emphasised the importance of children in connecting their parents to community garden initiatives:

*"In any case, children are very important with regards to connecting their parents to such a garden. You see that often. So, if you organise children's activities, of course the parents also come along."*
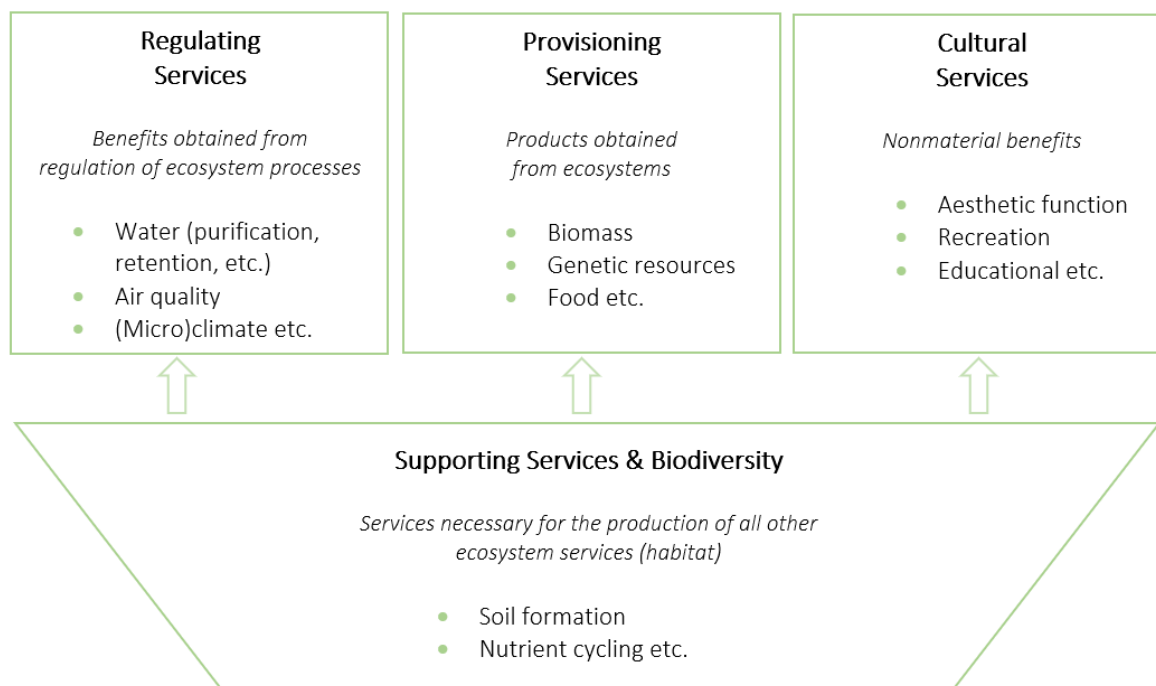
| Regulating Services | Provisioning Services | Cultural Services |
|---|---|---|
| *Benefits obtained from regulation of ecosystem processes* | *Products obtained from ecosystems* | *Nonmaterial benefits* |
| • Water (purification, retention, etc.)<br>• Air quality<br>• (Micro)climate etc. | • Biomass<br>• Genetic resources<br>• Food etc. | • Aesthetic function<br>• Recreation<br>• Educational etc. |

**Supporting Services & Biodiversity**

*Services necessary for the production of all other ecosystem services (habitat)*

• Soil formation
• Nutrient cycling etc.

**Figure 7** | Categories and types of ecosystem services provided by community gardens (Adapted from Dubová & Macháč, 2019).

## 4.1.2 The barriers and challenges of community garden initiatives

While community gardens certainly bring a variety of benefits to the urban environment, there are also potential concerns and risks of community gardens that need to be considered carefully. For instance, the use of mechanized tools, extensive use of synthetic fertilisers and pesticides, and excessive water consumption may negatively outweigh other positive environmental effects of community gardens (Dubová & Macháč, 2019). A study by Dewaelheyns et al. (2013), for example, found that in the northern part of Belgium, acidity and phosphorus levels were significantly higher in garden soils and carbon content was lower than optimal agronomic standards. There is also a higher risk of plot contamination due to greater exposure to contaminated dust in the environment or because the plot has already been polluted by previous use for certain purposes before being transformed to a community garden. This could impact the users of the community gardens through inhalatory (breathing) or oral (eating contaminated products) exposure of toxicants. Especially heavy metals could potentially have a substantial negative impact on human health and wellbeing. Gardeners are often not aware of the risks of exposure to toxicants in the soil and the products (Al-Delaimy & Webb, 2017). However, protective measures can be taken to decrease the risk of exposure to toxicants, including "raised beds, top soils, the use of untreated wood, and regular testing" (Al-Delaimy & Webb, 2017, p. 262). Education plays a very important role here (Al-Delaimy & Webb, 2017).

Diaz et al. (2018) have also defined a variety of physical barriers and challenges, as well as individual and community barriers and challenges to developing and sustaining community gardens. One main physical challenge mentioned in the study of Diaz et al. (2018) is "obtaining long-term tenure that is supported by policy and planning" (p. 198). Urban development may threaten community gardens that are located on vacant land, which in turn creates uncertainty among gardeners about their gardens in the long run (Diaz et al., 2018; Middle et al., 2014). However, expert respondent #1

emphasised how, in theory, it is not such a shame if an initiative is shut down. This respondent argued that the participants have gained certain experiences and something new may arise from it:

*"Those people have gained a certain experience and they can use that experience again in a next project or in a subsequent initiative. Just because the initiative of that moment stops does not mean that the movement that has been started with it will also stop."*

Obstacles related to physical attributes of gardens furthermore include water access and lack of available facilities, such as restrooms. Once community gardens are developed, resource demand, such as soil, compost, fertilizer, and seeds, poses a continual challenge. Finally, funding to support recurring costs as well as staff and organisations can be difficult to obtain, which can challenge growth and sustainability (Diaz et al., 2018; Rateike, 2015). Expert respondent #3, however, argues that it is not that difficult to gather resources and funding and stated the following:

*"For something like tools and so on and seeds and things like that, you can always knock on the door of funds or neighbourhood budgets of municipalities. That is not the main concern. The most important things are a group of people with long-term commitment, a good plot of land and that people stay involved."*

On the individual and community level, challenges may arise that can influence the success and sustainability of community gardens or community initiatives in general. The challenges identified include time commitment, lack of interest and participation, low visibility of the initiative, absence of technical skills, and distance to the site (Diaz et al., 2018; Middle et al., 2014; Rateike, 2015). At the individual level, participants need help with the development of strategies to raise awareness and reach out to communities as well as to increase support (Diaz et al., 2018). This challenge of recruiting and keeping volunteers on the long run and increasing support was also confirmed by all expert interviews (respondent #1, #2 and #3). As expert respondent #2 stated:

*"If you write a letter to one hundred people and you invite them and you inform them, then two people are going to do something."*

Expert respondents #1 and #3 also emphasised the need for volunteers who are able to spend much time and energy on initiating a community garden project or any community initiative. All three expert respondents furthermore argued that good communication and having personal conversations is key in convincing people to join, support or even just agree with the community initiative. Flexibility was also mentioned by expert respondent #3 as possible solution for recruiting more volunteers:

*"Well, by offering a lot of different activities, offering opportunities to maybe work flexible a few times a year or just to create many different tasks so that everyone likes something."*

Finally, at the community level, resource disparities may exist among gardeners of low-income and communities of colour. Whereas the first group may have difficulties contributing financial resources, the second group may have unequal access to political leaders and groups. This can result in a limited ability to secure public resources and funds (Diaz et al., 2018).

An overview of all benefits and challenges related to community garden initiatives is presented in Table 6.

Table 6 | Overview of the potential and challenges of community garden initiatives.

| Potential | | 36 |
|---|---|---|
| **Social benefits** | **Environmental benefits** | **Economic benefits** |
| • Improved health and wellbeing<br>• Promoting sustainable lifestyles and behaviour<br>• Education<br>• Increased food self-sufficiency and food security<br>• Increased mobilization and empowerment of residents<br>• Enhancing social equity<br><br>• Enhancing social capital/cohesion | • Regulating services<br>• Provisioning services<br><br>• Cultural services<br>• Supporting services & biodiversity<br><br>• Reduced heat island effects and increased ecological balance<br>• Reduced ecological footprint and animal cruelty<br>• Increased production of more sustainable, local and just food | • Increased property value<br>• Reduced unemployment rates<br><br>• Reduced poverty<br>• Reduced monthly expenses through self-sufficiency |
| **Challenges** | | |
| **Environmental** | **Physical** | **Individual or community level** |
| • Use of mechanized tools<br>• Excessive water consumption<br>• Extensive use of synthetic fertilisers and pesticides<br>• Increased risk of plot contamination | • Land and resource availability<br>• Water access<br>• Lack of available facilities (e.g. restrooms)<br>• Funding | • Time commitment<br>• Lack of interest and participation<br>• Recruiting volunteers and raising awareness<br>• Low visibility of the initiative<br>• Distance to site<br>• Absence of technical skills<br>• Resource disparities |

## 4.2 Gardening practices

### 4.2.1 Meanings

From the semi-structured interviews conducted among participants of the two case studies, certain meanings were emphasised regarding gardening practices. The most prominent meanings that respondents subscribed to gardening were social cohesion, relaxation, fun and seeing your food grow from seed to plant. Social cohesion was mentioned by almost all respondents and encompassed different meanings, such as working together with a diverse group of people, meeting new people from the neighbourhood and sharing the same opinions around sustainability and ecological gardening. One respondent from *Wereldtuin Verdeliet* (RW6) also emphasised the meaning of shared responsibility:

*"Initially, it is the idea that people do things together and collectively care for their environment, collectively care for the biological cultivation of the food that you eat and also, especially in the beginning, the shared responsibility."*

Relaxation was often related to working outside and being in contact with nature. Moreover, fun was often related to working together with other people in a green environment and growing your own food. Some respondents (RP2, RP6, RP7, RW2, RW3 and RW4) also emphasised the joy and proudness of being able to grow your own vegetables. One respondent of the *Plukroute* (RP2) stated the following:

*"Last year, for example, I planted broccoli in my garden for the first time and it is fantastic to eat your own broccoli. Yes, that is just nice, I can be very proud of that."*

Other meanings subscribed to gardening practices were being busy and being outside and in contact with nature, circularity, education and biodiversity. Five respondents of the *Plukroute* (RP1, RP2, RP3, RP4 and RP7) mentioned education with regards to children, more specifically the importance of teaching children the value of nature and the process of cultivating vegetables and fruits. Two respondents of *Wereldtuin Verdeliet* (RW2 and RW6) also mentioned education, but not just concerning children, stressing the importance of sharing. Some meanings that respondents attributed to gardening were also confirmed during all participant observations at *Wereldtuin Verdeliet*. Especially the meanings fun, relaxation, education (see text box 2) and social cohesion. Fun was related to the participants laughing and having fun together while gardening. Furthermore, everyone worked at their own pace and sometimes took breaks to relax, emphasising relaxation. Social cohesion was, for example, visible through the friendships that came forward from participating in the community garden initiative. There were also participants that occasionally had dinner together.

It became clear that meanings around gardening practices did not change too much over time due to participation in the community garden initiatives. However, there were two respondents (RP1 and RW4) who mentioned an increased consciousness about the value of nature and three respondents (RP1, RW3 and RW5) who mentioned an altered meaning of cultivating vegetables. The altered meaning of cultivating vegetables encompasses being inspired by the community garden initiative to start cultivating your own vegetables or other edible products at home. Increased consciousness about the value of nature is expressed by one respondent of the *Plukroute* (RP1) as follows:

*"It is not a shame if you do not harvest everything, so I think that is also an interesting one. We actually always see an apple tree only as a product, but of course it is also just a tree and nature."*

### 4.2.2 Materials

With regards to materials around gardening practices, the focus was on tools and having enough time and space to perform gardening practices at home. All respondents of the *Plukroute* and three respondents of *Wereldtuin Verdeliet* (RW2, RW5 and RW6) owned either a big or medium to small garden at their home. Five respondents of *Wereldtuin Verdeliet* (RW1, RW3, RW4, RW7 and RW8) did not have a garden at their home or have just a tiny garden or balcony, which was often also a reason for them to join the community garden initiative. Of the respondents with a garden at their home, not all of them cultivated fruits and/or vegetables there. Reasons for this vary from not having the time to practice gardening regularly at home due to busy work and life schedules to not wanting to or not being interested in it. The respondents who stated they did not want to or were not interested in cultivating fruits and/or vegetables at their home garden mainly used their garden as an ornamental one where they grow flowers and some other plants. One respondent (RW2), a participant of *Wereldtuin Verdeliet*, who has more of an ornamental garden at home stated the following:

*"No, I do not feel like it either. Especially now with two days and maybe often half a day in weekends, so being here for three half-days … No, that satisfies my need, so to speak, for gardening. I do not need to look for that elsewhere."*

One respondent (RW1) found it too difficult to maintain a fruit and/or vegetable garden at home by herself. Furthermore, half of the respondents cultivated their own vegetables in their garden. The vast majority of them also mentioned that they started cultivating more fruits and/or vegetables at home because they participated in the community garden initiatives and were inspired there. There was one respondent (RP5) who was almost self-sufficient, at least in the summer period, from the vegetables cultivated in his own garden:

*"Well, in the summer, I never have vegetables from the supermarket, because there is enough growing [in the garden]."*

The vast majority of respondents furthermore stated that they have a sufficient number of tools to work in their own garden. There was one respondent (RW1) who did not have enough money to buy gardening tools, but she also did not have a garden. This respondent said that if she would need them, there were always people that were willing to give or loan her things.

When looking at the influence of community garden initiatives on material use, one aspect that stood out was that some respondents became more conscious about reusing and recycling things. For example, two respondents (RP2 and RW3) mentioned that they reclaimed seeds from their garden and reused those to grow new flowers or vegetables. This aspect of reusing also came forward during participant observation (Text box 1). Four respondents (RP1, RP2, RP6 and RW4) also mentioned having started reusing and recycling other things, such as plastic bags, products from nature or waste products that were reused to build insect hotels. As one respondent (RW4), a participant of *Wereldtuin Verdeliet*, stated:

*"Yes, I think so, because we recycle a lot more and reuse a lot more here, I also reuse more bags at home and everything you can reuse, I use again at home. So that is something that I took home from Verdeliet and copied into my own life."*

### 4.2.3 Competences

Respondents showed mixed backgrounds regarding gardening skills, including knowledge on how to grow and harvest different local plant species. More than half of the respondents learned how to perform certain gardening practices, such as planting seeds or harvesting, from past experiences or from their parents and grandparents while growing up. Furthermore, almost half of the respondents learned about gardening by reading gardening books, from the internet, or just by doing. Three respondents (RP1, RW6 and RW7) followed workshops, trainings or participated in other community garden initiatives before. Only two respondents (RW2 and RW5) had little or no experience with regards to gardening. One respondent (RW5), a participant of *Wereldtuin Verdeliet*, initially joined the initiative for the people and did not have much knowledge of gardening as she explained:

*"No, not really. I am familiar with the general concept, but I am not sure about when it should be planted or harvested and if it should happen a certain way. No, I am very bad at that."*

One respondent (RP2) stressed how people are more and more disconnected from reality. Furthermore, a few respondents (RP2, RP6, RP7) emphasised how people are not aware of the origins of their food products and how community garden initiatives can play a role in changing that. As one respondent (RP2), a participant of the *Plukroute*, stated:

*"Some people and children do not know where everything comes from and for me that has always been self-evident and also to let our children grow up with it. So, that milk does not come from the factory, but from a cow. That a tomato hangs on a plant and that you cannot just buy it in the supermarket. You notice that people are getting more and more disconnected from reality and I think that the Plukroute can help with that."*

Even though respondents already had some or much knowledge around gardening as well as certain gardening skills, the vast majority of respondents stated that participating in the community garden initiatives helped them to gain new gardening knowledge or skills. Overall, respondents from both initiatives mentioned how they learned about certain plant species, edible plants, which was also observed during some participant observations at *Wereldtuin Verdeliet* (Text box 2), and how to perform certain practices, such as planting seeds or harvesting products. As one respondent (RP6), a participant of the *Plukroute*, described:

*"We now also grow certain plant species that we did not know yet, because we have seen how they grow at the Plukroute and what you can do with them. I think that is mainly it, that you discover new species and learn how to grow them."*

Moreover, half of the respondents showed that they gained more specific knowledge and skills, such as reclaiming seeds, leaving weeds on the ground as fertilizer, building insect hotels, reusing and recycling and more efficient water use. This new knowledge and the accompanying skills were all related to more ecological and sustainable gardening practices as well as to increased knowledge about biodiversity. Respondents stated that they either learned this by looking at other participants to see how they perform certain actions, but also through communication. This was also observed during all participant observations at *Wereldtuin Verdeliet*. Often, there was a skilled gardener present who demonstrated or explained certain actions, for example, the reason for leaving weeds on the ground instead of disposing of them.

> **Text box 2: Participant observation *Wereldtuin Verdeliet***
> **June 1, 2021**
>
> After the break from the gardening session, the skilled gardener gave a tour of the garden. He walked past all the vegetable garden beds, the greenhouse and the small food forest and talked about the vegetables, herbs and fruits planted there. He also told facts about some of the plants or why some vegetables did not grow so well. For example, there was a field with spring onions that was not thriving. The gardener explained that this was due to the leafminer, an insect species, which eats the plant from the inside out, causing the plant to rot at some point, especially in wet weather. During the tour, the participants were also allowed to ask questions and they often did. They asked about, for example, what species were planted somewhere or what the purpose was of certain structures. There were, for example, pots with straw in them hanging from the fruit trees. The gardener explained that the purpose of this was to attract earwigs which would eat the other insects living on the fruit trees and would keep the trees healthy. At the end of the tour, one of the participants said that she really enjoyed such tours and learns something new this way.

### 4.2.4 New, more sustainable gardening practices

This section addresses the interaction between the new, more sustainable elements and the creation of new, more sustainable practices. This section thus aims to determine whether existing social practices have shifted towards new, more sustainable practices with a reduced environmental impact. New, more sustainable practices that can be distinguished are related to (more) ecological gardening and recycling/reusing. Especially through gaining new competences, including knowledge and skills around ecological gardening and recycling or reusing, participants engaged in new, more sustainable gardening practices. From the semi-structured interviews as well as from all participant observations, it became clear that participants mainly learned from each other, from a skilled gardener (at *Wereldtuin Verdeliet*) or just by doing. This also encompasses sharing meanings around ecological gardening and sustainability and encouraging or inspiring each other to adopt such meanings. As such, gaining new knowledge and skills, as well as sharing meanings, enabled participants to engage in new, more sustainable gardening practices. These practices included reclaiming seeds from flowers, fruits or vegetables and reusing those to replant them, building insect hotels from waste or recycled materials, using weeds as fertilizer or eliminating pesticide use in their own garden.

## 4.3 Food-related practices: selecting and buying food products and preparing meals

### 4.3.1 Meanings

From the semi-structured interviews conducted among participants of the two case studies, certain meanings were emphasised with regards to food. The most prominent meanings that respondents subscribed to food were health and food being tasty. Other meanings subscribed to food included fairness, animal welfare, nature and the environment, necessity and sociability to food. Fairness is related to the quality of food and food being cultivated fairly with regards to nature and people, meaning that the production is fairly sustainable and the people working are treated right. As one respondent (RP1), a participant of the *Plukroute*, stated:

*"I just don't think it is fair if I have to live off other people's poverty or something, you know, that just would not be fair."*

Animal welfare, as well as nature and the environment, often came up in relation to the consumption of meat and fish products. Respondents often started eating less meat for environmental reasons, such as greenhouse gas emissions and land use related to meat production, but also out of animal welfare reasons. However, eating less meat was never related to participating in the community garden initiatives. It was more often related to seeing documentaries or reading papers or articles about climate change and related subjects. One respondent (RW2), a participant of *Wereldtuin Verdeliet*, captures the reasons for not eating meat as follows:

*"Well, in any case a big reason for not eating meat is that it takes up too much land by, among other things, the cows that go there, where actually another crop could grow and also of course the emissions of nitrogen and $CO_2$, name them all. So that is a big reason and of course in general also the animal suffering that goes with it..."*

Of course, respondents also stated that food is a necessity of life. You need food in order to survive. Three respondents (RP1, RP2 and RP6) also mentioned sociability, which was always related to eating together with your family or friends and enjoying that time together. One respondent (RP1) stated that this was more difficult at breakfast or lunch, due to different time schedules of the family members, but that dinner was always together:

*"At our place, it is always at the table, we do not eat in front of the television, so it is always really a meal together and then really a moment when you have the space to talk to each other. So phones go away and it is just eating dinner together."*

While meanings around food did not directly change due to participation in the community garden initiatives, the vast majority of respondents mentioned that they became more conscious or more aware of the quality of their food as well as of the locality and seasonality of their food. A few respondents (RP4, RP6, RP7 and RW6) stated to have started to value food more, due to the realization that people around them are also interested in the same subjects around sustainable food production and consumption and therefore being able to share that together. As one respondent (RP7), a participant of the *Plukroute*, stated:

*"Yes, I have come to value it more, because now I just know that more people share that with me, the interest in it and that they are even one step further in that. So that is actually motivating."*

### 4.3.2 Materials

With regards to materials around food-related practices, the focus was on products selected and bought in stores and products used to prepare or cook meals. Furthermore, the time available to shop and cook as well as the distance to stores were considered here. None of the respondents got all of

their fruits and vegetables at the community garden they volunteered at. At the *Plukroute*, the reason for this was that the harvest was just not "generous" enough (RP4). At *Wereldtuin Verdeliet,* the reason was more because the products were not ready for harvesting at the time of this research, or because of the convenience of shopping at the supermarket. The vast majority of respondents stated that they select and buy their food products at the supermarket. Reasons for this choice included convenience, distance to more specialised stores, markets or farmers or not having the time to travel longer distances to more specialised stores due to busy work schedules. A few respondents (RP2, RP4, RP7, RW1 and RW3) also indicated having the dilemma between choosing sustainable stores but having to drive quite a distance to stores offering more sustainable food products. As one respondent (RP7) stated:

*"Back in the days, we sometimes used to go to the Ekoplaza* [Dutch organic supermarket]*, but then you had to go all the way to Breda from here* [Hank]*. Then I think okay, I will buy sustainable products, but I have to drive a long way to get it. Doesn't that cancel each other out then?"*

Half of the respondents (RP1, RP2, RP4, RP6, RW1, RW3 and RW8) showed a preference for more specialised stores or shops, such as organic supermarkets, greengrocer's shops and markets or even buying products directly from farmers. The vast majority of respondents who mainly shop at the supermarket said that they do choose organic, local and/or seasonal food products at the supermarket and in that way try to select and buy more sustainable options. They are often also willing to pay more for more sustainable options with regards to food. As one respondent (RW3) argued:

*"No, for me it is not a reason not to buy it, because then you just leave out something else I think."*

However, respondents (RP3, RP5, RW1, RW3, RW4 and RW5) stated that such sustainable options are often too expensive due to restricted budgets. Almost all respondents furthermore preferred fresh food products over frozen products, fast food or ready-to-eat meals. With regards to meat and fish consumption, there were only a few respondents (RW1, RW2, RW3 and RW6) that were fully vegetarian. Some of them only ate meat or fish once or twice a month. Of the remaining respondents, half of them (RP1, RP2, RP, RP6, RW5 and RW7) tried to eat less meat or fish and the other half (RP3, RP4, RP5, RP7, RW4 and RW8) still eats meat or fish on a regular basis. Finally, with regards to packaging of food products, half of the respondents said that they tried to choose products that were not packed in plastic or take their own bags with them. However, it was often mentioned how difficult this was due to almost everything being packed in plastic in supermarkets.

When looking at the influence of the community garden initiatives on materials when selecting and buying food products and preparing meals, there were a few things that stood out. Firstly, some respondents (RP1, RP6, RW1, RW3 and RW4) showed an increased consciousness about local and seasonal food products. As one respondent (RW1) stated:

*"Yes, it does help, yes. The honey, for example, that it comes from here. I just was not aware of that. You would just buy honey from the store because you needed honey period."*

Another respondent (RP1), a participant of the *Plukroute*, also stated the following about local and seasonal food products:

*"You are working with it all the time, so it becomes more and more visible."*

Furthermore, there were two respondents (RW4 and RW6) who showed an increased consciousness about organic and fresh food products and about packaging. By participating in the community garden initiatives and talking with others about the sustainability of food, they started to choose more organic

food products over non-organic food products and paid more attention to whether products were packed in plastic or not. One respondent (RW4) also started to eat more fresh products:

*"Yes, I now eat much more fresh food products than before. I used to eat a lot more frozen products. Yes, that has changed."*

### 4.3.3 Competences

The vast majority of respondents revealed to have some or a lot of knowledge around sustainability with regards to food. This included knowledge about waste separation, food waste and recycling as well as choices of food products (local, seasonal, organic). It was often mentioned that the respondents learned about this through watching documentaries or shows on television or by reading about it in articles or books. Two respondents (RW3 and RW8) followed workshops or trainings. It was also often mentioned that they were already interested in food and sustainability around food, due to awareness about what is happening in the world. As one respondent (RW3) stated:

*"I also read quite a lot about it and I mean I also see what is happening in the world and how we are actually screwing up our world a bit, right?"*

With regards to food waste, half of the respondents mentioned to be very much aware about the impact of food waste on the environment or just think it is a waste to throw away food and therefore try to not waste any. Some respondents (RP6, RW2, RW6 and RW7) had knowledge around waste separation and were very conscious about this because of environmental reasons. One respondent (RW7) argued:

*"Well, I am very much in favour of separating your waste very well … I just see what is happening right now with regards to climate change and I am like yes, if I can contribute something to turn that away or turn it around a little bit, as far as possible, I think – if that can be done through waste separation or any other ways – please."*

There were, however, also some respondents who gained new knowledge and skills around food waste and waste separation due to participation in the community garden initiatives. Since both initiatives are actively separating their waste, respondents (RP1, RP6, RW3 and RW7) stated that they became more aware of the importance of separating waste. With regards to food waste, a few respondents (RP1, RW4 and RW5) showed that they do not waste as much food as they used to. As one respondent (RW5) stated with regards to wasting food:

*"I used to be much easier in not using things and now I think well no, it can be done differently, you know. So yes, it does affect me."*

Furthermore, some respondents (RP1, RP3, RP4, RP6, RP7, RW1) also mentioned using more products from nature, such as weeds or edible plants that they did not know existed before participating in the community garden initiatives. Due to participation and communicating with other volunteers as well as seeing certain products grow, they stated to have gained more knowledge about edible plants and how to use them when preparing meals. One respondent (RP1) nicely expressed this as follows:

*"Nowadays, I put weeds in my soup as well as leaves from trees … or elderberry juice. You are making more things yourself and picking things from nature. You actually eat even more locally."*

### 4.3.4 New, more sustainable food-related practices

Again, the remaining question addresses the interaction between the new, more sustainable elements and determines whether existing social practices have shifted towards new, more sustainable practices with a reduced environmental impact. New, more sustainable practices that can be distinguished are related to selecting and buying more sustainable food products, reducing food waste, waste separation and using more products from nature as well as more sustainable food products to prepare meals. By gaining new knowledge about more sustainable food products, including local, seasonal and organic food products, as well as altered meanings and increased consciousness, participants started to select and buy more sustainable food products and used those to prepare meals. It was often mentioned how they learned about more sustainable food products from each other, from the internet, or from television. This also encompasses becoming more conscious about what is happening in the world with regards to climate change and the environmental impact of current food systems. As such, by gaining new knowledge, skills and altered meanings around food and selecting more sustainable products due to participating in the community garden initiatives, respondents started to engage in new, more sustainable food-related practices. These practices included choosing and using more sustainable food products (local, organic, seasonal, unpackaged), using weeds or other edible plants from nature to prepare meals, wasting less food or separating waste.

## 4.4 Sharing food-related practices with non-participants

With regards to non-participants, only the indirect influence of community garden initiatives was measured by asking participants in what ways meanings, materials and competences were shared with non-participants. Half of the respondents stated to share materials, such as gardening tools or products from their garden, with non-participants. However, they often also argued that materials such as gardening tools were only shared with people whom they trusted, such as friends or family members. Products from gardens, such as seeds, plants or vegetables, were often shared with others if their harvest was generous. As one respondent (RP6) mentioned:

*"If we have nice seeds or stuff, it is nice to share it with other people, but we also do that with friends. If we see that we have a lot of plants from one species because it has grown a lot, we just hand them out."*

The vast majority of respondents furthermore stated to share meanings as well as knowledge with non-participants through informal conversations. This encompasses meanings and knowledge around (ecological) gardening and around sustainable food options. However, this was always only within a limited circle of friends, family and neighbours. It was also said that subjects, such as sustainability around food or ecological gardening were talked about when they came up, but respondents often did not force their ideas onto others. These informal conversations were more to inspire or motivate others with regards to sustainability, to give tips and tricks concerning ecological gardening (for example about natural pesticides) or to explain or demonstrate certain things related to, for example, ecological gardening. There was one respondent (RP7) who stated that she did not always share meanings or knowledge with others, since she felt like she did not have enough knowledge about certain sustainability topics herself. As this respondent (RP7) stated about sharing knowledge about sustainability with regards to food:

*"But other than that, yes, sharing that knowledge about it, I do not do that so much yet. Because I do not really give the perfect example there, I do not think of myself as the person for it."*

Furthermore, almost half of the respondents (RP1, RP5, RP7, RW1, RW3 and RW4) mentioned how knowledge and meanings are shared through social media in the name of the community garden

initiative. As such, the initiatives are trying to spread the word about sustainability and sustainable ways to cultivate fruits and vegetables to a wider audience. However, the extent to which this is done is limited. One respondent (RP6) mentioned how she sometimes posts something on Instagram for work about, for example, herbs that she harvested from the *Plukroute* and how she wants to inspire others this way.

Finally, several respondents stated that the community garden initiatives also share knowledge, skills and meanings through workshops (RP1 and RP2) or by writing something in the local newspaper (RP3 and RW1). Workshops were, however, often organised for children or in collaboration with schools and did not directly involve adults. One respondent (RP2) mentioned the following:

> *"There is also a club that really organises workshops for school children and then you should think about making insect hotels, that kind of stuff."*

With regards to sharing information in the local newspaper, this entailed only short articles about the community garden initiative or a short explanation about certain things, for example, pesticide use and its influence.

# 5. Discussion

This section will start by discussing how this research contributes to the broader academic debates. This will be done by positioning the research within the broader academic literature through adopting a transformative change and societal transitions perspective. Afterwards, this section will provide a reflection on Social Practice Theory and the methodological choices made in this research project. The chapter will end by explaining the limitations of this research and giving recommendations for practice and further research.

## 5.1 Contribution to and position within broader academic debates

From this research, it became clear that community garden initiatives do influence (elements of) social practices. Respondents, for example, became more conscious about the locality and seasonality of their food products, started to buy more organic food products, or improved their ecological gardening skills and knowledge. As such, this research contributes to the available academic literature by providing new insights into the influence of community (garden) initiatives on social practices, since there is only limited research on this as explained in section 1.2. But how extensive is such an impact when looking at a larger scale? To what extent can community garden initiatives contribute to the transition towards sustainable food systems and towards a more sustainable society in general? These questions will be discussed here by drawing on academic literature regarding transformational change and societal transitions, including the multi-level perspective framework.

### 5.1.1 Community Garden Initiatives and Transformative Change

Transformations can be defined as either sudden or gradual changes that are radical in scope; "it is a shift, not of approximation, but to something different, such as ice to water; it is a shift in form, as well as in content and process" (Brown & Miller, 2005, p. 169). From a transformative perspective, emerging environmental and societal problems are seen as rooted in society's fundamental features and the interrelation and relation between humans and the environment (Hopwood et al., 2005). From a transformative change perspective, it is argued that relations between society and/or humans with the environment require a transformation in order to avoid "a mounting crisis and even possible future collapse" (Hopwood et al., 2005, p. 45). Thus, the focus of transformations is on large-scale societal changes, either global, national or local, involving "social-ecological interactions" (Hölscher et al., 2018, p. 2).

Looking back on the results of this research, community garden initiatives do in a certain way transform societal structures and social-ecological relations. Community garden initiatives alter a neighbourhood's spatial environment and bring along various social, economic and environmental benefits (see section 4.1). By raising awareness through, for example, educational workshops, activities or parties, other people within the neighbourhood can become inspired to join the initiative or start a new initiative in a different place. It also increases awareness about food supply, food consumption, sustainability and biodiversity. Furthermore, by increasing social cohesion within neighbourhoods, community garden initiatives potentially decrease social alienation and unwanted behaviour by promoting sustainable behaviour. Also, the development of more sustainable social practices can be related to participation in community garden initiatives (see sections 4.2 and 4.3). This not only entails food-related practices, but also practices of reusing and recycling stuff, such as plastic bags, products from nature, such as weeds or edible plants that were unfamiliar to them before participating, or waste products. As such, by gradually reaching more individuals, community garden initiatives can ultimately improve social-environmental relations and achieve a societal transformation on a local scale. Other authors also argue that community garden initiatives can induce a transformative change of food systems by enabling cultural transformations as well as reshaping food-place relations (Barlett, 2011; Laycock & Robinson, 2018). Furthermore, it is argued that "urban agriculture projects can open doors to more radical social transformation through community

empowerment" (Gray et al., 2014, p. 190). Transformative change is furthermore highly dependent on changing values towards sustainability (WBGU, 2011) and as the results have pointed out, community garden initiatives can play an important role in changing meanings (values) around systems of food provision and consumption.

### 5.1.2 Community Garden Initiatives and Sustainability Transitions

From a societal or sustainability transitions perspective, the multi-level perspective (MLP) has often been found useful as heuristic framework. The MLP focuses on socio-technical or so-called sustainability transitions and captures the "dialectical relationships between microlevel actors and macrolevel structures" (Seyfang & Haxeltine, 2012, p. 383). According to the MLP, transitions are non-linear processes resulting from the "interplay of developments at three analytical levels: niches (the locus for radical innovations), socio-technical regimes (the locus of established practices and associated rules that stabilize existing systems), and an exogenous socio-technical landscape" (Geels, 2011, p. 26). A transition furthermore implies "a gradual, pervasive shift from one state or condition to something different" (Hinrichs, 2014, p. 145) or "from one socio-technical regime to another" (El Bilali, 2019, p. 2). According to Seyfang and Haxeltine (2012), it is especially important to understand transitions when dealing with lock-ins around dominant solutions which contribute to unsustainable development and when new solutions might be more sustainable. A visual overview of the MLP framework is presented in Figure 8. Here, the MLP framework will be employed to explore how community garden initiatives can contribute to a sustainability transition regarding food systems by positioning this research in the broader academic literature on food transitions.
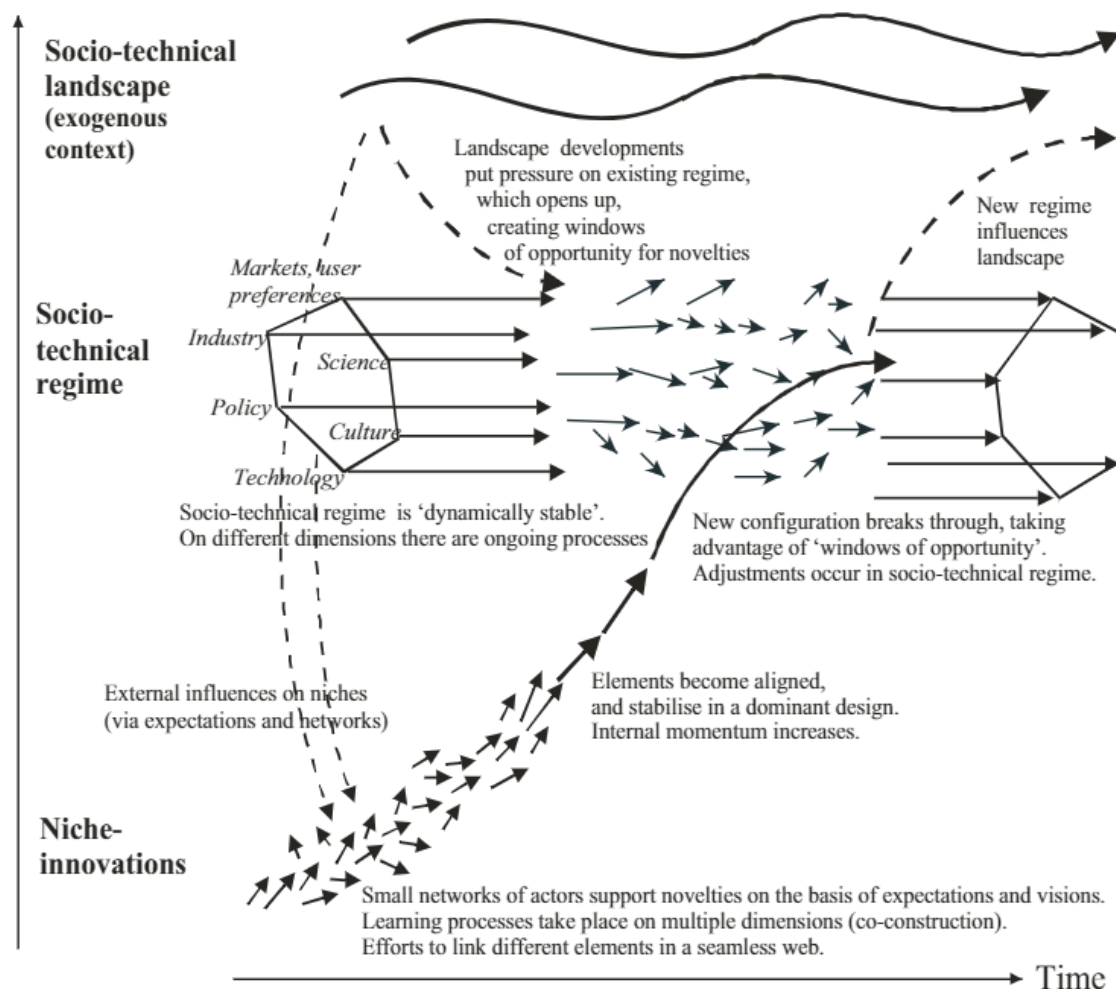


**Figure 8** | The multi-level perspective on transitions (Geels, 2011, p. 28).

The socio-technical regime includes elements such as "dominant rules and policies, structures, values, practices and beliefs stabilized over time" (Rut & Davies, 2018, p. 283). Within current food systems, these elements include, among other things, "business regulations and codes, food safety law, existing transport and logistics infrastructure, or business networks" (Hinrichs, 2014, p. 149). These elements provide dynamic stability of socio-technical systems (Geels, 2006). The landscape level is characterized by "external trends and exogenous factors that might create opportunities for change" (Rut & Davies, 2018, p. 283). As explained in section 2.1, food production and consumption trends in the Netherlands have major environmental and social impacts. Together with other ongoing trends, such as urbanization and decreased land availability, growing awareness about the environmental impact of current food systems and long-term political trends, including population growth and economic development, this landscape pressures current socio-technical regimes of food provisioning and consumption (Rut & Davies, 2018). This pressure causes destabilization of the socio-technical regime, creating windows of opportunities for new, innovative niches (El Bilali, 2019).

In this research, community garden initiatives can be considered as new, innovative, sustainable "niches", supporting new, more sustainable ways of cultivating and consuming food products. Within such community initiatives, a network of actors (individuals of the community) develops alternative rules and practices (El Bilali, 2019). Furthermore, community garden initiatives can be classified as grassroots innovations (see section 2.2.3), making them value-driven niches with a focus on social needs as well as intrinsic benefits (such as belonging or identity) (Rut & Davies, 2018). Community garden initiatives are gaining in popularity (see section 2.2.2) and the results of this research have proved how new, more sustainable practices are developed due to participating in such initiatives. However, to really induce a large-scale transition of the current food system towards a more sustainable system, more awareness has to be created among individuals to expand pressure on the current regime and enable change. One thing that stood out during this research is that participants of both case studies were often older individuals (aged 40 or above). Therefore, it would be interesting to discover strategies to attract younger individuals. Furthermore, this research has not fully investigated how new, more sustainable practices are shared among individuals (participants and non-participants). Exploring this could be valuable in determining the scope of influence from community garden initiatives. Ultimately, diffusion of community garden initiatives and their influence on practices is necessary to increase pressure on the regime.

Community garden initiatives are bound in specific spatial contexts, since they are based on personal interactions and emphasise local concerns, values and characteristics. Therefore, diffusion of such initiatives differs from conventional spaces for innovation (Pesch et al., 2019). Instead of diffusion towards a larger geographical or economic scale, diffusion more readily occurs by replicating ideas and practices, either by inspiring or by influencing "trans-local networks or organizations" (Pesch et al., 2019, p. 304; Boyer, 2015). The results of this research revealed how ideas and (elements of) practices are shared through educational activities or workshops, social media, local newspaper articles and informal conversations. Spreading practices among individuals, including non-participants, can furthermore lead to increased motivation to participate in community initiatives, resulting in further diffusion of practices and scaling up. In this sense, the focus is not so much on growth in the scale of projects, but on changing and spreading practices. These practices may be translated in the form of policies or business strategies, capturing the initiative's ideas and values in the broader institutional system (Pesch et al., 2019), by taking advantage of windows of opportunity. Such windows of opportunity are created by landscape developments pressuring the existing regime (Geels, 2011). These landscape developments can also be influenced by innovative niches through changing practices and values (Rut & Davies, 2018).

In conclusion, practices developed in community garden initiatives, which can be regarded as innovative niches, may spread among individuals and, together with external trends and exogenous

factors, influence the socio-technical landscape through altering practices and values, creating windows of opportunity. By taking advantage of these windows of opportunity, the ideas and values of community garden initiatives can potentially be captured in the broader institutional or societal systems and translated into policies or business strategies. Thus, community garden initiatives have potential in altering socio-technical regimes by influencing market, government and civil society spheres, ultimately inducing a sustainability transition concerning food systems.

So, whereas transformative change refers to large-scale, "fundamental shifts in human and environmental interactions and feedbacks" (Hölscher et al., 2018, p. 1), transitions are more focused on "fundamental, technological, institutional and economic change from one societal regime or dynamic equilibrium to another" (Hölscher et al., 2018, p. 1). When combining insights from both perspectives, it can be argued that a societal transformation caused by community garden initiatives can be regarded as a possible transition pathway towards more sustainable food production and consumption. Community garden initiatives can alter values and practices around food production and consumption. This can already be considered transformative change. Once these altered values and practices diffuse towards a large geographical or economic scale, a sustainability transition concerning food systems can be achieved.

## 5.2 Reflection on theory and methods

### 5.2.1 Social Practice Theory

With social practice theory, the focus is on the formation of practices and the reproduction, maintenance and stabilization of those practices as well as on how they are challenged and ultimately eliminated (Hargreaves, 2011). It is argued that practices are carried by practitioners who maintain and strengthen them through "continued performance" (Hargreaves, 2011, p. 84). In this research, the focus was on how practices are influenced by participation in community garden initiatives. However, many other internal and external factors that influence practices can be identified of which not all have been considered in this research. This section will discuss some of these factors that may influence food-related practices.

First of all, purchasing more sustainable food products is highly dependent on factors such as education, gender and availability (Salazar et al., 2013). Furthermore, individuals often experience 'lock-ins' to unsustainable consumption patterns due to factors that are outside of their control. These factors may include economic constraints, institutional barriers or inequalities in access (Jackson, 2014). Social practices are also influenced by social norms and the people around us. Other social and cultural elements that play a role in shaping symbolic meanings around food consumption include rituals, myths, narratives and institutions, such as families, communities or churches (Jackson, 2014). Policy implications furthermore influence consumer behaviour. Jackson (2014) describes the role of policy as to "ensure that the market allows people to make efficient choices about their own actions" (p. 262), which is often focused on the need to correct for market failures. Finally, pricing plays a significant role in the reproduction of social practices. If, for example, burgers at McDonald's stay cheap, then why would people stop purchasing food at McDonald's?

To fully understand how social practices are created, reproduced, maintained, stabilized, challenged and eliminated, all factors, internal and external, that may influence practices should be taken into account. This research only accounted for individual meanings, materials and competences and the influence of participation in community garden initiatives on these elements. Other factors that might have influenced the investigated practices, such as pricing mechanisms or institutional barriers, were not considered. However, since the focus of this research only concerned the influence of community garden initiatives on food-related practices and the questions of the interviews were developed with this focus in mind, this does not affect the outcomes of this research. Nevertheless, further research

should be conducted to determine how external factors influence food-related practices and how practices overlap and influence each other.

## 5.2.2 Methodological choices

With regards to the methods chosen, a few things should be noted. There are of course general concerns when conducting research that should be considered, such as ethics, trustworthiness, researcher's bias or lack of rigour. These general concerns have already been addressed in Chapter 3. However, some specific concerns can be identified when adopting a case study approach, including the provision of little basis for scientific generalization, long time horizon and enormous, unreadable documents, and the renewed emphasis on randomized field trials or "true experiments" (Yin, 2009, p. 15). The first concern, provision of little basis for scientific generalization, is often highlighted when adopting a single case approach and raises the following question: "How can you generalize from a single case?" (Yin, 2009, p. 15). However, Yin (2009) also argues that a case study approach allows for expansion and generalization of theories (analytical generalization), just like experiments allow for enumeration of frequencies (statistical generalization). Also, by adopting a multiple case approach, this concern is furthermore reduced. The second concern, long time horizon and enormous, unreadable documents, was avoided in this research by determining the scope of the research and setting clear goals beforehand. This allowed for a structured approach, reducing the time horizon and limiting the size of documents, such as field notes of participant observation, by focusing on specific practices. The third concern encompasses the renewed emphasis on randomized field trials of "true experiments" (Yin, 2009). According to many, case study research cannot be used to establish causal relationships. However, Yin (2009) argues that "case studies can offer important evidence to complement experiments" (p. 16). Furthermore, case studies can very well explain "how" or "why" questions (Yin, 2009). Since this research aims to address a "how" question, a case study approach is very much suited here.

Other methodological concerns are related to conducting semi-structured interviews. By conducting interviews, perceptions are measured, which might be subjective and thus may change over time due to different circumstances. Therefore, interviewees' responses may not always reflect reality or the "truth" (Alshenqeeti, 2014). Hammersley and Gomm (2008) argue that "what people say in an interview will indeed be shaped, to some degree, by the questions they are asked; by conventions about what can be spoken about, by whom and to whom, and so on; by what they think the interviewer wants; by what they believe he or she would approve or disapprove of; by the setting in which the interview is carried out; by the timing of the interview; by how it has developed over time; and so on" (p. 100). However, Alshenqeeti (2014) also argues that supplementing interviews with, for instance, observation allows the researcher to investigate the external behaviour and internal beliefs of the participants. During this research, participant observation was conducted at *Wereldtuin Verdeliet* alongside semi-structured interviews with participants, which partially confirmed responses of the interviewees. Partially, since participant observation at the community garden initiative mainly gave insights into gardening practices and not so much into the practices of selecting and buying food products or preparing meals. Furthermore, participant observation was not conducted at the *Plukroute*, due to distance and COVID-19 regulations.

## 5.3 Limitations of the research

Several limitations could be identified while conducting this research. First of all, there were some differences between the two case studies that were chosen. At the second case study site, *Wereldtuin Verdeliet*, skilled gardeners were present. During participant observations at this case study, it was observed how these gardeners shared their extensive knowledge about gardening with the participants of the community garden initiative as well as taught them new skills, such as planting seeds or harvesting. At the *Plukroute*, there were also a few participants with quite some or even extensive gardening knowledge. However, since participant observation was not possible there, it is

unknown to what extent such skills and knowledge were shared among participants at this community garden initiative. Furthermore, the number of participants was a lot higher at *Wereldtuin Verdeliet* when compared to the *Plukroute*. The harvest of fruits and vegetables was also smaller at the *Plukroute*. These last two concerns were not taken into account while conducting research, but came up while conducting semi-structured interviews with the participants.

A second limitation is related to the fact that participants taking part in the community garden initiatives, were often already interested in food and sustainability around food before participating. Since participants are already more interested in sustainable food and sustainability topics in general than the average citizen, the extent to which participating in community garden initiatives has influenced their practices is difficult to measure. This could be interesting for further research. For example, two groups of people could be compared: one group with participants that were not previously interested in sustainability topics and one group with participants who were already interested in sustainability topics. This way, by having a control group, the actual influence of community (garden) initiatives on social practices can be better investigated. However, this will probably be much more time consuming since for the control group, individuals that are not interested in sustainability topics must be selected and convinced to participate in a community initiative. This would not have been possible for this research due to a limited time span.

Another limitation of this research was related to determining how new, more sustainable food-related practices were shared with non-participants. For this research, this was only measured by asking questions to participants about how they shared (elements of) new, more sustainable food-related practices with other people outside of the community garden initiatives. Non-participants were thus not directly interviewed or observed to determine whether social practices were altered. This could be recommended for future research, since it could give a clear indication of the extent to which community initiatives can reach individuals and alter social practices. This could be useful for determining how community initiatives can, on a larger scale, contribute to sustainability transitions.

A final limitation of this research was the fact that participant observation mainly gave insights into gardening practices and not so much into practices of selecting and buying food products or preparing meals as mentioned before. In order to obtain more insights into the latter, individuals should have been observed while, for example, shopping for food at the supermarket or while preparing meals at home. However, due to COVID-19 and the accompanying regulations, this was unfortunately not an option.

## 5.4 Recommendations

### 5.4.1 Practical recommendations

The first practical recommendation that can be made based on this research is to increase attention towards citizen participation. While community initiatives may be supported by governments through funding or other practicalities, citizens often seem to initiate local projects and seek support from the government instead of the other way around. Furthermore, receiving funding, land or other resources may not always be easy and can be very time-consuming due to long procedures. If governments would start actively involving and/or supporting citizens in initiatives concerning their own environments, participation may increase. This could be realized in multiple ways. First, by increasing land and resource availability for setting up community initiatives, which may reduce the threshold of initiation by citizens of community projects. Second, by making funding more accessible and reducing procedure times, this threshold may be reduced even further. Third, municipalities can act as umbrella organisations, connecting various initiatives with each other in order to share knowledge, goals and values. This might result in further spreading of such community initiatives. Finally, municipalities could organise educational events to increase citizens' awareness of environmental issues related to unsustainable consumption patterns.

Furthermore, policy intervention should support a transition towards more sustainable consumption practices. This was also emphasised by Jackson (2014), who argues that policy intervention should focus on the following:

- "It must enable and facilitate access to more sustainable choices;
- it must ensure that incentive (and penalty) structures support rather than hinder the desired changes;
- it must engage people in community garden initiatives to help themselves renegotiate unsustainable behaviours and practices and develop more sustainable lifestyles; and
- it must exemplify the desired changes in Government policies and practices." (p. 263)

Promoting sustainable consumption practices through such policy interventions may stimulate citizens to adopt such sustainable practices more easily.

Finally, subsidy reforms are necessary to promote sustainable behaviour change. For example, by implementing carbon taxes or carbon permits, the relative costs of unsustainable decision-making increases and may directly influence behaviour (Jackson, 2014). At the individual level, subsidy reforms, such as increasing the price of meat products or subsidizing sustainable energy options may affect purchasing behaviour and alter social practices.

### 5.4.2 Recommendations for further research

Some recommendations for further research have already been introduced in section 5.3. However, these can be considered as follow-up research projects. This section will provide recommendations for further research that is not as much connected to the cases of this research.

This research only considered small-scale community garden initiatives and their influence on food-related practices. Community garden initiatives are specific types of food initiatives and do not include other innovations for sustainable food production and consumption, such as regenerative farming, food forests or agroecology. Further research should focus on the impact of different kinds of food initiatives, their relations and the extent to which they can contribute to the transition towards sustainable food production and consumption. Such research could help in clarifying the potential of different food initiatives in contributing to sustainability transitions regarding food systems.

Another recommendation for further research is a more comprehensive analysis of social practice theory including all factors influencing food-related practices. Such research can give insights into the extent of influence of different factors, which enables the development of focused strategies to change food production and consumption patterns. Furthermore, practices may overlap and influence each other. A more comprehensive analysis can also help to identify how this occurs and the extent to which practices influence each other.

Finally, community garden initiatives yield a variety of economic, environmental and social benefits, stimulate more sustainable food production and consumption, and can potentially contribute to a food transition. However, one main challenge concerning the development and maintenance of such initiatives in the Netherlands is (long-term) land tenure. Different factors are of influence here, such as housing shortages, high density of buildings, especially in cities, and increased urbanization. It would be valuable to determine land availability and suitability for the development of community garden initiatives, for example through a GIS-based analysis. These initiatives can, for example, also be developed on flat rooftops (often referred to as intensive green roofs). By providing an overview of possible locations for the development of community garden initiatives, such research may promote the integration of community gardens in urban development plans.

# 6. Conclusions

This thesis aimed to enhance our understanding of the potential and challenges of community garden initiatives and to determine the influence of such initiatives on (elements of) food-related practices among participants and non-participants. This chapter will first answer research question #1: *What are the opportunities and challenges of community garden initiatives?* Then, an answer will be given to the three sub-questions corresponding to research question #2: *How do community garden initiatives influence elements of food-related practices among participants and non-participants?* The answers to the sub-questions will be combined to provide an answer to this second research question.

An answer to research question #1 was established based on the literature review and semi-structured expert interviews. From this data, it can be concluded that while community garden initiatives have great potential and yield a variety of social, economic and environmental benefits, there are also some barriers and challenges that must be considered. First of all, community gardens can promote physical and ecological sustainability, social sustainability and economic sustainability. The social benefits of community garden initiatives include human health and wellbeing benefits, promotion of sustainable lifestyles and behaviour, improved knowledge and enhanced skills through learning, increased food self-sufficiency and food security, increased mobilization and empowerment and enhanced social capital as well as social cohesion. The environmental benefits include the provision of ecosystem services, namely regulating services, provisioning services, cultural services, and supporting services and biodiversity, reduced heat island effects, reduced ecological footprint and animal cruelty, increased ecological balance and an increased production of more sustainable, local and just food. Finally, the economic benefits include an increase in property value, reduced unemployment rates, reduced poverty and reduced expenses through food self-sufficiency. Identified barriers and challenges of community garden initiatives include environmental challenges, such as the increased risk of exposure to toxicants, the use of mechanized tools and excessive water consumption, physical challenges, such as land and resource availability and water access, and individual or community level challenges, such as commitment, visibility, participation and resource disparities.

This section will draw conclusions about the influence of community garden initiatives on meanings, materials and competences of the investigated food-related practices, namely gardening practices, selecting and buying food products and preparing meals, to provide an answer to sub-question 1. Overall, it can be concluded that elements of food-related practices are influenced by participating in community garden initiatives. However, the extent of this influence differs for each element. With regards to meanings of gardening practices, the results revealed that participants of the community garden initiatives became more aware of reusing and recycling, the value of nature and cultivating your own vegetables. As for the other food-related practices, the results revealed that participants became more conscious about the locality and seasonality of their food products as well as about the quality and value of food. The influence of community garden initiatives on materials of gardening practices was an increase in recycling and reusing things. With regards to the influence on materials of the other food-related practices, the results revealed that participants started to select and buy more organic, local, seasonal and/or fresh food products and paid more attention to whether products were packed in plastic or not. These products were then used to prepare meals. As for competences of gardening practices, the results revealed that participants gained new knowledge about certain plant species, edible plants, and new gardening skills, such as planting seeds, harvesting products, reclaiming seeds, leaving weeds on the ground as fertilizer, building insect hotels, reusing and recycling and more efficient water use. Finally, participants stated that they gained new knowledge and skills around food waste and waste separation, started to use more products from nature, such as weeds or edible plants that were unfamiliar to them before participating, and gained more knowledge about how to use different species of edible plants when preparing meals.

The second sub-question asked how new, more sustainable elements of food-related practices interact and create new, more sustainable practices. It can be concluded that the integration of altered meanings, materials and new competences from participation in the community garden initiatives resulted in participants' engagement in new, more sustainable gardening practices and other food-related practices. New, more sustainable gardening practices included reclaiming seeds from flowers, fruits or vegetables and reusing those to replant them, building insect hotels from waste or recycled materials and adopting more ecological ways of gardening, such as leaving weeds as fertilizer or eliminating pesticide use in their own garden. The other new, more sustainable food-related practices included choosing and using more sustainable food products (local, organic, seasonal, unpackaged), using weeds or other edible plants from nature to prepare meals, wasting less food and separating waste.

The last sub-question asked how new, more sustainable (elements of) practices are shared with non-participants. The results revealed that new, more sustainable food-related practices are shared with non-participants through informal conversations, social media, workshops or by sharing something in the local newspaper. However, participants only had informal conversations with a limited circle of friends, family and neighbours.

Finally, to answer research question #2, it can be concluded that participating in community garden initiatives influences food-related practices by altering meanings, materials and competences of these practices. The interaction between these altered elements resulted in new linkages between elements and the enactment of practices at specific moments in time and in particular local situations (practices-as-performances). Ultimately, this led to the development of new practices-as-entities, which included new, more sustainable practices of gardening, selecting and buying food and preparing meals. These (elements of) new, more sustainable practices were – although to a limited extent – shared with non-participants.

# 7. References

Ahmad, S., Wong, K. Y., & Ahmad, R. (2019). Life cycle assessment for food production and manufacturing: recent trends, global applications and future prospects. *Procedia Manufacturing*, *34*, 49-57.

Alaimo, K., Reischl, T. M., & Allen, J. O. (2010). Community gardening, neighborhood meetings, and social capital. *Journal of community psychology*, *38*(4), 497-514.

Al-Delaimy, W. K., & Webb, M. (2017). Community gardens as environmental health interventions: Benefits versus potential risks. *Current environmental health reports, 4*(2), 252-265.

Alonso, M. E., González-Montaña, J. R., & Lomillos, J. M. (2020). Consumers' concerns and perceptions of farm animal welfare. *Animals*, *10*(3), 385.

Alshenqeeti, H. (2014). Interviewing as a data collection method: A critical review. *English linguistics research*, *3*(1), 39-45.

Amantova-Salmane, L. (2015). Ethical aspects of sustainability. *Latgale National economy research*, *1*(7), 5-16.

Azzurra, A., Massimiliano, A., & Angela, M. (2019). Measuring sustainable food consumption: A case study on organic food. *Sustainable Production and Consumption*, *17*, 95-107.

Barlett, P. F. (2011). Campus sustainable food projects: Critique and engagement. *American anthropologist*, *113*(1), 101-115.

Béné, C., Oosterveer, P., Lamotte, L., Brouwer, I. D., de Haan, S., Prager, S. D., ... & Khoury, C. K. (2019). When food systems meet sustainability–Current narratives and implications for actions. *World Development, 113*, 116-130.

Bergman, N., Markusson, N., Connor, P., Middlemiss, L., & Ricci, M. (2010). Bottom-up, social innovation for addressing climate change. *Energy transitions in an interdependent world: what and where are the future social science research agendas, Sussex*, 25-26.

Van Berkum, S., Dengerink, J., & Ruben, R. (2018). *The food systems approach: sustainable solutions for a sufficient supply of healthy food* (No. 2018-064). Wageningen Economic Research.

Berners-Lee, M., Kennelly, C., Watson, R., Hewitt, C. N., Kapuscinski, A. R., Locke, K. A., & Peters, C. J. (2018). Current global food production is sufficient to meet human nutritional needs in 2050 provided there is radical societal adaptation. *Elementa: Science of the Anthropocene*, *6*.

Bonnett, M. (2002). Education for sustainability as a frame of mind. *Environmental education research*, *8*(1), 9-20.

Bourdieu, P. (1977). *Outline of a Theory of Practice*. (1972) Translated by Richard Nice. Cambridge: Cambridge University Press.

Bourdieu, P. (1990). *The Logic of Practice*. Stanford: Stanford University Press.

Boyer, R. H. (2015). Grassroots innovation for urban sustainability: comparing the diffusion pathways of three ecovillage projects. *Environment and Planning A, 47*(2), 320-337.

Brown, S., & Miller, W. R. (2005). Transformational change. In W. R. Miller & H. D. Delaney (Eds.), *Judeo-Christian perspectives on psychology: Human nature, motivation, and change* (pp. 167–183). American Psychological Association. https://doi.org/10.1037/10859-009

CBS, PBL, RIVM, & WUR. (2020a). *Temperatuur in Nederland en mondiaal, 1907 – 2019*. Compendium voor de Leefomgeving (indicator 0226, version 14). Retrieved from: Temperatuur in Nederland en mondiaal, 1907 - 2019 | Compendium voor de Leefomgeving (clo.nl).

CBS, PBL, RIVM, & WUR. (2020b). Zeespiegelstijging langs de Nederlandse kust en mondiaal, 1890 – 2018. Compendium voor de Leefomgeving (indicator 0229, version 11). Retrieved from: Zeespiegelstijging langs de Nederlandse kust en mondiaal, 1890-2018 | Compendium voor de Leefomgeving (clo.nl)

Ching, L. L. (2018). Agroecology for sustainable food systems. *Environment and Development series*, *19*.

Coenen, P. W. H. G., Van der Maas, C. W. M., Zijlema, P. J., Arets, E. J. M. M., Baas, K., van den Berghe, A. C. W.

M., ... & Dellaert, S. (2017). Greenhouse gas emissions in the Netherlands 1990-2015: National Inventory Report 2017.

Cohen, N., & Reynolds, K. (2014). Urban agriculture policy making in New York's "New Political Spaces" strategizing for a participatory and representative system. *Journal of Planning Education and Research*, *34*(2), 221-234.

Corkery, L. (2004). Community gardens as a platform for education for sustainability. *Australian Journal of Environmental Education*, *20*(1), 69-75.

Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.

Dana, L. P., Gurǎu, C., Hoy, F., Ramadani, V., & Alexander, T. (2019). Success factors and challenges of grassroots innovations: learning from failure. *Technological Forecasting and Social Change*, 119600.

Dewaelheyns, V., Elsen, A., Vandendriessche, H., & Gulinck, H. (2013). Garden management and soil fertility in Flemish domestic gardens. *Landscape and urban planning, 116*, 25-35.

Diaz, J. M., Webb, S. T., Warner, L. A., & Monaghan, P. (2018). Barriers to community garden success: Demonstrating framework for expert consensus to inform policy and practice. *Urban Forestry & Urban Greening*, *31*, 197-203.

Dobermann, A., & Nelson, R. (2013). Opportunities and solutions for sustainable food production. *Sustainable Development Solutions Network: Paris, France*.

Dubová, L., & Macháč, J. (2019). Improving the quality of life in cities using community gardens: from benefits for members to benefits for all local residents. *GeoScape, 13*(1), 68-78.

Duchemin, E., Wegmuller, F., & Legault, A. M. (2008). Urban agriculture: multi-dimensional tools for social development in poor neighbourhoods. *Field Actions Science Reports. The Journal of Field Actions, 1.*

El Bilali, H. (2019). The multi-level perspective in research on sustainability transitions in agriculture and food systems: A systematic review. *Agriculture*, *9*(4), 74.

Ester, P., Simões, S., & Vinken, H. (2004). Cultural change and environmentalism: a cross-national approach of mass publics and decision makers. *Ambiente & sociedade*, *7*(2), 45-66.

Etikan, I., & Bala, K. (2017). Sampling and sampling methods. *Biometrics & Biostatistics International Journal*, *5*(6), 00149.

Fanzo, J. (2019). Healthy and sustainable diets and food systems: the key to achieving sustainable development goal 2?. *Food ethics*, *4*(2), 159-174.

Feola, G., & Nunes, R. (2014). Success and failure of grassroots innovations for addressing climate change: The case of the Transition Movement. *Global Environmental Change*, *24*, 232-250.

Ferguson, R. S., & Lovell, S. T. (2015). Grassroots engagement with transition to sustainability: diversity and modes of participation in the international permaculture movement. *Ecology and Society*, *20*(4).

Ferreira, A. J. D., Guilherme, R. I. M. M., & Ferreira, C. S. S. (2018). Urban agriculture, a tool towards more resilient urban communities?. *Current Opinion in Environmental Science & Health*, *5*, 93-97.

Firth, C., Maye, D., & Pearson, D. (2011). Developing "community" in community gardens. *Local Environment, 16*(6), 555-568.

Frantzeskaki, N., Loorbach, D., & Meadowcroft, J. (2012). Governing societal transitions to sustainability. *International Journal of Sustainable Development*, *15*(1-2), 19-36.

Fudge, S., Peters, M., Hoffman, S. M., & Wehrmeyer, W. (Eds.). (2013). *The global challenge of encouraging sustainable living: opportunities, barriers, policy and practice*. Edward Elgar Publishing.

Galdas, P. (2017). Revisiting bias in qualitative research: Reflections on its relationship with funding and impact.

Garnett, T. (2013). Food sustainability: problems, perspectives and solutions. *Proceedings of the Nutrition Society*, *72*(1), 29-39.

Geels, F. W. (2006). Multi-level perspective on system innovation: relevance for industrial transformation.

In *Understanding industrial transformation* (pp. 163-186). Springer, Dordrecht.

Geels, F. W. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environmental innovation and societal transitions*, *1*(1), 24-40.

German Advisory Council on Global Change (WBGU). (2011). The great transformation: a heuristic concept? In WBGU, *World in transition – A Social Contract for Sustainability*, Berlin. Retrieved from: Publication | WBGU

Gerring, J. (2004). What is a case study and what is it good for?. *American political science review*, 341-354.

Guest, G., Namey, E. E., & Mitchell, M. L. (2013). Participant observation. *Collecting qualitative data: A field manual for applied research*, 75-112.

Giddens, A. (1991). *Modernity and self-identity: Self and society in the late modern age*. Stanford university press.

Gil, J. D., Daioglou, V., van Ittersum, M., Reidsma, P., Doelman, J. C., van Middelaar, C. E., & van Vuuren, D. P. (2019). Reconciling global sustainability targets and local action for food production and climate change mitigation. *Global Environmental Change*, *59*, 101983.

Godde, C. M., Garnett, T., Thornton, P. K., Ash, A. J., & Herrero, M. (2018). Grazing systems expansion and intensification: drivers, dynamics, and trade-offs. *Global Food Security*, *16*, 93-105.

Goel, S., & Sivam, A. (2015). Social dimensions in the sustainability debate: The impact of social behaviour in choosing sustainable practices in daily life. *International Journal of Urban Sustainable Development, 7*(1), 61-71.

Gorgitano, M. T., & Sodano, V. (2014). Sustainable food consumption: concept and policies. *Calitatea*, *15*(S1), 207.

Gray, L., Guzman, P., Glowa, K. M., & Drevno, A. G. (2014). Can home gardens scale up into movements for social change? The role of home gardens in providing food security and community change in San Jose, California. *Local Environment*, *19*(2), 187-203.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. *Handbook of qualitative research*, *2*(163-194), 105.

Guitart, D., Pickering, C., & Byrne, J. (2012). Past results and future directions in urban community gardens research. *Urban forestry & urban greening, 11*(4), 364-373.

Gustafsson, J. (2017). Single case studies vs. multiple case studies: A comparative study.

Hammersley, M. (2008). *Questioning qualitative inquiry: Critical essays*. Sage.

Hargreaves, T. (2011). Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change. *Journal of consumer culture*, *11*(1), 79-99.

Hargreaves, T., Haxeltine, A., Longhurst, N., & Seyfang, G. (2011). *Sustainability transitions from the bottom-up: Civil society, the multi-level perspective and practice theory* (No. 2011-01). CSERGE Working Paper.

Harrison, H., Birks, M., Franklin, R., & Mills, J. (2017). Case study research: Foundations and methodological orientations. In *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research* (Vol. 18, No. 1).

Heidegger, M., Macquarrie, J., & Robinson, E. (1962). Being and time.

Hernandez, S. (2020). De derde dimensie: minibreinen gebruiken om veranderingen in de hersenontwikkeling bij de ZvH te begrijpen - HDBuzz - Wetenschappelijk nieuws over de Ziekte van Huntington. HDBUZZ. Retrieved from: https://nl.hdbuzz.net/278

Higginson, S., McKenna, E., Hargreaves, T., Chilvers, J., & Thomson, M. (2015). Diagramming social practice theory: An interdisciplinary experiment exploring practices as networks. *Indoor and Built Environment*, *24*(7), 950-969.

Hinrichs, C. C. (2014). Transitions to sustainability: a change in thinking about food systems change?. *Agriculture and human values*, *31*(1), 143-155.

Hoes, A. C., Jongeneel, R., van Berkum, S., & Poppe, K. (2019). *Towards sustainable food systems: a Dutch approach*. Wageningen Economic Research.

Holland, L. (2004). Diversity and connections in community gardens: a contribution to local sustainability. *Local environment*, *9*(3), 285-305.

Hölscher, K., Wittmayer, J. M., & Loorbach, D. (2018). Transition versus transformation: What's the difference?. *Environmental innovation and societal transitions*, *27*, 1-3.

Van Holstein, E. (2017). Relating to nature, food and community in community gardens. *Local Environment, 22*(10), 1159-1173.

Hopwood, B., Mellor, M., & O'Brien, G. (2005). Sustainable development: mapping different approaches. *Sustainable development*, *13*(1), 38-52.

Hou, J. (2020). Governing urban gardens for resilient cities: Examining the 'Garden City Initiative'in Taipei. *Urban Studies*, *57*(7), 1398-1416.

Jabareen, Y. R. (2006). Sustainable urban forms: Their typologies, models, and concepts. *Journal of planning education and research, 26*(1), 38-52.

Jackson, T. (2014). Sustainable consumption. In *Handbook of sustainable development*. Edward Elgar Publishing.

Jaeger-Erben, M., & Offenberger, U. (2014). A practice theory approach to sustainable consumption. *GAIA-Ecological Perspectives for Science and Society*, *23*(3), 166-174.

Keller, M., Kiisel, M., & Vihalemm, T. (2015). *From intervention to social change: A guide to reshaping everyday practices*. Ashgate Publishing, Ltd..

Kliaugaite, D., & Kruopiene, J. (2017). Food waste generation and prevention measures in retail sector: A comparative study. *Environmental Research, Engineering and Management*, *73*(4), 7-20.

Krasny, M. E., Silva, P., Barr, C., Golshani, Z., Lee, E., Ligas, R., ... & Reynosa, A. (2015). Civic ecology practices: insights from practice theory. *Ecology and Society*, *20*(2).

Krom, M. de, M. Vonk & H. Muilwijk (2020), *Voedselconsumptie veranderen: bouwstenen voor beleid om verduurzaming van eetpatronen te stimuleren*, Den Haag: PBL. Retrieved from: Voedselconsumptie veranderen | PBL Planbureau voor de Leefomgeving

Lawson, L. (2004). The planner in the garden: A historical view into the relationship between planning and community gardens. *Journal of Planning History, 3*(2), 151-176.

Laycock Pedersen, R., & Robinson, Z. (2018). Reviewing University Community Gardens for Sustainability: taking stock, comparisons with urban community gardens and mapping research opportunities. *Local Environment*, *23*(6), 652-671.

Le Manach, F., Jacquet, J. L., Bailey, M., Jouanneau, C., & Nouvian, C. (2020). Small is beautiful, but large is certified: A comparison between fisheries the Marine Stewardship Council (MSC) features in its promotional materials and MSC-certified fisheries. PloS one, 15(5), e0231073.

Long, T. B., Looijen, A., & Blok, V. (2018). Critical success factors for the transition to business models for sustainability in the food and beverage industry in the Netherlands. *Journal of cleaner production*, *175*, 82-95.

Maciejewski, G. (2020). Consumers Towards Sustainable Food Consumption. *Marketing of Scientific and Research Organizations*, *36*(2), 19-30.

Maćkiewicz, B., Asuero, R. P., & Pawlak, K. (2018). Reclaiming urban space: A study of community gardens in Poznań. *Quaestiones Geographicae, 37*(4), 131-150.

Maye, D. (2018). Examining innovation for sustainability from the bottom up: An analysis of the permaculture community in England. *Sociologia Ruralis*, *58*(2), 331-350.

Mertens, D. M. (2014). Ethical use of qualitative data and findings. *The SAGE handbook of qualitative data analysis*, 510-523.

Middle, I., Dzidic, P., Buckley, A., Bennett, D., Tye, M., & Jones, R. (2014). Integrating community gardens into

public parks: An innovative approach for providing ecosystem services in urban areas. *Urban forestry & urban greening*, *13*(4), 638-645.

Minton, E. A., Spielmann, N., Kahle, L. R., & Kim, C. H. (2018). The subjective norms of sustainable consumption: A cross-cultural exploration. *Journal of Business Research*, *82*, 400-408.

Moseley, M. (2003). *Rural development: principles and practice*. Sage.

Musaiger, A. O. (1993). Socio-cultural and economic factors affecting food consumption patterns in the Arab countries. *Journal of the Royal Society of Health, 113*(2), 68-74.

Naess, P. (2003). Urban structures and travel behaviour. *European Journal of Transport and Infrastructure Research*, *3*(2).

National Gardening Association. (2014). Garden to table: A 5-year look at food gardening in America. *National Gardening Association*. Retrieved from: https://garden.org/special/pdf/2014-NGA-Garden-to-Table.pdf

Noble, H. & Smith, J. (2015) Issues of validity and reliability in qualitative research. Evidence Based Nursing, 18(2), 34-35. Retrieved from http://eprints.hud.ac.uk/id/eprint/23995/1/SmithIssues.pdf

Oda, K., Rupprecht, C. D., Tsuchiya, K., & McGreevy, S. R. (2018). Urban agriculture as a sustainability transition strategy for shrinking cities? Land use change trajectory as an obstacle in Kyoto city, Japan. *Sustainability*, *10*(4), 1048.

Ohmer, M. L., Meadowcroft, P., Freed, K., & Lewis, E. (2009). Community gardening and community development: Individual, social and community benefits of a community conservation program. *Journal of Community Practice, 17*(4), 377-399.

O'Leary-Kelly, S. W., & Vokurka, R. J. (1998). The empirical assessment of construct validity. *Journal of operations management*, *16*(4), 387-405.

Oostra, R. (Februari 2016). *Hank krijgt Plukroute*. Het Kontakt. Retrieved from: Hank krijgt Plukroute (hetkontakt.nl)

Oteman, M., Kooij, H. J., & Wiering, M. A. (2017). Pioneering renewable energy in an economic energy policy system: The history and development of dutch grassroots initiatives. *Sustainability*, *9*(4), 550.

Parry, D. C., Glover, T. D., & Shinew, K. J. (2005). 'Mary, mary quite contrary, how does your garden grow?': examining gender roles and relations in community gardens. *Leisure studies*, *24*(2), 177-192.

Peano, C., Merlino, V. M., Sottile, F., Borra, D., & Massaglia, S. (2019). Sustainability for food consumers: Which perception?. *Sustainability*, *11*(21), 5955.

Pesch, U., Spekkink, W., & Quist, J. (2019). Local sustainability initiatives: innovation and civic engagement in societal experiments. *European planning studies*, *27*(2), 300-317.

Plukroute. (n.d.) Plukroute Hank. Consulted on March 17, 2021 from: Een "heerlijke" wandeling (plukroute.nl)

Rateike, A. D. (2015). Community gardens in Knoxville: Insight into challenges facing community garden initiatives.

Reckwitz, A. (2002). Toward a theory of social practices: a development in culturalist theorizing. *European Journal of Social Theory, 5(2)*, 243-263.

Reisch, L., Eberle, U., & Lorek, S. (2013). Sustainable food consumption: an overview of contemporary issues and policies. *Sustainability: Science, Practice and Policy*, *9*(2), 7-25.

Ribeiro, N. F., & Foemmel, E. W. (2012). Participant observation. In *Handbook of Research Methods in Tourism*. Edward Elgar Publishing.

Ritchie, H., & Roser, M. (2020). Environmental impacts of food production. *Our world in data*. Retrieved from: Environmental impacts of food production - Our World in Data

RIVM. (2017). *Food consumption in the Netherlands and its determinants*. Background report to "What's on our plate? Safe, healthy and sustainable diets in the Netherlands.". Retrieved from: https://www.rivm.nl/bibliotheek/rapporten/2016-0195.pdf

Rogge, N., & Theesfeld, I. (2018). Categorizing urban commons: Community gardens in the Rhine-Ruhr

agglomeration, Germany. *International Journal of the Commons, 12*(2).

Roysen, R., & Mertens, F. (2019). New normalities in grassroots innovations: The reconfiguration and normalization of social practices in an ecovillage. *Journal of Cleaner Production*, *236*, 117647.

Rut, M., & Davies, A. R. (2018). Transitioning without confrontation? Shared food growing niches and sustainable food transitions in Singapore. *Geoforum*, *96*, 278-288.

Sala, S., McLaren, S. J., Notarnicola, B., Saouter, E., & Sonesson, U. (2017). In quest of reducing the environmental impacts of food production and consumption. *Journal of cleaner production*, *140*, 387-398.

Salazar, H. A., Oerlemans, L., & van Stroe-Biezen, S. (2013). Social influence on sustainable consumption: evidence from a behavioural experiment. *International Journal of consumer studies*, *37*(2), 172-180.

Sanchez, E. L., & Liamputtong, P. (2017). Community gardening and health-related benefits for a rural Victorian town. Leisure studies, 36(2), 269-281.

Sanchez-Sabate, R., & Sabaté, J. (2019). Consumer attitudes towards environmental concerns of meat consumption: A systematic review. *International journal of environmental research and public health*, *16*(7), 1220.

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2019). Research methods for business students (Eight edition). Pearson.

Saunders, M. N. K., & Tosey, P. C. (2013). The layers of research design. *Rapport*, (Winter), 58-59.

Schatzki, T. R. (1996). *Social practices: A Wittgensteinian approach to human activity and the social*. Cambridge University Press.

Schatzki, T. R. (2012). A primer on practices: Theory and research. In *Practice-based education* (pp. 13-26). Brill Sense.

Schatzki, T. (2016). Practice theory as flat ontology. *Practice theory and research: Exploring the dynamics of social life*, 28-42.

Scherer, L., Behrens, P., & Tukker, A. (2019). Opportunity for a dietary win-win-win in nutrition, environment, and animal welfare. *One Earth*, *1*(3), 349-360.

Shimpo, N., Wesener, A., & McWilliam, W. (2019). How community gardens may contribute to community resilience following an earthquake. *Urban forestry & urban greening*, *38*, 124-132.

Schwab, D. P. (1980). Construct validity in organizational behavior. *Res Organ Behav*, *2*, 3-43.

Serbulova, N., Kanurny, S., Gorodnyanskaya, A., & Persiyanova, A. (2019, December). Sustainable food systems and agriculture: the role of information and communication technologies. In *IOP Conference Series: Earth and Environmental Science* (Vol. 403, No. 1, p. 012127). IOP Publishing.

Seyfang, G., & Haxeltine, A. (2012). Growing grassroots innovations: exploring the role of community-based initiatives in governing sustainable energy transitions.

Seyfang, G., & Smith, A. (2007). Grassroots innovations for sustainable development: Towards a new research and policy agenda. *Environmental politics*, *16*(4), 584-603.

Sharma, G. (2017). Pros and cons of different sampling techniques. *International journal of applied research*, *3*(7), 749-752.

Shove, E. (2017). Matters of practice. *The nexus of practices: Connections, constellations, practitioners*, 155-168.

Shove, E., Pantzar, M., & Watson, M. (2012). *The dynamics of social practice: Everyday life and how it changes.* Sage.

Shove, E., & Walker, G. (2010). Governing transitions in the sustainability of everyday life. *Research policy*, *39*(4), 471-476.

Silva, A., & Stocker, L. (2018). What is a transition? Exploring visual and textual definitions among sustainability transition networks. *Global environmental change*, *50*, 60-74.

Smith, A., Fressoli, M., & Thomas, H. (2014). Grassroots innovation movements: challenges and contributions. *Journal of Cleaner Production*, *63*, 114-124.

Soethoudt, H., & Vollebregt, M. (2020). *Monitor Voedselverspilling: update 2009-2018: Hoeveel kilo gaat er in Nederland verloren?* (No. 2050). Wageningen Food & Biobased Research.

Spaargaren, G. (2011). Theories of practices: Agency, technology, and culture: Exploring the relevance of practice theories for the governance of sustainable consumption practices in the new world-order. *Global Environmental Change, 21*(3), 813-822.

Specht, K., Siebert, R., Hartmann, I., Freisinger, U. B., Sawicka, M., Werner, A., ... & Dierich, A. (2014). Urban agriculture of the future: an overview of sustainability aspects of food production in and on buildings. *Agriculture and human values*, *31*(1), 33-51.

Taylor, C. (1973). Interpretation and the sciences of man. In *Explorations in Phenomenology* (pp. 47-101). Springer, Dordrecht.

Van Thiel, S. (2014). *Research methods in public administration and public management: An introduction*. Routledge.

Trendov, N. M. (2018). Comparative study on the motivations that drive urban community gardens in Central Eastern Europe. *Annals of Agrarian Science*, *16*(1), 85-89.

Turner, B. (2011). Embodied connections: sustainability, food systems and community gardens. *Local Environment*, *16*(6), 509-522.

Turner, B., Henryks, J., & Pearson, D. (2011). Community gardens: sustainability, health and inclusion in the city.

Vermeir, I. and Verbeke, W. (2006) Sustainable Food Consumption: Exploring the Consumer "Attitude-Behavioral Intention" Gap. Journal of Agricultural and Environmental Ethics, 19, 169-194. https://doi.org/10.1007/s10806-005-5485-3

Waliczek, T. M., Mattson, R. H., & Zajicek, J. M. (1996). Benefits of community gardening on quality-of-life issues. *Journal of Environmental Horticulture*, *14*(4), 204-209.

Walter, P. (2013). Theorising community gardens as pedagogical sites in the food movement. *Environmental Education Research*, *19*(4), 521-539.

Warde, A. (2005). Consumption and theories of practice. *Journal of consumer culture*, *5*(2), 131-153.

Warde, A. (2016). *The practice of eating*. John Wiley & Sons.

Welch, D. (2017). Behaviour change and theories of practice: Contributions, limitations and developments. *Social Business*, *7*(3-4), 241-261.

Wereldtuin Verdeliet. (October 2018). Verdeliet als duurzame sociale en groene vrijwilligersonderneming 2018 tot 2020. *Evaluatie januari t/m September 2018/projectnummer 20170974.* Retrieved from: rapportage-fondsen-verdeliet | Verdeliet

Wereldtuin Verdeliet. (2019). Jaarverslag 2019 Wereldtuin Verdeliet Land van Cuijk. Retrieved from: Jaarverslagen | Verdeliet

Wereldtuin Verdeliet. (n.d.). Persberichten in de media. Consulted on April 22, 2021 from: Persberichten in de media | Verdeliet

Wereldtuin Verdeliet. (n.d.). Jaarverslagen. Consulted on April 22, 2021 from: Jaarverslagen | Verdeliet

Yin, R. K. (2003). Case study research design and methods third edition. *Applied social research methods series, 5*.

Yin, R. K. (2009). *Case study research: Design and methods / Robert K. Yin*. (4th ed., Applied social research methods series; 5). SAGE Publications.

Zantinge, E. M., van Bakel, A. M., van Loon, A. J. M., & Ocke, M. C. (2017). Drijvende krachten van de voedselconsumptie en het voedselaanbod: Achtergrondrapport bij'Wat ligt er op ons bord? Veilig, gezond en duurzaam eten in Nederland.'.

# Appendices

## Appendix A: Interview guide expert interviews

**Introductie**
1. Kunt u wat over uzelf vertellen? Wat is uw leef- en werksituatie en wat doet u in het dagelijkse leven?

**Informatie over gemeenschapsinitiatieven, werkomgeving en betrokkenheid**
2. Op welk gebied bent u betrokken bij gemeenschapsinitiatieven?
   - Hoe lang bent u al werkzaam of betrokken op dat gebied?
3. Wat zijn volgens u obstakels bij de ontwikkeling van gemeenschapstuinen/initiatieven?
   - Hoe zouden die obstakels volgens u voorkomen of opgelost kunnen worden?
   - Wat gaat er naar uw mening wel al goed?
4. Zijn er volgens u bepaalde eisen waaraan een gemeenschapstuin/initiatief moet voldoen?
   - Ziet u die eisen terug in gemeenschapstuinen waarbij u betrokken bent?
5. Wat is er volgens u nodig om inwoners te helpen een gemeenschapstuin tot een succes te maken?
   - Hoe kan een gemeenschapstuin/initiatief op de lange termijn worden onderhouden?
6. Wat voor type/categorie mensen zijn volgens u het meest geschikt om een gemeenschapsinitiatief mee op te starten?
7. Hoe kan ervoor gezorgd worden dat verschillende mensen binnen een gemeenschap betrokken willen worden bij een gemeenschapstuin/initiatief?
   - Wat zijn hierbij obstakels en hoe zouden deze verholpen kunnen worden?
8. Wat kan er gedaan worden om ook jongere mensen te motiveren en betrekken bij gemeenschapstuinen/initiatieven?
9. Wat voor kansen biedt een gemeenschapstuin in de ontwikkeling van duurzamere, lokale voedselsystemen?
   - Wat zijn hierbij barrières? Hoe zouden deze opgelost kunnen worden?
10. Hoe worden kennis en vaardigheden rondom tuinieren en voedsel gedeeld met deelnemers van een gemeenschapstuin?
    - Hoe zou het delen van kennis en vaardigheden volgens u verbeterd kunnen worden? Wat is daarvoor nodig?
11. Hoe kunnen mensen die een gemeenschapstuin/initiatief willen opzetten aan de benodigde materialen komen?
12. Hoe kunnen gemeenschapstuinen/initiatieven bijdragen aan een duurzamere denkwijze over voedselconsumptie?

**Afsluiting**
13. Heeft u nog vragen voor mij of zou u nog iets willen toevoegen?

## Appendix B: Interview guide participants of the *Plukroute* and *Wereldtuin Verdeliet*

**Introductie**

1. Kunt u wat over uzelf vertellen? Wat is uw leeftijd en wat doet u in het dagelijkse leven?

**Informatie over de Plukroute en deelname**

2. Kunt u mij wat vertellen over de Plukroute/Verdeliet?
   - Wanneer en waarom is het opgezet?
   - Denkt u dat het met een bepaald idee of doel is opgezet?
3. Wanneer bent u betrokken geraakt bij het initiatief "de Plukroute/Verdeliet" en wat heeft u gemotiveerd om een bijdrage te leveren?
4. Wat is uw rol binnen de Plukroute/Verdeliet?
   - Hoeveel uur in de week bent u actief bezig met de Plukroute/Verdeliet?
5. Bent u in uw dagelijkse leven bewust bezig met duurzaamheid? Let u bijvoorbeeld op verpakkingsmateriaal van producten in de supermarkt of op uw water- en energieverbruik?
   - Denkt u dat de Plukroute/Verdeliet daar invloed op heeft gehad? Zo ja, waarom?
   - Deelt u deze kennis met anderen in uw omgeving? Zo ja, waarom en op wat voor manier?
   - Wat is er volgens u nodig om kennisdeling te verbeteren en meer mensen te bereiken?

**Tuinieren**

6. Wat voor betekenis heeft tuinieren voor u?
   - Deelt u deze ideeën met anderen in uw omgeving? Zo ja, waarom en op wat voor manier? Zo nee, waarom niet?
7. Is tuinieren iets wat u in het dagelijkse leven doet? Zo ja, heeft u een eigen tuin of een moestuin waar u uw eigen fruit en/of groente verbouwd?
   - Zo nee, zou u dit wel graag willen? Wat houdt u tegen om zelf te gaan tuinieren?
   - Zo ja, waarom bent u begonnen met tuinieren/het zelf verbouwen van producten? Was dit voor of nadat u deelnam aan de Plukroute/Verdeliet? Of heeft de Plukroute/Verdeliet hier invloed op gehad?
   - Zo ja, hoe lang doet u dit al en hoe vaak bent u hier in de week mee bezig? Wat voor producten verbouwt u?
8. Heeft u voldoende materialen en gereedschap tot u beschikking om te tuinieren?
   - Deelt u deze materialen met anderen in uw omgeving? Zo ja, waarom en op wat voor manier? Zo nee, waarom niet?
9. Als we het hebben over vaardigheden en kennis rondom tuinieren, bijvoorbeeld weten hoe je iets moet planten, wanneer bepaalde producten groeien, wanneer je kunt oogsten, etc., waar heeft u dat geleerd?
   - Denkt u dat de Plukroute/Verdeliet daar invloed op heeft gehad? Zo ja, waarom?
   - Deelt u deze kennis en vaardigheden met anderen in uw omgeving? Zo ja, waarom en op wat voor manier? Zo nee, waarom niet?

**Handelingen rondom voedsel: kopen, selecteren en bereiden van voedsel**

10. Wat voor betekenis heeft voedsel voor u?
    - Op welke manieren hecht u waarde aan duurzaamheid op het gebied van voedsel?
    - Deelt u deze betekenis met anderen in uw omgeving? Zo ja, waarom en op wat voor manier? Zo nee, waarom niet?
11. Is er in de betekenis en waarde die u aan voedsel hecht iets veranderd sinds uw deelname aan de Plukroute/Verdeliet?
12. Waar koopt u normaal gesproken uw eten? Welke winkels hebben uw voorkeur?

13. Als we het hebben over vaardigheden en kennis rondom voedsel en duurzaamheid, bijvoorbeeld verpakkingsmateriaal, lokale producten, seizoensgebonden producten, etc., waar heeft u dat geleerd?
    - Denkt u dat de Plukroute/Verdeliet daar invloed op heeft gehad? Zo ja, waarom?
    - Deelt u deze kennis en vaardigheden met anderen in uw omgeving? Zo ja, waarom en op wat voor manier? Zo nee, waarom niet?
14. Hoe ziet een gewoonlijke maaltijd bij u thuis eruit en hoe belangrijk is het daarin dat de producten die u gebruikt vers zijn? Eet u veel magnetron maaltijden of fast food? Eet u vaak vlees? Voor flexitariers/pescetariers/vegetariërs/vegans: Waarom bent u vegetariër geworden?
    - Denkt u dat uw deelname aan de Plukroute/Verdeliet hier invloed op heeft gehad?
15. Ziet uw eetpatroon er anders uit tijdens feestdagen of weekenden? In welk opzicht?

## Afsluiting
16. Heeft u nog vragen voor mij of zou u nog iets willen toevoegen?