

# **Working the Land and Ploughing the System**

A qualitative analysis of farmers' strategies to deal with systemic barriers  
and their initiatives to make farming practices more sustainable

Master's Thesis

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## **Preface**

Before you lays the master thesis ‘Working the Land and Ploughing the system’. In this study, the barriers Dutch farmers face while becoming (more) sustainable are identified and the ways they strategize to overcome these barriers are explored using qualitative research methods. This thesis has been written to conclude my Master program Sustainable Development- International Development at the Utrecht University. From February 17<sup>th</sup> 2020 to the 7<sup>th</sup> of August 2020, I conducted the research and wrote the thesis.

Due to the outbreak of the coronavirus (COVID-19), the initially planned farm visits could not proceed and had to be replaced by video phone calls. The research could continue without major adjustments to the content. After conducting detailed interviews, I was able to answer the research questions. During the research, my supervisor, Janwillem Liebrand and my supervisor of Milieudefensie Jeanet van der Woude, always helped me to improve my thesis. They answered all my questions and inspired me to do my utmost.

Hereby I would like to thank my supervisors for the pleasant guidance, their support and encouragement. Moreover, I would sincerely want to thank all the farmers that were willing to cooperate in my research. Without their knowledge, visions, opinion and proposals, I could have never completed this research.

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## **Abstract**

The agricultural sector in the Netherlands is facing an unprecedented challenge. The current state of agricultural production exceeds the limits of the Dutch ecosystem and is not ecologically sustainable. At the same, a transition to more sustainable agriculture is hindered by systemic barriers that prevent farmers from switching to more sustainable farming practices.

This research examines what the systemic barriers that Dutch farmers encounter in the process of making their agricultural practices more sustainable are and how they strategize to overcome these barriers. It investigates how farmers define sustainability and what sustainability initiatives they attempt. Through the use of qualitative methods, in the form of semi-structured interviews, as well as desk research in the form of policy analysis, this thesis puts forward six systemic barriers identified by farmers and relates these barriers to the wider policy context. The barriers are directly or indirectly related to Dutch agricultural or environmental policies.

This thesis argues that farmers define sustainability not just as the ecological aspects of sustainable agriculture, but the socio-economic aspects. Farmers are not easily inclined to take a risk by changing their practices and must still be able to make ends meet. The thesis further shows that farmers undertake several types of initiatives, which are divided into two categories. These categories are initiatives that involve, firstly, ones that take place on the farm and secondly, lobby initiatives to change the agricultural system and policies. Several initiatives farmers undertake on their farms are presented to provide insight into the possibilities and initiatives found in the Netherlands. Further, lobby efforts taken by farmers are illustrated to show what sort of strategies are being used to counter the systemic barriers.

It becomes clear that farmers are often involved in making and changing policy, through the lobby efforts of the organizations, associations or unions, or on their own. This makes it difficult to distinguish a clear top-down/bottom-up separation. In reality, farmers are often involved in policy decisions and appropriated to the language of policy makers. Their involvement in lobby efforts is important because it has a farther-reaching impact than initiatives on their own farms. However, sustainable farmers must compete with the existing lobby of conventional farmers, which is challenging to overcome. Nevertheless an increase in sustainable agricultural lobby efforts can be witnessed and is an interesting avenue for further research. Possible follow-up studies could focus in more detail on upcoming lobby efforts and their strategies.

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## **List of abbreviations**

- CAP - Common Agricultural Policy
- CBS - Statistics Netherlands
- CETA - Comprehensive Economic and Trade Agreement
- CSA - Community Supported Agriculture
- EEA - European Environmental Agency
- EU - European Union
- GHG - Greenhouse Gas
- IAFS - Integrated Arable Farming Systems
- LTO - Dutch Agricultural and Horticultural Organization
- NAV - Dutch Arable Union
- NMV - Dutch Dairy farmers Union
- OECD - Organization for Economic Co-operation and Development
- TTIP - Transatlantic Trade and Investment Partnership
- WFD - Water Framework Directive
- WTO - World Trade Organization



## **1. Introduction**

The agricultural sector in the Netherlands is facing an unprecedented challenge. The current state of agricultural production exceeds the limits of the Dutch ecosystem and is not environmentally sustainable in the future. Dutch farming practices have undergone significant development since World War II. The production of agricultural products has risen tremendously due to highly effective mechanization, pesticides, specialization and intensification (van Doorn, Melman, Westerink, Polman, Vogelzang & Korevaar, 2016). According to the Organization for Economic Cooperation and Development (OECD) (2015), the Dutch yield per hectare of arable land is exceptionally high. The Dutch agricultural sector is now in a leading economic position in the world market. The Netherlands is the biggest exporter of agricultural products in Europe. Globally, it is in second place, trailing only the United States (Dutch Ministry of Economic Affairs and Climate, 2017). The 2019 annual export of agricultural products is estimated at 94.5 billion euros, which comprises 22% of the total Dutch exports (Statistics Netherlands (CBS), 2020).

However, the agricultural mass production required to produce this level of export is not without its complications. Reaching such a high yield comes at the expense of biodiversity and ecosystem services. This has a negative impact on climate and human health. According to Maxwell, Fuller, Brooks and Watson (2016), agriculture is one of the biggest drivers of biodiversity decline. In the Netherlands, the number of farmland birds has more than halved over the last 30 years (van Doorn et al., 2016). Populations of pollinators such as bumblebees, bees and butterflies are declining rapidly. Next to biodiversity loss, agriculture also has negative effects on ecosystem services or natural capital. Ecosystem services are natural benefits that provide free goods and services to humans. In the case of agriculture, the ecosystem services that are negatively affected include nutrient cycles, water quality and air quality. In particular, the surplus of nitrogen, which is produced in the form of ammonia caused by animal waste, is a contemporary problem (Stokstad, 2019). Current levels exceed the legally-permitted amount of nitrogen emissions according to the Dutch law. To reduce nitrogen emissions, the government recently put a “freeze” on the expansion of farms and suspended permits for new construction projects from May 2019 onwards.

These adverse effects suggest that the current highly intensive agricultural practices exceed the ecological ‘limits’. According to scientists, environmental organizations, and the Dutch Ministry of Agriculture, Nature and Food Quality, changes towards more sustainable forms of agriculture are needed (Rossing, Meynard & van Ittersum, 1997; Runhaar, 2017; Greenpeace, 2020; Ministry of Agriculture, Nature and Food Quality, 2020). According to van Dijk, Verburg, Runhaar and Hekkert (2018), transforming current practices into a more sustainable form of agriculture is challenging. The current export-oriented, ecologically ‘unsustainable’ agricultural system is hard to replace with a more ecologically ‘sustainable’ one for three reasons: (1) the market for sustainable products is difficult because these products tend to be ‘expensive’ and the current revenue model in agriculture is cost reduction; (2) the current production chain of agricultural products is stuck in existing feedback loops, which means the actors in the production chain are adjusted to the current economic agricultural system and are not able to change the way they do business and; (3) innovative ideas cannot be carried out because they are not in line with the existing regulations and laws (van Dijk et al., 2018).

These factors together create a lock-in effect, a situation of a big, complex system of interrelated technology use, economy, and government legislation that is hard to change.

Over the years, there have been attempts to increase sustainable agriculture, both top-down (by means of policy and law) and bottom-up (by means of initiatives of farmers). However, these attempts have to date not resulted in a significant growth of sustainable agriculture (van Dijk et al., 2018). A top-down attempt by the Dutch Ministry of Agriculture, Nature and Food Quality, for example, is the 2018 announcement of their new vision towards agriculture, claiming that the Netherlands is a leader in circular agriculture. Such a vision expresses a view of the future, rather than describing actual practice. However, bearing in mind the current nitrogen crisis in the Netherlands, the results of the Dutch governmental policies to acquire a more circular agricultural sector have been minimal to date.

Earlier research of a top-down attempt was carried out by de Buck, van Rijn, Röling and Wossink (2001), who began their study by identifying farmers' reasons for adoption or non-adoption of new sustainable agricultural policies implemented by the Dutch government. The research focused on the disappointing adaptation of a new policy measure – the Integrated Arable Farming Systems (IAFS) – a farming system introduced by the Dutch government, aiming to promote multi-functional crop rotation, reduce pesticides and improve nutrient management of the arable land. It integrates many ways of cultivation in a small space. In their results, they struggled to distinguish the 'more sustainable production systems' from the 'conventional systems', and found a continuum of gradual adoption of some measures, mainly for economic reasons. IAFS is not adopted as a package, making it possible to adopt separate measures, losing the coherence of IAFS (Buck et al., 2001). Farmers experienced some uncertainties emanating from market conditions and experienced resistance towards more demanding policies. They did not understand why other European countries could use chemicals that are forbidden in the Netherlands and hence have a lower cost of production (de Buck et al., 2001). In addition to a lack of successfully implemented Dutch policies, as illustrated in the example above, the European Union (EU) continues to heavily subsidize the existing, ecologically unsustainable farming system in the Netherlands, including the export-oriented meat production industry, which is contrary to the change towards a more sustainable agricultural sector (Wakker Dier, 2020). It seems as if there is little political will to change the agricultural production system.

Available research on the topic, such as the study of de Buck et al. (2001) mentioned above, does not provide clear insight into the problems that farmers are experiencing. Studies mainly focus on top-down policies such as the IAFS and less so on other (bottom-up) forms of sustainable agriculture. Hence further study is needed which focuses on the bottom-up initiatives of farmers and understand – from their perspective - the difficulties that are there and how they think about, and try to increase, ecological sustainability in their farming practices. Dutch bottom-up initiatives are increasingly recognized by policy researchers and policy makers, but they often 'fail' to gain scale because they face systemic barriers. Systemic barriers are policies, practices or procedures that make it difficult for farmers to change their practices to become more sustainable. According to Oppedijk, van Veen, van den Berg, Roeters, de Moel & van Geel (2019), a new movement of Dutch farmers is emerging. They aim to contribute to a more ecologically-oriented agriculture that does not damage the environment, and that improves the lives of citizens and farmers

and produces healthy products. This desire for a more sustainable agricultural practices is expressed through a wide array of initiatives (Oppedijk et al., 2019). Examples of initiatives of sustainable agricultural practices are organic farming, circular agriculture and agroecology, in which farmers use methods such as polyculture, green manure, agroforestry and limited pesticide use. Besides farmer initiatives, there are also bottom-up initiatives commenced by farmer organizations. BoerenNatuur (Farmer and Nature), for example, is a collective of farmers engaged in agricultural nature management. For this research, the researcher collaborated with Milieudefensie, a Dutch environmental organization with a wide network of farmers that is involved in both top-down and bottom-up agricultural initiatives. The researcher cooperated with Milieudefensie to contribute to their research and policy agenda of sustainable agriculture, and to gain access to farmers involved in their network of knowledge and expertise.

### **1.1 Research aim and research questions**

An increase in the number and scale of ecologically-oriented bottom-up farming practices can enhance the sustainability of the Dutch agricultural sector. The aim of this research is to identify the barriers and problems farmers face when they consider or attempt to change their farming practices into more sustainable agricultural practices. With the identification of these barriers – as perceived by farmers – new policy solutions could potentially be articulated based on existing, bottom-up sustainability initiatives rather than on envisioned, top-down sustainability thinking. Such an approach could stimulate the adaptation and development towards more sustainable agricultural practices in the Netherlands. To create insight into the barriers as perceived by farmers, the following research question and sub questions will be answered:

What systemic barriers do Dutch farmers encounter in the process of making their agricultural practices more sustainable and how do they strategize to overcome these?

- How do farmers in the Netherlands define sustainability and what sustainable agricultural initiatives do they attempt?
- What systemic barriers do farmers face in the Netherlands when considering and attempting sustainable agriculture initiatives?
- How do farmers strategize to overcome the identified systemic barriers?

In Chapter 2, the theoretical and conceptual framework provides insight into the relevant concepts and theories that are used in this research, such as systemic barriers, and top-down and bottom-up definitions of sustainable agriculture. It also introduces Dutch farming practices. The methods used for this research are described in Chapter 3, followed by the background of Dutch agriculture in Chapter 4. Chapter 5 touches upon the farmers' perspective on sustainable agriculture and presents the sustainable agricultural initiatives they attempt. Chapter 6 discusses the systemic barriers identified by the farmers themselves and mentions several farmers' initiatives used to overcome these barriers. Finally, Chapters 7 and 8 outline the main conclusions and examine both limitations to the study and recommendations for further research.

## **2. Theoretical and conceptual framework**

In this section the theories and concepts used during the research are presented. First, systemic barriers are explained in more depth and transitions towards sustainability are conceptualized. Then, approaches to definitions of sustainability and sustainable agriculture are described to explain different methodological approaches to articulate sustainability definitions (e.g. top-down, bottom-up). After this, practices of farming in the Netherlands are clarified through explanation of the position of farmers in the structure-agency debate and through examples of different bottom-up practices and methods Dutch farmers initiate. Lastly, sustainability challenges in the Netherlands are identified.

### **2.1 Systemic barriers and conceptualizing transitions towards sustainability**

This research focuses on the Dutch agricultural system and the systemic barriers farmers experience when trying to improve their sustainability. So-called systemic barriers are a concept in transition theory. In transition theory, systemic change is conceptualized as a fundamental or radical change that changes how a whole system functions. A system can be defined as:

“Groups or combinations of interrelated, interdependent, or interacting elements forming collective entities” (Arnold & Wade, 2015 p. 7.)

For the purpose of this research, the elements described in this definition will be defined according to the study by Caldwell (2015) about the components, linkages and rationale of the agricultural system. He mentions six elements that can be identified as part of the agricultural system. He emphasizes that this list of elements is not exhaustive. The elements are: the farmers, the natural environment, the government, agribusiness, technical and professional expertise, and the non-profit and community sector. Caldwell explains the elements in his study as follows:

“1. Farms: Farms of various sizes produce a range of crops, livestock and other goods and services. They can include multiple properties and combinations of owned and rented lands.

2. Natural Environment: Including climate, soil types, and water access, these and other natural inputs impact agricultural viability but are also impacted by farming activity.

3. Government: Services and programs, policy directives, and regulations from all levels of government impact production, building and other on-farm activities, as well as marketing, processing, and distribution.

4. Agribusiness: Includes the range of wholesale or retail companies who buy, process, package, store and/or distribute goods or services to or from farms, including crop inputs and farm outputs.

5. Technical, and Professional Expertise: Farms depend upon labor and the services of various technical and professional people, including accountants,

bankers, lawyers, IT service providers, crop advisors, tile drainage contractors, nutrient management consultants, veterinarians, electricians, carpenters, and plumbers.

6. Non-Profit and Community Sector: Includes a broad range of organizations including those involved in research, innovation, and knowledge transfer. It also includes agricultural associations and non-profit organizations, which offer organizing, programmatic, and advocacy support for agricultural communities” (Caldwell (2015 p. 14.)

All these elements can be the location of systemic barriers. For instance, farm size or particular properties of the land can constitute a systemic barrier for change, or the interests of the agribusiness, or law and legislation in the policy domain. This research focuses on the ‘element’ of farms, trying to understand how farmers perceive the systemic barriers in relation to their farms and farming practices, and how they try to overcome the barriers in relation to all the elements.

Silva and Stocker (2018) explain that changes towards sustainability are often changes that happen within societal systems (such as the agricultural system) and why that makes them complex:

“Environmental and social stressors indicate our societal models must adapt towards more sustainable processes, practices and outcomes, a challenge that is both multifaceted and multi-dimensional (...) In this discourse, the issues are framed as systemic: they are not just a question of specific products or production processes, but rather require an approach on a systems level, often explicitly embracing complex systems thinking” (p. 61).

Following this explanation, a transition towards a more sustainable agricultural system cannot be explained using a linear model, and instead must be approached in a systemic manner.

The barriers farmers face when attempting sustainable agricultural initiatives are multifaceted, multi-dimensional and complex and need to be analyzed as systemic barriers. However, systemic changes are often explained using transitional theories. Transition is a popular term that is often used to describe the need to move from a current state, to a hypothetical future state (Silva & Stocker, 2018). Often this hypothetical state is conceptualized as a more harmonious and sustainable society (Markard, Raven & Truffer, 2012). Figure 1 shows the three different states of a transition. As can be surmised, a transition is conceptualized as a ‘phase’ between the past and the future, between the current state and future state. It suggests that it is possible to distinguish the different states a transition is going through, because they are, somehow, in some sort of an equilibrium, and not in constant change. In practice, however, the identification of these states (where they begin and where they end) is difficult, and it may actually not do justice to the diverse practices in reality. The model can be helpful in communicating the

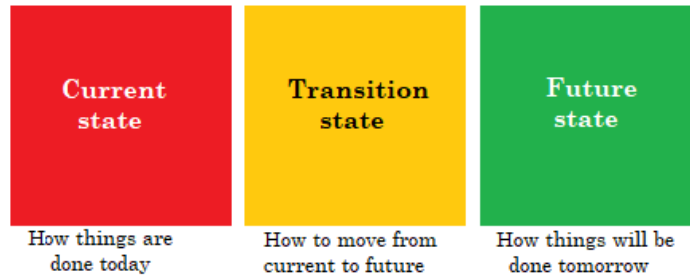


Figure 1. Simplified three states of change, based on the changes process in Jones (2013)

need for change, at a very abstract level, but on a practical level, it is difficult to apply in field research of actual agricultural practices. Agricultural systems are complex and diverse, and answers to the question whether these developments lead towards a ‘more harmonious and sustainable society’ depend on definitions (or norms) of ‘transition’ and to whom the question is asked. Some may say ‘yes’, many others would probably say ‘no’.

Because environmental system changes or transitions are multi-dimensional, they should be approached from different perspectives or definitions. Systems are often complex and the examination from different disciplines can offer more understanding of the different aspects. An example of one of such a model of transition theory has been made by the European Environmental Agency (EEA) (2019). Figure 2 shows the socio-ecological, socio-economic and socio-technical perspective to systemic changes. In the middle of the Venn diagram are notions that must be kept in mind for system change. Even though this model includes different perspectives, it remains a model, which means that it may not actually fit with the diversity found in reality. Agricultural change will have to deal with different perspectives. It is needed to understand what different actors see as sustainable agriculture. They potentially have a different view on sustainability, sustainable agriculture and the transition towards sustainability, which makes it important to clarify these differences. In the next section, the differences in perspectives will be identified by comparing different ways of defining sustainability and sustainable agriculture.

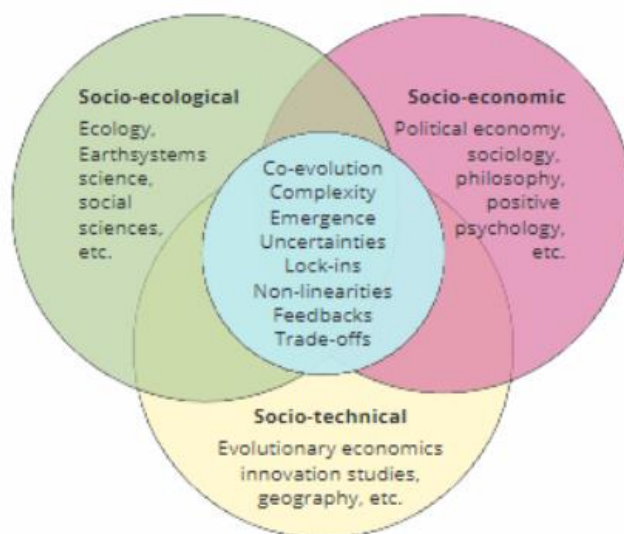


Figure 2. Socio-ecological, socio-economic and socio-technical perspectives to systemic change (EEA, 2019).

## 2.2 Approaches for articulating definitions of sustainability in agriculture

Two different approaches to define sustainability can be distinguished: ‘top-down, theory-driven’ and ‘bottom-up, practice-driven’. It is important to understand the different approaches to defining sustainability because it has implications for the conceptualization of transitions, and how transition theory can inform policies, such as those of the EU. Generally, government definitions are mostly top-down and driven by academic theory and knowledge. In the form of policies, sustainability definitions become normative or standardized, while farmers – in appropriating the dominant language – have a more bottom-up, practice-driven definition of sustainability that drives their initiatives. Understanding this deviation in definition can create insight into why farmers act the way they act and help understand the systemic barriers they face. The two different approaches will thus be explained in further detail.

Top-down, theory-driven definitions are definitions in which the subject is described in the way it should be or ought to be. It creates a norm or set of norms that should be met. An example of such a definition of sustainability is the definition of the UN Brundtland Report (1987):

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

This definition describes sustainability as it ought to be and sets the conceptual norm that the future of next generations should not be compromised. However, the definition is not very strict, which leaves room for interpretation. When a top-down, theory-driven definition is more strictly defined, it becomes standardized. Standardized definitions can be seen as taking the normative definition and creating rules that need to be followed in order to conform to the definition. These rules are more focused and specific and can for instance state the exact amount of CO<sub>2</sub> that can be emitted per hectare arable land. A standardized definition for sustainable agriculture established by the Dutch government as part of the Dutch Climate Agreement is the following:

"The agricultural and land-use sectors have received a target for 2030 for an additional decrease of 3.5 Megaton of greenhouse gas emissions on top of existing policy" (Rijksoverheid, 2019a) p. 18.

If these rules are met, the agricultural sector is assessed as ecologically ‘sustainable’.

Bottom-up, practice-based definitions of sustainability and sustainable agriculture are definitions that originate from actual practice, experience or observation. As mentioned before, farmers have their own understanding of ecological sustainability. They experience in their daily lives which sustainable agricultural practices economically work for their businesses and which do not. The initiatives they take towards a more sustainable agriculture are based on their own, practice-based definition of sustainability. An example of a farmer’s definition of sustainable agriculture given in a conversation with civilians organized by Milieudefensie in 2018 is:

“Closing the manure cycle. The manure that the cows produce returns to their own land, which feeds the soil on which grass and corn can grow, which returns to the cows as silage” p. 20.

This definition is applied by the farmer and shows his view on ecological sustainability and the practices he uses to achieve it, and refers to a closed circle of nutrient flows, without adding (or disposing) nutrient flows from ‘outside’ the farm. This results in a reduced need for additional fertilizers and food and cuts down environmental pollution. However, when farmers speak of sustainability, they often do not only imply the ecological side of sustainability. They also speak of the socio-economic aspects of sustainability that need to be met, in order to undertake the ecological sustainability initiatives. They need to be able to earn a living in order to undertake ecological initiatives. When farmers speak of sustainability, it is likely meant in an integrated way, combining both ecological and socio-economic aspects.

Additionally, it is significant to mention that at first, the word ‘sustainability’ was a term used in the area of environmental policy (Cox & Béland, 2013). The term is now being used more frequently and broadly, including by farmers. They have internalized the terminology used by policymakers in order to communicate better on the subject. Farmers are often very involved in and informed on policy matters. They are part of lobby organizations, they join in policy debates and speak the same ‘language’ in terms of terminology as policymakers. This said, the strict deviation between top-down and bottom-up approaches, in which the top-down theory driven approach would determine the policies, needs some nuance. Policymakers are often influenced by farmers, who therefore have a say in the development of policies. It was in fact a Dutch farmer, Sicco Mansholt, who became the founder of European agricultural policy (Bieleman, 2010) (the history of Dutch agriculture will be further discussed in Chapter 4). Farmers have a historically rooted influence on agricultural policies. Policies seem to be deeply integrated in the agricultural sector and vice versa. This said, the difference between top-down and bottom-up approaches are not always easily identified. To better understand the interaction between policy and farmers, the structure-agency debate will be examined.

### *2.2.1 Structure-agency*

In order to understand the actions that people (in this case farmers) take and to better comprehend the interaction between policy and farmers, it is important to briefly mention the structure-agency debate. This debate discusses the shaping of human behavior (Tan, 2011). Structure can be described as the external pressures that influence human behavior (Barker, 2005). It can exist out of rules, resources or other exogenous forces. In the case of farmers, this can be agricultural and environmental policies, farmland and the political economy of farming (Burton & Wilson, 2006). In other words, the ‘structure’ is the ‘system’ and the ‘systemic barriers’ in transition theory. Agency can be described as the capacity of humans to act independently and to make their own choices, based on their beliefs, attitudes, identities and social systems (Barker, 2005). In this debate, the current agricultural system as described by Caldwell (2015) can be seen as the structure that sets the boundaries for the possible initiatives for farmers (Burton & Wilson, 2006). This structure causes systemic barriers for the farmers in the system. In this thesis, the focus



lays particularly on the existing policies because they present the boundary conditions for the agency of the farmers (the ‘government’ element, see discussion above). Agency can be seen as the bottom-up actions the farmers take to increase their sustainability. Farmers implement their own actions, within the existing agricultural system.

Again, this strict distinction of top-down and bottom up (in this case, structure and agency) is in need of some nuance. As explained in the section above, farmers (the agents) are often involved in the development of policies (the structure). This involvement can also be found in the initiatives farmers take. Importantly, farmers’ sustainability initiatives can be categorized into two sets of practices. The first one is farmers trying to practice sustainable agriculture on their farm, in one way or another. The second one is trying to influence policies through lobbying and trying to make policies more sustainable. Both are bottom-up initiatives, yet, the second category is focused on changing the ‘top-down’ structure. Both are found throughout this thesis. It is important to realize that farmers and policies are interacting. The relation between these two is not as static as ‘structure and agency’, or ‘top-down and bottom-up’. These concepts can be useful to understand the different positions, but the actual dynamic is more complex.

As illustrated, defining sustainability and sustainable agriculture can be approached in different ways. In this thesis, the bottom-up, practice-based definitions of farmers are examined further, in order to understand the systemic barriers farmers face in trying to reach what they see as sustainable agriculture. This bottom-up focus also helps to show how such a methodological approach can inform thinking on transition theory. However, the notion that the distinction between policy and farmers cannot be identified clearly must be kept in mind. Now that the different approaches to define sustainability have been illustrated, it is important to gain insight to farming practices that can be identified in the Netherlands.

## **2.3 Farming practices in the Netherlands**

Different types of farming can be found in the Netherlands. The country counts 53.230 farms in 2019 (CBS, 2020). The common types of farming are arable farming (11.000 farms), dairy farming, (16.300 farms), pig farming (4200 farms) and horticulture (6700 farms) (Bruil, 2008; CBS, 2020). This makes farmers a heterogeneous group. Farmers also differ in their farming practices. There are conventional farmers but a rising number of organic farmers can also be identified (Skal, 2020). These different types of farming face different difficulties. However, sustainable initiatives often apply to multiple types of farming. To better visualize farmers’ agricultural practices, different components of sustainable agriculture are explained and some important sustainable agricultural practices are described. Lastly the sustainability challenges in the Netherlands related to farming will be discussed.

### *2.3.1 Components of sustainable agriculture*

To better understand the possible practices farmers undertake, the concept of sustainable agriculture requires further explanation. The concept of sustainable agriculture is a term that has been defined in many ways and has many synonyms (Keeney, 1990). For instance, terms found in literature are: ‘low-input sustainable agriculture’, ‘nature inclusive

agriculture', 'organic farming' and 'agroecology' (Keeney, 1990; Francis, Lieblein, Gliessman, Breland, Creamer, Harwood & Wiedenhoeft (2003); van Huylenbroeck (2005); Cone & Myhre (2000); Holster, van Opheusden, Gerritsen, Kieft, Kros, Plomp & Venekamp (2014); Erisman, van Eekeren, van Doorn, Geertsema & Polman (2017). These terms are all examples of sustainable agriculture, but they have slightly different meanings. According to the Dutch Ministry of Housing, Spatial Planning and Environment (2001), sustainable agriculture can be explained as agriculture that produces in a clean manner, contributes to global food supplies, produces safe food, respects animal welfare, contributes to the preservation of nature and biodiversity and promotes the preservation of the Dutch characteristic landscapes and vital countryside. As can be surmised, lots of components are described in this definition, both in terms of 'economic' sustainability (contribution to global food supplies, read: export), and 'ecological' sustainability (contribution to preservation of nature and biodiversity). Keeney (1990) also mentioned components of sustainable agriculture, but in a more structured and detailed manner, and they relate primarily to ecological sustainability. He mentions seven important components and discusses them in detail. The seven components are: agronomic, cultural practices, pesticides, soil erosion, crop rotation, other resources and animal husbandry. These seven components will now be discussed in more detail, to provide some examples of possible methods of sustainable agricultural production.

### *Agronomic*

Agronomy is a branch of agricultural science that deals with sound agronomic principles. According to Keeney (1990), agronomic principles are for instance soil erosion control, weed management, maintenance of soil fertility, minimization of the leaching of pollutants through the roots and maximizing the efficiency of production.

### *Land management practices*

Land management practices are low cost activities that aim at providing a suitable environment for plants to grow. Harvesting crops removes nutrients from the system, which are needed for a next batch of crops (Keeney, 1990). Fertilizers or livestock manure can be used to increase the amount of nutrients in the soil. However, a surplus of nutrients will cause the risk of soil, water and air pollution (OECD, 2013). For this reason it is important to balance the input and the output of nutrients to the system. Important nutrients are nitrogen, potassium and phosphorus. Especially nitrogen management is important to avoid a surplus and leakage into the environment.

### *Pesticides*

Pesticides are widely used by farmers to reduce crop losses and waste. Pesticides are mostly chemicals or biological agents (Aktar, Sengupta and Chowdhury, 2009). Without pesticides, a large part of the harvest is lost to pathogens, weeds, fungi and insects. However, pesticides, if used improperly, can cause harm to humans, animal health and the environment (Aktar et al., 2009). In sustainable agricultural practices, pesticides are limited as much as possible and replaced by a less harmful bio-pesticide or other non-chemical methods.

### *Soil erosion*

Maintaining the quality and quantity of the topsoil is one of the prime goals of sustainable agriculture (Keeney, 1990). The conservation of soil is a long-term challenge, as soil can be affected by lots of different changes. If the erosion goes beyond the ability of the soil to restore itself, fertile land is lost and pollutants and sediments can end up in rivers and streams (World Wildlife Fund, 2013). Keeney (1990) explains the difficulty of soil erosion as such:

“Soil-conserving agricultural practices must be resilient to social, political, and economic changes, must be economical, must not involve tradeoffs that increase the rate of pollution of ground or surface water, and must increase the diversity of the landscape and its biota” (p. 283).

### *Crop rotation*

Crop rotation, as opposed to monoculture, is an important component of sustainable agricultural practices, which helps to conserve soil and resources (Keeney, 1990). It can prevent crop diseases. Crop rotation involves growing different crops in the same land area in sequenced seasons, or in different years. Some crops have benefits for the soil and can lessen soil erosion and improve the fertility of the soil.

### *Other resources*

The scarcity of resources needed for sustainable agriculture must be considered. But scarcity can be relative. For example, water is in some places in the world abundantly present, but in others it is a scarce resource (Keeney, 1990). Sustainable irrigation systems and water management are highly important when dealing with water scarcity.

### *Animal husbandry*

Animal husbandry is the breeding, raising and keeping of animals to obtain products like meat, milk, or eggs. Besides the products that can be obtained, animals can also provide nutrients through manure and can add diversity to farm operations (Keeney, 1990). However, animal agriculture also comes with sustainability and animal welfare complications. A surplus in animal manure can pollute the land, air and water. To keep animals in a sustainable manner, the animals must be treated humanely, the negative effect that the manure can cause must be mitigated, but the manure can also be used as a bio-fertilizer.

These definitions of components of sustainable agriculture are ecological sustainability practice as they are generally conceived in academic literature. They help to better understand the sustainable practices farmers can undertake.

#### *2.3.2 Sustainability practices in agriculture*

The components mentioned above can be found in different farming practices. Bottom-up farming initiatives use one or more of these components. To see what actions are taken in

practice, important practices of sustainable agriculture are described. The important practices are agroecology, organic farming, community-supported agriculture, circular agriculture and nature-inclusive agriculture.

Agroecology is an ecological approach to agriculture that makes optimal use of natural resources and services, without damaging them (Francis et al., 2003). Gliessman (2014) states that the more an agro-ecosystem looks like the local natural ecosystem, the more sustainable the system will be in the long term. Techniques that can be used in agroecological practices are crop rotation, polyculture, use of compost, green manure, soil coverage, livestock and crop integration, agroforestry and biological pest control. Organic farming is a form of agriculture that explicitly takes environmental impacts and animal welfare into consideration (van Huylenbroeck, 2005). Organic farmers do not use chemical pesticides, fertilizers or genetically modified organisms. Animals have more space to move and can show their natural behavior. There are various labels to monitor these requirements, such as the EU Bio label.

Community-supported agriculture (CSA) is a way of agriculture where consumers and farmers work closely together. The consumers invest in the farm and all own a small part of the company (Cone & Myhre, 2000). In return they receive a part of the production. In the Netherlands the foundation Herenboeren Nederland connects consumers to farmers. The farmer is directly paid by the consumers and they all receive the farming products.

Circular agriculture is a form of agriculture in which the cycle of substances and nutrients is closed (Holster et al., 2014). This means that all of the substances that leave the ground must be put back in the ground. This can for instance be done by closing the fodder-manure cycle and reusing as much of the streams of waste water as possible.

Nature-inclusive agriculture operates while making optimal use of, and contributing to, the quality of the natural environment. It takes nature into account. Not only by using it, but also by protecting and caring for it. Four important points of nature-inclusive agriculture are functional agrobiodiversity, landscape diversity, source areas and connection zones, and the conservation of species (Erisman et al., 2017).

In addition to the different forms of agriculture, there are farmer organizations, environmental organizations and funds that initiate both economic and ecological sustainability initiatives. Some examples are: the Dutch Agricultural and Horticultural Organization (LTO) who strive for a more sustainable sector through knowledge and innovation projects (LTO, 2019), and the application of new, scientific technologies; the Dutch Greenfunds (Groenfond) a fund focused on financing sustainable agricultural start-ups and scale-ups (Nationaal Groenfond, 2018); the Dutch Farmers Council (Boerenraad), a movement of enthusiastic farmers and horticulturalists who are committed to sustainable food production by 2030 (Bruil, 2019); and Milieudefensie, a Dutch environmental organization that has a wide network of farmers and is involved in top-down and bottom-up agricultural initiatives.

As can be surmised from the various definitions of sustainable agriculture above, the focus of these definitions is predominantly on sustainability in ecological terms, i.e. a focus on saving resources, producing more efficiently and increasing biodiversity. By and large, economic and social aspects of sustainability receive less attention.

### *2.3.3 Sustainability challenges in the Netherlands*

The Dutch landscape and nature faces multiple difficulties caused by agricultural practices. Many of these difficulties are translated into environmental norms and laws. Farmers have to comply with these rules. For instance, the nitrogen crisis that began in 2019 is caused by an exceeding of the legal norm of the nitrogen emission of agriculture, foreign countries and traffic (Stokstad, 2019). The legally permitted amount of nitrogen was exceeded, which caused the crisis. The nitrogen compounds in manure have the largest share in the emissions. Dutch farmers are trying to cope with the manure-surplus that has been a problem since the Dutch intensification of agriculture (Oenema, van Liere, Plette, Prins, van Zeijts & Schoumans, 2004). In addition, decreasing soil quality and fertility is a problem for Dutch nature. The intensive agriculture that takes place in the Netherlands can deplete the soil of its nutrients (Vegter, 1995). Also the decreasing biodiversity, the increasing greenhouse gas emissions and land subsidence are difficulties caused by the agricultural sector (Leip, Billen, Garnier, Grizzetti, Lassaletta, Reis & Westhoek, 2015; Nieuwenhuis & Schokking, 1997).

### **2.4 Chapter conclusion**

In sum, the Dutch farmers trying to increase their sustainable practices are facing systemic barriers within the agricultural system. Approaches for articulating definitions of sustainable agriculture can differ depending on the perspective of the actor. Top-down theory-driven definitions and bottom-up practice-based definitions are described to explain the differences between farmers and governmental bodies. However, farmers are often involved in policy making. They join debates and speak the language of policy makers. The focus of this study is on the bottom-up practice-based initiatives farmers undertake. The structure-agency debate is presented to provide some insight into the position of policies and farmer initiatives. However, it is important to keep in mind that this relationship is not as static as presented. Two categories of initiatives can be distinguished. Next to sustainable practices on the farm, farmers can also be active in a more political sense by lobbying. Farmers are a heterogenous group. This means they have different and contradictory interests. The Dutch landscape faces multiple challenges caused by agricultural practices, which are translated into environmental norms and laws, that farmers have to comply with. In this study the question how to overcome the agricultural systemic barriers is approached from the perspective of farmers. The goal of this thesis is to better understand the systemic barriers farmers face in trying to become more sustainable. Since this thesis is also done in cooperation with Milieudefensie, the perspectives of farmers found in answering the research question could be added to the organization's body of knowledge and thus help the organization's further lobby efforts for more sustainable practices.

### **3. Methods**

To answer the research question and sub questions, qualitative data and quantitative data was collected. To understand the systemic barriers the farmers face, it was necessary to examine their experiences in detail, which was possible with qualitative research methods. Qualitative research allows the researcher to identify issues from the perspective of the study participants (Hennink, Hutter & Bailey, 2011). This way the researcher can understand the meanings and interpretations the study participants give to behavior, events or objects. Qualitative research can provide detail, nuance and context to the research issue (Hennink et al., 2011). To be able to derive this information, it is important for a researcher to be open-minded, curious, empathic, flexible and to be able to listen to people telling their own story (Hennink et al., 2011). Qualitative researchers also study participants in their natural settings. This helps to see how their experiences and behavior are shaped by their personal situation. This can be an economic, social, cultural or physical context (Hennink et al., 2011).

According to Lund (2014), qualitative research is not just about understanding the participants. He states that most claims about research cases are a combination of specific, general, concrete and abstract claims that are moving between four dimensions. These analytical movements are generalization, specification, abstraction and concretization. He emphasizes the need to think about 'of what' one's work is a case. Qualitative research is an important building stone in developing new concepts and theories of development.

#### **3.1 Qualitative research methods**

Different qualitative research methods will be used to answer the research questions. The following methods have been used: in-depth interviews, observations and a policy analysis. The methods as well as their applicability to this research are outlined.

##### *3.1.1 In-depth interviews*

To understand what farmers see as sustainable agriculture and to examine what barriers they face in the process of becoming more sustainable, semi-structured interviews were conducted. The purpose of in-depth interviews was to explore the experiences, views, motivations and/or beliefs of the study participant (Gill, Stewart, Treasure, & Chadwick, 2008). The interviews were semi-structured, because the intention of the interviews was to understand their view and experience of the different concepts, but there was room for the interviewee to explain further or add unexpected input. Basic questions were asked as well, about their background, farm and practices. In Appendix I the interview guide can be found with open questions and probing questions. The farmers' definitions of sustainability, the system and the barriers were discussed in detail and probing was used to get complete and clear answers.

##### *3.1.2 Observations*

The interviews were supposed to be conducted on sight so that the researcher could observe the environment of the farmer. According to Kaluwich (2005) "participant observations help to develop a holistic understanding of the phenomena under study that is as objective and accurate as possible given the limitations of the method." It can increase the validity of the study, as nonverbal expressions of feelings can be identified and it can

provide more insight in the situation of the study participant. Being on the farm helped to understand a farmers' definitions of sustainability, because the farmer was able to show the measures (s)he is taking, which helped to understand the barriers (s)he is facing. However, due to the outbreak of the coronavirus (COVID-19), almost all observations had to be replaced by video calls. In these calls the non-verbal cues of the interviews could still be found, though not as thoroughly as in person, due to the call being a video call. However, the farm and practices could not be observed.

### *3.1.3 Desk research*

In addition to the field work (interview and observations) the researcher also undertook desk research in the form of policy analysis in order to contextualize the historical developments and current policy framework relevant to this research. This policy analysis was first carried out on the national level to uncover how Dutch agricultural and environmental policies have over time set boundaries for sustainable farmer initiatives. The European level was then studied and analyzed in terms of the relevant environmental European Directives and the Dutch environmental and agricultural policies derived from these Directives. The desk research paid particular attention to policies that are currently active or have been ended within the last two years. The desk research further led to norms and laws that specify environmental regulations such as how much can be emitted, which have also been mentioned where relevant to the study.

## **3.2 Data collection and selection of respondents**

The data collection started at the end of March 2020 and took approximately three months. The research was conducted in the Netherlands. Originally, the interviews were planned to be conducted during farm visits, where the interviews could be combined with observations. However, due to the outbreak of the coronavirus (COVID-19), the farm visits were replaced with online interviews, using online communication platforms with video telephony. Only one farm visit took place, while maintaining appropriate distance. The first two weeks of the research were used to do desk research into the existing policies and to start the policy analysis. Next to desk research, the farmers were approached to make appointments for the online interviews. The farmers were part of the network of my contact at Milieudefensie. She approached most of the farmers with the question if they were willing to cooperate with my research. Some (conventional) farmers I approached myself, to explore other ways to contact farmers, in order to attract more respondents. The farmers were selected with purposeful sampling, using a number of criteria. The purpose of this method is to bring a wide variety of views and opinions of farmers forward. The criteria used were:

- A variety of sectors (arable, dairy, etc.)
- Diverse practices (conventional, organic, agroecological, etc.)
- Different sustainable initiatives
- Known to have an opinion on the matter
- Accessibility

Eight out of the fourteen approached farmers were willing to give an interview. The used sampling method provided a diverse group of eight farmers. This number of farmers

provides a sufficient amount of diversity. An overview of the sample of farmers can be found in table 1 below.

<b>Sector</b>	<b>Type of practice</b>	<b>number of farmers interviewed</b>	<b>Percentage of interviewed farmers</b>	<b>Percentage of Dutch farmers population</b>
Arable farming	Conventional	2	25%	+/- 20%
Mixed farming	Biodynamic	1	12,5%	+/- 1%
Dairy farming	Conventional	2	25%	+/- 30%
Dairy farming	Organic	1	12,5%	+/- 1%
Forest gardening	Agro-ecological	1	12,5%	< 0,1%
Community Supported Agriculture (Horticulture)	Agro-ecological	1	12,5%	< 0,1%

Table 1. Overview of the sectors and practices of the interviewed farmers in comparison to the Dutch farmer population (Statistics Netherlands, 2018, 2020; Hense & van Benthem, 2015; Stichting Voedselbosbouw Nederland, 2017).

In table 1, the farmers are divided into sectors and types of practice. The percentage of interviewed farmers and the percentage of Dutch farmers population can be found in the last two columns. As can be seen, the percentage of interviewed conventional dairy and arable farmers corresponds roughly to the percentages of the Dutch farmers population. However, the non-conventional farmers are highly over-represented, compared to the Dutch farmers population. This choice of representation was consciously made to make as many different voices heard. Farmers practicing sustainable types of agriculture can be seen as a niche, as they are only a small part of the farmers population. It is important to include these farmers in this uneven distribution, because they are most likely very aware of the systemic barriers they have faced in their process of becoming more sustainable. In addition, their initiatives can illustrate future possibilities of sustainable agriculture in the Netherlands.

The sample of farmers can be generally described as well-educated, socially and environmentally aware, active within unions, associations and/or organizations, to have outspoken beliefs and most of them originate from several generations of farming. Illustratively, most were interacting with Milieudefensie. Almost all incline to a transition towards a more sustainable agriculture in the Netherlands. The interviews took 60 minutes on average. They were conducted in Dutch, the native language of the farmers. The farmers agreed that their names could be used.



### 3.3 Operationalization

The table below shows how the concepts have been operationalized. This way, the terms found during the interviews were connected to the concepts discussed. This table is not an exhaustive list of all examples that were given during the interviews, but it does provide an idea of what could be discussed.

Concepts	Operationalization
<i>Agricultural transition</i>	<ul style="list-style-type: none"> <li>• Increasing sustainability</li> <li>• Changing agricultural practices</li> </ul>
<i>Sustainability / sustainable agriculture</i>	<ul style="list-style-type: none"> <li>• Agronomics</li> <li>• Cultural practices</li> <li>• Crop rotation</li> <li>• Pesticides</li> <li>• Soil erosion</li> <li>• Animal husbandry</li> <li>• Green manure</li> <li>• Polyculture</li> <li>• Livestock and crop integration</li> <li>• Agroforestry</li> </ul>
<i>Sustainable agricultural practices</i>	<ul style="list-style-type: none"> <li>• Agroecology</li> <li>• Organic farming</li> <li>• Community-supported agriculture</li> <li>• Circular agriculture</li> <li>• Nature-inclusive agriculture</li> <li>• Organizations</li> </ul>
<i>The system</i>	<ul style="list-style-type: none"> <li>• Farmers</li> <li>• Natural environment</li> <li>• Government</li> <li>• Agribusiness</li> <li>• Technical, and professional expertise</li> <li>• Non-profit and community sector</li> </ul>
<i>Barriers</i>	<ul style="list-style-type: none"> <li>• Manure policies</li> <li>• Economic price-models</li> <li>• Expansions</li> <li>• Soil fertility</li> <li>• Land subsidence</li> <li>• Distance between farmer and consumer</li> <li>• Decreasing biodiversity</li> <li>• Increasing GHG emissions</li> </ul>

Table 2. Operationalization of key concepts derived from Oppedijk van Veen et al. (2019); Van Dijk et al. (2018); Keeney (1990); Francis et al. (2003); Van Huylenbroeck (2005); Cone & Myhre (2000); Holster et al. (2014); Erisman et al. (2017); Stokstad (2019); Oenema, van Liere, Plette, Prins, van Zeijts & Schoumans( 2004); Vegter (1995); Leip, Billen, Garnier, Grizzetti, Lassaletta, Reis & Westhoek (2015); Nieuwenhuis & Schokking (1997); Caldwell (2015).

### 3.4 Data analysis

During the interviews the researcher took notes to describe the definitions the farmers gave of the system, sustainability and the barriers they come across. The participants gave

consent to record the interviews, after which the interviews were transcribed to make quoting possible. If farmers answered with clear definitions, barriers and examples, the answers were literally adopted. If this was not the case, the answers the farmers gave were summarized and interpreted as correctly as possible. The answers from the farmers were analyzed and translated to English. This means some answers have been interpreted twice, as translation is a matter of interpretation as well (Temple & Young, 2004). In this case, the researcher is a native Dutch speaker and has done both the translation and interpretation. The interpretation is done to the best of the researcher's ability, but it is important to be aware of the act of interpretation.

#### *3.4.1 Case study selection*

In Chapter 5, three case studies were selected in order to gain insight into the sustainable initiatives farmers undertake. These case studies are descriptions of the practices, beliefs and definitions used by a specific farmer. Three farmers have been selected to present as case study. The cases were chosen because they offered the opportunity to show what different initiatives are possible. The cases are not a representative sample of the Dutch farmers population, because the intention of the cases was to show possibilities of sustainable agriculture, while most Dutch farmers are conventional farmers and mostly do not practice sustainable initiatives. Sustainable farming practices such as organic farming are still only a small percentage of all Dutch farming practices, but be that as it may, they are important to look into, as they present the possibilities for sustainable agriculture. Three very diverse cases were chosen, to create insight in the possibilities of sustainable initiatives over a broad spectrum. Three different types of farming were presented; dairy farming, horticulture and mixed farming, which undertake three different types of farming practice; conventional, CSA and biologic dynamic. The three cases are clear examples of possible initiatives.

### **3.5 Reliability and validity**

In order to guarantee the internal validity and quality of the research, a number of important points have been taken into account. The aforementioned purposeful sampling of farmers made the selection of farmers as varied as possible. This provided a wide representation of voices, within the heterogeneous population of Dutch farmers. In order to increase the validity of the given systemic barriers, triangulation is utilized. Data triangulation is a method used to check and establish validity in studies by analyzing the research question from multiple perspectives (Guion, Diehl & McDonald, 2011). The goal of this triangulation is to uncover deeper meaning in the data and to find consistencies in the answers. When barriers are mentioned several times, saturation of the barriers occurs. This means there is concurrence among the farmers and therefore their answers can be generally applicable to more farmers. When a barrier was already mentioned before, I tried to deepen the barrier by asking further questions and asking for examples. It was also important to limit socially desirable responses. One way to ensure this, was by asking open questions that are not leading or suggestive. This way, the farmers were invited to elaborate on her/his answer.

## **4. Background of Dutch agriculture**

To better understand the Dutch agricultural sector it is important to learn more about the history of the sector and the origins of the existing policies. This chapter first presents a brief history of Dutch agriculture, followed by a description of the current agricultural and environmental policies and their origins.

### **4.1 A short history of Dutch agriculture**

In the period of 1500 to 1650 the foundations for Dutch agriculture were laid. The population growth and the urbanization were stimulating the agricultural production. Farmers in that time produced mainly for their own use on small mixed farms (Kromhout, 2003). The seventeenth century brought change. Agricultural areas were expanded by drainage, labor and capital were used more intensely and the farmers started to specialize, in order to keep up with the demand. After 1650 the population growth stagnated and livestock diseases arose. This caused a lot of harm, as the amount of cattle decreased rapidly.

The Dutch population started growing again around 1750. The industrial revolution of 1850 meant the introduction of an abundance of new technical equipment. This caused the production to increase, enabling farmers to provide the growing population with food. This trend continued into the nineteenth century. Dutch farmers thrive by exporting cattle, meat and cheese. However, the open agricultural economy is vulnerable to outside influences (Bieleman, 2010). The ocean liner is introduced, which is used to import great amounts of grain from America. This at the expense of the Dutch sales. Next to the arable farming sector, the livestock farming sector also suffers from falling prices. The introduction of the cheap butter substitute, margarine, caused competition problems on the market. These years are known as the Great Agricultural Depression. The depression led to a lot of governmental interference (Kromhout, 2003). In 1886 an agricultural committee was established with the aim to structurally improve Dutch agriculture. The committee was spreading knowledge and new techniques and encouraged farmers to organize themselves in cooperatives.

The twentieth century was off to a rough start. Because of the First World War, the import and export of products came to a halt. The government took measures to ensure the stability of the food prices. This should stimulate the domestic production and prevent famine (Bieleman, 2010). Shortly after the end of the war, agricultural prices fell. This was caused by worldwide overproduction as a result of improved productivity. Unfortunately, the Dutch agricultural sector was very dependent on export. This dependence caused the economic crisis to strike severely (Kromhout, 2003). The government interfered by trying to keep the prices of agricultural products up.

From the 1930s a lot of land consolidation happened in the Netherlands (van den Bergh, 2004). Land consolidation is the relocation of agricultural plots, in order to give every owner as much connected (de-fragmented) land as possible. This way, the fragmented landscape turned into a landscape with long fields that could be processed better and faster with agricultural machines. The Second World War again caused lots of damage to the agricultural sector. Farms and dykes were destroyed and livestock had been cut back to a minimum. However, the sector did recover considerably fast (Bieleman,

2010). In the fifties and sixties, Dutch agriculture expanded again, and more land was mined and drained. After the Second World War, the Dutch wages were rising and to keep up with the purchasing power, the production also needed to increase. This led to upscaling and intensification.

After the war, the Groningen farmer Sicco Mansholt was working on a European agricultural policy (Bieleman, 2010). In 1958 he was appointed agricultural commissioner of the European Economic Community. As a result of his policy, European agriculture was experiencing an enormous up-scaling and an increase in mechanization. Production figures had never been higher. In 1971, a memorandum written by Mansholt was accepted by the committee, which lowered guaranteed prices. This way, small European farmers were sidelined to fight the production surplus (Kromhout, 2003). This led to many protests in European countries. In the Netherlands, a lot of small farmers had to stop, but pig farmers got lucky. Mansholt had not been able to stop the import of cheap cattle feed from the Global South. This created a surplus of grain in the rest of the Netherlands, because it was no longer used to feed the pigs (Kromhout, 2003). At the same time, the large amount of pig resulted in a manure surplus, which led to acidification of the Dutch environment.

In the late 1980s, the government imposed restrictions on the spreading of manure on the land and it became mandatory for livestock farmers to keep manure records (Bieleman, 2010). To survive the financial setback of this time, farmers started to search for other activities to do, next to farming. They for instance started a shop to sell their products, or rented out holiday homes. In the same period, the government also increasingly emphasized the importance of nature conservation and environmental policies.

It is important to be aware of the history of Dutch agriculture, because it lays the basis for the current policies and it can help to understand what farmers mean when they speak of Dutch agriculture in former times. In the next section the current agricultural and environmental policies are explained, to understand what policies farmers have to deal with.

#### **4.2 Dutch agricultural and environmental policies**

Agriculture in the Netherlands has to conform to different fields of policies. Both environmental policies and agricultural policies are applied to agriculture, with somewhat different objectives. The environmental policies that are in order are mostly setting boundaries for agricultural emission and pollution. The agricultural policies are often more focused on the export oriented industrial agriculture and offer subsidies to ensure high production numbers (Daniel & Perraud, 2009). According to the OECD (2018), the twin policy challenge of ensuring food security for a growing population while improving environmental performance is an essential conflict of interests. The Dutch policies that apply to agriculture can be found in different policy documents, originating from European directives. The policies concerning agriculture are dispersed, because agricultural activities influence various subjects. Food, chemicals, water, nature and climate policies all concern agriculture. Clarity in this whole set of policies will be provided to understand the Dutch environmental and agricultural policies. After explaining the origin of these policies, they will be described in more depth.

First, the European policies that are of influence are discussed. The Dutch

agricultural policies origin from the Common Agricultural Policy (CAP). This is the agricultural policy of the European Union (European Commission, 2019a). This policy consists of two subsidy pillars: direct income support for farmers to ensure production and income stability, and rural development funds. This second pillar is not that focused on supporting agricultural production, but instead aims at landscape management, nature conservation, rural development and environmental protection. In this sense, this pillar does not fit the previous description of the solely export oriented industrial agriculture (Daniel & Perraud, 2009).

Next, three environmental European policies impact agriculture. The European Union Water Framework Directive (WFD) is of influence, as it protects the water quality (European Commission, 2019c). The European Nitrates Directive aims to protect the water quality across Europe by preventing nitrates from agricultural sources polluting ground and surface waters and by promoting the use of good farming practices (European Union, 2010). The European Birds and Habitats Directive ensures the conservation of a wide range of rare, threatened or endemic animal and plant species (European Commission, 2019b). These habitats, described in the Birds and Habitats Directive are united in the Natura 2000, a network with the aim to ensure the long-term survival of Europe's most valuable and threatened species and habitats (European Commission, 2020). These three European policies form the base of the Dutch environmental policies that impact agriculture.

It is noticeable that the CAP is not necessarily in agreement with the European Birds and Habitats Directive and the WFD (Vewin, 2019). According to research from the European Court of Auditors (2017), the current CAP (2014-2020) has failed to achieve its ambitions to improve sustainability. The measures taken have hardly contributed to solving environmental problems because the ambitions were too low. Here the aforementioned policy challenge becomes very evident.

The Dutch national agricultural and environmental policies stem<sup>1</sup> from the European directives. The European directives influence the Coalition Agreement that is made when the Dutch parties form the cabinet. The country must explain to the European Commission how they plan on achieving their goals. These plans are translated into action programs. For instance, the 6<sup>th</sup> Action Program Nitrate came from the Coalition Agreement (Ministry of Agriculture, Nature and Food Quality & Ministry of Infrastructure and Water Management, 2017). This action program is based on the European Nitrate Directive. The Agricultural Nature and Landscape Management is derived from the Birds and Habitats Directive. This collective offers subsidies to farmers who contribute to nature and landscape management (RVO, 2020a). Two other policies stem from the European Nitrate Directive: the Nitrogen Approach Program and the National Manure Policy. The Program Approach Nitrogen has now been abolished. This program made it possible to obtain a license to emit nitrogen, even before the emission was actually emitted. This ended in the nitrogen crisis, where the legally permitted amount of nitrogen was exceeded, which led to constraints in the construction sector and

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<sup>1</sup> To say Dutch policies stem from European Directives is a simplified version of the truth. European member states try to influence the European Directives and are involved in their development. In this manner they are also partly responsible for the content of the European Directives and therefore are involved in the development of their own policies as well.

the agricultural sector (Remkes, van Dijk, Dijkgraaf, Freriks, Gerbrandy, Maij, & Vet,(2020). In the National Manure Policy, outlines the norms and laws concerning the allowed levels of phosphate, nitrogen and ammonia.

Farmers in the Netherlands need to comply with these norms and levels. According to the nitrogen use norm, farmers are allowed to apply 170 kilograms of livestock manure on their land per hectare per year (RVO, 2020b). When the farmer owns a derogation permit, more livestock manure may be used. The amount depends on the soil type and varies between 230 and 250 kilogram per hectare per year. Random sampling and checks are carried out by the Netherlands Enterprise Agency. When the norms are exceeded, administrative fines can be imposed. Farmers must keep their administration in order by law and have to keep track of the amount of nitrogen and phosphate they use and emit. The number of livestock also needs to be administered.

Farmers can contribute to agricultural nature and landscape management and when they comply with the requirements they can receive subsidies. The requirements depend on the type of nature area (RVO, 2020a). Four areas plus the category water can be determined: open grassland, open arable land, wet connected lands (ditches, streams, creeks, marshes, reed beds etc.) and dry connected lands (wooded banks, hedges, bushes, dikes, paths etc.). Examples of requirements are not mowing meadows before a certain date, no or moderate fertilizer use, digging small pools for amphibians and installing bird nesting facilities. Other subsidies include direct payment from the CAP per hectare and possible rural development program subsidies when working on the development of the countryside as an agricultural entrepreneur, on behalf of an organization or the government (European Commission, 2019a).

In 2018, the Dutch minister of Agriculture, Nature and Food Quality presented a new vision regarding the future of Dutch agriculture. This vision is focused on circular agriculture, and in this sense, it presents a radical new vision compared to the past and the origins of the CAP. Circular agriculture is described as a system with minimal unnecessary losses. The vision states that the different agricultural sectors firstly use the raw materials from each other's chains and residual flows from the food industry (Ministry of Agriculture, Nature and Food Quality, 2020). These chains can be arranged differently: within a company, a region, the Netherlands or across borders. The motto is: local where possible, regional or international when needed. This vision presents a new trend, not yet united with the existing Dutch policies. This marks a change away from the conventional export-oriented farming practices. However, this is policy in its infancy, and the actual outcome of this vision is unknown.

Thus, the history of Dutch agriculture can be characterized by the upscaling of production to keep up with the growing demand. The European agricultural policy designed by Sicco Mansholt encouraged the industrialization and expansion of agricultural practices. Environmental problems arose and measures needed to be taken. Environmental and agricultural policies are conflicting as the agricultural policies are focused on an increase of production, while the environmental policies try to set boundaries for pollution and emissions and therefore production. The Dutch agricultural and environmental policies are derived from the European Directives and are dispersed and therefore complicated to understand as a whole.

## **5. Sustainability initiatives and opportunities - a farmer's perspective**

Now that the background of Dutch agriculture and the agricultural and environmental policies are clear, some of the sustainability initiatives farmers attempt are described. The manners in which the farmers apply sustainability in their practices and their understanding of sustainability will provide insight into the possibilities and initiatives found in the Netherlands. Some frontrunners of sustainable agriculture are highlighted and their stories are told. This helps understand the lay of the land and introduces the farmers. Two categories of initiatives can be identified in this chapter. As explained in the theoretical framework, initiatives can be: (1) sustainable agricultural practices on the farm and (2) lobby work and trying to influence policies. The main focus of this chapter will be on the first category, but the second category initiatives will be briefly mentioned as well. In the next chapter, the focus will be more towards the second category, because lobby efforts are more aimed at confronting the barriers. The initiatives in this chapter are structured into three themes. Per theme, a case study is described in which the practices and vision of one farmer is presented in detail. This provides a clear understanding of their practices and beliefs. As explained in the methodology, these three case studies were selected because they are diverse and offer the opportunity to show what sustainable agricultural initiatives are possible. There are three different agricultural sectors presented (dairy farming, horticulture and mixed farming) and three different practices (conventional, biological dynamic and CSA).

### **5.1 Care for the soil: no-tillage and reduce artificial fertilizer and pesticide use**

The first theme of initiatives is the soil. Every farmer that was interviewed mentioned the importance of taking care of the soil as part of sustainability. They described sustainability as being future-proof or maintainable. All of the farmers mentioned in their definition of sustainability that the soil should not be exhausted because it should be a system that can be maintained for generations to come. The soil should still be fertile in 50 or 100 years. Every farmer mentioned the importance of a fertile future-proof soil, but there is a difference in the initiatives that conventional farmers undertake compared to organic/agro-ecological farmers. The organic/agro-ecological farmers see this future-proof soil as a soil on which no pesticides and fertilizers are applied and which is not ploughed, while the regular farmers have a less pronounced idea. Leendert Jan Onnes, a conventional arable farmer in Groningen, indicated that he considers it very important that farmers use fertilizers and pesticides consciously. He uses as much animal manure as possible and makes his own compost from frozen reed that washes up in the Dollard river. He believes that fertilizers and pesticides are sometimes necessary to maintain the level of production. He tries to plough as little as possible, but sometimes it can be needed to fasten the process of nutrient uptake.

Piet van Ijzendoorn, a biodynamic farmer with a mixed farm in Flevoland does not plough his lands and does not use fertilizers or pesticides. He indicated that his soil is balanced by his methods and is resistant to disturbances (pests and weeds). He said that all agricultural diseases can be found on his farm, the Zonnehoeve, but they do not cause any major damage. He sees the complete elimination of diseases as a way to become more

vulnerable, because there is no resilience left. This being said, it is likely that this has an effect on his productivity, or the crops might be of a lesser uniform standard. His biological products are grown mainly on a contract basis and then sold through organic wholesalers and specialty stores. The grain he grows is used to bake bread in his bakery. This discrepancy in the use of pesticides and fertilizers is noteworthy. Especially for conventional arable farmers it seems as if the need for a high production leaves them no choice but to use pesticides and fertilizer. However, they do take initiative in trying to find alternatives and try to make a conscious choice. The organic/ agro-ecological farmers see the soil more as a natural system that should not be affected by external chemical inputs. All dairy farmers interviewed do not plough their pasture. Corneel van Rijn, a small-scale biological dairy farmer in Zuid-Holland indicated that he deliberately does not plough because ploughing produces a lot of CO<sub>2</sub> and he tries to create a very diverse grassland. Alex Datema also emphasized that he does not plough and is trying to build up the organic matter content in the soil. The following case study clarifies his practices and beliefs in detail.

### *5.1.1 Case study Alex Datema*

Alex Datema is a conventional dairy farmer who has continued his family farming practices as a fourth generation farmer in Groningen. He has about 110 cows and 70 hectares of pasture. The cows are fed approximately 60% grass and 40% purchased concentrates. He strives for permanent grassland and wants to let it be as much as possible. Fifteen hectares are used as active meadow bird management, herb-rich grassland and delayed mowing. He also practices a puddle technique. He is consciously wetting the grassland by means of a solar collector pump that pumps water on top of the land to ensure sufficient food for meadow birds. For these agricultural nature and landscape management practices he receives subsidies.

He sees a healthy soil as the basis of a good farm. He indicated that this is also the reason that he stopped ploughing.

"We are trying to slowly rebuild the organic matter content in the soil, which has slowly subsided over the years. Now we have stopped ploughing for almost 20 years and the organic matter content has risen from 5/6 % to 16/17 %. I cannot say exactly what effect this has. My feeling says that it makes the soil healthier, that we suffer less during dry or extremely wet periods, but that is not scientifically substantiated, that is the feeling that I have as a farmer."

Datema thinks that the Dutch agriculture has been made vulnerable to external influences due to the increase in production and intensification and therefore emphasized the importance of an economically resilient company.

Datema deems the best practice of sustainable agriculture has not yet been found. He believes we have to work towards an agricultural system which is "future-proof", one which could last forever. He emphasized that the agricultural system must have a large production capacity in order for it to be economically sustainable and future-proof. These two issues cannot be seen separately because the demand for food is still increasing. This makes sustainable agriculture challenging, he said. It is important to notice that his definition of sustainability reaches further than solely ecologic objectives. He sees



sustainability as a social and economic concept as well. Datema believes sustainable agriculture must keep up with the growing food demand, and thus does not immediately believe that organic farming is the answer. He spoke of the difficulties of organic farming:

“I think, one, that the production capacity is quite a bit lower, I wonder if that is sufficient [to feed the Dutch population], and two, you run, especially on a large scale, a lot of risks because you can no longer use certain tools [fertilizer and pesticides] if you want to comply to the organic farming standards. This increases the chances of a real crop failure.”

He thinks there is a future for organic products because there is a market for it, but that conventional agriculture could also develop much more sustainably than is happening now. He sees fertilizer as something that is finite, but wonders if it is wise to focus on this reduction, while the demand for food is so great: "Perhaps people should see a reduction of fertilizer as an additional development of a more natural food system, where less fertilizer will be included."

Datema identified two important methods to make conventional agriculture more sustainable. He says we should look back on earlier manners of working, how to farm 'closer to nature', and make more use of natural processes such as natural pest control and, for example, work in strip cultivation to cultivate more varied crops on a plot. However, he emphasized that we should not only look at the past, but also at how modern techniques can be of help. For example, robotization can help increase sustainable agriculture. Robots can be used for strip cultivation. If the work is robotized, it does not matter in terms of labor whether one plot is cultivated or several strips.

Datema is chairman of BoerenNatuur, the umbrella organization of agricultural nature management, to which 10,000 farmers are affiliated. He is also a board member of Delta Plan for Biodiversity Recovery. Lastly, he is a co-founder of the Boerenraad, a coalition of farmers who want to see sustainable change in the agricultural sector. The Boerenraad is still in its infancies, but connects different types of farmers who have the same sustainable future vision in mind. “The media often portraits angry farmers who do not want change when it comes to for instance, the nitrogen problem. We [the Boerenraad] want to offer a stage to farmers who are working on innovation. Together we look for a better future for agriculture.” It can be concluded that Datema is highly active in terms of the second category initiatives. He is engaging in different organizations and coalitions that aim at increasing sustainable agricultural practices.

In sum, farmers see soil as a very important aspect of sustainability. A difference arises between conventional farmers and organic/agro-ecological farmers when it comes to fertilizer and pesticide use. Conventional farmers use these products because they have to meet a high level of production. As Alex Datema explains, the economic and social side of sustainability need to be considered as well. This might mean using some fertilizer and pesticides to keep the production capacity high. The sustainability initiatives that fall under the first category regarding soil often concern the act of abstaining farming practices like ploughing or the use of fertilizer and pesticides. All farmers seem willing to decrease their use as much as possible, but it appears to be difficult for conventional farmers to withhold completely.

## 5.2 Improving the producer-consumer connection

An often-recurring theme of initiatives that the interviewed farmers undertook involved trying to reduce social distance between farmer and citizen. Van Rijn has a farm shop in his yard. He sells homemade products and crops from his food forest. In addition, he also has holiday homes on the yard and organizes farm education. By selling products in their yard, farmers and citizens have direct social contact. The farmers enjoy this experience, as they see who buys their products and how much the customer appreciates the products. Van Ijzendoorn also sells his products directly to the consumer. He has started an internet shop with two other farmers, enabling them to deliver products directly from the land to people. His farm also offers several options in the field of education. For example, he offers excursions, study days and work weeks. These ways of making connections with consumers are positively described by the farmers.

Together with other farmers, Datema has set up a natural meat cooperative in which the animals graze on natural land for at least two summers and are fed locally. The meat is sold regionally. He enjoys the initiative and especially likes to show the consumer that they are capable of producing such local sustainable products. Datema recognizes that direct selling from producer to consumer is not a possibility for all farmers, but emphasized the importance of farmers telling their story and showing what they do and produce. If more farmers would provide insight into their practices, contact with the consumer may improve and the consumer will be more aware of the origin of the products. The initiative that Bregje Hamelynck has taken is a positive example of the possibilities in the connection between farmer and citizen and will be discussed in the following case study.

### 5.2.1 Case study Bregje Hamelynck

Bregje Hamelynck, a current CSA farmer with a degree in economics, witnessed the financial crisis of 2008 and realized the vulnerability of the economic system. She was shocked by the dependence of people on the market and the lack of self-sufficiency and decided to obtain an education in permaculture. Permaculture stands for permanent agriculture, which means that there is an essential contribution from perennials in the system. Hamelynck and her husband conceived the idea of not only starting a vegetable garden for themselves, but for the entire region. They started a Community Supported Agriculture (CSA) farm, which means that people begin a long relationship with them. People join the garden for €250 per year. Members can independently harvest fruits and vegetables in the garden at any time. For people who do not have the time, or as Hamelynck emphasizes, no priority, to harvest themselves, a vegetable bag can be ordered. This initiative strengthens the connection between farmer and citizen, as the citizens see and pick the fruits and vegetables they eat themselves. In this way they learn about the plants and the way these products are cultivated.

Hamelynck is chairman of the CSA network in the Netherlands. She is also co-founder of the Boerenraad. Hamelynck's practice is based on the power of nature, observing natural processes and imitating these processes as much as possible. She sees agriculture as a holistic system based on natural processes. Her definition of sustainable agriculture is agriculture where no pesticides are sprayed and no fertilizer is used. The

local circle should be closed as much as possible. According to Hamelynck biodiversity is a crucial aspect of sustainable agriculture:

"If you don't use pesticides, you have to find other ways to prevent and control diseases and pests in the garden. For us, the solution is biodiversity. We call ourselves soil farmers. We feed the soil, increasing the soil life and increasing the organic matter content, making the soil healthy again. If the soil functions well, it can use its restorative power. There is a web of fungi under the ground, the real World Wide Web if you will, that repairs all kinds of imbalances. Minerals and trace elements are actually spread through that fungal threads web, so that if there is too much or too little of a substance in a certain area, it is actually restored. As soon as you start ploughing, you disturb that entire web. 90% of our agriculture does that ploughing. We do not do that. We actually try to disturb the soil as little as possible. So for permaculture, underground biodiversity is as important as above-ground biodiversity."

The shared garden consists of a strip cultivation with a logical structure that promotes biodiversity. This high biodiversity makes it possible to fight pests and diseases naturally, because the perennials and trees are home to all kinds of natural control agents such as predatory wasps and frogs. They use compost as fertilizer.

In addition to the harvest garden, Hamelynck has set up a food cooperative with her members. Members can order all the food products they need for the week through the food cooperative. Hamelynck works with many local farmers where local milk, cheese, bread, eggs, meat and fish is produced and provided. In this manner, almost all the ordered food can be delivered. The products that cannot be produced locally are supplemented by the organic wholesaler. All of the products are collected in a barn in the yard and the members can pick up their orders and take a walk through the harvest garden to collect their fruits and vegetables. Thus, all products are available and a supermarket is no longer needed. Complete food security is provided.

Hamelynck wants to share and disseminate her practices. At the time of the interview she was setting up a platform where farmers and citizens can sell and buy products among themselves. For example, a group of 15 households can start a similar food cooperative as just described. Through the group, people can ask farmers in the area to deliver to their cooperative and the products that are missing are supplemented by the organic wholesale. All that is needed is a shed, cellar, community center or canteen of a school, for example. This initiative ensures close contact between farmer and citizen. It offers an alternative for the consumer. According to Hamelynck, more needs to be done to make people aware of how the food chain works. The platform avoids the vulnerability of the current system and guarantees sustainable local food.

The connection between farmers and citizens proves to be important to farmers. They enjoy the contact with the consumer and it educates citizens about the origin of food and the way it is produced. Hamelynck's initiative, her CSA garden, vastly improved the involvement of citizens. Her vision in which food is produced and consumed locally and close contact between producer and consumer is assured is an impressive sustainable alternative to regular food retailing. Noticeable is that her initiative can be classified in

both categories. In addition to working in the harvest garden, she also launched a new platform to enlarge and share her ideas. In this way she is lobbying for the short supply chain and reducing the power of supermarkets.

### **5.3 Setting an example to increase trust in sustainable initiatives**

According to Alex Datema, farmers always try to be good farmers. The question is, what is a good farmer? Ten years ago, a good farmer was a farmer who produced a lot and kept his yard in good order. We may have to define a good farmer for the future in a different way because practices are changing. However, changing methods creates uncertainty. According to Ijzendoorn, it is a psychological challenge for farmers to change. Changing can mean breaking with the methods of your father's company, doing something different than the neighbors and no longer belonging to your safe group. It is difficult to get out of this comfort zone. Front runners are often made an outcast at the beginning and it takes a lot of confidence to persevere. However, some of the interviewed farmers did manage to successfully change or start their practices and are now setting the example.

Van Rijn clearly recognizes the challenge of change and explained his experience on the basis of meadow bird management. He said that for meadow bird management, it has been shown with various studies that you can easily reserve a certain percentage of your land to apply delayed mowing. From an economic point of view, this adds almost no additional cost and it enables the farmer to help the birds. However, this is certainly not common practice. Farmers have persistent tunnel vision of their typical practices. According to van Rijn it is their social duty to practice meadow bird management, notwithstanding the acknowledgement they can get for being involved with such practices. These rigid thought patterns should be broken and maximum contributions to sustainable initiatives should be the norm. It is important to ensure that the farmer is comfortable with the changes. According to Datema, this can be achieved by bringing farmers into contact with each other and having them exchange their views about how things can be done differently. When farmers experiment together and learn from each other, a sense of connectedness is created that makes farmers feel comfortable and decreases the uncertain position of the frontrunner. The following case study explains how van Ijzendoorn applies this principle in his practices. Setting an example for others is a combination of the two categories of initiatives. Category one initiatives are used to show others that change is possible. Setting an example can be seen as a way to influence others, which tends more towards the second category of initiatives. These initiatives cannot always be separated and therefore the initiative of setting an example is discussed in this chapter. The case study of Piet van Ijzendoorn, presented below, clearly demonstrates the interplay of the two categories of initiatives.

#### *5.3.1 Case study Piet van Ijzendoorn*

Piet van Ijzendoorn is a farmer who originated from conventional agriculture in the 1960s, but he noticed something was not right. The increasing use of chemicals, the increase in scale and the outflow of farmers made him feel that things needed to be done differently. Van Ijzendoorn decided to study environmental science in Groningen in 1972. His graduation project concerned the world food issue and whether organic farming was only for "the happy few". His conclusion was that organic farming is the best way to feed the

world and he continued to act on his findings. After seven years of giving practical training at the agricultural school, he moved to Flevoland to start the Zonnehoeve, his farm. He started a biologically dynamic mixed company. The Zonnehoeve is a care farm. This means it provides mental health, social and educational care services. In addition, at the Zonnehoeve they practice horticulture, breed horses and have a bakery. This wide range of practices puts the farm in a financially stable position.

No pesticides or fertilizers are used on the Zonnehoeve. Van Ijzendoorn described the system he wants to create on the farm and compared it to the current agricultural system. For this comparison he used an illustration that can be found in Figure 3. He described the current system as the red curve with the ball on top.

"We are now in a control system, an exclusion system. Everything is controlled and needs a high input. If you invest €1,00 in the system and €1,05 comes out, you do it. If you cannot keep up with the needs you are excluded. The system is completely financially controlled and I think it has nothing to do with agriculture or farmers anymore."

He refers not just to the ecological boundaries of the system, but to the political and socio-economic aspects as well. For these aspects, he refers to boundaries such as the liberalization of the international market, increasing laws and policies which restrict farmers, low prices for agricultural commodities, the financialization of farming.

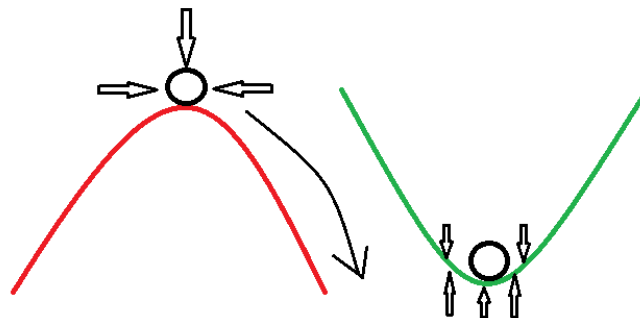


Figure 3. An illustration of the drawing used by van Ijzendoorn during the interview

The first system (as shown in the figure) indicates keeping everything in its place, that is what the inward-pointing arrows symbolize. This description illustrates his opinion on the current agricultural system. If in some way the system fails, the ball will fall and it is extremely hard to restore the balance. According to van Ijzendoorn, there is no development possible in such a system, because fighting symptoms and keeping the ball high on the curve requires all available time and energy. The other system, visualized as the ball resting in the green inverted curve, is the system pursued by van Ijzendoorn. He sees a future in an inclusive adaptation system and thinks it is important to make the system of plant growth and food production stronger and more resilient. He explained that this applies not only to agriculture but to our entire culture. He had the same feeling about mental health care as he had about conventional agriculture, namely that something was not right. For this reason, Van Ijzendoorn has also completed an education in orthopedagogics and post-academic education in diagnostics and psychotherapy. The care facility of the Zonnehoeve consists of people who live in the yard and do daytime activities.

Van Ijzendoorn ensures that they are involved in his system and are not excluded. He described how they can now experience a sense of life and feel connected to the whole instead of spending their time as a burden for the balancing society.

His idea for the Zonnehoeve was two-part. On the one hand, he wanted to show to (conventional) farmers that things can be done differently. That food production is possible in a sustainable way, without going back to the agricultural practices of the fifties.

"We started at the same time as our neighbors and for the first 10 years we showed that we were able to survive. They probably thought that within 3 years we would be covered in weeds and pests and we would go bankrupt. Now they have also made the switch to organic."

His intention to set an example for others has led to a sense of trust in organic practices. Because he led the way, others dared to follow. On the other hand, the goal is to connect with the citizens. This was not only through food, as he wanted to spread a wider social function. His care farm practices offer a meaningful interpretation of life to people who need it and his pioneering business has turned into a community business in recent years.

Van Ijzendoorn explained that for him sustainability means not being dependent on "inputs". The nutrient cycles need to be clearly organized. If you grow something, and you have cows, you have manure. Manure must be used in the right place where it is needed in your own system, so that the soil can develop. There should be no extra input from animal food, because the manure will not return to the place where the animal food grows. He further explained that the Zonnehoeve is based on the power of the sun and human development. Lastly, he added that all minerals are finite, you can use them, but you should not consume them.

According to van Ijzendoorn : "That is agriculture, making sure you have an eye for what the soil needs and which crops make a positive contribution to that. If you take that as a starting point, you automatically produce enough food. That's thinking the other way around, usually people think, what can I get from using that ground, add a little fertilizer and fight some weeds and you get a high yield. However, that is at the expense of the development of that soil."

Changing practices creates uncertainty. It is essential that frontrunners lead the way and show others that it can be done. Getting into contact with each other and seeing and discussing sustainable practices can increase the trust in new practices and break through the existing tunnel vision. Both categories of initiatives come into play here. Van Ijzendoorn shows that by doing what he does, he becomes an example for others. His beliefs about an inclusive adaptive system go beyond agriculture. He sees sustainable agriculture as a system that does not need inputs and supports everything that is included.

## **5.4 Chapter conclusion**

The three themes described have created more insight into the initiatives the interviewed farmers are taking. It is important to realize that the definition of sustainable agriculture used in this research and the definition that the farmers gave of sustainable agriculture differs. In the theoretical framework, sustainable agriculture is described with a focus on the ecological aspects of sustainability. Only the literal effects on the environment are

described and social and economic aspects are not taken into account. However, the farmers do describe the social and economic side as part of sustainable agriculture. For sustainable agriculture to be future-proof, it needs to be socially and economically feasible as well. Farmers need sufficient income to carry out their practices and food production must be high enough to provide an adequate amount of food to feed the growing (world) population. It became apparent that the two different categories of initiatives described in the theoretic framework cannot always be distinct, because they can be combined. The first category of initiatives, the actions taken on the farm, can be transformed or used as category two initiatives, that influence and lobby for the system. It should be noticed that some difficulties arose from discussing the initiatives. Sustainable agricultural initiatives are not always easy. For example, the conventional arable farmers described that it was not possible for them to completely stop using fertilizer and pesticides and the last theme expressed the difficulty for farmers to break with their conventional ways. It may be concluded that sustainable agriculture is facing difficulties in the Netherlands. The farmers have the best intentions, but it seems as if they are confronted with the barriers that arise from the system. In the next chapter, the farmers are asked about the barriers they experience and identify and the barriers will be discussed in detail.

## **6. Farmers' views on barriers to become (more) sustainable**

Now that the initiatives farmers undertake have been described, the barriers identified by the farmers will be discussed. In the previous chapter it became apparent that it is not easy to farm sustainably, as there are various obstacles to overcome. From the interviews with Dutch farmers, several barriers for sustainable agriculture in the Netherlands emerged. As explained in the theoretical framework, the focus of the research lies particularly on policies, because they present boundary conditions for the farmers practices. All of the identified barriers relate to policy, directly or indirectly. While some barriers can be derived directly from the policies in place, others barriers can be conceptualized as an indirect result of policies. In this chapter, the barriers are first described by giving voice to the views of the farmers, after which their statements are put into context and analyzed to explain how the barrier in question relates either directly or indirectly to governmental policy. This relates the barriers farmers experience back to the overall 'system'. Farmers from different sectors of agriculture described a total of six system barriers, which apply to all sectors. Each barrier was described and endorsed by at least four farmers. After the identification and analysis of the six systemic barriers, a number of category two initiatives of the farmers in the form of policy proposals are presented and discussed.

### **6.1 The systemic barriers**

The identified systemic barriers are first presented as described by the farmers, after which each section ends with an analysis of how the barriers relates to policy and the farmers statements are placed into context to better understand why the barrier is identified.

#### *6.1.1 Access to land*

According to Bregje Hamelynk, an agro-ecological horticulture farmer, in charge of a small CSA farm, high land prices make becoming a new farmer in the Netherlands difficult. This applies not only to new entrants but also to successors. Agricultural land in the Netherlands has the highest land price in Europe. Since 1965, the land price has risen from an average of € 5.000 per hectare to an average of € 64.000 in 2009, according to figures from Statistics Netherlands (Boerderij, 2020). In the Noordoostpolder, this price even rises to € 120.000 per hectare (Feenstra, 2019). Increasingly, it is financially not feasible for the farmer to own the land. Instead, the farmer pays rent to the owner of the land. The land does not become the property of the farmer. In 2018, 28.5 % of agricultural land was leased. Parties actively buy Dutch farmland to issue it as a leasehold. This makes it difficult for new farmers with sustainable ideas to start up because the land is expensive. Secondly, farmers who lease the land need to produce very efficiently to be able to pay their rent and make a profit. Sustainable practices are not always the most efficient practices and therefore not feasible for farmers who have trouble affording the land. Piet van Ijzendoorn, a biodynamic farmer who cultivates wheat to bake bread pays rent to the state. He described the problem as follows:

“if we cultivate wheat, 70 % of that gross yield has to be paid as lease. We pay for the lease of the land, which comes from the state. We pay +/-€1.400 per



hectare. Whether you are conventional or organic, yes conventional produces more kilos, but if you get a slightly lower price, you will lose 70 % of your yield. That is why in response wheat is no longer grown.”

As van Ijzendoorn described, a major disadvantage of leasehold is that the rent can be up to 70% of the market value (Rijksoverheid, 2019b). Next to the rent, production costs have to be paid as well. When the rent is that high, it is not feasible to grow that specific crop because it will not make ends meet. Van Ijzendoorn further explained:

“The financial charges are far too high. When taking over a farm, you have to deal with the capital costs, inheritance, takeover costs and this makes it difficult for young starting farmers to survive financially. It is difficult to make sustainable choices in business operations, as these often do not bring about the highest possible yield per hectare.”

These costs make it tough for farmers to earn a living. Farmers often get a loan from the Rabobank (a large commercial bank that historically is active in agriculture in the Netherlands), to be able to afford agricultural lands. The bank promotes expansions of farms and has provided high loans, with the result that farmers end up facing high debts (NPO, 2019). Due to these financial challenges, farmers are not inclined to increase the ecological sustainability of their practices, as that often goes hand in hand with slightly lower production and therefore a lower income.

Van Ijzendoorn also made another observation. He believes that paying rent is part of consuming something, making something worse or decreasing the value. According to him, his way of sustainable farming, biologically dynamic without plowing, fertilizers and pesticides, ensures that the soil is increasing in quality. It does not consume the soil, it enhances the soil. He stated: "if you do something for the future, you should be rewarded for it."

Leendert Jan Onnes, a conventional arable farmer also sees the expensive land price as a barrier to sustainable agriculture. He owns 120 hectares of land, 10 % of which he practices agricultural nature management. Due to the large amount of land in his possession and the advantages of agricultural nature management, he supports the choice to contribute to nature management. However, if he had to buy 10 extra hectares, he would have to produce as efficiently as possible to pay the interest and repayment and would have had to reconsider practicing agricultural nature management.

As the interviews with farmers indicated, the land prices in the Netherlands are so high as to create a barrier to both new farmers entering the agricultural sector and farmers continuing a family legacy of farming. A high land price is a barrier to sustainable farming as there are many costs to pay off, which means farmers need to produce as efficiently as they can to pay their loans. Not only do high land costs form a barrier to entry (the acquiring of the land, usually in the form of an expensive leasehold) but they also have a knock-on effect, since they exasperate other farming costs such as that of capital costs, inheritance or day-to-day cost of operations. The overall picture formed from the collected data is thus one of a lack of available land (for direct purchase) and market-driven leasehold prices that deny the farmer the flexibility to explore sustainable methods, instead focusing their agricultural practices on maximum yield and maximum income.

This situation is directly influenced by government policy and the way the overall agricultural system is governed. The maximum price of agricultural land is determined by the government every year (Rijksoverheid, 2019b). The government therefore directly influences how expensive the land can and will be through its policies. Smaller governments such as municipalities can also own land and the municipality often leases the land to farmers. In this manner, the lease generates income for the municipalities. In 2017, the Dutch Socialist Party (SP) raised questions in the Dutch House of Representatives about the high lease prices and the difficulties that arise from the high prices for sustainable land use (van Gerven, 2017). Van Gerven asks the minister if he agrees that the sharp increases in lease prices are unfavorable for the agricultural sector. Nevertheless, despite the high prices being known and raised in official debates, the maximum price of agricultural land is still rising each year (Rijksoverheid, 2019b). In several Eastern European countries, land prices stay below €5.000 per hectare (Silvis & Voskuilen, 2018). Moving west, the price rises to be between €5.000 and €25.000 per hectare, with only Italy going above with €35.000 per hectare. The land prices of the Netherlands are almost twice as high as those of Italy. Instead of alleviating the barrier for farmers - lowering maximum prices to allow lower take over and operation costs and hence further exploration of sustainable practices - current policy maintains the identified barrier. A shift in priority towards sustainable farming, on a policy level, could include the lowering of the maximum land costs and increasing availability, so as to give farmers a reasonable option of using sustainable practices while also generating the necessary profit to continue their operations long into the future.

### *6.1.2 Legislation*

A significant barrier mentioned by all farmers is the Dutch agricultural policy and Dutch environmental legislation. According to the farmers, the agricultural policy is aimed at the short term and intensive agriculture. Keimpe van der Heide, board member of the Dutch Arable farming union, the NAV, described the current agricultural policy as a huge barrier to the long-term vision: "If you want to take good care of your soil and take good care of your business, you must have a long-term vision, but that is counteracted by the current agricultural system, the current agricultural policy." He alluded to the CAP that mainly focuses on increasing production as mentioned in Chapter 4 and lacks sustainability in its policies. Short-term production increase cannot be easily united with a long-term vision.

According to Alex Datema, chairman of BoerenNatuur and conventional dairy farmer: "most of the agricultural policy is old and based on outdated ideas of how it should be." As he explained, the current policy focus on intensive agriculture can be explained by the history of Dutch agriculture as described in Chapter four. The policies are based on increasing and intensifying production, but not on making industry more sustainable. The focus on intensive agriculture can be found in both agricultural and environmental policies. The following examples of the farmers who try to initiate sustainable practices and are hindered by environmental or agricultural policies illustrates this barrier.

van Rijn, a biological dairy farmer describes how biological farmers can be the victim of the conventional farming practices:

“It happens often in politics that they say they are going for greening or responsible agriculture or whatever, but if you take a closer look, it mostly comes down to the opposite. Just to go back to that phosphate crisis, you actually see that the milk quota was set loose and as a result there was a huge growth in the dairy farming sector. The government had to restrain the growth and they did that through the phosphate rights. But the way that worked out, as they used a certain reference date, you actually see that the companies that have grown very aggressively and contributed most to the problems are being punished the least. The extra cows they have bought are treated as if they were not just bought [because the reference date was in 2015 and the cut back was in 2017] and they were not cut back more than companies that had just remained constant and did not purchase additional cows. Those companies have actually done the right thing, they have not caused the problem, but they have to contribute just as much to solving the problem. In my opinion, the bulk of governmental policy is always more in favor of large-scale intensive companies than of small-scale companies of which they also state they are good and interesting and admirable.”

The example illustrates that agricultural policy, aiming to regulate and slow down the intensification of agriculture, in practice tends to benefit large-scale farmers.

Ijzendoorn, explained how the phosphate and nitrogen legislation (environmental policies) affects him as a biologic dynamic mixed farmer. Dairy farmers need to obtain phosphate rights to pay per kilogram milk for the phosphate cows emit, not depending on the practices a farmer uses or the actual phosphate the cow emits. According to van Ijzendoorn:

"With the phosphate and the nitrogen, even though we have no guilt in the matter whatsoever, with the generic measures we are simply tarred with the same brush. That is not fair, we have cows that we do not feed concentrates<sup>2</sup>, so compared to conventional cows, they give less milk, but still we are in the same regulations. We could have two cows where the conventional farmer has one. Then the government set the standard at 11,000 kg of milk, which is the unit in which they measure in the phosphate legislation. 11,000 kg of milk is the maximum amount after which the excretion stops increasing. Now what those conventional farmers do, they try to get their cows to give 15,000 liters, so they have 4,000 liters for free. That way they don't have to buy phosphate rights for that. Meanwhile our cows only give half of that."

As can be surmised, the phosphate law is disadvantageous for biological farmers compared to conventional farmers. The biological farmers do not feed concentrates to their cows and stay within the legally permitted limits. However, they are treated the same way

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<sup>2</sup> Concentrates can be defined as animal feeds with a more concentrated nutritional value. They can be distinguished into simple concentrates, such as grains and legumes, and compound feeds. Farmers feed their cows concentrates to increase the milk production.

as conventional farmers. No distinction is made and therefore they struggle to survive financially.

Datema explained the difficulties that biological farmers experience when it comes to manure:

“for example, we now have fertilizer legislation that allows me to use a maximum amount of nitrogen from livestock manure on my crops and if my crops need more nitrogen then I have to buy fertilizer. Instead, you could also just say, well if you need more nitrogen, you get it out of your manure and you make sure it doesn't leak to the surface water and you use it all. Instead of having to use fertilizer.”

This example illustrates how practices that differ from conventional farming encounter barriers when it comes to Dutch policies.

The farmers also indicated that they often run into regulations as regards to their applied sustainable practices. The initiatives that the farmers want to take are not always allowed because they have to comply with a multitude of rules. They described various situations that showed how the policies are not suitable for sustainable forms of agriculture. Hamelynck, the CSA horticulture farmer with a permaculture gave one such example:

“We built three pools on our land, which is part of an attempt to increase biodiversity, frogs, toad, ducks and insects. While we were digging those pools, the environmental enforcement organization of the province of Friesland turned up. They said that what we were doing was not allowed. At least, you have to apply for the excavation permit. The excavation law states that you may not put a shovel in the ground, unless you apply for the permit. Plowing is allowed, but they try to prevent soil trade. That you are not going to dig up ground and resell it. However, there are many exceptions. You have to apply unless you install drainage pipes in your ground, that is an exception. You can build pools in nature reserves, no application needed. Only no one had thought of the idea of building pools on agricultural land. So there was no exception for us in the provincial law and we had to apply for it and it cost €1.200. We now [ironically] speak of the pools with a golden edge. In the end, the provincial states decided that they felt sorry for us and so we got a discount. In the end we then had to pay €200. But there is still no exception in that law, every subsequent farmer that wants to build such a pool will encounter the same problem. There should be an exception for the construction of ponds on agricultural land in the excavation law.”

This case illustrates that policies tend to work against new initiatives, because the law envisions a particular set of delineated practices, and anything that falls outside these boundaries – even if good for nature – is punished as an illegality.

Van Ijzendoorn encountered similar complications with rules. He explained:

“Well, it is the small things, in which it becomes clear how the agricultural industry actually works. We have a bakery but we also had a mill, a very large millstone where we used to grind our own grain. However, a new commodity law

was introduced that did not allow to grind grain in open bins. It was a matter of public health, but that is nonsense because in the oven it heats up to 280 C°, but those are rules we have to deal with.”

His practices were not allowed because of changing regulations that complicated the manner in which he was locally producing bread.

These are some examples of regulations that complicate the methods and practices of sustainable initiatives. It is made clear once again that most policies are aimed at large-scale intensive conventional agriculture. Van Ijzendoorn believes that the policy suppresses many initiatives, as it is difficult to get through.

Van Rijn partly nuances the counteracting power of the government. He put forward that sustainable farmers are a smaller group and that the rules are therefore logically not tailored to the minority, but to the standard. He does not necessarily feel discriminated against because the government is not saying that you should use fertilizers or antibiotics. Many actions the sustainable farmers take are the practices of not using something - No plowing, no fertilizer, no pesticides, that is not made impossible by the government. Nevertheless, he believes that government policies should change to be more ecologically responsible and should be more reliable, in that the rules should not change as often.

Datema highlighted yet another problem with Dutch law and regulations. He agrees that Dutch agricultural and environmental policy is quite complex. However, he stated that the complexity is also caused by the farmers themselves who demand multiple exceptions to every new legislation. He sees how the policy becomes complicated due to the combination of European requirements and the Dutch context. He mentioned that one of the consequences of this complex policy is that farmers do not understand the policies and ask for help with their manure accountancy from their fodder advisor, who understands the policy better. The problem with this is that the fodder advisor may have a different interest than the farmer, which means that this does not help to reach optimal implementation for the farmer. This will be discussed in the next barrier.

It is clear from the perspective of farmers that legislation creates a barrier to sustainable practices across all types of farming. All of the farmers interviewed, being from different sectors and using different types of farming practices, pointed to areas of legislation that prevent them from using or switching to sustainable ways of farming. Whether a milk quota, phosphate rules or barriers to excavating sites on their land, all encountered rules more oriented towards large-scale intensive conventional practices which presented difficulties for sustainable farming initiatives. When policy is based on conventional practices, less-used practices can be left at a disadvantage, either from being placed under unmanageable ways of working for sustainable farming or by being overlooked entirely. Even Datema, as a conventional dairy farmer, agreed that the Dutch agricultural and environmental legislation is a barrier to sustainable initiatives.

It is perhaps unsurprising that legislation, and thus policy, cater towards the most conventional or dominant practices used in the current agricultural market. However, practices arguably cannot shift in a significant way towards sustainable farming unless legislation and its corresponding policies are changed to facilitate such a shift. As long as legislation remains focused solely on large-scale agriculture and prevents, for example, a

farmer like van Ijzendoorn from grinding his own grain due to a commodity law aimed at large farms, smaller farms will remain disadvantaged. Though a swing entirely in the opposite direction would seem inappropriate, since after all current legislation is based on the most-used methods, there could be a better balance struck between upholding the status quo and large-scale measures of public health while also keeping in mind smaller farms and more sustainable methods.

### *6.1.3 Knowledge, research and education*

The third barrier is knowledge, research and education regarding sustainable agriculture. According to Hamelynck, current agricultural education is not aimed at sustainable forms of agriculture, but rather at intensive farmers, with maximization of production as the goal. At the agricultural school the aim seems to be to produce as efficiently and as much as possible, not necessarily to produce sustainably. Datema said that he regularly received students from the secondary agricultural school who have to do a school assignment. The only questions they ask him are about how much he produces and how he can produce more. They never ask the question of whether he also contributes to agricultural nature management, for example. This illustrates the focus of the education these students receive. They ask questions about increasing production because that is the main focus of their study program, not sustainable initiatives. Agriculture students seemingly are not taught about sustainable agriculture. This imposes a barrier for the increase of sustainable initiatives because if future farmers are not studying these practices, it cannot be expected that they will become sustainable farmers.

Rijn has also noticed the problems concerning agricultural education. When he spoke about the lack of sustainable education with the agricultural vocational education, the educator explained that in order to ensure that not too many students drop out, they want to stay close to home. They did not want the practices to differ from what their parents (often farmers as well) have taught them. He said:

"I find that so strange, it should be the task of agricultural education to show things they don't know, to break through the limited vision. This does not mean that everything has to be changed immediately, but at least they take note of it so they are aware that it can be done differently."

The knowledge of novice farmers is formed through education, along with any prior knowledge that may have been gained through the family business. Related to this problem is the troubling notion that most agricultural research is also dominated by the conventional forms of agriculture. According to Hamelynck, this is due to the fact that research is co-financed by parties in the food chain such as Lays, Unilever, Albert Heijn and Friesland Campina. Van Ijzendoorn agrees that most of the research is co-financed by the agro industry. Research into small-scale sustainable initiatives is complicated to achieve, since the current parties in the food chain do not support this research. They are not interested in small-scale sustainable products, but in large-scale conventional production. Hamelynck also explained that the sustainable research that is done does not necessarily end up in the right place. It often ends in a drawer of policy makers. In fact, she explained it is not even the problem that research does not end up in the right place, but that agro-ecological farmers, for example, have completely different issues than the

issues that are looked into. As an example she said: "take the use of manure, for agro-ecological horticulture. Does that manure contain de-wormer? If you use that fertilizer in your garden, will that also have an effect on your soil life? That is a type of practical need for research that is not discussed in the current research institution."

Van Ijzendoorn also indicated that he experiences the research focus on conventional agriculture. When he started his business in Flevoland, he was told that the phosphate level in the ground would be too low. However, he discovered that there is enough phosphate, only the phosphate was not taken into account as available because they assumed that plants could not absorb it using the usual agricultural methods. Thus, the soil research that is done only takes conventional methods into account.

As mentioned in the previous section, another problem with agricultural knowledge is that of mixed interests. Datema explained this concretely:

"I notice that I have a lot of parties around my company who all provide me with advice, but they are actually all companies that also have an interest in that advice. Fodder suppliers who also advise me about my fodder. The Rabobank (a large commercial bank) advises me on my loans. So we are caught up in a system that we have organized ourselves, that is not something you can blame someone on, but that is the system, that we get advice from someone who has an interest in that advice. So the chance that my fodder supplier will say to me: 'if you are going to feed your animals less concentrates, maybe you will earn more.' In that case they would shoot themselves in the foot."

He mentioned the loans of the Rabobank, which has encouraged farmers to produce more and invest more (NPO, 2019). The farmers are left with debts and need to produce as much and as efficiently as possible to stay in business. Thus, the companies that provide advice for farmers on their products might not have the interest of the farmers in mind. They can be biased. They are not independent as they can benefit from the farmers using more of their product.

Datema described 'the system' as the system of agribusinesses and advisors surrounding farmers, and he described the market system as being under influence of policies and worldwide competition. In their definitions of 'the system' in which they function, the interviewed farmers mentioned policies, the market, consumers and agribusinesses.

It is clear that the focus of education and research is on conventional intensive agriculture. This can be explained by looking at the focus of the Dutch agricultural policy. As discussed in the previous barrier, policies cater towards the most conventional or dominant practices used. When policies are aimed at a certain practice, it often follows that education and research focus on that practice as well. If policies are aimed at maximization of production, agricultural research and education bolster the same aim in order to reach a higher production, since research is needed to inform the intensification of production and farmers must also be educated on the most common, conventional methods of farming as well as any challenges or developments in this area. For research, this may also mean there is more funding available in these areas, for example. These two aspects, knowledge and education, are linked to one another and arguably to the agricultural 'vision' of the

current policies on agriculture. They often maintain popular methods or the predominant policy priorities. As attested to by the farmers, less used sustainable methods had not even been included in some vocational education. This leaves a gap in the knowledge and education of future generations of farmers, and is a barrier to embracing and carrying out sustainable farming. Farmers cannot act if they do not have the correct knowledge, and part of that knowledge should come from their education. As van Rijn mentioned, this need not be a complete change or even a push towards new practices, only an inclusion of all the possible information so that farmers can make their own informed choices. The agricultural school in Dronten can be taken as an example. On their website they state what students will learn. The keywords they use to describe their learning program are: cultivation, crop protection, soil, fertilization and plant breeding (Aeres Hogeschool, 2019). They do not mention sustainable methods or practices within their study program. Thus though no policy dictates that sustainable initiatives *not* be included, knowledge and education as well as research reflect the goals of the system. This can lead to a barrier for farmers that indirectly suffer from the lack of knowledge and development in the area.

Another complexity that can be gleaned from the information provided by farmers based on their experiences is that the complexity of the agricultural and environmental policies in place are difficult for farmers to fully understand. The complexity itself is a barrier for farmers. As reported by several farmers, farmers often have trouble comprehending the policies and so they must rely on advice from advisers that often have mixed interests. Consequently, the complexity of the policies indirectly leads to the farmers seeking advice from companies who do not necessarily have their best interests in mind.

#### *6.1.4 Position of the farmer in the chain*

There are about 60,000 farmers in the Netherlands. The problem with their position is that there are only five food purchasing organizations (PBL, 2012). Hamelynck explained the problem. through an example: if a farmer wants to supply cauliflowers to the supermarkets and (s)he wants five cents more, the food purchasing organization can simply refuse to buy the cauliflower. The farmer has no options because the other for-purchase organizations can do the same thing. In this manner, the agricultural industry and the supermarket have control over food prices. Van Ijzendoorn sees this as a major problem. He stated that both citizens and farmers no longer have a say in the matter and that, for the agricultural industry, food is only a revenue model. However, he emphasized that food is so much more: "Nutrition is part of the first needs of life in the pyramid of Maslow. I don't think you should give that away." These farmers stress the importance of more honest prices for farmers, because the low prices supermarkets want to pay makes it harder for farmers to make ends meet. This means they have to produce as much as possible and as efficiently as possible, if they want to earn a decent living. In this situation, it is understandable that farmers feel as if they cannot switch to more sustainable practices, as they do not want to lower their production and their income.

The alternative, selling products more at the farm and in the short chain, directly between farmers and citizens, is desirable, but according to Datema it is not possible for the majority of farmers. Van der Heide agrees. He explained the problem:



“Look, an average arable farm is maybe 80 acres. If a quarter of your land is potato, average yield is 50 tons per acre, then it's not abnormal if you have 1000 tons of potatoes in the shed, a million kilos. You cannot imagine 100,000 people coming to get 10 kg of potatoes from your farm shop.”

This example illustrates that such a short chain is not always a possibility for farmers.

Van der Heide emphasized that supermarkets are therefore a smart distribution system. Selling products at home is difficult with a one-man business. The supermarket makes it possible to get all kinds of different products from one place. However, he also believes that the supermarket should not be in control of the chain.

In addition, according to Datema, another problem is the supermarkets' focus on the lowest price: "Abroad, supermarkets advertise with the quality of the products, but in the Netherlands the emphasis is on the low price. We have very good quality, but more importantly, the lowest price!" This focus on offering food for the lowest possible price takes the focus away from the quality of the food and the quality and sustainability of the production methods. A low price means a low price for the farmers and less opportunity to increase their sustainability.

As seen from the interviews with the farmers, they do not have a strong position in the chain. Farmers in the Netherlands supply their products to 1,550 transporters, who supply 5 purchasers, who then distribute their products to 25 supermarkets with approximately 5,000 retailers (PBL, 2012). This concentration of power in the chain held by the food purchasing organizations can be explained by the increase in scale of the food trade. In such a competitive market, often only the largest players remain, who then have the most power (PBL, 2012). This power dynamic does not go unnoticed. In a 2018 letter to the House of Representatives, the Minister of Agriculture, Nature and Food Quality expressed her concerns about the position of farmers in the chain (Schouten, 2018). She also mentioned the degree of concentration of power further down the chain, concerning the purchasing organizations, which can create unbalanced bargaining power. The Minister also indicated that farmers and horticulturalists often have to accept market prices and that their position is put under pressure. For farmers, this results in a barrier because they do not have the power to change their situation. Their priorities also may not match that of those who are in power, whose focus is on driving costs down. As such, the farmer's ability to change to sustainable methods may be hindered by their position in the chain and limited availability of purchasers as well as the priorities of those purchasers. In the current agricultural system it is worthwhile to recognize that the Dutch government has supported the scale increase of food production and supply after the second world war and is now facing pushback over the problematic aspects this power concentration poses (Kromhout, 2003).

#### *6.1.5 Free-trade*

NAV board member Keimpe van der Heide explained NAV's view on free-trade agreements. He said the NAV does not believe in free trade of food because food is far too important to be left to the market alone. It should be under society's control:

"In Europe, certainly in the Netherlands, we place higher requirements on food production than in the rest of the world. We set requirements for our own production methods, but not for our import products, due to the agreements made in the World Trade Organization. In the WTO it has been agreed that you may set some requirements for food safety, but not for the production method. So what we are not allowed to produce here, we may consume here."

This barrier is identified by all farmers. In 2019, the Netherlands exported 94.5 billion worth of agricultural goods (Jukema, Ramaekers & Berkhout, 2020). This makes the country one of the biggest exporters in the world. The worldwide market competition made possible by trade agreements with countries such as the United States, Canada and Brazil, makes the transition towards more sustainable agriculture complicated.

Free trade means that an onion farmer from, for example, Dronten has to compete with onion farmers from, for example, Colombia or India. According to Datema, consequently, farmers are not given the opportunity to produce more sustainably, since food will be acquired from the supplier that can produce it the cheapest. Van Rijn agrees. He argues that there is no such thing as a level playing field for farmers in the world. "In New Zealand you can produce at such lower costs with barely any animal welfare regulation. You can never compete with that. Without the subsidy system we have now, there would be a clear-cut in the countryside and only large companies would remain." He mentioned the subsidies that Dutch farmers receive from the government that make exports possible. Without these subsidies, he said farmers would not survive. The difference between the vision of the LTO and the NAV and the NMV is remarkable. The LTO strongly supports free trade and believes that the Netherlands has a strong interest in international trade as a small country with an open economy. The LTO states that, for example, CETA, the free trade agreement between the members of the European Union (and therefore the Netherlands) and Canada will bring farmers and horticulturalists in the Netherlands more than it costs. However, the NAV disagrees. The union takes the position that every region should have food sovereignty. Van der Heide explained in more depth:

"If we cannot grow coffee in Europe and we need coffee, you have to be able to import it. We are not against trade and against exports, most farmers produce much more than they can eat, so export is common business, but it has to be desired trade. If you are exporting something to a country, it should be because they are not able to grow it, or it is off-season. But because of the free trade agreements, for example the CETA treaty that has already entered into force temporarily, we export dairy products and cheese to Canada, while they have a very large and good dairy farming sector there and do not need it at all, but with those free trade agreements you have to open your borders to it. That causes a lot of shipping of food around the world which is actually not necessary at all. That is very unsustainable, if you look at sustainability and climate you should not want that. Therefore, food must be produced as close to where it can be eaten."

The deviating vision of the LTO can be explained by the heterogeneity of farmers in the Netherlands. Some farmers do experience free trade as a barrier, while others might not believe it to be a barrier.

Datema expressed doubts about whether 'free market thinking' is suitable for a product as important as food. He wonders if food is not important enough that good agreements can be made about it. He emphasized that the free market does not really exist. All the markets we know must still comply to rules and regulations, so there are no truly free markets anywhere. He gave the labor market as an example:

"You may not just go work in a country, and if so, there is an agreement on how much they should pay you as a minimum. Therefore yelling that the free market economy is sacred is in my opinion hypocritical, because all the markets we have are subject to rules. It is not that we have to abolish the entire market, it is about under what conditions the market should operate. And in my opinion, food would be a product that is so important, we set some rules. we want good food, we want it to be affordable for everyone, we want food to not damage the environment, we want food production to maintain or promote biodiversity. That means you have to make agreements about how that market should function."

Van Rijn highlighted an additional problem of free-trade. The surplus of free trade-driven overproduction is sold in African countries. The advantage of this is that they have relatively cheap food, but the disadvantage is that the African agricultural sector cannot develop as they have to compete with cheap products. This is detrimental to the food sovereignty of African countries, given that having an adequate agricultural sector in your own region makes the country more food secure than depending on the surpluses of other countries. Van der Heide also mentioned this point and added that being a farmer in such countries is actually a guarantee of bitter poverty. Without agriculture, the poorest part of the population no longer has any means of subsistence. It is important to realize that the possibility to sell the overproduction on the African market creates even less of an incentive to export less. If there always is a market that will take up the overproduction, there is less reason to stop overproducing. In addition, the low food sovereignty and poverty of African countries is a serious sustainability challenge that needs to be solved in order to establish a sustainable developed world.

In an example, van der Heide described what happens when a country moves against world trade resistance. He explained that Colombia has imposed an import levy on fries, because they grow enough potatoes to meet their own needs (Bontjes, 2019). Colombia states that it does not need European potatoes because European prices are so low that it completely destroys their own potato cultivation. However, the WTO has started a lawsuit against Colombia because they believe that import levies should not be allowed.

The interviewed farmers emphasize that they are not opposed to imports and exports, but rather to the lack of agreements on trade. Datema believes that the products you import should at least meet the same production requirements as you have for your own production. It must be said that this would greatly benefit Dutch farmers compared to those in third world countries, because Dutch farmers are in a much better position to meet production requirements. Datema also mentioned that the Netherlands indeed exports a lot, but that 80 % of our exports remain within the European Union. The Netherlands mainly exports to Germany, Belgium, France and England (Rijksoverheid, 2020). He believes production requirements within European borders should be possible.

Finally, van Rijn discussed the viewpoint that the responsibility should be placed

in the hands of the citizens. On the one hand, citizens like to see calves walking by their mother, but buy the cheapest dairy on the other. Their choices can influence the production methods. However, as previously mentioned, only a small part of Dutch production is consumed in the Netherlands, which means that consumers in for instance Germany, China and Canada can also influence the Dutch production methods. Datema makes a similar comparison. He practices meadow bird management and still considers meadow bird management in the Netherlands to be too small. However, expanding meadow bird management is expensive and cannot be recouped through the milk price.

"In the Netherlands it would be possible, here I can explain to people that I take good care of my godwits and therefore sell some more expensive milk, but for milk going to China, it is difficult to explain the importance of a bird they have never heard of."

This example illustrates the difficulties that arise from the influence (international) consumers have on the production methods.

As shown by the interviews with farmers, free trade agreements make it so that farmers must compete with cheap import products from all over the world. Food is imported from the place where it is offered the cheapest. Selling food cheaply in other countries is often accompanied by unsustainable production to keep costs as low as possible (Leahy, 2008). The requirements for the sustainability of food production are different in all countries. As a result, the requirements can be many times lower abroad than they are in the Netherlands, despite the fact that they are still in competition with one another. These free trade agreements are policies. They are made by and agreed between governments. As raised by one farmer, van Rijn, the high level of export would not even be possible in the Netherlands without government subsidies. This is also a policy decision made by the government. As an example, the Netherlands voted in the House of Representatives this year on CETA, the free trade agreement with Canada. The House of Representatives ultimately gave its approval, but the votes were divided and the majority was small (Sondermeijer, 2020). The treaty has yet to be approved by the Upper House, where it is not expected to get through. This is just one example of how free trade agreements depend on the decisions made in the context Dutch politics and decided on by the government. It is a policy decision to enter into and conclude agreements and therefore when such policies disadvantage farmers it may be seen as policy creating a direct barrier, in this case to the advancement of sustainable farming. The interviewed farmers showed a cohesive viewpoint that there is insufficient policy, they want the production conditions for food for free trade to improve. This is not to decrease import and export, but to ensure trade should be desired by both parties, and to ultimately create fair competition for farmers.

#### *6.1.6 The distance between producer and consumer*

The last barrier is the distance between producers and consumers, or farmers and citizens. This relates to the farmer's position in the chain, but will be described as a separate barrier, because it was frequently mentioned by the farmers. Van der Heide defined 'the system' as the production and consumption system within Dutch society where society can make demands for the agricultural production, of which they do not want to bear the consequences. This definition is framed negatively towards the consumers' willingness to

pay. This can be explained by the growing distance between producer and consumer. Over the years, from the perspective of farmers, a social-cultural distance has developed between citizens and farmers. According to half of the farmers, citizens sometimes seem to lack awareness of where the products originate from and farmers feel less appreciated in public opinion. This lack of appreciation by the public can be explained by the position of the supermarket between the farmer and the consumer. Van der Heide mentioned a farmer who sold his products partly in his farm shop and partly to a trader.

“This farmer has been selling his potatoes to consumers for 25 years and never did a customer say: well I like your potatoes, but they are too expensive. Instead they say: last time you had those tasty potatoes, do you have any more of that? But he doesn't sell all his potatoes at home, part of it just has to go through a trader. The trader sees my products and immediately states I am asking too much. The customers have never complained about the price, because they have seen where the product came from.”

Van der Heide's example demonstrates the appreciation of the product that can arise when consumers purchase their product from the producer. They seem more willing to pay when they are aware of the origin of the product. The trader however, demands the lowest price possible, because when the product is sold in the supermarket, the consumer actually does not want to pay as much. This makes it financially difficult for farmers to produce sustainably, because the lowest production prices are attained by conventional industrial production, not by sustainable production.

Lack of awareness about the origin of products among citizens is a barrier to sustainability according to the interviewed farmers. Van der Heide said he understands it is difficult for the consumer to choose a good product, giving an example: “Suppose I stand before the cheese shelf and there are ten types of cheese that seem to be comparable to me, I would choose the cheapest one, which makes sense.”

However, it could make a big difference if citizens' appreciation grew. Hamelynck stated: “as a citizen, what you eat can influence how your landscape looks and whether biodiversity has a chance.” Datema agrees that the consumer can make many choices with their eating habits. He said:

"we live in a country where we believe that every product that is for sale must be good. The products indeed meet all quality requirements, but they are not always produced in a good way. The consumer must realize that they are actually making choices on a daily basis, through what they buy. That is the power of the consumer, which they can use, but it does require awareness.”

Van Ijzendoorn stated that if all citizens really knew how things are going in conventional agriculture, there would be a large democratic majority that would politically impose requirements on production methods. Van Ijzendoorn's beliefs illustrate how he thinks awareness could change the political opinion of consumers. This emphasizes the distance farmers experience between them and consumers and the importance of the willingness to pay for sustainably produced products.

As becomes evident from the interviews, there is dissatisfaction concerning the connection farmers have with consumers. In identifying this barrier, the farmers focused attention

for the most part on the lack of willingness to pay for their products and a lack of awareness about the origin of the products on the part of the consumer. This situation is caused by the distance that has formed between farmers and consumers, in part due to the outflow of small farmers that started after the introduction of the Common Agricultural Policy by Dutch farmer and politician Sicco Mansholt, as explained in Chapter 4 (Kromhout, 2003). Small farmers could not compete in the industrializing and upscaling industry and had to stop production. Up to this date, the Dutch farmer population has been declining. Due to this decline in farmer population, it is arguably unsurprising that consumers are more distanced from farmers. Before the upscaling of the industry, being a farmer was a more common profession. Maybe your father was a farmer, or your grandfather or aunt. This decrease of farmers, caused in part by changes to policy in the form of the CAP and subsequent developments, can be seen as a principle reason for the growing distance between farmers and consumers. In this way, policies such as the CAP indirectly affect the relationship between farmer and consumer, by changing the nature of farming nationally, and contribute to this barrier for Dutch farmers. The other part of the equation, the attitudes of consumers and their lack of awareness, fall outside the scope of policies but may be seen as a consequence of the changes to farming in the Netherlands over time and the decline in small scale farms.

#### *6.1.7 Sub conclusion*

The interviewed farmers identified six systemic barriers, which are all directly or indirectly related to policy. Both environmental and agricultural policies influence the creation of barriers. Often the focus on large-scale industrial conventional farming has an indirect connection to creating or maintaining systemic barriers for farmers. Policy plays a dominant part in limiting the possibilities farmers have for sustainable initiatives. It becomes clear from the interviews that the barriers which the agricultural system faces are directly and indirectly determined through policy decisions, which fits with the structure-agency debate discussed in the theoretical framework. In the structure-agency debate, the policies are presented as the structure in which the agents (the farmers) can move.

It is important to recognize that part of the difficulty created by the identified barriers is the financial burden for farmers trying to make their practices more sustainable. They seem financially stuck and need to keep producing in an industrially conventional manner in order to make ends meet. As explained in the previous chapter, sustainability for farmers is not only related to the ecological factors, but also has to be economically and socially feasible. The identified barriers make it difficult to even consider sustainable practices. The lack of trust of farmers in pursuing sustainable practices mentioned in the previous chapter is understandable, given the barriers described. The need for farmers who set an example becomes even more distinct. The importance of the initiative of increasing the connection between farmers and citizens also becomes clear after understanding the distance that farmers experience. These two bottom-up approaches - farmers that lead the way and increased connection with the consumer - could help to overcome some of these barriers faced by farmers trying to utilize sustainable farming practices.

It has become apparent that farmers within different sectors and with different practices experience barriers differently. Farmers are a heterogeneous group and

therefore have different interests. Nevertheless, all of the barriers described were mentioned by at least half of the farmers interviewed. Lastly, the farmers often speak about the system. They define the system mostly as policies, the market, society and agribusiness, which does not differ much from the definition provided in the theoretical framework. They seem to recognize the role policies play in the barriers, which makes their lobby efforts to influence agricultural and environmental policies a logical next step. These lobby efforts and initiatives - made in response to the barriers identified - are therefore discussed more in depth in the following section.

## **6.2 Lobby efforts**

Now that the systemic barriers that farmers face are identified, the strategies that farmers undertake and propose to overcome the barriers will be discussed. As mentioned in the theoretical framework, the initiatives farmers take are divided into two categories. Chapter 5 dealt with the first category, namely the sustainable practices of farmers. The second category, which will be illustrated in this section, concerns the lobby efforts farmers undertake to increase the sustainability of the agricultural system. Farmers strategize to overcome the barriers through lobby efforts that can be shaped in the form of organizations, associations and coalitions, or farmers that make their own effort to speak up (i.a. to the researcher) and try to pressure the system to change. In the discussions about the barriers with the farmers, four lobby initiatives came to light. These initiatives are outlined to better understand how farmers strategize to increase the sustainability of the agricultural system and to overcome the identified barriers. These are just some examples of strategies, and not an exhaustive list of sustainable initiatives. They serve to give a view of the initiatives taken by the farmers interviewed, and in doing so also highlight what they see as important issues to tackle and the corresponding strategies to do so.

### *6.2.1 Sustainability focus within agricultural and environmental legislation*

Dutch agricultural policies are mainly focused on conventional agriculture. This creates a long list of obstacles for farmers who try to implement sustainable farming methods. Instead of asking for an exception on every policy that should not be applicable to sustainable farmers, Bregje Hamelynck and some interviewed farmers plea for new legislation that is focused on sustainable, local agriculture. In this legislation, exceptions can be made for directives that are aimed at conventional agriculture. This way the farmers strategize for sustainable initiatives to not have to endure the impact of the policies that are not meant for them and to be stimulated instead of discouraged. This strategy involves (organic/agro-ecologic) farmers who are not considered in Dutch agricultural and environmental policies currently. They strategize to change their situation by proposing a new legislation with a more sustainable focus.

### *6.2.2 Financial investments revision*

Financially, the transition to more sustainable agriculture requires support. The financial position of the farmer is weak. Piet van Ijzendoorn, the biologic dynamic farmer with a mixed farm, explains in an article of Veerhuis, a Dutch knowledge centre, that the leasehold of Dutch agricultural lands is extremely high and the costs for the farmer can make it impossible to make a living (Mentink, 2020). Van Ijzendoorn often appears in the

media. This exposure of his beliefs can be classified as a category two initiative. By giving interviews, he strategizes to spread his vision about sustainable agriculture and the changes the system needs to implement. At the moment, subsidies that can be obtained in the Netherlands are largely focused on conventional agriculture and most of the money invested in agriculture focuses on research into production maximization of current agricultural practices. According to i.a. Hamelynck and van Rijn, this subsidy system should focus more on promoting sustainable agriculture. Hamelynck mentioned that the existing subsidies that are focused on sustainability are only relevant if you own a large amount of land. Her two hectares of permaculture allow for hardly any subsidy.

In the interview for this research with Van Ijzendoorn, he proposes that pension funds invest in Dutch agricultural land. There is approximately €15.600 billion in pension assets in the Netherlands and it would cost €70 billion to buy all of the Dutch agricultural land. In this way, the Dutch agricultural land would be owned by the people, which they themselves would benefit from. This would make money available to facilitate the transition towards more sustainable farming practices. This proposed strategy could financially support the farmers in becoming more sustainable.

As becomes clear, the interviewed farmers are strategizing to improve their financial situation. They propose to change the subsidies, to change the way pension funds invest to make agricultural land cheaper. They want more money for sustainable research and the promotion of sustainable agriculture. In this way they promote their interests and try to get more money for their goals.

### *6.2.3 Market regulation*

Although the production methods of Dutch farmers could be made more sustainable on a large scale by means of bottom-up or top-down initiatives, the problem of free trade remains. Free trade in food means that competition for farmers is high worldwide. The large Dutch exports make it increasingly complicated to set requirements for the production methods in the country, while the competitor does not have to comply with these requirements. Almost all interviewed farmers agree that food is too much of an important product to leave to the free market. Van der Heide, board of the NAV, explained the vision of the union on the matter of free trade. The union explicitly takes a stand against free trade agreements such as CETA and TTIP. They argue for protection of the market and supply management in order to regulate the food price (NAV, 2020). On a broader level, a manifest against new European free trade agreements has been initiated by nine agricultural and environmental organizations (Milieudedefensie, 2019). The initiators are Agriactie Nederland, Dutch Dairyman Board, Dutch Arable Union, Dutch Dairy farmers Union, Dutch Poultry farmers Union, Association for Organic Dynamic Agriculture and Food, Federation of Dutch Trade Unions, Platform Earth, Farmer Consumer and Milieudedefensie. Over 25 other organizations support the manifest. The manifest is intended to protect farmers, workers, consumers, animals and the planet against the coming free trade agreements.

Van Rijn, a biological dairy farmer, proposed a different system to price milk. He gave an example of how milk is regulated in Canada. A committee has been established in Canada that determines what a fair milk price is based on research. This price includes the fair production price and reasonable compensation for the farmer. Since fair payment



is provided for the production, it is also possible to set requirements for this production. Ideally, Van Rijn would like to see such a system in force in Europe. More farmers are in favor of a regional approach. Van der Heide would ideally see that a region such as Europe would be as self-sufficient in food as possible and should impose a substantial import tax on products that can be produced within the region. Import and export should only be something that benefits both parties. Datema emphasized that it must at least be ensured that what you import meets the same condition as what you can grow yourself. Again, this would benefit the Netherlands and could pose a disadvantage for countries that do not have the possibilities to meet the same production.

This particular strategy involves farmers joining together to stand up to the existing conventional agricultural lobby that is in favor of free trade. They arguably need to strategize in this manner, in order to stand a chance against the established order. This big organized lobby is a clear example of a category two initiative, where farmers try to defend their interests through lobbying efforts.

#### *6.2.4 Independent institutions*

Currently, many farmers make decisions about their farming practices based on their prior knowledge, education and the advice they receive. According to the interviewed farmers, there is a lot of room for improvement. Agricultural education should focus more on the sustainability of practices rather than on maximizing production. Van Rijn stated it should be the core task of education to offer alternative farming practices. Additionally, a great improvement could also be made in the advisement of farmers. Datema believes that farmers should be advised by independent consultants who have no commercial interest, rather than by consultants who possibly benefit from the advice.

It is worth noting that this strategy is in a way also a policy proposal, because the farmers propose to introduce independent advisors and independent education. As explained in 6.1.3, the current institutions often follow the dominant (conventional) policy focus and corresponding priorities. One could say that introducing independent institutions would go against the established order and their advice might also not be in line with the current policy focus.

#### *6.2.5 Sub conclusion*

The interviewed farmers suggested several policy proposals to strategize to overcome the barriers in the form of category two initiatives. These lobby efforts are attempted alone or within organizations, associations or unions. The interviewed farmers suggested these policy proposals to the researcher. These suggestions can thus also be seen as some sort of lobby efforts. They tried to convince the researcher of the importance of the suggestions and in doing so defended their interests. It is noteworthy that the interviewed farmers are actively strategizing ways to change policy. Almost all farmers are in a way connected to lobby efforts, through organizations, associations, unions or on their own. Even farmers who are not actively doing any sustainability initiatives that could fall in category one, are still actively involved in lobby efforts, to defend their interests. Arguably, they all seem to want to be involved in policy making and try to unite to attain a stronger lobby position. Lastly, they all seem to have appropriated the language of policymakers, as they use the terminology of policy makers throughout their proposals.

## **7. Conclusion**

In this study, the research question ‘what systemic barriers do Dutch farmers encounter in the process of making their agricultural practices more sustainable and how do they strategize to overcome these?’ is answered. To this end, a qualitative study is conducted in which 8 farmers with diverse farming practices were interviewed about the initiatives they undertake and the barriers they face in their attempts to become (more) sustainable. The study has attempted to identify barriers as perceived by farmers to possibly suggest new policy solutions based on bottom-up sustainability initiatives.

The results show that farmers define sustainable agriculture not only as ecological practices but also taking socio-economic aspects into consideration. According to farmers, sustainable agriculture must also be socially and economically feasible. Farmers are not easily inclined to take a risk by changing their practices and must still be able to make ends meet. Farmers undertake several types of initiatives, which can be divided into two categories. These categories are initiatives that, firstly, simply take place on the farm and secondly, lobby initiatives to change the agricultural system and policies. The initiatives that take place on the farm (category one initiatives) can be subdivided into three themes. The farmers care for the soil, by ploughing less and adding less fertilizers and pesticides to the soil to not distort the natural processes. They try to reduce the social distance between consumers and themselves, by increasing consumer contact, supporting the short chain contact and increasing consumer awareness. Farmers cultivate trust in sustainable practices by setting an example. When they show that sustainable practices are actually feasible, others become more willing to try such practices.

Six systemic barriers that directly or indirectly relate to policy were identified by the farmers. These barriers are: (1) access to land, as the expensive land prices in the Netherlands make it hard to earn a sufficient living and this makes switching to sustainable agriculture even less inviting; (2) legislation, as the environmental and agricultural policy in the Netherlands is mainly designed for conventional farmers. The policy is aimed at increasing production and reducing emissions that conventional farmers emit. Sustainable farmers are disadvantaged, because they do not contribute to those emissions, but must comply with the same policies. Also, many sustainable initiatives cannot be implemented, because they are not allowed; (3) knowledge, research and education poses a barrier because in agricultural education, new farmers learn little about sustainable farming practices and the educational aim seems to be to maximize production. Agricultural research is mainly focused on conventional farming because the research is co-financed by agribusinesses who have an interest in more production. Agricultural education and research both seem to follow the focus of the policies, and since agricultural policies seem focused on conventional farming practices, they conform to that vision. Since the policy is quite complex, farmers need advice on their practices. This advice is provided by the parties that can benefit from the advice, so the interests of the farmer are not necessarily protected; (4) The position of the farmer in the chain leaves farmers with little to say. Farmers have to sell their products to only five purchasing organizations. These organizations have the power to control the price of agricultural products and a low price results in no room for sustainable initiatives. The policy induced

upscaling of food production has led to the concentration of power which caused only a few players to remain; (5) Free trade and world-wide free trade agreements mean that farmers have to compete with products that are produced all over the world. Sustainable production methods result in more expensive products that still have to compete with products originating from other countries that have much lower and less sustainable production standards; (6) The distance between the producer and the consumer makes farmers feel unappreciated and consumers are less willing to pay the extra cost for production of products because they are not aware of differences in production. This distance can be explained by the declining farmer population, caused by the industrialization of the agricultural sector since 1970. Striking about the identified barriers is that five out of the six cause financial difficulties for the farmers. Sustainable farming is in many cases not financially feasible due to these barriers.

The farmers undertake two categories of initiatives. The second category is described as lobbying efforts to change the system and defend sustainable interests. The farmers attempt this alone or with, for example, an organization. The results have indicated that the farmers propose policy and system changes to strategize to overcome the identified barriers. They propose new legislation specifically for sustainable farming practices and an increased focus within environmental and agricultural policies on sustainability. They want farmers to receive better financial support in order to become more sustainable through subsidies or investments in Dutch agricultural land. They argue for market regulation where a more regional approach is used and import is only carried out if the country cannot produce the product itself. They also stress the importance of more sustainable education and independent agricultural advisors to provide farmers with advice.

This qualitative study has shown that farmers perceive six systemic barriers in attempting to make their farming practices more sustainable. The barriers are all policy related and often create financial difficulties for the farmers that obstruct them from becoming (more) sustainable. Farmers in the Netherlands undertake various types of initiatives, both on the farm, where sustainable practices are carried out, or as lobby efforts, through policy proposals to overcome the barriers.

## **8. Discussion**

In this chapter the results are interpreted and in retrospect compared to the theoretical framework to check for coherence. Next the limitations of the research are discussed. Hereafter, the theoretical and managerial implications are examined. How the research extends the current theoretical insights and adds to literature is explained and further policy advice is given. Lastly, suggestions for further research are presented.

In the results section, the definition that farmers use for sustainable agriculture was given. Their definition deviates from the definitions given in the theoretical framework. The farmers described sustainable agriculture as ecological practices such as caring for the soil and making sure the soil would be able to provide them with crops for years to come, but they also include the socio-economic aspect of sustainable agriculture. It should not be forgotten that farming is their way of making a living and their income needs to remain sufficient in order to consider changing their practices to become more sustainable. The reason why the socio-economic part of sustainable agriculture is less considered can be explained by the focus that exists in the literature. Literature often focuses on the ecological side of sustainable farming practices, such as emissions, organic matter content, soil erosion and pesticides as presented in the theoretical framework. This is understandable, considering the norms and laws in Dutch agricultural and environmental policies are mainly focused on the legally permitted amount of minerals such as nitrogen or phosphate. These top-down theory-driven definitions do not include the socio-economic aspects that matter for the farmers. Farmers themselves notice sustainable agriculture is only possible if it is financially feasible. The importance of realizing the difference between top-down theory driven definitions and bottom-up empirical driven definitions explained in the theoretical framework is demonstrated here. However, as explained in the theoretical framework and shown in the results, the distinction between top-down and bottom-up may in the case of farmers and policy not be so strict. Farmers are actively involved in influencing policy and therefore the difference between top-down and bottom-up cannot be as clearly defined.

In total six barriers that relate to policy were identified by farmers and for each barrier at least half of the farmers mentioned the identified barrier. These barriers ranged from access to land to trade agreements and related either indirectly or directly to policy. Various examples were given for each barrier, which illustrated the difficulty faced by farmers in trying to apply sustainable methods. Such examples included laws such as the milk quota or wider framework issues such as the position in the chain. The socio-economic aspects of sustainable agriculture also appeared to be of importance when evaluating the systemic barriers found. In total, five of the six barriers contained an aspect of financial difficulties for farmers: access to land is difficult because the land prices are costly, Dutch policies that are mostly aimed at conventional agriculture can result in extra costs for sustainable farmers, the weak position of farmers in the chain leads to low prices of products, the distance between producer and consumers causes a lack of willingness to pay and free trade results in worldwide competition for the lowest possible price. Thus the barrier in place, which relates to Dutch policy and how the agricultural sector is managed, contains not only an ideological component but a financial one. The financial difficulties farmers face limit their ability to become more sustainable because they are in the end

bound by the cost of their day-to-day operations and they must find a way to keep their farms afloat in the market. Thus in addition to a change in vision, attention should be paid to the financial side of the transition for the farmer.

Further, the results show that farmers undertake both categories of initiatives as explained in the theoretical framework. In Chapter 5 the first category of initiatives are presented, such as caring for the soil and connecting to consumers through farm practices. In Chapter 6, the strategies farmers undertake to influence policy are described, such as lobbying against free trade united in organizations and unions and policy proposals such as introducing independent agricultural advisors. The two categories are sometimes simultaneously carried out, which seems logical, as they can use the first category (initiatives on the farm) to reach the second category (lobby efforts) as was seen in the case study of van Ijzendoorn. Arguably, the second category of initiatives is seen more often, as all farmers, even the ones who do not practice sustainable initiatives on their farms (category one), are part of or involved in an organization, association or union that protects their interests. They strategize to create a more favorable view among the public or to create more favorable policies. Farmers are not just solely working on their lands anymore, they are actively involved in lobby efforts, to protect their interests. That being said, the sustainable lobby efforts some of the interviewed farmers actively undertake must compete with the existing conventional lobby efforts. The conventional practices are supported by the current policies, which leads to barriers for the sustainable initiatives, as shown in the identified barriers. Nevertheless, category two initiatives can achieve big changes and one could say it is the most important initiative a farmer can undertake, because its influence will go beyond her/his own farm.

There is a rise in farmers who try to speak up and defend their interests. Milieudéfensie stated to the researcher that farmers are increasingly collaborating and forming coalitions to take action and support sustainable agriculture. The manifest against new European free trade agreements initiated by i.a. Milieudéfensie, the NAV and the NMV is supported by over 25 other organizations. This increase in collaboration is needed if the sustainable agricultural lobby tries to challenge the powerful conventional agribusiness lobby.

The second category was also highlighted by the efforts the farmers made by lobbying to the researcher. The researcher presented herself as part of Milieudéfensie and Utrecht University, which resulted in the farmers defending and lobbying for their interests. They tried to convince the researcher of the importance of a change of the system and mentioned policy proposals. It seems as if they were trying to lobby for the importance of research on the subject. This makes sense considering the knowledge, research and education barrier found.

The results also mention the definition farmers used to describe the agricultural system. They define the system as policies, the market, society and agribusinesses and they place themselves in the system as well, as being affected by the system. This is in coherence with the definition given by Caldwell (2015) in the theoretical framework, who defines almost the same aspects of the agricultural system. Farmer's also recognized the link to policy of these barriers, as was shown in their description of the various barriers and their second category initiatives.

This research has shown that the current agricultural system in the Netherlands

creates barriers that make it difficult for farmers to make their practices more sustainable and it has shown the way farmers strategize to overcome these barriers.

## 8.1 Limitations

The first limitation to this research is the amount of farmers that were willing to give an interview. Eight farmers were interviewed, while fourteen were approached. If more farmers had responded, it is possible that the barriers could have been explored in more depth. However, it does not seem likely that completely new barriers would have been discovered if more farmers had cooperated. Each barrier was appointed by at least half of the farmers, most of the barriers by even six farmers. This does give a clear picture that the barriers are really being experienced. It is possible that the researcher has influenced the results by asking follow-up questions on subjects and by the interpretation of the answers. Nevertheless, the farmers always had the opportunity at the end of the interview to add or clarify barriers or other subjects. The barriers found are mentioned often by a diverse group of farmers, which shows they are barriers caused by the agricultural system.

The sampling criteria can be a limiting factor for the research. However, the criteria used have led to a wide range of farmers. It must be said that eight farmers representing the diverse group of 53,000 farmers in the Netherlands might appear limited. However, the variation in farmers and the consideration of the representation in the method resulted in six clearly identified barriers that are identified by this varied group. Of course not all farmers in the Netherlands would agree with these barriers, but that can be explained in part by their form of practices. If they are not motivated to increase their sustainability, they are less likely to experience the identified barriers as limiting.

The outbreak of the coronavirus (COVID-19) is an unfortunate limiting factor for the research. Due to preventative measures, the researcher could not conduct the interviews on sight and therefore no observations were made (except for one interview). Being at the farm and seeing how the farmer brings about her/his initiatives could have helped to create a better understanding of the initiatives and barriers. The farmers would have possibly been able to show how their practices are limited or how they experience certain barriers. In the video call interviews, the farmers were asked to describe their practices in detail and follow-up questions were asked if things remained unclear. However, it could be possible that the farmers were subjective in answering the questions which would paint a misleading picture. Reasons for subjective answers could be the above-mentioned lobby efforts. Nevertheless, subjective answering of the questions could also have happened during a farm visit. Additionally, it can be assumed that the farmers spoke truthfully, as it is in their best interest to help identify the systemic barriers.

The last limitation to this research is that of translation and interpretation. The interviews were conducted in Dutch and the farmers used typical Dutch farming concepts to explain their practices and the barriers. To write the results chapter, the answers given in the interviews were translated, interpreted and described. This was difficult because many agricultural terms are Dutch and the farmers also used Dutch proverbs and sayings to clarify their point, which are hard to translate. Furthermore, the words used to describe 'sustainable' in Dutch are more varied. The farmers for example used 'volhoudbaar', 'toekomstbestendig' to describe their definition of sustainability, that are not perfectly translated by sustainable. The researcher attempted to not take the answers out of

context. This possibly resulted in some instances in less pleasantly readable sentences. The essence of the message is kept as much as possible, even if it meant that a sentence could not be literally translated and had to be completely rewritten.

It could be advised to conduct a follow-up study where the farmers are actually visited on sight. This could provide a better idea of the initiatives in real life and possibly create more insight into the systemic barriers.

## **8.2 Theoretical and managerial implications**

In speaking about the theoretical implications, it is necessary to return to the transition theory set out in the theoretical framework. As mentioned in the framework, in transition theory, transition is conceptualized as a state or 'phase' between now and the future. The theory suggests a distinction is possible between these states, while in practice, this might not be the case. In the research, it has become clear that the agricultural transition is not as unambiguous as described in the theory. It is not clear what phase the transition is in, or if phases can even be determined. Some might say the transition towards more sustainable agriculture is already slowly happening, others might say it has not even started yet. Based on this research, it is difficult to recognize the direction the transition is going. It depends on who you speak with, agro-ecological farmers might state that the transition is already happening, while conventional farmers might not recognize a transition or even the need for one. The truth stays in the middle, a transition might just not be so easily identified. However, it must be said that the amount of sustainable farming initiatives in the Netherlands are still an insignificant percentage of Dutch farming. So if a phase of the transition must be determined, it would be that no real change is happening yet. This might not come as a surprise, with the new vision of the Ministry of Agriculture, Nature and Food Quality still in its infancies. This does however indicate that the start of a transition might be in sight.

In most of the existing academic literature, barriers have been looked at almost exclusively from a top-down perspective. This perspective is understandable, because it is important to understand why policies or other top-down approaches fail. That being said, the distinction between top-down and bottom-up cannot be made as easily, as explained throughout the research. Farmers are involved in lobby efforts, have appropriated the language of policy makers and unite in organizations. These terms of top-down and bottom-up create a deceptive image of the reality, which is in fact more complex. Nonetheless, the perspective of sustainable farmers should not be forgotten. This research provides insight into the bottom-up perspective of the sustainable farmer, which indicates what barriers (s)he is encountering in making his or her practices (more) sustainable. In the current system, the biggest lobby consists of the conventional farmers, that have the biggest influence on policies. The upcoming sustainable farmers need to be better represented in the political lobby. With the identification of these barriers - as perceived by farmers - new policy solutions could potentially be articulated based on existing, bottom-up sustainability initiatives rather than on envisioned, conventional thinking. This point of view is of great importance because a problem can best be solved by approaching it not only top-down, but bottom-up as well. What happens in practice needs to be considered. This research presents the recommendations that farmers have in the form of category two initiatives to change the system so that the barriers are reduced.

There is a need for cooperation between the initiatives that farmers themselves can undertake (taking good care of their soil, improving contact between them and consumers and increasing trust in sustainable practices) and systematic sustainability changes that farmers lobby for (sustainable education, no free trade, more sustainably-focused policies and better financial support).

Based on the above, the advice put forward would be to include the identified systemic barriers in the reconsideration of agricultural and environmental policy in the Netherlands. Especially the voice of the farmers trying to improve their sustainability, but face these barriers, should be heard. The initiatives on the farm (category 1) could also be disseminated and supported. The identified policy issues ought to be taken seriously. As shown in Chapter 6, all barriers are related to policy, directly or indirectly, and could, over time, for a big part be solved by policy changes. The lobby that sustainable farmers have is growing and will most likely receive more political attention. However, they do need to compete with the conventional lobby, which makes it even more important for them to make their voices heard. Fortunately, organizations are already starting to come together and form alliances, as mentioned in section 6.2.3. A suggestion for further research would be to explore the lobby initiatives by movements such as the Boerenraad, that strategize to protect the interests of sustainable initiatives. This movement is still in its infancies, but is emerging to connect different types of farmers in different farming sectors who have the same vision in mind. It would be interesting to see how they communicate with each other and how they communicate to the outside. This could provide an image of how they strategize to make a sustainable agricultural future their main lobby effort.



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## Appendix I

### Interview guide (English version)

**Research Question:** *What systemic barriers do Dutch farmers encounter in the process of making their agricultural practices more sustainable and how do they strategize to overcome these?*

### Introduction

Hello, thank you for participating in this interview. My name is Juliette Brink and I am studying the master Sustainable Development in Utrecht and I am conducting my master thesis research about the barriers and problems farmers face when they consider or attempt to transform their farming practices into more sustainable agricultural practices. This can be all sorts of initiatives, such as nature-inclusive agriculture, agroecology, or circular agriculture. The aim is to understand how farmers see sustainability and what barriers they have to overcome to increase their sustainability. The data collected with this interview will be analyzed, to identify barriers. This master thesis will be submitted at the Utrecht University. If permitted by the participant, the interview will be recorded and notes will be made. Do you consent with these terms? Do you have any questions before we begin?

Open questions	Probing questions
How did you become a farmer?	<ul style="list-style-type: none"><li>● Own start-up?</li><li>● Family company?</li><li>● Education?</li><li>● why did you choose farming?</li></ul>
Can you tell me about you farm?	<ul style="list-style-type: none"><li>● What type of farming? arable farming, animal husbandry, dairy farming, horticulture, combination?</li><li>● What type of soil?</li><li>● Where in the Netherlands?</li></ul>
Can you explain what you think about sustainable agriculture?	<ul style="list-style-type: none"><li>● Positive/negative?</li><li>● Important?</li><li>● Needed or not?</li><li>● Difficult?</li><li>● Do you feel responsibility to increase your sustainability?</li></ul>
How would you define sustainable agriculture?	<ul style="list-style-type: none"><li>● agronomics, cultural practices, crop rotation, pesticide use, soil</li></ul>



	erosion, animal husbandry, green manure, polyculture, livestock and crop integration, agroforestry?
Are you working on the sustainability of your farming practices?	<ul style="list-style-type: none"> <li>• What practices? (Agroecology, organic farming, community-supported agriculture, circular agriculture, nature-inclusive agriculture)</li> <li>• What methods? (agronomics, cultural practices, crop rotation, pesticide use, soil erosion, animal husbandry, green manure, polyculture, livestock and crop integration, agroforestry)</li> <li>• Are you part of bigger initiatives/organizations? LTO, Boerenraad etc</li> </ul>
Do you feel like you are part of a certain system as a farmer?	<ul style="list-style-type: none"> <li>• If yes, what system? Can you define the system?</li> <li>• If no and I explain the system, can you relate?</li> <li>• Ask about politics, market price, value chain</li> </ul>
Do you think the system should change?	<ul style="list-style-type: none"> <li>• Why?</li> <li>• How?</li> <li>• More sustainability?</li> <li>• Changing agricultural practices?</li> </ul>
Tell me about the barriers this system causes for sustainable agriculture	<ul style="list-style-type: none"> <li>• What difficulties/barriers/obstacles? ;</li> <li>• Manure policies</li> <li>• economic price-models</li> <li>• expansions</li> <li>• Soil fertility</li> <li>• Land subsidence</li> <li>• Distance between farmer and consumer</li> <li>• Decreasing biodiversity</li> <li>• Increasing GHG emissions</li> </ul>
Does this system create difficulties for you?	<ul style="list-style-type: none"> <li>• In what way?</li> <li>• Do you notice it often?</li> <li>• What practices/methods have become more difficult?</li> <li>• Why?</li> </ul>
What sustainable agricultural methods you use are successful?	<ul style="list-style-type: none"> <li>• Why?</li> <li>• Why those?</li> </ul>

	<ul style="list-style-type: none"> <li>• Can you explain that in connection to the previous answer?</li> </ul>
Do you have any further issues to discuss?	<ul style="list-style-type: none"> <li>• Own problems</li> <li>• Future</li> <li>• Nitrogen crisis</li> </ul>

Table 3. Interview guide for the interviews that will be held with Dutch farmers

I would like to thank you very much for this interview and for your time and I wish you a great day. If you are interested in the final thesis results, please let me know or send me an email: [j.h.f.brink@students.uu.nl](mailto:j.h.f.brink@students.uu.nl) and I would gladly share this with you.

## **Appendix II**

### Research brochure

Dear participant,

Thank you very much for your participation for this research. My name is Juliette Brink and the results of the interview will be used in my master thesis research about the barriers and problems farmers face when they attempt to transform their farming practices into more sustainable agricultural practices. This thesis will be submitted at the Utrecht University.

If you have any questions,

if you are interested in the results,

if you come up with something you forgot to say,

or if you want more information,

please contact me at [j.h.f.brink@students.uu.nl](mailto:j.h.f.brink@students.uu.nl) or call me on 0627928119.