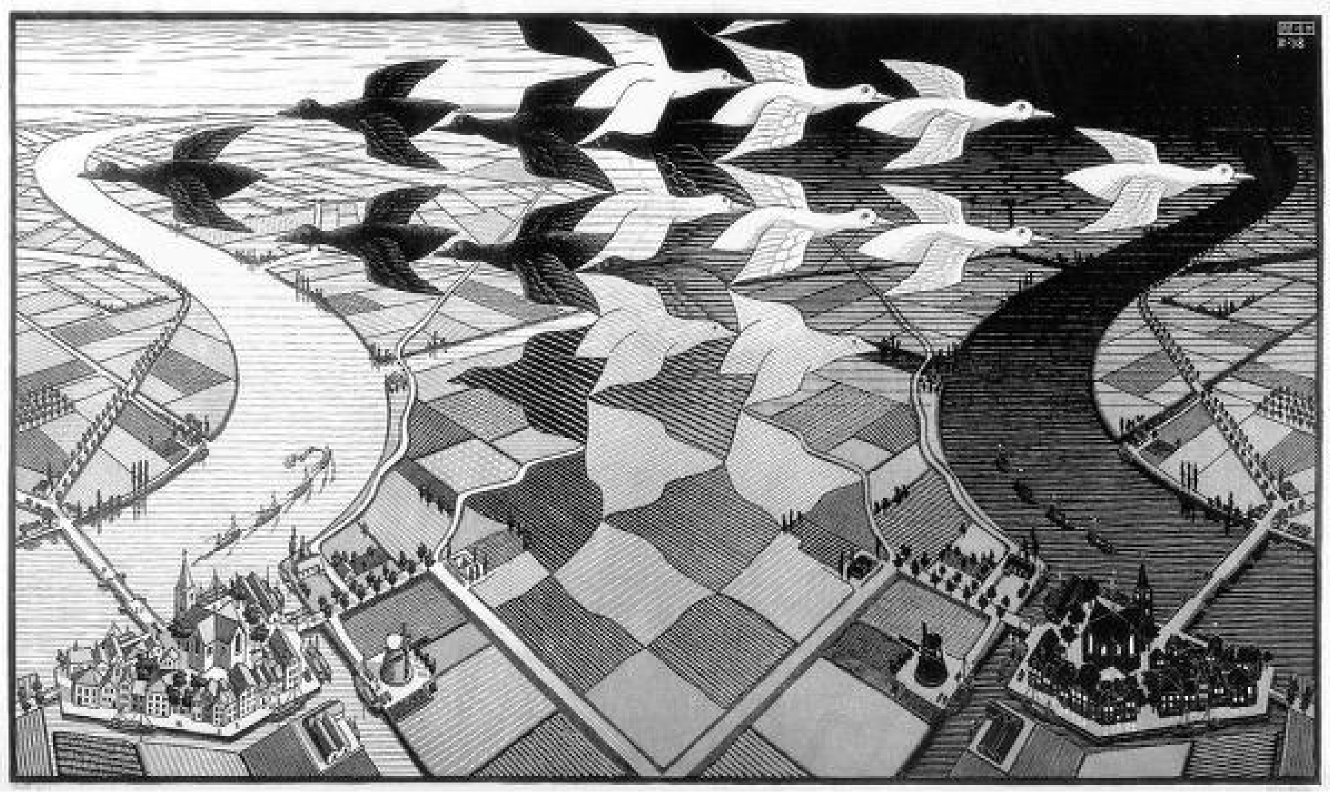
Attitudes Towards Diversified Farming Practices in a Region Dominated by Conventional Agriculture

Farmers Take Climate Action by Diversifying Their Farming Practices Irrespective of Generally Accepted Norms: A Drenthe Case Study

Yente Wilms



(Escher, 1938)

Bachelor Thesis Geography, Planning and Environment (GPE)
Nijmegen School of Management
Radboud University Nijmegen
August 2023

Attitudes Towards Diversified Farming Practices in a Region Dominated by Conventional Agriculture

Farmers Take Climate Action by Diversifying Their Farming Practices Irrespective of Generally Accepted Norms: A Drenthe Case Study

By

Yente Wilms

Bachelor's Thesis Geography, Planning and Environment (GPE)

Nijmegen School of Management

Radboud University Nijmegen

August 2023

Supervisor: dr. A.J. Calo

Second reader: dr. I.V. Barba Lata

Student number: s1055624

Mail: yente.wilms@ru.nl

Word count main text: 26.069

Preface

I grew up in a natural environment as the daughter of a farmer in Drenthe. There, I enjoyed walks in the woods and in the moors, but also saw the impact of agriculture and human activities on the rural area. Partly because of this, my interest arose in researching what good care for our planet entails. To discover how I can contribute to this and to increase my knowledge, I started studying in Nijmegen. During my studies in Geography, Planning and Environment, I mainly specialized in sustainability & environment in relation to society.

Climate change and the decline in biodiversity, present us with the complex task of achieving a livable future. My vision is that it is necessary to work together and that it is crucial here to create space for the views of others. For I believe that as human beings, we ourselves can be the key to a sustainable future by creating a shared sense of urgency and work together towards fair transitions of our systems.

Moving on, the finalization of writing this thesis has been a challenge at times, but have learned tremendously from this process. Learning how I may be able to scientifically tell the story of people, has been a valuable experience to me. I hope that you, the reader of this thesis, will keep an open mind while you are reading my work and, in this way, may gain a little more understanding of the realities of farmers and what is driving the decisions that these farmers make.

Now, I would like to thank my supervisor, dr. Adam Calo from the Radboud University, for providing his guidance, knowledge, and expertise. I could not have undertaken this journey without his feedback and patience. I also want to thank dr. Adrian Rinscheid from the Radboud University for his positivity. His contribution helped keeping my motivation high during this process. I want to express my gratitude to the farmers who participated in this study for opening a window into their lives by sharing their stories and experiences. Thank you for the sincerity and openness.

Finally, I want to thank my sister. Us being study-buddies during the final weeks of both of us finalizing our theses, has been essential. I also want to thank my family, my significant other, and friends for their belief in me and the support throughout the process of researching and writing this thesis. To the reader of my thesis, I hope reading this research will be insightful, enjoy!

Yente Wilms

Nijmegen, August 2023

Summary

This study set out to investigate how diversified farming practices of Dutch farmers emerge in a region dominated by conventional agriculture. The reason for investigating this phenomenon is that the food system is in trouble. In the Netherlands, conventional agriculture is the norm (Ministerie van Landbouw, Natuurbeheer en Voedselkwaliteit, 2023). Importantly, as indicated by Van Der Ploeg et al. (2008) and others, conventional agriculture has a negative impact on biodiversity and the environment. An alternative to conventional farming may be diversified farming (Kremen, 2015; Berkeley Food Institute, 2018). However, addressing ecological problems requires understanding how farmers make decisions amidst pressure to change (Petersen-Rockney, 2022).

An attempt has been made to answer the main research question: *How do diversified farming practices of Dutch farmers emerge in a region dominated by conventional agriculture?* The research has been conducted using qualitative research methods. In particular, this research has investigated diversified farming in The Netherlands, where politics are strong and ecological realities are pushing down on farmers. Diversified Farming Systems (DFS) in The Netherlands have been researched through a case study of diversified farming within region where conventional farming is the norm and that is known for the pushbacks to the seemingly green agenda of the Dutch government. In Drenthe, a province in the North of The Netherlands, seven farmers were interviewed to understand their world-views and obtain insights on how they are engaging with diversified farming. The importance of understanding how world-views, values, and good farmer identities have been shaping farmer decision making, is that we need to understand the politics of farmer decision-making to ensure that the elements of diversified farming will be able to intervene in the debate on nature versus farming (Petersen-Rockney, 2022).

Turning now to the description of the research, there are different theories on farmer decision-making. These theories tell conflicting stories on how farmers are making up their mind amidst pressure to change. On the one hand Petersen-Rockney (2022) indicated that, at the more broad level, decision-making is driven by world-views, identity and politics. Decision-making being shaped by these decisive world-views and other aspects, is driving farming practices to be a certain way. On the other hand, based on insights of research of Skrimizea et al. (2020) and others, farmers may make decisions based on top-down expert and political advice telling them what to do. So, there have been certain experts telling the farmers what to do and not to do through top-down advice, and politics that are governing enabling factors like policies and rules. Contrastingly, farmer world-views haven been shaping the ideals of how farmers want to farm in a certain way. In all, there is a strong

interplay between world-views and farmer realities compared top-down advice. Petersen-Rockney (2022) confirmed that strong world-views are make farming practices to be one way, but controversially suggested that ecological realities pushing down on farmers have been forcing farmers to practice another way. Resulting of this potentially being true, this implied that the two theories do not necessarily explain farmer decision making (Petersen-Rockney, 2022; Figure 1). Based on the notion of Petersen-Rockney 2022, farmer decision-making is driven by three things, namely, (external) top-down advice, personal world-views and ecological realities. This suggests that the ecological realities for farming still have power to cut through political debates under the right circumstances (Kremen & Merenlender, 2018).

To sum up the results, the data of the interviews shows that diversified farming may be an alternative for conventional (industrial) farming, for diversified farming has been showing promise in contributing to re-interweaving farming and the environment, while at the same time promoting livelihood security and creating a new space for farmers in the food system. However, the outcomes of this research should be interpreted with caution due to the limitations of this research.

In all, the answer to the research question of *"How do diversified farming practices of Dutch farmers emerge in a region dominated by conventional agriculture?"*, may be answered by describing how farmers in Drenthe have been making decisions regarding farming amidst pressure to change. In particular, the research question may be explained through understanding the politics of farmer decision-making. Namely, world-views, values, and good farmer identities have been driving farmer decision-making in Drenthe over other aspects such as economic rationality, educational training and, most importantly, top-down advice. In addition, top-down advice and new ecological realities have been shaping current farming practices. Importantly, this research discovered five potential additional drivers of farmer decision-making, these will be explained next. In short, participation of farmers in Drenthe that are currently engaged in diversified farming are relies on attitude, agency and motivations, but turning around how farmers are making decisions is decided by factors of strong world-views and ecological realities together with the previously undiscovered potential drivers of: 1. Moral sense of responsibility for future generations, 2. Unique characteristics and values of the individual, 3. Entrepreneurial spirit, 4. Taking advantage of political opportunities, and 5. Out of obligation (for different reasons).

Based on the conclusions of the outcomes of this research, further research is needed to establish if farmers indeed may up their mind by the previously suggested drivers of world-views, top-down advice and ecological realities; as by the five newly discovered potential drivers. Another key recommendation is that future studies may improve the connection between scientific research and farmer realities, by gaining a deeper understanding of these realities. Next, the avenues for resolving the political friction potentially are listening to recommendations of farmers on how moving towards sustainability may be attainable promote getting farmers to shift. To illustrate, a key lever of getting farmers to change may be to simply draw up preconditions and let the farmers work out themselves how to work towards what is expected of them while adhering to these preconditions at the same time. Future studies may establish insights on how diversified farming may contribute to reducing the gap between top-down political advice on sustainable farming practices and farmer realities.

To conclude, the research outcomes suggest that diversified farming shows promising opportunities in reuniting farming and the environment, ensuring farmers livelihoods and creating a new space for farmers in the food system. According to farmers, future farms may be shaped by opportunities of diversified farming such as reducing monoculture, collaboration, producing energy and creating livelihoods through additional business operations. Following the recommendations on how the political friction may be solved, society should consider how grave uncertainty and facing challenges and adversities are impacting farmers' lives, especially considering that farmers believe that being a farmer is not simply a profession, but rather an identity. To ensure an inclusive society, the Dutch society may have the assignment to create a space for farmers to be who they are, for diversity provides a place for everyone.

Keywords: decision-making, sustainability, Diversified Farming Systems, farming, politics.

Table of Contents

List of figures and tables

1 Introduction

1.1 The Food System in Distress

The food system is in trouble. Slowly but steadily, the environmental costs of the current production of food have reached alarming levels. Globally, humanity is threatened by climate change, biodiversity loss and global food insecurity (Petersen-Rockney et al., 2021). Scholars call this confluence of problems "the Anthropocene triple threat" as stated by Kremen and Merenlender (2018, p. 1), and (Petersen-Rockney et al., 2021). It is a triple threat because the population is confronted by a threefold challenge that comprises of the following aspects: 'preventing biodiversity loss, mitigating and adapting to climate change, and unsustainable land use' (Kremen & Merenlender, 2018, p. 1; Petersen-Rockney et al., 2021). The threefold challenge is especially visible in the effects of climate change such as the deterioration of ecosystems, biodiversity and soil- and water quality (see IPBES, 2019; IPCC 2019). The Anthropocene triple threat is extra problematic because human population needs to feed hungry people, which may imply intensification of farming. So, the human population is in a seeming paradox because unsustainable intensification of farming may threaten planetary boundaries (Willett et al., 2019).

Farming augments the three problems faced by the global population through the following specifics. First, farming adds to the problem of global warming and other consequences of climate change by interference in the global nitrogen and phosphorus cycles (Willet et al., 2019). Global warming is increasing as the result of the greenhouse feedback mechanism, which is aggravated by pollutant emissions of food production through conventional, or in other words industrial, farming. Second, farming relates to the problem of biodiversity loss by negatively impacting ecosystems, to explain, among other things, plant protection products are harming the insect species (Willet et al., 2019). Third, farming relates to the problem of unsustainable land use by making use of fertilizers, water use, land degradation crop management (Willet et al., 2019).

Having established that the food system is in predicament, in order to understand how the food system can be changed, a deeper level at understanding how farmers make decisions is necessary (Petersen-Rockney, 2022). According to Van Der Ploeg et al. (2008), to reconcile farming with nature it is necessary for the producers of food to change course, for which farmers need to shift agricultural practices. This will be further laid out in the following sections.

1.2 Reconciling the Environment and Food Production Through Diversified Farming

The current difficulties in the food system may be resolved with the help of Diversified Farming Systems (Kremen, 2015). In particular, the diversification of farming, alongside several ecological and social dimensions may address the problems of the ''Anthropocene triple threat''. Scholarship on DFS provides insights how diversified farming might resolve some of the more ecological problems of the current food system, as will be elaborated later in the chapter of the literature review and theoretical framework. Kremen et al. (2012, p. 2) define Diversified Farming Systems (DFS) as: 'farming practices and landscapes that intentionally include functional biodiversity at multiple spatial and/or temporal scales in order to maintain ecosystem services that provide critical inputs to agriculture, such as soil fertility, pest and disease control, water use efficiency, and pollination'.

Kremen and Merenlender (2018, p. 3) along with other food system scholars indicate that using sustainable agriculture and forestry techniques can contribute to enhancing farmer livelihoods and aiding resilience to climate change. Diversified Farming Systems (DFS) promote minimal biodiversity loss and maintain and create (farmer) livelihoods. Diversified Farming Systems show promise in reconciling land uses with nature (Kremen, 2015), and thereby resolving the food system. This is potentially relevant because, according to Van Der Ploeg et al. (2008, p. 4), as result of increasing environmental pressures, farming practices cease to be 'the nexus (the liaison) between society and nature'.

Efforts to counteract harmful consequences to nature include the sustainability objectives that are determined in the Paris Agreement (2015) to protect life on earth and the designation of specific nature areas as Natura 2000 areas by the European Nations, hereby giving them a special status in nature policy (Ministerie van Landbouw, Natuur en Voedselkwaliteit, n.d.). Natura-2000 areas are based on the Birds Directive and Habitats Directive, the objectives of these directives are the conservation of birds and special habitat types (Ministerie van Landbouw, Natuur en Voedselkwaliteit, n.d.).

In order to protect nature, practices that are located in or proximate to Natura 2000 areas and which activities (might) have significant negative impacts on nature in these areas cannot continue current practices (Ministerie van Landbouw, Natuur en Voedselkwaliteit, n.d.). For example, the continuity of farms located in or proximate to Natura 2000 areas; compulsory discontinuing threatens the future of farmers because farms being next to nature areas are currently a problem because of the pollution emissions from conventional farming (Petersen-Rockney et al., 2021). This puts nature and farming seemingly in an inherently opposed position. But what if there was a way to intertwine farming and food production with nature again?

1.3 The Politics of Farmer Decision-Making and New Ecological Realities

Moving on, in addition to what has been discussed earlier on diversified farming, DFS literature set out in particular how farmer decisison-making is currently a values, beliefs and political issue. That is why for this thesis, the researcher pays particular attention to the way political values, norms and identities may shape seemingly apolitical agronomic practice and (dairy) livestock production. The proposition that will be closer examined in this study is that farmers make decisions through their view on the world, their values, good farmer identities, ecological realities, and other previously undiscovered enabling factors over other aspects such as economic rationality, educational training and, most importantly, top-down advice. Experts are telling farmers what to do and what not to do, but what according to them ought to be done does not always translate into what is actually done by farmers. Hereby, seemingly making decision-making political.

Hence, changing the production-side of the food system is a social issue rather than a technical issue. Put simply, the necessary techniques already have been figured out, but the politics have remained unknown. Now that climate change has become more of political problem as well as purely technical, research (o.a. Petersen-Rockney, 2022) has begun to study how political beliefs shape farmer's practices in the face of a rapidly changing climate. To summarize, changing the food system is thus a political, technical, economic and social problem. This research asks, even if farmers reject climate change adaptation on political grounds, what do they do when the land runs dry?

That is why this research seeks to look at the problem through a case where politics are strongly present, and yet, where the ecological reality is severely pushing down on farmers. For this reason, this study examines the current situation in The Netherlands, here the problem of the triple threat is exemplified. Notably, in The Netherlands, land area available for exploitation is limited, and competing demands on the use of land are increasingly felt and politized (NOS, 2023b; Ministerie van Algemene Zaken, 2022). The production of food is one of these demands. However, the current food system places a 'critical constraint on nature' because agriculture is an extractive land use and is therefore burdening already degrading nature (Kremen, 2015, p. 1).

In The Netherlands, new ecological realities of nitrogen and carbon dioxide emission & other ecological indicators have been creating a government desire to legally respond to the nitrogen issue and push a transition to the whole European Union. The reduction of nitrogen emissions is part of efforts to achieve committed sustainability objectives in the determined in the Paris Agreement (2015), as previously mentioned. To accomplish these objectives, the Dutch government has a responsibility in supporting food system stakeholders overcoming barriers to agricultural diversification.

To elaborate, the Dutch government has taken on certain concepts and strategies in different levels of extremes, to reduce emission and attain sustainability. For example, the government has taken on the concept of circularity (Ministerie van Algemene Zaken, 2022). Despite efforts to change agricultural practices, several social and political events have halted developments. Because the government is running out of options, they are currently exploring the extreme strategy of buyouts of farms to reduce nitrogen emissions (Ministerie van Algemene Zaken, 2022). This reveals how complex the issue is. However, these government attitudes and decisions are resulting in strong political backlash on farms, wherein ecological issues may be pushing down on farmers and shaping their realities.

Nonetheless, if these problems are not solved it will result in increasing the threat to a sustainable future from which consequences will be felt widely and deeply, including by government authorities, farmers and citizens. For example, the future decline of rural communities (Carolan, 2016 in Peterson-Rockney et al., 2021) as a consequence of ecological devastation and increasing weather extremes potentially making food producing food in the countryside nearly impossible (Kremen & Merelender, 2018). As a result, farmers may no longer be able to make a living from current farming (Kremen & Merelender, 2018; Karki et al., 2019). Contrastingly, research of Peterson-Rockney et al. (2021, p. 2) showed that farmers have indeed always faced these challenges, and that these challenges have tested their ability to continue farming.

However, what also might result in the decline of rural communities (Carolan, 2016 in Peterson-Rockney et al., 2021), is if society decides to protect biodiversity at all costs. For, rural habitants of The Netherlands then may need to leave the area to make space for nature, this may potentially result in a green countryside with no rural culture such as farming. This suggests a framing of the countryside being solely available for either nature or farming, instead of providing a space for nature and farming to connect.

This frame of nature versus farming is problematic (Van Der Ploeg et al., 2008), for the government and the farmers take very different positions in this debate. This presents a tension between the government and society, but there is a political will to improve. In the tension between government priorities and burdensome changes to land use, farmer citizens may feel threatened by the current ambitions of bureaucrats to achieve national sustainability objectives. In particular, the current decisions of moving towards sustainability through buyouts results in partially removing farming practices altogether. Some researchers as Van Der Ploeg et al. (2008, p. 3) and Hermans et al. (2010, p. 47) and others, suggest that the pursuit of sustainability presents an existential threat to farmer livelihoods, or even farming altogether. They report that farming is a declining activity. However, some Dutch farmers risk fighting to the extremes to prevent these changes from coming about. However, the transformation of the Dutch agricultural food system to a healthy and sustainable food system can provide perspective for both farmers and global and local sustainability.

In the recent elections of 2023 for the provincial councils, the Boer Burger Beweging (BBB) has become the largest political party in every province of the Netherlands (NOS, 2023). The BBB is a Dutch political party with the objective to promote livability of the countryside and is committed to the agricultural sector, the party considers itself as 'the voice of and for the countryside' but their objective target audience comprises of citizens from all over the Netherlands as well as farmers (Boer Burger Beweging, 2023). These events are interesting because there is an increasing focus on the production of food in both society and academics, since according to scientific research (o.a. Kremen, 2015; IPBES, 2019; IPCC 2019) farming practices have environmental costs such as major influences on biodiversity on farmland and in natural areas. The significant electoral victory of the BBB indicates a rejection of environmental management from the top-down level, as is seen in the dissatisfaction of the voters on the how the government is currently addressing the nitrogen crisis. The recent elections show that scientific determinations about what is ought to be done in (terms of policy, etc.) does not always translate into what is done.

1.4 Diversified Farming in A Region Dominated by Conventional Farming

Next, certain actors in the food system such as the farmers in Drenthe have proceeded to look for spaces where both strong agricultural land use and biodiversity, or in other words farming and nature, can happen by developing initiatives that demonstrate alternative approaches to the challenge of reconciling farming and nature. For, balancing the pursuit of multiple goals in the food system is crucial to prevent the degradation of biodiversity (Petersen-Rockney et al., 2021, p. 1). This research explores how and to what extent the status-quo of farming and the major gap between farmer realities and top-down scientific advice is challenged.

Turning now to the aim of this study, this research endeavors to investigate if diversified farming is possible in a place like this by gaining a deeper understanding of how farmers make decisions. This research focuses in particular on Drenthe, a province in the North of the Netherlands. In Drenthe politics are strongly present but ecological realities are also severely pushing down on farmers. To find an answer on the question whether a diversified farming system is possible in this place, a case study will be conducted of farmers who are involved in diversified farming within a region that is known for the pushbacks to seemingly green government agendas.

Through these interviews, there will be examined what world-views are present and if these world-views have been shaping how farmers engage with the elements of diversified farming. In addition, this research seeks to gain an understand of how world-views are seeping into the lived experiences of farmers and farmer realities, compared to top-down advice on farming. The importance of understanding how world-views, values, and good farmer identities are shaping farmer decision making, is that it is necessary to understand the politics of farmer decision-making to ensure that the elements of diversified farming will be able to intervene in the debate on nature versus farming.

This research aims to explore how and to what extent the gap between farmer realities and top-down scientific advice can be closed. Because scientific determinations about what ought to be done in (terms of policy, etc.) does not always translate into what is done, a contribution to knowledge is necessary to ensure that the production-side of the food system can make a contribution to biodiversity and to keep farming from becoming a declining activity, as indicated by Van Der Ploeg et al. (2008, p. 3) and Hermans et al. (2010, p. 47).

In view of this, how may farmers be convinced to make the switch to more sustainable, diversified farming practices? This shift depends on the space for conventional farmers to transition to DFS and the ability to change, as will be addressed in later in this research. A substantial aspect of DFS is that diversified farming practices develop with both traditional knowledge and craftmanship of farmers, as with scientific knowledge (Kremen et al., 2012, p. 3). Therefore, DFS may contribute to closing the gap between farmer realities and top-down scientific advice. This thesis explores if diversified farming may be an alternative for conventional (industrial) farming, because diversified farming potentially shows promise in re-interweaving farming and the environment, while at the same time promoting livelihood security and creating a new space for farmers in the food system.

1.4.1 Research Questions

To situate the efforts of farmers in Drenthe in the transition from conventional agriculture to a healthy food system through diversified farming, the following research question is formulated: *How do diversified farming practices of Dutch farmers emerge in a region dominated by conventional agriculture?*

To answer the main research question the following sub-questions are formulated:

1. *How do farmers experience received top-down political advice regarding farming and sustainability?*
2. *What encompasses farmer realities in Drenthe?*
3. *What is in the way of, and what are enabling conditions of farmers engagement in diversified farming?*
4. *How do farmers see the role of policy in increasing Diversified Farming Systems?*

1.5 Relevance and Situating the Topic in Research Questions

1.5.1 Societal Relevance

This research aims to contribute to getting a better understanding of how farmers are making decisions, this is relevant because gaining this deeper understanding of farmer decision-making is necessary to understand how the food system can be changed. According to Vennix (2019, p. 215) this can be achieved by the following: 'Understanding clearly and explaining how people's behavior are meaningfully related to each other'. For the research has practical value, potentially recommendations can be made to improve the food system based on the findings of this research. In addition, policy improvements may be implemented. For example, according to Kleijn et al. (2020) alternative instruments and approaches to biodiversity conservation need to be developed:

> Current conservation instruments, which for most species rely heavily on protected areas, are insufficient to halt biodiversity loss …. The relationships between biodiversity and KPIs can subsequently be used to develop biodiversity-based business models and to inspire and help stakeholders within and outside these focal areas to actively join the initiative.
>
> (Kleijn et al., 2020, pp. 127-128)

In addition, Kremen (2015, p. 18) argues that in order to achieve sustainability, agricultural methods are needed that are both productive and wildlife-friendly, this requires: "… a massive and concerted effort to find common ground among advocates for disparate but related causes—from conservation and environment to food sovereignty, labor justice, anti-monopoly, and land rights activists, among others (Kremen, 2015, pp. 17- 18)".

The diversification of farming systems aids the enlargement of the adaptive capacity of farmers according to Peterson-Rockney et al. (2021), and thereby protecting farmer practices and livelihoods. Diversifying farming systems is important for sustainability because the Anthropocene 'triple threat' of climate change, biodiversity loss, and global food insecurity will have the consequence of drastic climatic, ecological, socioeconomic, and political challenges for agriculture and food system (Peterson-Rockney et al., 2021, p. 2). Therefore, the research focusses on diversified farming systems to ensure the production-side of the food system making contribution to biodiversity. Sustainability objectives can only be achieved when humans will be in harmony with nature (Kremen, 2015; Van Der Ploeg et al., 2008).

1.5.2 Scientific Relevance

This research is scientifically relevant because findings may contribute to knowledge about the transition of the production-side of the food system by providing insights on how farmers are making decisions. There is a research gap because underlying social aspects of agricultural transformation have not been studied extensively (Skrimizea et al., 2020). It is important to conduct research on these aspects in order to achieve a just transformation of the food system. This research may contribute to explaining how and to what extent the gap between farmer realities and top-down scientific advice can be closed.

In the debate on transforming the food system, thinking about land use has become crucial aspect. Considering the aspect of land use contributes to determining which demands on the available land are feasible and thus what type of land management is the outcome. Kremen (2015) distinct two approaches to agricultural land management, land sparing and land sharing. Combined they form the land-sparing/land-sharing framework. Kremen (2015) reported that land-sparing and land-sharing are both undesirable options for nature conservation and cannot reconcile agricultural land use with biodiversity conservation. This will be further discussed in the literature review. A recent critical development is that sustainability becomes a values and politics issue that needs unpacking.

This relevance of this research is also based on the relevant recommendations for follow-up research from existing articles of Skrimizea et al. (2020), Kremen (2015) and Constance (2008). According to Skrimizea et al. (2020, p. 2): '…research on agricultural transformations fails to engage deeply with underlying social aspects such as differing perceptions of sustainability, uncertainties and ambiguities, politics of knowledge, power imbalances and deficits in democracy'. This indicates that research currently is not closing the gap between scientific advice and farmer realities, this study may take a closer look into this issue. In addition, Kremen confirms this opportunity by stating that:

> 'To meet the challenge of reconciling agricultural and other forms of production with nature conservation, ecologists and conservation biologists should focus their limited time, energy, and funds on studies that will inform concrete conservation and management plans. New studies can also be more applicable to the real world by embedding their findings within the local socioecological context'.
> (Kremen, 2015, p. 11)

Also, this research may contribute to a more just food system as is suggested by Constance (2008, p. 3) in the following statement: 'researchers should engage as public social scientists to bring about a more just and equitable agrifood system'. To conclude, this research is relevant because it investigates alternative approaches to, according to Skrimizea et al. (2020, p. 2): 'guide future transdisciplinary research that can support agricultural transformations towards sustainability'.

What is more, Constance critiques research that: 'tends to focus on management practices', and argues for research that offers a more holistic approach to agrifood systems by incorporating the environmental, economic and social dimensions of sustainability (2008, p. 5). Constance argues that: 'Opportunities are growing to influence and change policy to support a new food system. We have credentials and the knowledge; get a seat at the table and impact policy' (2008, p. 10). So, the recommendations of the outcomes of this research may contribute to supporting the new food systems.

1.5.3 Situating the Topic in Research Questions and Reading Guide

The main research question endeavors to investigate attitudes of farmers towards diversified farming practices and how engagement in these practices emerges, because the Netherlands, and the region of Drenthe, are dominated by conventional agriculture (Ministerie van Algemene Zaken, 2022). With the first research question will be established what the current situations of farmers are, which challenges have to deal with, and what their experiences are of top-down political and expert advice on sustainability and DFS. Additionally, by describing farming practices of individual farmers, there will be investigated what farmers in Drenthe are currently doing to diversify their farming practices and to become more sustainable, compared to conventional farming.

The second research question investigates the reality of the farmer, and how the world around the farmer may be affecting them. This research question also probes what the farmers attitudes and beliefs are because these may be underlying drivers in choosing a farming approach.

The third research question will take an in-depth look of motivations and restrains of farmers to engage in diversified farming practices or in other words, why the farmers do or do not engage in these practices. Farmers may be restrained in their ability to change by social and technological lock-in. This research question aims to examine the space of farmers to change. Examples of drivers and barriers are the regional policy contexts, social and economic factors, etc. In conventional farming systems certain communication and measures seem to be more acceptable than others, this is important in order to determine how one can get farmers to make the switch to DFS. This is relevant for the resilience of farms. Additionally, there will be a description of what drives farmers that are currently engaged in diversified farming and there will be investigated if the current approach of these farmers relates more to conventional or diversified agriculture.

The fourth research question endeavors to describe how farmers see the role of policy in increasing diversified farming. Through a critical reflection of what the conflicts are between top-down advice and farmer realities, there will be discussed on what makes that farmers can or cannot make the connection with current policy. In this research question may also be explored what untaken opportunities for alternative farming approaches are.

Turning now to the reading guide for this thesis, in this section, 1 Introduction, the research topic has been grounded and relevant background information has been shared. The next section, 2 literature review, provides an overview of relevant previous scientific research follows. The insights from the literature review provided the basis for the theoretical framework of this research. The theoretical framework and operationalization are included in section 3 Theoretical Framework.

Details of the research design are discussed in the methodology section, 4 Methodology. This section contains the characteristics of the research, details of the sample, data collection methods and data analysis strategy. Here, the validity and reliability of the research are also discussed. Next, the results of the field research are discussed in section 5 Results.

In section 6 Discussion key findings and their interpretations and implications are discussed. Included in this section is a reflection on the limitations of the research results and recommendations. Thereafter follows the section 7 Conclusion, here the main research question is concisely answered and the central argument and emphasis of the contribution to the field is highlighted.

The reference list is included in section 8 reference list. Finally, in the section 9 Appendices, complementary information used for the study is included. This section contains the research schedule, interview guideline, interview summaries and a list of linguistic changes in the interview transcriptions.

2 Literature and Theorical Framework

2.1 Literature review

2.1.1 Larger Debates on the Future of the Food systems

In the previous chapter has been indicated that the food system is in trouble, but in what particular way is the food system currently in trouble? According to Gorman et al. (2001), the negative effects of burdensome land uses, such as farming, consist of endangering nature by, for example: pollution problems linked to industrial agricultural production, and creating barren landscapes as the result of certain forms of intensive monoculture that have effects on the landscape by creating large fields with few trees or hedges. This indicates that the current working landscape of food producers is dysfunctional. Gorman et al. (2001) report that extensive farming systems may contribute to the landscape quality and to biodiversity. Petersen-Rockney et al. (2021, p.1) endorse this statement by reporting that balancing the pursuit of multiple goals in the food system is crucial, for falling short in this objective or exceeding land use activities will result in the decline of biodiversity.

This indicates a challenge in reconciling land uses with nature (Kremen, 2015). Kremen and Merenlender (2018, p. 1) suggest that this challenge can be addressed by the responsible and sustainable management of land used for the activities of farming, forests, and rangelands. Van Der Ploeg et al. (2008) support the call of Kremen (2015) to reconcile land uses with nature, with the argument that farming increasingly has been separated from nature. In addition, according to Van Der Ploeg et al. (2008, p. 4), as result of increasing environmental pressures, farming practices cease to be 'the nexus (the liaison) between society and nature'. Sustainable farming practices can resolve our food system because the future of the food system will be determined by what we eat and how it is produced (Willet et al., 2019).

Turning now to the current debates on the future of the food systems, there are multiple theories that propose a solution to resolve the challenges regarding the food system. These theories help to conceptualize reconcile farming with nature. One approach that advocates pursuing multiple goals in the food system is the strategy of land-sharing, according to Kremen (2015) biodiversity conservation and agriculture can be accomplished in the same landscape by implementing this approach. Kremen (2015) distinct two approaches to agricultural land management, land sparing and land sharing. According to Kremen (2015, p. 1) land sparing entails: 'high-yielding agriculture on a small land footprint'.

In contrast to this approach, Kremen (2015, p. 1) states that land sharing comprises of: 'low-yielding, wildlife-friendly agriculture on a larger land footprint'. In her review, Kremen aims to reframe the land-sparing/land-sharing debate for biodiversity conservation, meaning to explore if the framework of land-sparing/land-sharing can unify agricultural land use with biodiversity conservation in order to contribute to the knowledge necessary for reaching the general sustainability objectives determined in the Paris Agreement (2015). Kremen argues that a fragmentated landscape is not beneficial in order for biodiversity to thrive (2015). Kremen also investigates farming methods that are wildlife-friendly and the opportunities for protected natural areas by shifting the framing from 'either-or' to 'both-and' regarding the approaches of land-sparing and land-sharing (2015, p.1). Also, an important finding is that there is an opportunity for government in combatting world hunger by implementing policies that reduce the relative advantages of large agribusinesses relative to smallholder-farms, for this might be more effective than increasing efficiency (2015, p.16).

Next to the approach of land-sparing/land-sharing, according to Van Der Ploeg et al. (2019) is the alternative approach of agroecological farming. Based on Van Der Ploeg et al. (2019, p. 2) agroecology entails the following: 'Agroecology is an approach to farming and food systems that is based, as much as possible, on the use of natural resources and ecological principles and on closing biological cycles at farm or local level'. The data collected in their analysis of agroecological farming in European countries indicates a large potential for farmers to develop the basis for the future (agri-)food system and policies that consequently will transform the Dutch food system. Agroecology enables sustainable production and improves the income of farmers (Van Der Ploeg et al., 2019). Farmers that practice agroecology have considerable autonomy and are relatively resilient (Van Der Ploeg et al., 2019). A remarkable discovery in their research is that there are many farming practices in Europe that contain the characteristics of agroecology, however, do not use this specific definition to define their approach to farming (2019, p. 2).

Further, Fisher et al. (2008, p. 380) underline the importance of balancing biodiversity conservation and agricultural production and review the approaches of 'land-sparing' and 'wildlife-friendly farming'. Wide policy guidelines on the protection of biodiversity in agricultural landscapes are recommended based on the highlights of these approaches. Fischer et al. (2008, p. 380) argue that land-sparing is associated with: 'an island model of modified landscapes, where islands of nature are seen as separate from human activities'. Wildlife-friendly farming is defined by Fischer et al. (2008, p. 380) as the following: 'Integrates conservation and production within more heterogeneous landscapes'. Fischer et al. (2008, p. 380) argue that wildlife-friendly farming is associated with: 'emphasizes heterogeneity, resilience, and ecological interactions between farmed and unfarmed areas'. Both approaches rely on different scientific world views (Fischer et al., 2008, p. 380). The research also offers insights in different characteristics of farming based on these approaches.

2.1.2 Understanding the Need for Farming Systems to Change

The future of farmers depends on the ability to cope with expected and unexpected changes and adversities, the theoretical concept of resilience helps explain how and to what extend farmers have this ability. Resilience consists of social and ecological resilience (Flood et al., 2022) and is by a combination of the definitions from Pimm; Holling in Perrings (1998, p. 504) and Adger (2000, p. 361) defined as: 'the ability and capacity to cope with external surprises and large-scale changes (to their social infrastructure) that consists of the time taken for a disturbed system to return to some initial state and the magnitude of disturbance that can be absorbed before a system flips from one state to another'.

Findings in literature on resilience indicate the use of different definitions of resilience by different groups, as also confirmed by Blair and Mabee (2020). According to Blair & Mabee (2020) resilience theory is used as descriptive theory (to explain what has happened) and as a prescriptive theory (to be better able to deal with what might happen). In debates concerning resource management, sustainable development, disaster planning, economic planning, urban planning and others, resilience theory has become a regular term (Blair & Mabee, 2020). Blair and Mabee report that the pursuit of resilience addresses questions regarding appropriate forms of government decision-making and management, and critical needs concerning adapting to climate change.

According to Flood et al. (2022, p. 316) resilience is the ability to maintain livelihoods in the face of major environmental, political, economic and social stresses is fundamental is critical to build resilient social and ecological communities. Flood et al. (2022) conceptualize resilience based on o.a. Adger (2000) as a social and ecological objective in policies on natural resources and management where it is relevant how people respond to climate change and other external factors. They report that experts and current scientific research have a major focus on large scale processes. Therefore, it may be relevant for future research to investigate processes on smaller scales such as local processes.

Theory on resilience from Perrings (1998), Adger (2000) and Flood et al. (2022) and others shows that resilience is often related to ecology. This research follows the conceptualization of resilience of Flood et al. (2022) as a social and ecological objective. Hence, social resilience needs to be defined. Adger (2000, p. 361) argues that social resilience can be defined as: 'the ability of communities to with stand external shocks to their social infrastructure'. Social resilience is dependent on natural resources. Adger (2000, p. 354) states that social resilience is determined institutionally and can be examined through institutional change, economic structure and demographic change.

Adger (2000) reports that there is a link between social and ecological resilience, for social groups and communities that are dependent on ecological and environmental resources for their livelihoods. But he states that further confirmation is necessary to support evidence indicating that resilient ecosystems enable resilient communities. To elaborate, Adger (2000) reports that research from Zimmerer (1994), Gunderson et al. (1997) and Levin et al. (1998) suggest that there may be determined that social systems depend on the resilience of ecological systems, but that how the resilience of social and ecological systems exactly are related is still undefined. According to Adger (2000, p. 361) resilience: 'provides the capacity to cope with surprises and large-scale changes', and that this capacity will enable 'innovation, coping with change and social learning in social institutions'. Literature implies that 'decision-making' has implications for 'resilience' as is visualized in Figure 1.

2.2 Theoretical Framework

2.2.1 Conflicting Theoretical Stories on How Farmers are Making Decisions

Now moving on to the theoretical framework, this research uses two main theories on farmer decision-making. These theories tell conflicting stories on how farmers are making up their mind amidst pressure to change. On the one hand Petersen-Rockney (2022) and Kremen & Merenlender (2018) indicated that, at the more broad level, decision-making is driven by world-views, identity and politics. Decision-making being shaped by these decisive world-views and other aspects, is driving farming practices to be a certain way. On the other hand, Skrimizea et al. (2020) and Petersen-Rockney (2022) indicated that farmers make decisions based on top-down expert and political advice telling them what to do. So, there have been certain experts telling the farmers what to do and not to do through top-down advice, and politics that are governing enabling factors like policies and rules. Contrastingly, farmer world-views haven been shaping the ideals of how farmers want to farm in a certain way. In all, there is a strong interplay between world-views and farmer realities compared top-down advice.

Petersen-Rockney (2022) confirmed that strong world-views are make farming practices to be one way, but controversially suggested that ecological realities pushing down on farmers have been forcing farmers to practice another way. Resulting of this potentially being true, this implied that the two theories do not necessarily explain farmer decision making (Petersen-Rockney, 2022; Figure 1). Based on the notion of Petersen-Rockney (2022), farmer decision-making is driven by three things, namely, (external) top-down advice, personal world-views and ecological realities. This suggests that the ecological realities for farming still have power to cut through political debates under the right circumstances (Kremen & Merenlender, 2018). As a result, this creates an interesting framework to dive into; this will be further elaborated in the section of the case study in The Netherlands.

A solution for overcoming the current difficulties in the food system is proposed by scientific research of Kremen and Merelender (2018) and others. Sustainable land use entails pursuing multiple goals within planetary boundaries, for example, accomplishing biodiversity conservation and agriculture can in the same landscape (Kremen, 2015), amongst others Ricciardi et al. (2021) focus on this. Diversified Farming Systems are an alternative approach to farming for conventional (industrial) farming.

Kremen et al. (2012, p. 2) define Diversified Farming Systems (DFS) as: 'farming practices and landscapes that intentionally include functional biodiversity at multiple spatial and/or temporal scales in order to maintain ecosystem services that provide critical inputs to agriculture, such as soil fertility, pest and disease control, water use efficiency, and pollination'. Findings in existing research from Constanza et al. (1995, in Adger, 2000) and others indicate that resilience is increased by high levels of functional diversity. The 'diversification of (agricultural) practices' is argued by Van Der Ploeg et al. (2019), Peterson-Rockney et al. (2021) and others. In addition, according to Petersen-Rockney et al. (2021) diversification of agricultural practices in the food system can accelerate responses to the challenges humanity currently faces.

Kremen et al. (2012) investigated the social side of diversified farming systems. Their findings indicate that using sustainable farming practices and forestry techniques such as diversified farming practices may contribute to enhancing farmer livelihoods and aiding resilience to climate change (Kremen and Merenlender, 2018, p. 3). Diversified Farming Systems (DFS) show promise in resolving the food system by reconciling land uses with nature (Kremen, 2015).

Also, diversified farming practices share a common focus on: 'local production, agro-ecological and local knowledge, and whole systems approaches to agriculture, based on promoting ecological diversity and ecosystem services from field to landscape scales' (Berkeley Food Institute, 2018). According to the Berkeley Food Insitute and others, diversified farming systems and agroecological approaches can contribute to farmer livelihoods and reducing hunger and poverty in rural and urban communities (Berkeley Food Institute, 2018).

The findings of Kremen and Merenlender (2018, p. 1) denote that diversification has significant benefits. These compose of improving biodiversity, habitat connectivity, yields, profitability and enhancing livelihoods and food security (Kremen & Merenlender, 2018, p. 1).

Literature shows that improving biodiversity and habitat connectivity leads to the complementing of protected areas and providing increased resilience to climate change. Kremen and Merenlender also suggest that diversified farms support more wild species because the landscape is more permeable (2018).

Further, a substantial aspect of DFS is that diversified farming practices develop with both traditional knowledge and craftmanship of farmers, as with scientific knowledge (Kremen et al., 2012, p. 3). These findings provide a starting point to think about the potential of DFS to create a sustainable and healthy food system, for in conventional farming practices, farming and sustainability are excluding each other but DFS may help to explain how farming practices and nature can be reconciled, the challenge that Kremen (2015) determined. This is why DFS may contribute to closing the gap between farmer realities and top-down scientific advice, as indicated in the previous chapter.

Turning now to why the uptake of DFS may be difficult, biodiversity-based management practices can contribute to creating 'landscapes that work for nature and people' according to Kremen and Merenlender (2018, p. 1). However, they suggest that socioeconomic challenges currently hinder the uptake of these practices. Findings of Kremen and Merenlender indicate that 'improving voluntary incentives, market instruments, environmental regulations, and governance are essential to support working lands conservation' (Kremen & Merenlender, 2018, p. 1). A further discussion of why the implementation of DFS is halting will follow in the section on what is mediating farmer decision-making. According to Kremen and Merenlender, overcoming the socioeconomic challenges that impede the uptake of biodiversity-based management practices depends on: 'community action, social movements, and broad coalitions among citizens, businesses, nonprofits, and government agencies' for they 'have the power to transform how we manage land and protect the environment' (Kremen & Merenlender, 2018, p. 1). That is why increasing the use of diversified farming practices may contribute to overcoming the challenge of reconciling land use such as farming with nature.

To summarize, different approaches to agricultural practices investigate which farming methods best promote sustainability. In conventional farming practices, farming and sustainability are in the way of each other; the diversification of farming practices may help to explain how farming practices and nature can be reconciled (Kremen and Merenlender, 2018). To elaborate, the diversification of farms and landscapes can simultaneously contribute to transform land management and the protection of the environment, as it can promote livelihoods and enhance resilience to climate change (Kremen and Merenlender, 2018). Therefore, the diversification of farming systems may contribute to reconciling land uses with nature, the challenge that Kremen (2015) determined; and by reducing environmental pressure farming practices may be reinstated as the nexus or liaison between society and nature (Van Der Ploeg et al., 2008, p. 4). Sustainable farming practices can resolve our food system because the future of the food system will be determined by what we eat and how it is produced (Willet et al., 2019).

2.2.2 Farmer Decision-Making: A Confluence of Attitudes and Norms

As indicated in the previous chapter, farmers may be the key to transitioning to sustainable food. According to Petersen-Rockney et al. (2021, p. 1) balancing the pursuit of multiple goals in the food system is crucial. According to Petersen-Rockney (2022) the front-line workers managing climate change are farmers. Brunson and Huntsinger (2008) state that farmers always have managed environmental uncertainty, however farmers now face more extreme climate events than ever before in history (Pathak et al., 2018; Azadi et al. 2019). To elaborate, according to Petersen-Rockney et al. (2021, p. 2): 'Farmers have always dealt with climatic, ecological, socioeconomic, and political challenges that test their ability to continue farming…'. However, they also state that: 'These long-standing 'normal' challenges will … be transformed, predominantly for the worse … and the consequence is the exacerbation of long-standing climatic, ecological, socioeconomic, and political challenges for agriculture and food systems (2021, p. 2).

This is why natural resource-dependent communities such as farmers are threatened by climate change (Petersen-Rockney, 2022). Farmers are faced with the challenge of having to struggle for their livelihood in the face of emerging disruptions caused by climate change (Karki et al., 2019). This indicates that, in order to prevent the decline of both rural communities and nature, farmers are required to explore how their activities can contribute to changing the food system by pursuing multiple goals such as biodiversity targets.

As discussed previously, addressing ecological problems requires understanding how farmers make decisions amidst pressure to change (Petersen-Rockney, 2022). Farmer decision-making is made up of both economic incentives and social drivers (Petersen-Rockney, 2022). There are several ways in which these drivers may influence decision-making. This research understands farmer decision-making as a confluence of the political domain, personal attitudinal beliefs, social norms, and economic and technical drivers. By addressing these concepts, it may be possible to find out how farmers can be persuaded to take climate action by diversifying their farming practices, irrespective of generally accepted norms.

Farmer decision-making has two main aspects according to existing research, an economic and a social aspect (o.a. Petersen-Rockney, 2022). The economic aspect of farmer decision-making primarily focusses on management practices, reducing costs and increasing efficiency (Petersen-Rockney, 2022). In particular, to ensure being able to the latter, farmers receive top-down advice on how they may best approach their business.

In addition to the management practices now follows, maintaining livelihood security (Kremen and Merenlender, 2018), access to technical assistance (Petersen-Rockney, 2022; Takahashi et al, 2019), and business arrangements and obligations such as agricultural contracts (Schewe and Stuart, 2017). Farm and farmer characteristics have not proven to be explanatory for farmer decision-making in exisiting research (Prokopy et al., 2019). The economic aspect of farmer decision-making may be based on factors such as: 'socially constructed sense of identity, place and culture' (Lequin et al., 2019 in Petersen-Rockney, 2022, p. 3). The social aspect of farmer decision-making is shaped by personal experiences and cognitive factors, that form and are formed by these experiences, such as belief, attitudes and perceived agency (O.a. Yakahashi et al. 2019 in Petersen-Rockney, 2022). In addition, The main social divers are the pressure to reform (o.a. Kremen, 2015; Kremen and Merenlender, 2018), future generations and positive reinforcement from society (Banack and Hvenegaard, 2010).

Turning now to a different dimension of the social aspect farmer decision-making, research of Karki et al. (2020) farmer decision-making is partially determined by experiences. Karki et al. (2020, p. 81) state the following: 'Farmers hold differing explanations and respond accordingly to combat those changes. To orient adaptation measures towards those who are already experiencing and trying to respond to such changes, it is crucial to recognize and understand their views when formulating adaptation plans and policies'. Another researcher, Petersen-Rockney investigated 'climate change experience, belief and response in rural northeastern California' (2022, p. 1). The research of Petersen-Rockney helps to conceptualize how farmers experience and perceive climate changes in their daily lived-experiences. The conceptualization of farmer experiences is based on three dimensions: 'awareness, understanding and experience' (Madhuri, 2020 in Petersen-Rockney, 2022). That is why this research seeks to investigate the experiences of farmers.

The findings of Petersen-Rockney are that farmers 'recognize and describe climate change' that match scientific evidence of 'anthropogenic climate change', except farmers accredit these changes to 'weather cycles and harsh geographies' (2022, p. 1). Interesting is that regardless of their (stated) belief in climate change, farmers are implementing climate adaptation practices. To clarify, the researcher distincts anthropogenic and natural climate change, the first is the result of human activities that have negative effects on the climate, and the second are natural changes in climate over time or as the result of natural phenomena.

Moving on, the 'good farmer' concept helps understanding farmer decision-making, practices and attitudes in order to make useful meaning. Westerink et al. investigated production-oriented ‘good farming’ norms in Dutch farming culture. ‘The good farmer is not an unambiguous truth, a good farmer is constructed. There are certain things, disciplining force on good farmers such as: ‘working hard, taking good care of land and livestock, being entrepreneurial, a good neighbor and taking responsibility for the environment’ (Burton, 2004; Burton et al., 2008; McGuire et al., 2013; Saunders, 2016; Sutherland and Burton, 2011; in Westerink et al., 2021, p. 65) Trying to be a good farmer is driving social norms as much as economic.

Westerink et al. (2021, p. 65) found confirmation of findings of the studies mentioned above, but also diverge from this conception. The respondents in the research of Westerink et al. (2021) add ‘innovativeness, responsibility towards biodiversity and society, a good work-life balance, and happiness’ to the description of ‘a good farmer’. In summary, Westerink et al. (2021, p. 66) reported that: ‘a ‘good farmer’ takes good care of land, livestock and soil, has the business side of the farm in order, behaves responsibly in relation to society and the environment, is social and happy and works hard, but not too hard’. In this research the definition of the ‘good farmer’ of Westerink et al. (2021) is followed.

For this thesis, the researcher pays particular attention to the way political values, norms and identities may shape seemingly apolitical horticultural and agronomic practice. As climate change has become more of political problem as well as purely technical, research (o.a. Petersen-Rockney, 2022) has begun to study how political beliefs shape farmer's practices in the face of a rapidly changing climate. This research asks, even if farmers reject climate change adaptation on political grounds, what do they do when the land runs dry?

As discussed in the introduction, in The Netherlands, new ecological realities of nitrogen and carbon dioxide emission & other ecological indicators have been creating a government desire to legally respond to the nitrogen issue and push a transition to the whole European Union, however, this is resulting in strong political backlash on farms. In Drenthe politics are strongly present but ecological realities are also severely pushing down on farmers, this may be shaping their realities.

Petersen Rockney, a researcher of farmer decision-making in California's more conservative areas, has delved into the question of what farmers will do when they are confronted with ecological devastation, and revealed some key principles of how farmers are making decisions. Petersen-Rockney investigated ‘climate change experience, belief and response in rural northeastern California’ (2022, p. 1). The first key principle is farmers ‘recognize and describe climate change that match scientific evidence of anthropogenic climate change, except farmers accredit these changes to ‘weather cycles and harsh geographies’ (2022, p. 1).Therefore, the researcher distincts anthropogenic and natural climate change, the first is the result of human activities that have negative effects on the climate, and the second are natural changes in climate over time or as the result of natural phenomena. The second key principle is that regardless of their (stated) belief in climate change, farmers are implementing climate adaptation practices. The third key principle helps understanding phenomenon by explaining that the findings of Petersen-Rockney (2022) indicate that severe weather events catalyzed action to adapt but did not shift farmers belief in anthropogenic climate change. That is why increasing evidence suggests that climate change belief and action are not fixedly linked.

Safi et al. (2012) suggest that farmers' limited belief in anthropogenic climate change and reduced perceptions of climate risks is related to conservative political ideas and mistrust of the government of individual farmers (Safi et al., 2012 in Peterson-Rockney, 2022).

In one study, based on over 100 interviews of what Peterson-Rockney (2022) calls conservative farmers, she found that even though they may think climate change is a hoax or 'paper problem' led by democrats of government, they still take the management of their land very seriously will do what it takes to keep their operations running. For some, this means taking on more ecologically sensitive ranching practices. This suggests that the ecological realities for farming still has power to cut through political debates under the right circumstances (Kremen & Merenlender, 2018). The policy practices that Petersen-Rockney argues is that it doesn't matter why farmers change as long as they do. These findings provide a starting point to think about the political pressure for reform in the Dutch sector. For, the research on farmers in California may be a forecast of the potential to adapt in the future of other farming systems (Petersen-Rockney, 2022).

Whereas climate change is a perceived as hoax by farmers in California, we can observe the pressure to reform the livestock sector in NL a "green craziness" (An anonymous conservative farmer, personal communications, 6 March 2023). For many farmers, as evidenced by Van Der Ploeg et al. (2008), Hermans et al. (2010), the pressure to change is an existential threat to honest work. The knowledge and expertise of farmers are culturally relevant and full of meaning. Images of young urbanites glueing themselves to airport tarmacs and artworks does little to assure farmers that pressure to change is in their best interest.

2.2.3 Mediating Farmer Decision-Making

This section identifies different dimensions of farmer decision-making. The political domain, personal attitudinal beliefs, social norms, and economic and technical lock-ins are all driving decision-making. Research shows that farmer decision-making may be significantly determined by structural forces such as access to technical assistance and limited resources;

and cognitive factors such as personal agency and beliefs (O.a Petersen-Rockney, 2022a; Takahashi et al, 2019). The conceptual model in Figure 1, shows a visual conceptualization of how attitudes and experiences shape farming practices.

Overall, literature on food systems indicates that farming practices need to diversify (o.a. Petersen-Rockney et al., 2021; Kremen, 2015). Therefore, it is important to identify what are drivers and barriers to this diversification. Banack and Hvenegaard (2010, p. 67), identify 'motivations' of landowners to engage in biodiversity-friendly farming practices and to understand 'triggers' and 'barriers' that are connected to more sustainable farming practices. Moving now on to explaining what is motivating farmers to change, the findings of Banack and Hvengaard (2010) include six categories of motivations: 1. moral obligation, 2. self-fulfillment, 3. wildlife protection, 4. economic, 5. future generations, 6. positive reinforcement.

However, there are also several barriers halting the implementation of diversified farming practices, such as limited resources and access to technical assistance (o.a. Petersen-Rockney, 2022a; Takahashi et al, 2019) and societal pressure to reform. In addition, in research of Banack and Hvenegaard (2010, p. 67) the following barriers to wild-friendly farming practices have been identified: 1. financial issues, 2. socially affected, 3. time and labour requirements. Other common barriers have been reported less but include the following: lack of finances, time, knowledge, government participation, labor, interest and urgency (Banack and Hvenegaard, 2010, p. 67). In the conceptual model, these barriers are included in the overarching concept of 'other context factors'. Research from Petersen-Rockney (2022), Takahashi et al. (2019) and others indicate that 'other context factors' may partially drive decision-making, the connection between these aspects is visualized in the conceptual model.

The political domain, social norms, economic and technical lock-ins are all (external) context factors, theories show that some of these factors have a direct influence on decision-making and some have an indirect influence via experiences and attitudes. Carr and Tait (1991, p. 281) reported the following on the economic aspect and personal norms: 'the attitudes and behaviour of farmers showed that attitudes to farm productivity, efficiency and tidiness dominated management decisions to the exclusion of wildlife considerations'. Research of Holling (1995) in Adger (2000, p. 350) indicate a relation between worldviews and the management of resources. Adger (2000, p. 350) reported that the findings of Holling (1995) determined that how one manages the environment is based on philosophical beliefs of the right of people to manage natural resources. However, according to Petersen-Rockney, belief in anthropogenic climate change does not hinder taking climate adaptation and mitigation action (2022, p. 5).

Farmer belief systems, that oppose scientific evidence of anthropogenic climate change, may restrain making decisions to farm in a more sustainable way. The following literature helps to conceptualize how belief systems, or in other words world-views, help or stop farmers to decide for shifting towards more sustainable farming practices. Personal experiences, and 'belief or disbelieve in anthropogenic climate change' shape experiences of (extreme) weather (2022, p. 4). According to Petersen-Rockney, belief in anthropogenic climate change does not hinder taking climate adaptation and mitigation action (2022, p. 5). According to Peterson-Rockney (2022) severe weather events catalyzed action to adapt but did not shift farmers belief in anthropogenic climate change. Petersen-Rockney and other scholars found that farm and farmer characteristics (also Theory of Planned Behaviour) do no predict farmers beliefs and experiences (2022, p. 18). This is in contrast with the notion that generally, one tries to make decisions based on their beliefs. That is why increasing evidence of Petersen-Rockney (2022, p.18) and others suggests that climate change belief and action are not fixedly linked.In addition, Safi et al. (2012) suggest that farmers' limited belief in anthropogenic climate change and reduced perceptions of climate risks is related to conservative political ideas and mistrustful of the government/anti-government ideologies of individual farmers (Safi et al., 2012 in Peterson-Rockney, 2022).

Having considered world-views, now will be considered self-perceptions and perceived agency agency of farmers. Literature indicates the value of perceived agency (O.a Petersen-Rockney, 2022a; Takahashi et al, 2019) and self-perception. Petersen-Rockney (2022, p. 19) states the following on how farmers beliefs, experiences and actions are shaped: "farmers' perceptions of themselves in their social context, including group understandings of climatic change and understandings of structural and material access to resources, were more powerful forces in shaping farmers' beliefs, experiences, and actions than how individual farmers identified or what they farmed".

Farmers have diverse socially situated identities and motivations (Hyland et al., 2016 in Petersen-Rockney, 2022), understanding of their experiences with weather and climate (Karki et al., 2020), however, the most important thing is that divergent motivations can result in convergent action: if farmers take action deal with the effects of climate change, does it matter what the individual motivations are? It is necessary to decouple climate belief and action, to open up de debate to new possibilities, accepting taking climate action for motivations from economic benefits until mitigation potential. According to Petersen-Rockney (2022, p. 19), enabling diverse stakeholders to find common ground can be achieved by leaving belief aside; 'focusing on impacts instead of causes, and solutions instead of blame'.

Further, Petersen-Rockney (2022, p. 2) describes the following about new realities: 'Currently the cultural and ecological context of climate change is changing as climate extremes intensify, people are living in new and changing times'. Examples of these cultural and ecological changes are: "public climate discourse, and political polarization, as well as record-setting droughts, heatwaves and wildfires" (Petersen-Rockney, 2022, p. 2). According to Margiana Peterson-Rockney (2022, p. 2): "how farmers discuss and respond to climatic changes is not static. Instead, discourses, field-management practices, and livelihood strategies shift in relation to wider social and ecological changes…". Farmers may be more inclined to initiate taking action, this presents chances for promoting climate action.

It is now necessary to explain why responding to climate impacts is not unambiguously determined by experience and perception, as determined by research of Banack and Hvenegaard (2010). According to them, concerns of farmers are often overshadowed by pressing market forces. Structural barriers that farmers face are limited resource access and insecurities in land tenure. Schewe and Stuart (2017) also argue that agricultural contracts are the major restrain to the adoption of climate adaptation and mitigation practices.The findings of Petersen-Rockney (2022, p. 19) indicate that: "farmers are also changing their livelihood strategies in response to changing ecological and policy contexts around climate change".

As previously discussed, scholars have identified a gap between: 'scientific understanding of climate change and farmers' adoption of adaptive management practices' (Schewe & Stuart, 2017 in Petersen-Rockney, 2022; Davidson et al., 2019 in Petersen-Rockney, 2022). According to Schewe and Stuart (2017), scholars dismissed the information deficit, or lack of knowledge, as limiting behavioral change. Instead, Schewe and Stuart (2017) argue that agricultural contracts are the major restrain to the adoption of climate adaptation and mitigation practices.

2.2.4 Recent Agri-Politics in The Netherlands

To look at the issue of decision-making becoming a values and politics issue, now will be shifted to The Netherlands, here a healthy and sustainable food systems may be achieved by reducing (nitrogen) emissions and protect and restoring biodiversity. The Dutch government is trying to achieve sustainability by removing farming practices altogether: farmers are possibly facing compulsory buyouts in order to reduce nitrogen emissions (Ministerie van Algemene Zaken, 2022). The reduction of nitrogen emissions is part of efforts to achieve committed sustainability objectives in the determined in the Paris Agreement (2015). The Dutch government is faced with the important task of making and implementing environmental policies that aim to achieve these sustainability objectives. However, these current decisions present an existential risk to farmer livelihoods (Kremen & Merelender, 2018; Karki et al., 2019), to Dutch farmers a risk worth fighting to the extremes to prevent.

According to the Dutch and European government, to protect these valuable but vulnerable land areas, future activities in the food system may need to be line with nature conservation objectives such as the Natura 2000 policy (Ministerie van Landbouw, Natuur en Voedselkwaliteit, n.d.). Establishing large, protected areas such as Natura 2000 is needed to obtain sustainability objectives, as is determined by literature on conservation biology as incorporated in the work of Kremen (2015, p. 17). Kremen reported that considering the land-sparing/land-sharing framework both approaches are undesirable options for conservation and cannot reconcile agricultural land use with biodiversity conservation. She instead states that large, protected regions and favorable surrounding structures are needed to promote biodiversity conservation and that they should work 'synergistically' and are not 'mutually exclusive' (2015, p. 1).

Diversified farming practices seem to be most suitable to promote minimal biodiversity loss and maintain and create (farmer) livelihoods in The Netherlands. However, because in the Netherlands the land area available for exploitation is limited, and competing demands on the use of land are increasingly felt and politized (NOS, 2023b; Ministerie van Algemene Zaken, 2022). Political parties take very different positions in the debate in how the available land is used best, increasing political tension, hereby making dealing with climate change a political problem. There is a tension between the national government and provincial government authorities because the implementation of national policies threatening farmer livelihoods is challenged by provincial government authorities for their suitability and feasibility. To help explain this tension the context of the recent elections of 2023 for the provincial councils is relevant.

As indicated in the introduction, in the recent elections of 2023 for the provincial councils, the Boer Burger Beweging (BBB) has become the largest political party in every province of the Netherlands (NOS, 2023). This is relevant because both academics and society are developing a new vision regarding the connection between food production and the current state of the environment. In short, the significant electoral victory of the BBB shows a pushback against a seemingly unjust green governmental agenda, indicated by the dissatisfaction of the voters on the how the government is currently addressing the nitrogen crisis. That is why, the recent elections show a gap between farmer realities and top-down scientific advice, because these scientific determinations about what farmers should do is not always translated into what farmers are actually doing.

Notably, the BBB reports that supposedly, in the Netherlands food production is responsible, safe and of high-quality, and states that the increasing focus on food production leads to more intensive contact and mutual understanding between citizens and farmers (Boer Burger Beweging, 2023). Both voters from rural and urban areas share critical motives for voting for the BBB, they used their vote to protest their discontent about current important challenges in society: the nitrogen dossier, dissatisfaction with national politics and lack of confidence in Prime Minister Rutte (NOS, 2023b).

As previously discussed, the frame of nature versus farming is problematic (Van Der Ploeg et al., 2008), for the government and the BBB take very different positions in this debate. This presents a tension between the government and society, but there is a political will to improve governance. In the tension between government priorities and burdensome changes to land use, farmer citizens may feel threatened by the current ambitions of bureaucrats to achieve national sustainability objectives. The results of the recent elections (NOS, 2023a; 2023b), farmer protests (NOS, 2022) and other events indicate that the solution of removing farming practices altogether, for the problem of sustainability in the food system, is currently met with much resistance from citizens. Because, in this event farmers do no longer get the chance to change farming practices. Hence, the opinion of citizens that this approach does not offer a lot of perspective for farmers. People feel threatened by the current ambitions of bureaucrats to eliminate farming activities altogether in order to comply with internationally made agreements made by the Dutch government. Currently, the cabinet of the national government is debating if the significant electoral victory of the BBB has or should have broader implications to their governance.

However, scientific findings on agricultural practices show that there are ways to do farming and to achieve Natura 2000 and other sustainability goals, which will be further elaborated in the sections of 2 literature review and 3 Theoretical Framework, by approaches such as agroecological and extensive farming (o.a. Petersen-Rockney et al., 2021; Kremen, 2015). Alternative farming practices to conventional farming, like the concept of Diversified Farming Systems, may help explain how Dutch provinces such as Drenthe can operate given the correct governmental support. Finding solutions for the question on how farming and sustainability can be reconciled would challenge both the governments positions and the BBB position.

Turning now to the case study area, the findings of literature provide a starting point to think about the potential of DFS in Drenthe. According to Margiana Petersen-Rockney (2022) and Karki et al. (2020), climate change may create opportunities for farmers in some regions, but agriculture worldwide will be negative. Farmers adapt to climate change, often they adapt before mitigating to climate change (Arbuckle et al. 2013). According to Haden et al. (2012), decision-making around adaptation is more locally focused and influenced than mitigation.

To create a sustainable and healthy food system, it is necessary to examine the space where farming practices and nature can be reconciled. The food system would look very different if other farming practices than conventional farming were the norm. More than half of the total land area in Drenthe is designated for agriculture, see Figure 2. Drenthe is dominated by conventional farming; therefore, Drenthe provides an ideal place to examine how: 'farmers experience, perceive and respond to climatic extremes like drought' (Peterson-Rockney, 2022, p. 2). The question is, how did conventional farming become the norm? Addressing these aspects by researching farmers that already shifted via obtaining their knowledge at 'the kitchen table', promotes linking to farmer realities, this may help finding out how we can get conventional farmers to change. Explaining how conventional farmers can shift with DFS may eventually resolve the Dutch food system of troubles.

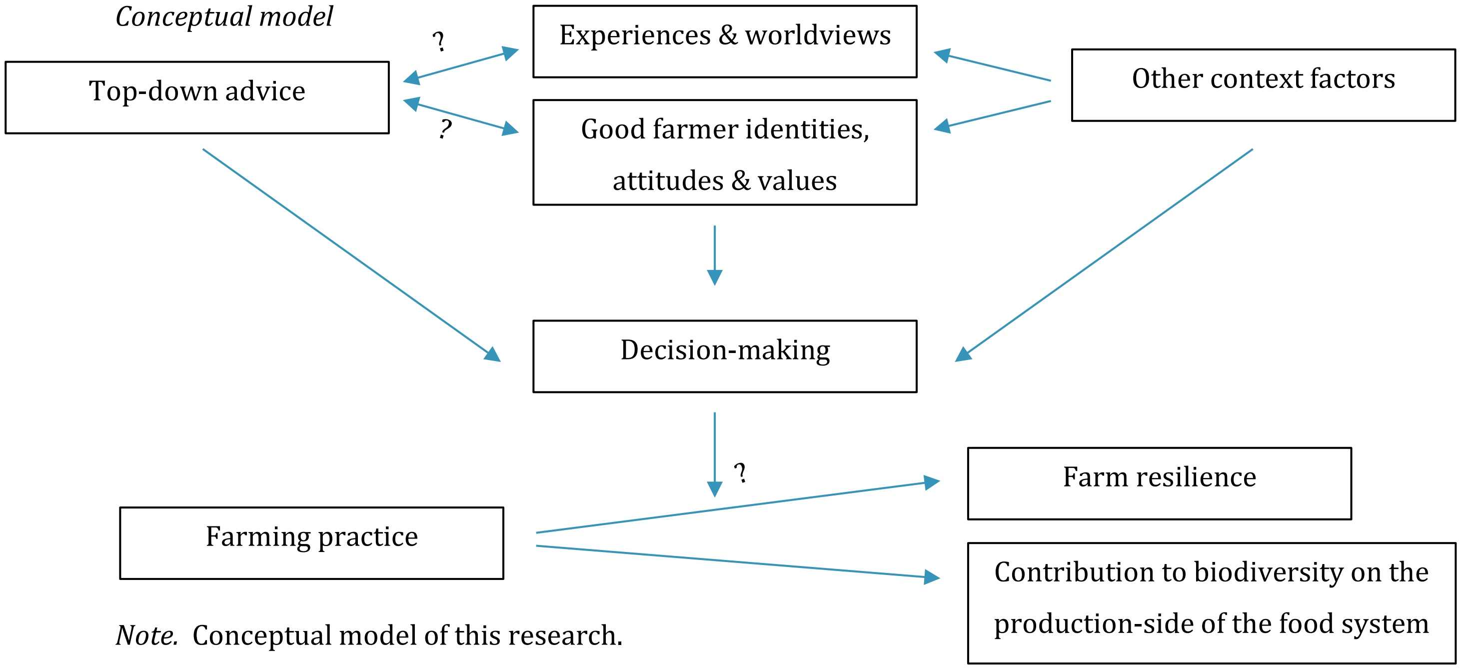
2.2.5 Operationalization and Conceptual Model

Now will follow a description of how the theory set up in the argumentation line of this research works, this is visualized in Figure 1. Central in the conceptual model is the concept of decision-making. The arrow going from "farming practice" to "contribution to biodiversity on the production-side of the food system" represents the suggestion of Kremen (2015) and others that current difficulties in the food system may be resolved with the help of Diversified Farming Systems, this will be explored in this research. The other arrow going from "farming practice" to "farm resilience" visualizes the potential opportunity of DFS in enhancing the resilience of farms by protecting farmer livelihoods and aiding resilience to climate change as indicated by Kremen & Merenlender (2018, p. 3), and Kremen et al. (2012).

Above the concept of "decision-making", the concepts of "experiences", "world-views", "attitudes" and "values" are visible. Other critical sub-concepts of good farmer norms, agency, motivations and potentially undiscovered influential concepts are not included as individual concepts in this conceptual model because they are included in the four main concepts above. The arrow going from these four concepts to "decision-making" represents that these four concepts may have been shaping farmer decision-making, as indicated by the literature discussed in this chapter. Important in this research is these concepts potentially drive farmer decision-making over other aspects such as economic rationality, educational training and, most importantly, top-down advice.

Figure 1

Conceptual model



Note. Conceptual model of this research.

In this thesis world-views are part of, and defined as, the concepts of ‘experiences’ and ‘attitudes’. The management of resources, as mentioned by Holling (1995) in Adger (2002) is in this thesis incorporated under the concept of ‘farming practice’. Motivations and barriers drive decision-making on the management of resources and thus farming practices. Literature of Adger (2000) and others implies that ‘decision-making’ has implications for ‘resilience’. Resilience consists of social and ecological resilience (Flood et al., 2022). According to Flood et al. (2022, p. 316) resilience is: ‘the ability to maintain livelihoods in the face of major environmental, political, economic and social stresses is fundamental is critical to build resilient social and ecological communities’. Findings from research of Pimm; Holling in Perrings (1998, p. 504) and Adger (2000, p. 361) result in a composed definition of resilience, resilience is: ‘the ability and capacity to cope with external surprises and large-scale changes (to their social infrastructure) that consists of the time taken for a disturbed system to return to some initial state and the magnitude of disturbance that can be absorbed before a system flips from one state to another’. Based on the literature from Adger (2000) and others, this thesis follows the assumption that ‘diversification’ improves resilience. This is visualized in the conceptual model in Figure 1.

However, farmer decision-making on how to respond to climate impacts is not unambiguously determined by experience and perception, instead this is driven by necessity because of ecological realities, as indicated by Petersen-Rockney (2022, p. 19); also, as previously discussed, structural barriers and pressing market forces. These “external factors” are visualized on the right in the conceptual model. The different aspects of ecological realities, structural barriers and pressing market forces are not included as individual concepts but instead are included under this concept of “external factors”.

What is more, the concept of “top-down advice” is visible on the left with an arrow to “decision-making”; as previously discussed there is a gap between farmer realities and top-down scientific advice. In the conceptual model there is a double-sided because scientific determinations about what farmers should do is not always translated into how farmers are farming. To elaborate, the question marks indicate that top-down advice may be seeping into farmer realities through world-views and experiences, but also reflects the pushbacks of farmers to green government agenda’s.

Moving on, the research questions are based on relevant key concepts and relations from existing literature. In the main research question, a relation is assumed between attitudes, values, norms, identities, world-views, top-down advice together with decision-making, hereby shaping the emergence of diversified farming approaches through decision-making. The main research question endeavors to investigate attitudes of farmers towards diversified farming practices and how engagement in these practices emerges, because the Netherlands, and the region of Drenthe, are dominated by conventional agriculture.

With the first research question will be three things established. First, what the current situations of farmers are. Second, which challenges have to deal with, And third, what their experiences are of top-down political and expert advice on sustainability and DFS; through identifying how farmers in Drenthe think about sustainability and the diversification of farming practices, because there may be a connection between certain believes of farmers and their agricultural approach. Banack and Hvenegaard (2010 suggest that farmers attitudes and believes are an underlying cause in making decisions on farming practices. Additionally, by describing farming practices of individual farmers, there will be investigated what farmers in Drenthe are currently doing to diversify their farming practices and to become more sustainable, compared to conventional farming.

The second research question investigates the reality of the farmer, and how the world around the farmer may be affecting them. This research question also probes what the farmers attitudes and beliefs are, because these may be underlying drivers in choosing a farming approach.

In the third research question, will take an in-depth look of motivations and restrains of farmers to engage in diversified farming practices in other words, why the farmers do or do not engage in these practices. To elaborate, this research question aims to examine the space of farmers to change. Banack and Hvenegaard (2010), Westerink et al. (2021) and others identified ‘motivations’ of landowners to engage in biodiversity-friendly farming practices and thereby aim to understand ‘triggers’ and ‘barriers’ that are connected to more sustainable farming practices. Petersen-Rockney et al. (2021) also identified opportunities and barriers to diversification. These findings can be applied to this bachelor thesis by providing certain assumptions that the researcher expects to find in the interviews. Examples of drivers and barriers are the regional policy contexts, social and economic factors, etc. In short, farmers may be restrained in their ability to change by social and technological lock-ins. In conventional farming systems certain communication and measures seem to be more acceptable than others, this is important in order to determine how one can get farmers to make the switch to DFS. This is relevant for the resilience of farms. Additionally, there will be a description of what drives farmers that are currently engaged in diversified farming and there will be investigated if the current approach of these farmers relates more to conventional or diversified agriculture.

The fourth research question endeavors to describe how farmers see the role of policy in increasing diversified farming. This is potentially important, because literature suggests that diversified farming practices contribute to the resilience of farms. Through a critical reflection of what the conflicts are between top-down advice and farmer realities, there will be discussed on what makes that farmers can or cannot make the connection with current policy. In this research question may also be explored what untaken opportunities for alternative farming approaches are.

4 Methodology

4.1 Qualitative and Key Characteristics of the Research

4.1.1 Research Design

If one wants to investigate how decision-making is constructed, and why these decisions are being made, a qualitative research approach is the most suitable method to obtain in-depth information. Therefore, the selected overall methodological approach for this research is the qualitative research approach for in-depth data collection. The research is performed within the frame of the qualitative research design of a case study. To explore the possibilities of achieving sustainability goals without presenting an existential risk to farmer livelihoods, it is necessary to gain a better insight into farmer practices and their attitudes towards farming and the environment (Kremen & Merenlender, 2018; Van Der Ploeg et al., 2008).

The qualitative approach in this research is part of interpretative research, this refers to investigating how people 'construct their reality (Vennix, 2019, p. 214). Herein, the process of 'Verstehen' by Max Weber is critical. According to Weber 'Verstehen' entails 'understanding and interpretating' (Weber, cited by Vennix, 2019, p. 204). To in explain in more detail, Vennix (2019, p. 215) states that the concept can be interpreted as the following: 'Understanding clearly and explaining how people's behaviors are meaningfully related to each other'. Accordingly, the focus of the research questions is interpretating what and why exactly is happening. The aim of this research is obtaining in-depth information regarding people's experiences, attitudes, beliefs, thoughts and expectations. Therefore, the particular phenomenon of the diversification of farming systems will be explored in detail by the means of in-depth interviews. The in-depth interviews enabled in-depth investigation of ideas and participants to respond in their own words (McCombes, 2023).

According to o.a. Vennix (2019) qualitative research has benefits and disadvantages, these will be explained in the following alinea. The first benefit is that specific details of the methodology can be adjusted after obtaining new insights during the research. This procedure provides flexibility. A second benefit is that qualitative research can be conducted with small samples, that is why findings of a case study remain relevant. The disadvantages of qualitative research are that findings cannot be generalized to larger populations and that standardizing the research is difficult. The findings of the research dependent on the interpretation of the researcher, therefore it is necessary to critically reflect on the choices and assumptions made by the researcher. After transcribing the interviews coding will be used to reveal relevant findings and overarching themes. First open coding will be conducted, after that axial coding and selective coding. The data collected in this research will be analyzed via the approaches of thematic analysis and content analysis. There is a focus on the content of the data and the objective on organizing and coding the data to discover overarching themes.

4.1.2 Issues of the qualitative, holistic approach and field research

As the qualitative approach relies on interpretative research, certain aspects could form a problem to conducting objective research. Two of these issues can be referred to as the 'observer bias' and the 'participant bias'. According to Vennix (2019, p. 214), the 'observer bias' relates to the following: '… we always make certain choices when observing and describing … and each of us makes these choices on the basis of our own unique perspective. It is important for the researcher to identify one's biases. Concerning the 'Participant bias' Vennix states that:

> … the participation of the researcher will in itself mean that the 'natural setting' is no longer completely natural (as it was before the researcher took part). Yet a qualitative researcher has no choice but to participate actively in the setting being studied if he or she is to achieve an understanding of the structure and dynamics of the situation. (Vennix, 2019, p. 214)

To compensate for the possibility of 'observer bias' influencing the research the methodological solution of triangulation was used. Triangulation entails according to Vennix (2019, p. 214) the following: '… is to make use of not only observation, but also to interview people and possibly to study written material as well…'. There is no explicit solution for the 'participant bias', however, in order to limit the occurrence of this particular bias it was important for the researcher to be critical of 'involvement and distance' (Norbert Elias, cited by Vennix, 2019, p. 214). An important aspect of conducting ethically and objective research is in this case was informed consent of the participants. The participants of this research were informed about the concept of informed consent before starting with the interview questions, the concept entails that participants could interrupt the interview to ask questions or ask for clarification and that they could stop at any moment during the interview without being held accountable. The research schedule of the research plan is included at the end of this research proposal in 9.1 Appendix A. Research Schedule.

4.2 Data Sampling

4.2.1 Case Study Area

The case study area of this thesis was Drenthe, a Northern province in The Netherlands. The location of Drenthe on the map is entailed in Figure 2. More than half of the total land area in Drenthe is designated for agriculture, as mentioned in Figure 2. Drenthe is dominated by conventional farming (Ministerie van Algemene Zaken, 2022); therefore, Drenthe provided an ideal place to examine how: 'farmers experience, perceive and respond to climatic extremes like drought' (Peterson-Rockney, 2022, p. 2). The findings of literature provided a starting point to think about the potential of DFS in Drenthe, therefore it was relevant to research farmers in Drenthe that already incorporated diversified practices. Obtaining the knowledge of these farmers at knowledge at 'the kitchen table' helped understanding farmer realities, this may contribute to finding out how we can get conventional farmers to change.

As climate change threatens the future of farming worldwide (Margiana Petersen-Rockney, 2022; Karki et al., 2020), it was relevant to investigate how opportunities can create space for nature and farming by adapting to climate change. Literature showed that farmers often adapt before mitigating to climate change (Arbuckle et al. 2013). According to Haden et al. (2012), decision-making around adaptation is more locally focused and influenced than mitigation, there focusing on the local level was more relevant than on the national level. To create a sustainable and healthy food system in The Netherlands, it was necessary to examine the spaces where the reconciliation of farming practices and nature is pursued. Understanding this may help explain how conventional farmers may be persuaded to shift with the aid of diversified farming practices in order to resolve the Dutch food system of troubles.

4.2.2 Participant Characteristics

The participants of this study included five cisgender men and two cisgender women between 40 and 60 years old from the province of Drenthe in North of The Netherlands. All participants were farmer by profession and identify as Dutch. All participants are working on sustainability and diversifying their farm, however in this sample the decision-making and farming practices to obtain these goals vary. The language preference of some of the participants was 'Drents', a dialect spoken in the province of Drenthe in the North of the Netherlands. The socio-economic status of the participants was overall determined medium by the researcher.

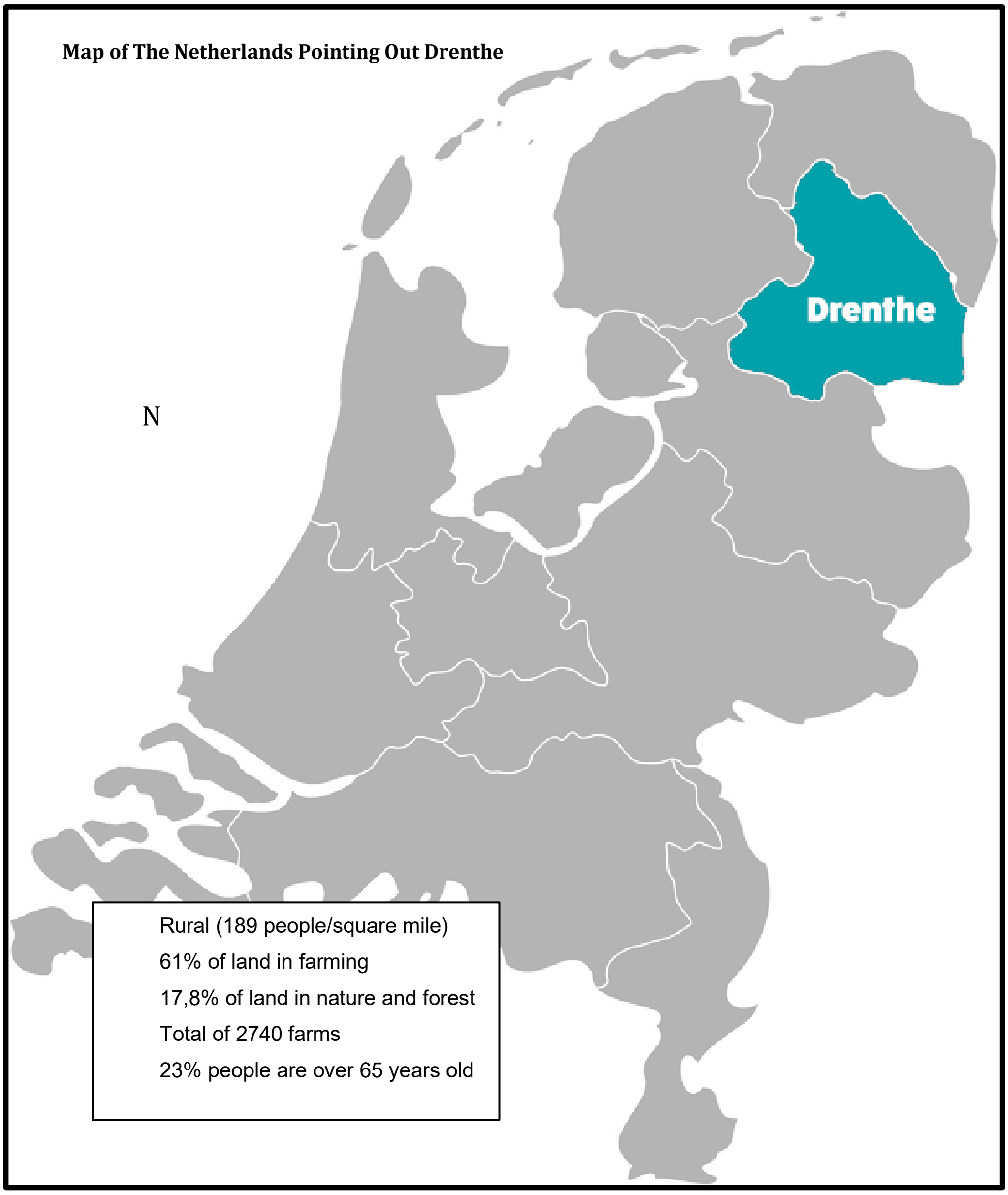
4.2.3 Sampling Procedures

Appropriateness approval for the case study area was obtained before the researcher began recruiting participants. Current farmers that participate as 'gebiedscontactpersoon' (area contact person) in the project 'Duurzame Melkveehouderij Drenthe' were invited to participate. As there were more than one cases where the phenomenon of diversified farming systems was present, participants for the research had to be selected. Vennix (2019) makes a few suggestions for case selection in qualitative research such as case selection based on academic literature. The research existing literature did not suggest a specific preference for case selection; therefore, cases were selected based on a combination of theoretical sampling and purposive sampling. This entails that during the course of the research theory provided criteria the cases should meet. The literature on the topic indicated research based on a sample of farmers that practice DFS, this is the theoretical sampling. After researching the occurrence of DFS in Drenthe the researcher purposefully selected farmers from the case study area Drenthe that were knowledgeable about the phenomenon of DFS that was studied, this is also purposive sampling.

The participants eventually were selected from the case study area by the researcher and were invited through targeted emails and personal phone calls. There may be critique on the objectivity of these cases, for effects may exist from the connection of these participants to the provincial government. After some pre-selected participants declined the invitation, the researcher received the help of one of the participants. The individual managed to arrange the participation of the selected participants by asking them this as a personal favor. Also, the researcher selected two other relevant farmers that were not connected to the project of the province of Drenthe to achieve a sufficient number of participants in the study. One of these participants was a farmer connected to a pilot project of the national government. The other participant was politically active for the futures of farmers in Drenthe. Both interviews with these two respondents were conducted online via Microsoft Teams for practical reasons. All participants were compensated for their time with a treat in the 45-60 minute interviews.

Figure 2

Map and Characteristics of Drenthe, The Netherlands



Note. Map is modified for the purpose of this research, originally retrieved from Make It in the North (2023); Data retrieved from CBS (2022) via Drenthe In Cijfers and Trendbureau Drenthe (2023).

4.3 Data Collection Methods

4.3.1 Desk Research of Academic Literature

Desk research of academic literature on the topic provided clear understanding of the key aspects regarding DFS and decision-making. The information included in previous academic research is already collected by other scientists and is thus secondary data. The secondary data for this study is collected through desktop research and document analysis in order to create an overview on existing literature and create new perspectives on existing knowledge by making new connections through analysis. The secondary data contributed to ‘triangulation’; the concept of triangulation is previously discussed in the section on the issues of the qualitative approach, and is further addressed in the section on validity.

4.3.2 Semi-Structured Interviews About Decision-making for DFS

The primary data is collected by the researcher using a case study. Original data collection of farmers in Drenthe that use diversified farming practices, was provided by conducting semi-structured interviews with the participants. These semi-structured interviews were used to investigate decision-making processes of farmers in Drenthe to engage in DFS. This field research allowed the primary data to be collected in their natural context instead of in isolation from their context (Vennix, 2019). Using interviews to investigate farmer practices and attitudes contributes to identifying cultural norms and narratives.

The research of Westerink et al. (2021) provided findings on the abilities of a farmer being nature-inclusive by the ‘good-farmer concept’. The research aimed to contribute to knowledge about shifting cultural norms in farming in the Netherlands. They used interviews to collect data. The interview questions asked in the research of Westerink et al. (2021) reflect many questions which this thesis also attempts to ask the farmers in Drenthe. Therefore, the core of the interview questions from Westerink et al. (2021) provided a source of inspiration for the interview questions of this thesis. An attempt has been made to adjust and paraphrase the interview questions of Westerink et al. (2021) but they remained the largely the same at their essence The interview guide of Westerink et al. (2021, pp. 67-69) is included in the appendix of their research. The interview guideline for the semi-structured interviews on diversified farming systems of this research are included in 9.2 Appendix B. Interview Guideline Semi-Structured Interviews DFS.

The Dictaphone of the Apple Iphone X was used to record the interviews in order to verbatim transcribe the interviews. During some of the interviews, the researcher made notes of relevant statements and concepts that were discussed. Six of the interviews were conducted in-person at the farms of the respondents in a semi-formal setting. Two of the interviews were conducted online using Microsoft Teams on a Macbook Pro. An overview with relevant information of the conducted interviews is included in Figure 3.

Based on practical reasons and purposes of the study, such as followability of the text for non-dialect speakers, the interviewer decided not to type out the interviews verbatim in dialect, but to transcribe sentences into Dutch standard language with as few changes as possible. The researcher has knowledge of the regional language because the individual grew up in the area, therefore the researcher was able to transcribe the interview into Dutch standard language. This was certainly done with respect for the original meaning of what was said and sentence structure, without adding and changing the text via own interpretations.

The respondents expressed confidence in the interviewer to prepare a correct transcript of the interview in Dutch standard language. A general list of the most common changes was compiled, this list is included in the supplemental materials in 9.4 Appendix D. List of Linguistic Changes in Interview Transcripts.

Figure 3

Overview of Conducted Interviews

Main agricultural form	Location	Date	Interview code
Extensive	Beilen	01/06/2023	Interview 1 / Interviewee 1
Biological	Foxwolde	05/06/2023	Interview 2 / Interviewee 2
Intensive	Diphoorn	07/06/2023	Interview 3 / Interviewee 3
Extensive (?)	Ruinerwold	12/06/2023	Interview 4 / Interviewee 4
Mixed (dairy and arable)	Anderen	14/06/2023	Interview 5 / Interviewee 5
Intensive	Veenhuizen	20/06/2023	Interview 6 / Interviewee 6
Extensive	Koekange	21/06/2023	Interview 7 / Interviewee 7

4.4 Data Analysis of the Interviews with Coding

The interviews have been manually transcribed in Microsoft Word with the help of oTranscribe, afterwards the researcher checked the transcripts and removed any errors. After finishing the transcriptions of the interviews, they have been read to get a general impression of the interviews. Reading the transcripts multiple times during the analysis contributed to become acquainted with the data and to discover relevant overarching topics and themes. These interviews have been analyzed with the help of coding in Atlas.ti, this was used to reveal relevant findings and overarching themes. First open coding was conducted, to highlight relevant text fragments and concepts. These codes formed the basis for the initial code book. After that axial coding was used to put the determined codes under overarching themes, additionally codes were reduced, and irrelevant codes were removed. These main and subcodes then have been put in the code scheme, the codebook used for this analysis is included in a separate attachment. Finally, selective coding was conducted, here a comparison of relevant text fragments and responses of the respondents was performed. From this a clear overview of similarities and differences emerged.

Finally, these ideas were expanded upon, associations between the respondents' responses were made, and conclusions were reached. All of the interviews were conducted in Dutch, consequently, so was the initial data analysis. However, relevant research findings and quotes from the interview were translated into English because this thesis is written in English. A family member has reviewed these translations to ensure that there have been no big errors.

Overall, the data collected in this research was be analyzed via the approaches of thematic analysis and content analysis, through this it was possible to interpret the meanings, identify patterns, and extract the most relevant parts of the data, as indicated by McCombes (2023). There was a focus on the content of the data and the objective on organizing and coding the data to discover overarching themes. Finally,

4.5 Validity and Reliability

4.5.1 Validity

The researcher, and interviewer, has no personal bias and aimed to maintain a respectful neutrality for the duration of the interviews. Hereby sincere information from the participants could be obtained. By remaining respectfully neutral, but also showing an understanding attitude research participants showed openness in their responses. Remaining neutral is necessary for valid research (Statistics Solutions, 2022).

The validity of the interviews is determined by the number of cases that are researched. Researching more cases increases the representativity of the research findings, and thereby increasing the validity of the research (o.a. Vennix, 2019; Scribbr, n.d.). Practical considerations and time pressure of research set limitations to the number of cases that could be investigated. Seven interviews were conducted in this research. That is why the external validity of the research may be medium-low because of the small sample of cases, seven interviews were conducted in this study. However, the researcher approached saturation on the fifth interview, after this interview almost no relevant new themes and aspects were revealed. To promote validity, two more extra interviews were conducted for a deep saturation into the topic.

Triangulation via desk research promoted the validity of the research because this allowed the research to be conducted from multiple perspectives. The validity of the research was also checked by means of validation. The initial results of the first interviews were tested with the other participants by absorbing some aspects and themes in the interview questions to see if the results were authentic and if the respondents recognized the results. This strategy contributed to a clear emergence of relevant themes that the interviewees shared.

4.5.2 Reliability

Standardizing the research progress and consistently applying the methods to ensured that the interviews took place in the same setting, this improved the reliability of the research (Vennix, 2019; Scribbr, n.d.). By consistently making use of a semi-structed interview guideline and protocol, consistent measurements of the responses of the participants were promoted. By standardizing the interview process the researcher ensured that the research participants were provided with the same information before asking their opinion on a specific topic of phenomenon. The consistent guideline provided the opportunity to conduct the interviews in a similar setting. The semi-structured interview approached allowed further enquiries into responses of the participants used to obtain in-depth information. After saturation was approach on the fifth interview, the extra interviews that were conducted contributed to a deep saturation in the research. Responses became more consistent with the increasing number of participants; this promoted the reliability of the data.

5 Results

5.1 Probing Farmers Realities & Decision-Making at the Kitchen Table

This chapter will outline the empirical findings of this research. Based in part on theory and the conceptual model, the results of the data-analysis will be discussed in a systematic manner. In this study on the way political values, norms and identities may shape seemingly apolitical horticultural and agronomic practice in The Netherlands, several key findings were revealed about farmer decision-making in a region that is particularly known for its pushbacks to the current, relatively green governmental agenda. In this section, the key findings from the data are presented in a logical order based on the four research (sub-)questions. To create a sustainable and healthy food system, it was necessary to examine the space where farming practices and nature can be reconciled (Kremen, 2015). For, the food system would look very different if other farming practices than conventional farming were the norm.

In the findings of the research, which are being discussed in this results section, will be mapped out how farmer decision-making occurs amidst pressure to change in a region dominated by conventional agriculture, and what the key levers for decision-making have been. Importantly, the emergence of farmer decision-making to engage in diversified farming implies that seemingly apolitical agricultural practice may be decisively shaped by certain key levers.

Farmer decision-making, based on the findings of this research, has been identified to be a two-fold concept. Put simply, decision-making has been identified as being based on the following two dimensions: the internal and external dimension. Theory (Kremen, 2015; Petersen-Rockney, (2022) supplemented by the data from the interviews provided the identification of eleven key levers that have been driving farmer decision-making. What the key levers for decision-making are in farmer realities, and what they concretely entail was asked of the respondents. These respondents are the seven DFS farmers in Drenthe, see Figure 3. Their experience will be outlined in the following sub-sections, a summary of the interviews in included in 9.3 Appendix C. Summary of Interviews.

To begin with, findings regarding the differences between farmer realities and how they perceive received top-down advice will be highlighted. Then, there will be discussed what the realities of diversified farmers in Drenthe are composed of. Next, comes a section on what enables farmer decision-making to engage in diversified farming, followed by an elucidation on what is in the way of farmers deciding to engage in diversified farming. Finally, a depiction of what is conducive in promoting a healthy food system, on the production-side, through engagement in diversified farming will be presented.

5.2 Farmer Decision-Making Amidst Pressure to Change, Environmental Devastation and Political Unrest

Turning now to the presenting the findings, several key findings have been discovered about farmer decision-making in Drenthe. Seven farmers have been interviewed for this research. The researcher has talked to two women and five male participants. In this study it was possible to dive into farmer realities by conversating with farmers right at their kitchen table. Conducting the interviews in a semi-formal setting offered the opportunity for the farmer and researcher to have a genuine conversation rather than giving the farmers the feeling that they were being questioned or interrogated, hereby accessing more in-depth information. To elaborate, through these conversations the researcher has been let into the personal realities of the farmers. This then enabled the researcher to obtain insights that really touch base with the personal realities of these farmers, as can be seen in the (world-) views and stories they shared.

To begin with, the interviews found eleven decisive reasons for why diversified farming has emerged in Drenthe. In all, one group decided to change because they saw opportunities for both their business and nature by diversifying, another group engaged in diversified farming to become information deliverers to politicians and colleagues, and there were a few who took climate action based on deep personal values and beliefs on farmers being a part of nature. The transition of these farmers took place on both personal determinations, as with the help of political initiatives, such as the project 'Duurzame Melkveehouderij Drenthe' of the provincial government of Drenthe.

5.2.1 Farmers Dealing with Confronting Realities

Moving on to the key findings of the first research question, the data shows a gap between top-down expert and political advice on sustainable farming practices & farmer realities, as also indicated earlier in Figure 1. This became clear from how respondents were talking about their perceptions on the received top-down advice on farming and sustainability. Next, from the interviews a theme of political dissatisfaction emerged. Some farmers spoke of their frustrations on political decisions and the lack of clarity and clear political leadership. The former two concepts will be discussed later in this sub-section.

Moving on, considering all government entities, the government has the following attitudes according to farmers: 1. Restricting; 2. Focus on what they don't want; 3. Box thinking; 4. Top-down; 5. Suspicion; 6. Willing; 7. Cooperative. This data shows a clear distinction between the government attitudes that farmer have been experiencing as negative, and the attitudes perceived as positive. According to the interviewed farmers, the experience of first five attitudes is negative and the last two are positive.

Additionally, in contrast to the experiences of the negative attitudes of the government, farmers do have been experiencing that the provincial government is reaching out to them. The respondents described that they experience this attitude as more positive than the previously mentioned government attitudes. For this reason, the farmers believe that there is a difference in the attitude of the national and the provincial government, that is to say: the provincial government seems to be more cooperative according to the farmers. For example, in an interview with a farmer that is engaged in diversified farming by incorporating more extensive and area-oriented practices, the following was said about government attitudes:

> *"... Nationally, I would say, we actually only make policy based on what we do not want and also mistrust. And if we really want things to move forward, then we have to dare to make more policy based on trust and describe where we want to go instead of just putting up guardrails: you can't go here and you can't go here either."* (Interviewee 4).

All of them expressed that they are experiencing friction between the top-down advice on farming and sustainability compared to the challenges they are currently facing their own personal realities. In this way the impact of these policies may limit sustainable decision-making. Especially in Drenthe, there is much distrust on top-down advice. However, the respondents voiced experiencing critical differences between the attitudes of the provincial and the national government. To illustrate, the following was said by one farmer from which this became partially clear:

> *"The municipality of Midden-Drenthe I must say is really a rural municipality. They are also in the middle of it. A lot of understanding of the farmer ... they really think along. But, they run into national issues, so things are imposed on them and they cannot implement them. So, because they can't do these things, nothing happens and that also affects the province. They want to grant permits, but they cannot test that"* (interviewee 1).

To elaborate, some farmers shared their experiences of the challenges they have been facing. In a conversation with one farmer, the following was said of how he has been experiencing the challenge of climate extremes increasing:

"... Quite intense. I've been a farmer for 35 years now, and I remember that ... in the mid-1990's we still had grass in the pit at the beginning of October: that was really exceptional. Normally, the last cut is in September, and if I see now ... in October you are still digging as standard, and sometimes you still have a cut in November. So that the climate became different in those last 30/40 years, that is very clear. We shouldn't deny that with each other. And whether the finger should be pointed at agriculture? I don't think so. I think we just, as a whole society, we have to take action" (Interviewee 7).

In this example, the farmer acknowledged anthropogenic climate change, in comparison, some of the farmers with whom the researched has talked with, are more critical towards what they believe to be the real cause of these climatic extremes. And yet, these farmers too acknowledged that the weather extremes and environmental devastation will increasingly become more problematic. Also, the farmers revealed what their realities contain by sharing sincere and sometimes even emotional stories & clarifying their world-views and personal values. In these conversations also influential factors surrounding the reality of these farmers were uncovered.

5.2.2 World-Views from the Farmyard: A Technical Debate in an Emotional Truth

Turning now to the key findings of the second research question, as theory of Petersen-Rockney (2022) and others indicated in the previous sections, farmers have an identity. The collected data shows that the identity of farmers in Drenthe is built from four aspects. These are the following: values, emotions and feelings, awareness, good farmer identities and norms. How did farmers talk about this? To illustrate, examples of these four aspects will be demonstrated in the next four quotes. First, one farmer said the following on values:

"What I think is important? Well, that I keep a financially healthy company running that is in good balance with the environment and in balance with the soil, with nature, that I have tackled these challenges well" (Interviewee 6).

In this example the farmer talks about that is important to him to be in harmony with the environment by considering the soil and biodiversity in his practice. That aside, being in balance with the environment must be accompanied by being able to run a profitable business. This may indicate that increasing more diversified, and in this case nature-inclusive farming, is depending on certain prudential preconditions. Turning now to the second example of farmer identities, one farmer said the following on emotions and feelings:

"And especially … what society wants and what the economy does, they are often at odds with each other, and I notice that split does cause stress" (Interviewee 4).

In this particular case, the farmer talks about the emotional response as a consequence of the societal demands which is clashing with the economic reality of the farmer. The farmer is experiencing stress because she is not able to practice farming in way that is in line with her identity, and on top of that she experiences external pressure to behave in a certain way while economic responsibilities are pushing down on her. This indicates that farmer identities & societal norms and economic realities may be conflicting. Next, in the third example, one farmer said the following on awareness:

"But we do see there is a lot of motion, that it is restless, and so we deliberately chose to scale back so that our company fits the soil on which we are located" (Interviewee 4).

In this example, the farmer indicates that she adopted a strategy of scaling back and considering the environment surrounding the farm to cope with uncertainty. This development indicates that farmers may adapting to their new realities to re-establish certainty. In the interviews, the farmers shared various reasons for deciding to engage in diversified farming, as will be discussed later. Lastly, there are also social norms that are reflected in good farmer behavior. One farmer said the following on good farmer identities and the accompanying norms and values:

"Well, … what I think is important is that we produce the milk in such a socially responsible way, so to speak. I really don't want people to be very bothered by me. We do have a very large company … or very large, we have a large company, we milk 400 cows and I realize that it has an impact on the environment, so to speak. We try to take this into account as much as possible." (Interviewee 6).

As can be seen in this example, the farmer is trying to take the environment into consideration because of personal convictions, but more importantly, because of social and good farm norms pushing down on him of not trying to bother other people. This indicates that norms may be driving how these farmer have been interacting with top-down advice. Overall, these examples on farmer identities suggest that extremes and tensions may be morals and values based. In addition to gaining an understanding of farmer identities, from the interviews, certain beliefs and concerns of farmers surfaced. Stated otherwise, the beliefs are defined as world-views in this thesis. The world-views and concerns became partially clear in the following statement of one farmer on world-views:

> *"I think that, as a farmer, whether you are an arable farmer or a dairy farmer, you are already very close to nature. … they all say you have to include nature, but I think that if you are involved in agriculture in a good way, then you are already very close to it. Agriculture and nature are closer together than the Netherlands currently suggests. And that is both on the farmer's side and on the environmental side. I think that the polarization that is there now, … is something that is not right, and then in particular with regard to nature than other things, we have not really been talking about nature for a while. I think that nature and agriculture are closer to each other than many people think. And of course, as agriculture we also have to 'turn around', we have to try to get even closer to nature, so with less input of plant protection products and fertilizers, I am also convinced that things have to go in that direction. But I think that is also possible, and I also think that nature and agriculture will come even closer together, I am convinced of that"* (Interviewee 7).

The example above indicates that some farmers may see nature and farming as being intertwined. This farmer that is trying to involve the environment in his farming practices, indicates a desire to be close to nature. Stated otherwise, this may indicate a desire to be intertwined with the environment. The interconnectedness of nature and farmers has surfaced in at least two more of the other interviews. To elaborate, another farmer shared a world-view in the following example from the interviews:

> *"Well, ... I think we shouldn't only look at that farm either. We need to look at the 'B.V. The Netherlands'. Of course, agriculture: because we have an area of land in use and we also have the potential to produce energy, and have the potential to retain water, agriculture is a very important thing. But we must, as all Dutch people together, make a switch. We must also consume sustainably, not only produce more sustainably, but also consume more sustainably"* (Interviewee 7).

This indicates that some farmers may see moving towards sustainability is a societal responsibility, and not mainly as an individual responsibility. This indicates that DFS may be increased by creating a shared sense of urgency. Also interesting is that through the interviews a theme of natural selection regarding farmers futures emerged. How did the farmers talk about this? Some said that they felt like it is necessary to show that you are willing to change and are open minded. These farmers also believe that diversifying their farming practices will guarantee their survival, for it will be inevitable that natural selection will take place at the disadvantage of farmers who are not willing to change. This became clear in the interview with one of the diversified farmers, this farmer said the following about natural selection:

> *''So yeah, I'm not worried about that, because that's going to be natural selection. And that sounds harsh, but I do think that's how you should actually stand if you want to remain a farmer."* (Interviewee 3).

The attitude that appears in the example above, indicates that some farmers may feel that they have to fight to preserve a place in the food system, stated otherwise: to fight their right to exist. It can be seen in this that farmers may feel threatened. Accordingly, gaining an understanding of farmer realities may promote identifying key drivers of farmer decision-making. Following this, these farmers also acknowledge a dichotomy within the agricultural sector. Some spoke about the moral righteousness that they see as the result from process of natural selection. According to them the best farmers will survive the mass cull of the farmer population, which may only further improve the sector in the long term.

Next, the respondents also voiced their concerns. For example, some farmers expressed their concern about the transition of the agricultural sector putting groups of farmers against each other. It can be seen in the examples above that these world-views and concerns are leading to certain opinions regarding their practices. The identity, which is formed of the four aspects explained above, together with farmer world-views, concerns and opinions on farming form the personal dimension; one of the two dimensions of decision-making. The two main aspects may currently be critically influencing decision-making through the personal dimension are worldviews and beliefs on politics.

Importantly, what really surfaced in the interviews is how ecological and political realities have been pushing down on farmers. The farmers talked about being frustrated, and having the feeling that they continuously must face challenges and adversities, consequently this has been leading to farmers experiencing stress, desperation, negative attitudes and misery. One farmer experiences a lot of pressure to practice more intensive farming, she said the following about how they experience the pressure to change:

> *"Very, very much. Yes, that lies on the kitchen table, that sticks to us ... that gives tears, ... there is shouting at each other in the stable. Only purely because of the tension … But we don't want to leave. And that is something that affects me very much, also here, but also*

> *because I am still an area contact person for 'Duurzaam Boeren Drenthe', I also know how things are going at those other kitchen tables ... It is all over Drenthe, but in particular the challenges in the Drentse Aa area are very large. So the goals to be achieved here are very high. But, we as farmers do not know those goals. The only target you know is the nitrate guideline of those 50 mg at area level. And for all the other goals … the province says, 'yes, we don't actually know them yet either'. So you … go crazy in your own head, because you are 150 meters from Natura [Natura2000]. What is poured out through the national media and local media … well, we just have a real dip every now and then. That we're like: 'Shall we be like the rest, shall we just put it up for sale?' … But then the dairy farming will leave this area, and we are in such a beautiful area, characterized by the intertwining of agriculture and nature. Agriculture is: arable farming, livestock farming and nature. Yes, you perfectly have to be able to farm here!"* (Interviewee 5).

In particular, the farmer talks about the emotional responses to the challenges and adversities that she herself, and her family have been facing; but also, about feeling the drive to go on. This may suggest the resiliency of farmers in Drenthe. Turning now to a different dimension of the emotions and feelings of farmers, in the same way, a different farmer highlighted the deterioration of the mental health of some farmers. These farmers may have been experiencing stress, desperation, negative attitudes and misery as a result of continuously facing challenges, adversities and in particular the critical uncertainty resulting from the seeming indecisiveness from the government. The farmer said the following about an intense experience on this topic:

> "Well, the government just has to decide for once… just decide, do something. Better a wrong choice than no choice, because now you don't know where you stand. Just like with the 'toeslagenaffaire', it shouldn't take years to sour, how much misery comes from that. Just now, another young farmer, who was 25, killed himself. Also from my age, again. There is a lot of hidden suffering, people don't know where they stand. … Mental health, that is also with the farmers. Now, I have positive attitude, I've got it reasonably figured out and I don't let myself go crazy right away. But if you're on your little island and you're grinding in your head and you don't raise your problems, you're a bit introverted, then suddenly … something snaps and then you're gone" (Interviewee 1).

In addition, one farmer shared the story of his personal experience with the effects on his mental health from the pressure to change. He stated that he generally sees himself as someone with a positive attitude, and that he also wants to convey this positivity to other people. And yet, after receiving bad news once again, he expressed the he became really bummed out. He shared the following about his struggle:

> "…The map of Van der Wal just came out with all the areas coloured in and well, here is also a 44 percent reduction. Then I went through a period ... I was actually so upset that when I started to talk about it, that I'd tear up. And I thought, well, I don't want that, so then I noticed to myself, now I have totake a step back because now it's getting much too close. And I do find that... I'm doing better now, but it does come up every now and then. The outside world is always quick to say to me, you are always very positive & you can tell that story, but I have sometimes had trouble with it. And then I think oh, it did make an impression, because they told me at the time that when I wasn't there for that reason, people hadn't thought that I took it so hard. So now that I talk about it like this, I do notice, that it does affect me. Well, there is frustration and also a bit of anger, and especially because they didn't actually want to listen to that to my feeling" (Interviewee 3).

In addition to these two examples, another farmer also pointed out in particular that, because of the current difficulties farmers have been facing, the mental health of farmers is at risk. This suggests that some farmers may be at the end of their rope. This farmer mentioned that they would rather stay anonymous on this particular statement, and thus did not want to be literally quoted on this statement because of the sensitivity of this topic. However, the identification of mental health problems in farmer realities may be relevant. To support this statement, the researcher has included this description of the topic of mental health surfacing in the interview. Notably, the farmer said that in some cases, the mental health problems of these farmers even had a fatal outcome. The severity of this situation may imply that this cry for help need to be heard by both society and politics.

Nonetheless, the respondents, the seven farmers that currently have been engaging in diversified farming in Drenthe, demonstrated and voiced that they have been attempting to keep a positive attitude, and do their utmost to see the difficulties they are confronted with as a challenge instead of a problem. This became clear in an interview with one of the farmers, he said the following about his personal attitude:

> *"I do have a lot of trouble with the fact that injustice is done every now and then and I notice, we've talked about that at home ... we can't stand injustice. And that is a basic attitude that we have. And I sometimes get fierce, but then I also sometimes get frustrated, so maybe I want to give something extra"* (Interviewee 3).

This example may indicate that despite the frustrations of farmers, they still have pugnacity. Utilizing this pugnacity may even promote getting farmers to shift to more diversified farming. To illustrate, in the interview with one farmer, he said the following about changing perspectives and pugnacity:

> "This week someone said ... you shouldn't see everything as a problem, you should see it as a challenge and that's what we're going for. I thought, yes, I am always positive, I have to take that with me, they are challenges. It's not easy, but we just go for it and then we'll see how far we get. That's the beauty of a pilot project, then you can try it" (Interviewee 1).

Lastly, the data shows that farmers experience feeling restricted, namely, some farmers feel forced by the policies of the agricultural and financial sector together with the political domain to farm in a certain way. For instance, one farmer talked about the external pressure to engage in more intensive farming, whereas the farmer self is trying to explore more extensive farming. The interplay between world-views and top-down advice suggests that some farmers may be forced to practice in a way that is not (entirely) in line with their world-views, values and realities. Hence, as previously discussed in the subsection of the first research question, that is why the data shows a gap between top-down expert and political advice on sustainable farming practices & farmer realities, this conflict is indicated earlier in Figure 1.

Having considered the consequences of experiencing stress, desperation, negative attitudes and misery as a result of feeling frustrated and having the feeling of continuously having to face challenges and adversities, this section now moves on to the following topic of drives and barriers of farmers engagement in diversified farming.

5.2.3 A Hard Row to Hoe: Good Farmers Taking Climate Action Irrespective of Accepted Norms

To begin with, the farmers talked about certain negative experiences in the current reality of being a farmer. For instance, one farmer said the following about a personal negative experience:

"Sometimes I then think, yes, there are many powers at play, double agenda powers. And of course a company such as Agrifirm has no interest in me buying grain directly from that arable farm, because they don't earn anything from it" (Interviewee 3).

Namely, the conversations were diving into what is in the way of farmers engaging in diversified farming. The data shows that there are barriers that are restraining diversified farming systems in Drenthe. Two main barriers that have surfaced in the interviews are: 1. Large companies and influential actors that are discouraging sustainable farming; and 2. Too much external pressure to change. Some farmers stated that in their eyes, education is also contributing to these limiting conditions. Other barriers and reasons that farmers have mentioned are entailed below in Figure 4.

Figure 4

Barriers of Farmers to Engage in Diversified Farming and Increase DFS

As mentioned in the previous sections, at the more broad level, big players in the agricultural sector such as the dairy industry, agribusinesses and the financial sector have interests that are not necessary beneficial to more sustainable ways of farming. Some of the farmers were complying with this assumption, and yet, some other farmers expressed that they did not experience the agribusinesses being part of this.

In the conversations, a theme of conflict between top-down advice and farmer realities emerged from the interviews. How did farmers talk about this? Some expressed that they did not feel seen by the government, based on the advice the farmers have been receiving. While discussing this topic, a theme of imaging emerged. Some spoke about feeling misunderstood by politics and society. Farmers described that they experience a certain bias when it comes to the visibility of sustainability. Namely, when people think about sustainability, they have certain image in mind: an acre full of flowers or happy cows running in the field. However, in practice this not always the case, because, according to some farmers, keeping cows in the stables may reduce emissions even further than when farmers are letting cows graze in the meadows. And yet, seeing cattle being stuck in the stables on a sunny day may not be the image that people like to see when they envision a sustainable farm.

At the same time, there is also external pressure for farmers to change to a more sustainable way of farming. While this may be true, farmers talked about certain reasons that are keeping them and other from diversified, more sustainable farming. These reasons are the following: Business turnaround, financial challenges, sustainability detracting from quality according to farmers, lack of knowledge, permits. Even so, some farmers voiced that sometimes were willing to change, but did not have the ability to.

From these insights the question is rising, what is then driving the farmers that are currently already engaged in diversified farming? In short, data shows key insights on personal attitudes, agency and motivations that may have been driving the decision-making processes of these farmers. In particular, one farmer said that he is willing to adapt, but that he is awaiting the decision of the national government on a clear direction. The example of his personal attitude follows next:

> *"Well, just clarity in all kinds of areas, so to speak, and I don't care what the outcome is, even if it is very negative for our company. Then I just have to manage it so that it fits again, so to speak, I don't care. I do care, I'd prefer something that's in my business model, but if not, I don't mind. Now we 3-4 cows per hectare and say, 15 years from now... you are only allowed one cow per hectare? That is very annoying, but as long as I know that well in advance, I can anticipate it"* (Interviewee 6).

This data may indicate that some farmers have a cooperative, flexible attitude. This may be relevant in trying to close the gap between top-down advice and farmer realities. To elaborate, one farmer also said the following about his personal attitude:

> *"I say, the government expects certain things, wants to offer us perspective. We don't get that from the government, I make perspective myself"* (Interviewee 3).

This example suggests that some farmers may not be willing to wait around until the political domain makes up their mind, but instead are already beginning to transition by themselves. In addition, in the conversation with another farmer became clear that for some farmers, their attitude is shaping certain visions for how they are seining diversified farming becoming attainable. In this conversation, the following was said about this topic:

> *"I just think that the input I supply in my company, I must convert that in the most efficient way possible, so to speak. And if I have losses in that, it doesn't matter what kind of losses, we should minimize those as much as possible. And I think that's sustainability. And sustainability is also part of affordability, because we can want anything, but if I can't afford it, then everything just stops, so to speak"* (Interviewee 6).

In particular, this example implies the decisiveness of financial limitations in the willingness to farm more sustainably. Moving on, farmers described their motivations for engaging in diversified farming. Key findings of these motivations are the visualized in Figure 5 below. To elaborate, other reasons for engaging in DFS according to farmers, are visualized in Figure 6 below.

Figure 5

Motivations of Farmers to Engage in Diversified Farming

Figure 6

Reasons of Farmers to Engage in Diversified Farming

To illustrate the data that is shown in Figure 5 and Figure 6, one farmer enclosed the following about her motivations to engage in diversified farming through circularity:

> *"We are also pioneers, ... you can just pioneer well with other crops at the moment. And we both like that. And we also really like to share that, well what we learn from it with other people. So we're just very much exploring right now 'how far can we go in closing those loops'. 'What can we do ourselves' and 'what can you and do you want to grow yourself' and also in terms of land use of 'yes, what do you actually need?'. 'How much grass, how much arable land', to close your cycle as well as possible. And that is our personal motivation!"* (Interviewee 5).

5.2.4 Getting Farmers to Shift Through the Leadership of the Farmers of the Future

Having considered what is in the way of and what the enabling factors are of engagement in diversified farming & insights on the conflict between top-down advice and farmer realities, now the key findings of the fourth, and final, research (sub-)questions will be presented. The interviews have showed that farmers have their own concrete ideas of what the 'future farmer' will look like. The respondents also shared ideas on how they think sustainability on the production-side of the food system is reachable. As mentioned previously in the sub-section on key findings of research (sub-)question three, according to the respondents, farmers are missing the two main aspects of financial means and political strategies about future farming.

In the conversations with these farmers, the respondents have described developments that are taking place right now. Relevant developments are, for example, the project of 'Duurzaam Melkveehouderij Drenthe' from the province Drenthe, farmers themselves imparting knowledge to experts and farmers themselves stimulating sustainable agriculture.

Even so, the interviewed farmers in Drenthe described that there are certain things missing they believe are necessary to convince other farmers to join the shift. Two main aspects that farmers are missing according to the respondents are financial means and political strategies about future farming. For instance, one farmer said the following on what farmers are missing in his view:

> *"We have a mono-fermenter on our farm, … we want to start up with 4,000 cows. The plans are now like this. And then there is a central point where all the green gas we generate is collected. And then that we simply turn it into natural gas for households or liquefied gas. That is the plan, but that has now all come to a standstill because, well, that permit has to be approved, the government ... of the policy that is currently being pursued, everything has come to a standstill ... The whole of the Netherlands has come to a standstill because the government has no choices dare to do. Yes, they want to make choices, but none of us support that, and then if you don't have faith that that's what's best for this country, nothing will happen at all. … The cabinet talks about accelerating, yes, … they have to start. And then the acceleration comes naturally"* (Interviewee 7).

Considering this example, data identifying that farmers are experiencing that they are missing certain things, implies that there may be certain critical pieces missing in getting farmers to change to resolve the more ecological problems humanity is currently dealing with. Utilizing these enabling aspects and conditions may increase DFS, hereby the production-side of the food system may contribute to biodiversity.

Following this, the respondents shared in more detail what they need in the transition towards sustainability in the production-side of the food system, and what elements they think will help them, and others, change. In their view, these are requirements for shifting toward sustainability. According to the respondents, what farmers need, and what will help the farmers in the transition towards sustainability, is the following: 1. Being heard; 2. Being seen; 3. Appreciation; 4. Increasing understanding; 5. Government being willing to listen to farmers; 6. Seeing back appreciation from society in rewards; 7. Interest from society; 8. More cooperation and assistance; 9. More trust from the government; 10. Being able to tell your story; 11. Targeting the sustainability issue with the whole society; 12. More knowledge in political domain. In particular, one farmer said the following about requirements for sustainability:

> *"What I think is important ... is that, but that is a bit of a more general answer, is that farmers need to know what is expected of them, of their farm so that they can work towards that and that is not the case at the moment . It is not even clear per sector, for example what the climate tasking is, we now know a bit about that for the agricultural sector as a whole, but not which part is for dairy farming, let alone what you should achieve per company. So I notice that it is difficult to deliver on sustainability at a company level if you do not know what is expected of you and you are not rewarded for it or if it only costs money. Then there is not enough movement, I do worry about that"* (Interviewee 4).

This example was confirmed by another farmer, this confirmation may also show that farmers need to know what is expected of them and of their farm so that they can work towards those objectives. Following this line of thinking, clear policies should be made by the government. To illustrate, the farmer who confirmed this example above said the following about the necessity for clarity:

> *"And Everyone is also responsible for how they behave themselves. And please let them work more goal-oriented, and not action-oriented. When they give us a goal, when they say to us, 'Well, these and these are the goals, those are the tasks, if you can farm the in there? Then we'll leave you alone, you can do it yourself.' Well, then we can do something with it. But we can't do anything with all those measures"* (Interviewee 5).

Hence, these examples may indicate an opportunity of farmers moving forward by themselves if they clear have a clear framework of pre-conditions in which they are able to farm and policy objectives to which they can work towards. Another requirement that surfaced in the interviews, is the need for space to experiment and collaboration. One farmer said the following about this requirement:

> *"That collaboration, it should actually be there, because if we extensify a bit for agriculture, then we should actually be able to use those hectares. So, it really shouldn't*

be the case that all that land is taken away from us and that it goes to nature and that we then will actually become more intensive on our own hectares. And sustainability, of course, I am participating in the Sustainable Farmers Drenthe project, where we are simply scored on nine parts and we are actually trying to create a very integrated story. So not on one thing, no, on all sorts of things. And then you actually have to give each company its own space to do what it does" (Interviewee 3).

The example suggests that this farmer may believe that through an integrated approach, collaboration, and the space to experiment farmers can work towards sustainability objectives. Moving on, another final example of requirements for sustainability according to farmers, is the need for appreciation. One farmer said the following about this:

> *"That* [what does the farmer need] *the product is paid for. That society values it, and that you see that reflected in appreciation. And appreciation is not only in money, but also in regulations and legislation. If only it was appreciated in that way"* (Interviewee 5).

Mainly, this example confirms that farmers may have a deep desire for being recognized, valued, and appreciated by society. According to this farmer, appreciation is not only about financial rewards, but instead the valuation of farmers should be reflected in rules and policy.

Finally, the respondents explained their thoughts about how diversified farming may resolve current political and ecological issues that are confronting farmer realities. From these conversations a theme emerged of how these farmers see the role of policy in increasing DFS, and how they see diversified farming helping the food system. Farmers described that diversified farming may promote a sustainable food system by bridging the gap between top-down advice and farmer realities. For instance, individual farmers may contribute to a healthy food system by staying in balance with their environment. To illustrate, one farmer is trying to adhere to these goals by doing the following:

> *"...If I tell the story here in Sleen for another group and it's just the lower classes or the middle classes, they understand that we just want to do our best. We don't waste our land, so to speak, otherwise nothing will come of it and we don't overexploit our cows, because otherwise we won't have any milk from them in the end. So we try to be more efficient on all sides"* (Interviewee 3).

Additionally, the respondents described what they think the opportunities are for individual farmers, and the sector, to get the production-side of the food system to contribute to biodiversity and other aspects that promote a healthy food system. Importantly, the agricultural sector may contribute to a healthy food system by taking into account nature when using diverse farming practices such as extensive, intensive, mixed and biological farming; considering their environmental impact, trying reducing emissions, and reusing residual flows for energy production and other opportunities.

To conclude, in the interviews farmers have emphasized that being a farmer is not a profession, but really is this identity and that therefore the ability of being a farmer is crucial and irreplaceable to them. That is why the respondents have been questioning why buying farmers out is the solution for sustainability in the production-side of the food system. This suggests that diversified farming may contribute to resolve the current ecological and political challenges by inviting people to an alternative instead of inviting people to conclude their businesses.

6 Discussion

6.1 Summary of the Research and the Key Findings

To review, the food system is in trouble; to understand how the food system may be changed, it was necessary to gain a deeper level of understanding of how farmers make decisions (Petersen-Rockney, 2022). On the grounds that it could be interesting to look at the problem through a case where politics are strong and ecological reality is pushing down on farmers, this research has investigated diversified farming in The Netherlands. In particular, a case study of diversified has been conducted of Drenthe. In this region conventional farming is the norm and pushbacks to the seemingly green agenda of the Dutch government are common. Understanding the politics of farmer decision-making is important to ensure that the elements of diversified farming will be able to intervene in the debate on nature versus farming.

To sum up the results, the data of the interviews shows that diversified farming may be an alternative for conventional (industrial) farming, for diversified farming has been showing promise in contributing to re-interweaving farming and the environment (Kremen, 2015; Berkeley Food Institute, 2018), while at the same time promoting livelihood security and creating a new space for farmers in the food system. However, the outcomes of this research should be interpreted with caution due to the limitations of this research. These limitations will be laid out later. How did farmers in Drenthe have been making decisions regarding farming amidst pressure to change?

This may be explained through understanding the politics of farmer decision-making. Namely, as indicated by Petersen-Rockney (2022), world-views, values, and good farmer identities have been driving farmer decision-making in Drenthe over other aspects such as economic rationality, educational training and, most importantly, top-down advice. In addition, top-down advice and new ecological realities have been shaping current farming practices (o.a. Skrimizea et al. 2020; Petersen-Rockney, 2022). Importantly, this research discovered five potential additional drivers of farmer decision-making, these will be explained next.

Overall, participation of farmers in Drenthe that are currently engaged in diversified farming are relies on attitude, agency and motivations, but turning around how farmers are making decisions is decided by factors of strong world-views and ecological realities together with the previously undiscovered potential drivers of: 1. Moral sense of responsibility for future generations, 2. Unique characteristics and values of the individual, 3. Entrepreneurial spirit, 4. Taking advantage of political opportunities, and 5. Out of obligation (for different reasons). It is now necessary to explain the interpretations of the research outcomes in the next sub-section.

6.2 Interpretations

To lay out the interpretations of the key findings of the research in more detail a short overview will follow next. First, the data shows a gap between top-down political advice on sustainable farming practices and farmer realities. However, the farmers indicated experiencing a different attitude of the provincial government of Drenthe compared to the national government. These different attitudes have been resulting in conflicting policy approaches.

Second, farmers consider being a farmer as an identity, not just as a profession. Farmers have an identity, build from values, emotions and feelings, awareness and social norms that are reflected in good farmer behavior. In addition, farmers have their worldviews and concerns. These aspects have been seeping into the lived experience of farmers, leading to certain opinions regarding their practices. Together this forms the personal dimension of farmer decision-making. The strong world-views have been driving farming to be more diversified, but these farmers are restricted by the policies of agricultural and financial sector to make farmers farm more conventional.

Third, the data shows that there are barriers which restrain farmers engaging in diversified farming The two main barriers are big players in the agricultural sector that are counteracting engagement in diversified farming & too much (external) pressure to change. According to farmers big players in the agricultural sector such as the dairy industry, agribusinesses and the financial sector have interests that may not necessarily be beneficial to sustainable ways of farming. Other additional reasons and barriers keeping farmers changing are entailed in the results section. At the same time, society, the political domain, and experts have been pressuring farmers to change to a more sustainable way of farming. Participation of farmers in Drenthe that are currently engaged in diversified farming are relies on attitude, agency and motivations, but turning around how farmers are making decisions is decided by factors of strong world-views and ecological realities.

Fourth, according to farmers, increasing engagement in DFS mainly depends on providing the enabling conditions of sufficient financial means and rewards & political visions and strategies about the future of farming. Other additional necessities and desires are entailed in the results section. Farmers also expressed the need for space to experiment and collaboration, and the deep desire of farmers of being recognized, valued, and appreciated by society. From the interview emerged that, according to farmers, chances and opportunities for individual farmers and the sector to make a contribution - from the production-side of the food system - to biodiversity are the following: staying in balance with nature, considering their environmental impact, trying reducing emissions, and reusing residual flows for energy production and other opportunities.

Altogether, the data shows that farmers are making decisions based on the internal and external dimension. The research outcomes will now be compared to existing research, different theories on farmer decision-making have been telling conflicting stories on how farmers are making up their mind amidst pressure to change. On the one hand [SOURCE] indicated that, at the more broad level, decision-making is driven by world-views, identity and politics. Decision-making being shaped by these decisive world-views and other aspects, is driving farming practices to be a certain way. On the other hand, Skrimizea et al. (2020) and others indicated that farmers make decisions based on top-down expert and political advice telling them what to do. So, there have been certain experts telling the farmers what to do and not to do through top-down advice, and politics that are governing enabling factors like policies and rules. Contrastingly, farmer world-views haven been shaping the ideals of how farmers want to farm in a certain way. In all, there is a strong interplay between world-views and farmer realities compared top-down advice. Petersen-Rockney (2022) confirmed that strong world-views are make farming practices to be one way, but controversially suggested that ecological realities pushing down on farmers have been forcing farmers to practice another way. Resulting of this potentially being true, this implied that the two theories do not necessarily explain farmer decision making (Petersen-Rockney, 2022; Figure 1). Instead, based on the notion of Petersen-Rockney (2022), farmer decision-making is driven by three things, namely, (external) top-down advice, personal world-views and ecological realities. This suggests that the ecological realities for farming still has power to cut through political debates under the right circumstances (Kremen & Merenlender, 2018).

However, the results of this current research suggest an additional explanation supplementing current theories on how farmers are making up their minds. Namely, that farmer decision-making may be explained by the confluence of the previously undiscovered five main drivers - 1. Moral sense of responsibility for future generations, 2. Unique characteristics and values of the individual, 3. Entrepreneurial spirit, 4. Taking advantage of political opportunities, and 5. Out of obligation (for different reasons) – together with the drivers already discovered in previous research of top-down advice (o.a. Skrimizea et al. 2020), personal world-views (Petersen-Rockney, 2022) and ecological realities (Petersen-Rockney, 2022).

6.3 Implications

Having discussed how the interview data has been interpreted by the researcher, now a reflection of how the results relate back to the theoretical framework and literature review follows. The outcomes of this research confirms that farmers are making decisions based on the internal and external dimension. The findings of similar studies and relevant literature of decision-making and DFS have suggested that farmer decision-making is driven by three things, namely, (external) top-down advice, personal world-views and ecological realities. However, the results suggest an additional explanation. The results build on existing evidence of Petersen-Rockney (2022) and others on how farmers are making up their minds. This explanation will be laid out next.

The data shows that world-views, values, and good farmer identities have been driving farmer decision-making in Drenthe over other aspects such as economic rationality, educational training and, most importantly, top-down advice. Also, in line with the theories used in this study, top-down advice and new ecological realities indeed have been shaping current farming practices. Overall, participation of farmers in Drenthe that are currently engaged in diversified farming are relies on attitude, agency and motivations, but turning around how farmers are making decisions is decided by factors of strong world-views and ecological realities. The latter is in line with the suggestions of Petersen-Rockney (2022) and others. However, the data suggests that this may not entirely explain how diversified farming practices of Dutch farmers emerge in a region where conventional agriculture is the norm. The data from interviews implies that the progression of DFS in Drenthe emerges based on variated previously undiscovered reasons next to these three theories of top-down advice, world-views and forcing ecological realities deciding farmer decision-making. To explain, in a region dominated by conventional agriculture and where almost no space to experiment is present, farmers that have decided to engage in diversified farming are outliers. The farmers that have been interviewed in this study are part of this particular group of outliers.

Because currently there is almost no space available to experiment in this region dominated by conventional agriculture in which strong ecological realities are pushing down on farmers, stressful realities have been developing in which farmers are not able to take a step into a different direction to relieve the pressure of the challenges they are facing. Moreover, the positive ecological effects of diversified farming do not matter significantly to some of these exceptional farmers, but they decided to proceed with engaging in diversified farming anyway. In these cases, the drivers and enabling factors for DFS have been the following: because they saw the (non-ecological) opportunities of DFS, economic benefits, were persuaded by the innovations, unique characteristics of the individual, individual aspects, future generations, needing to change if they wanted to be able to stay at same place in the following 50 years, wanting to take a certain leadership, status, taking advantage of political opportunities.

Thus, the main five drivers have been: 1. Moral sense of responsibility for future generations, 2. Unique characteristics and values of the individual, 3. Entrepreneurial spirit, 4. Taking advantage of political opportunities, and 5. Out of obligation (for different reasons). For this reason, the results suggest that farmer decision making may be explained by the confluence of the five main drivers above in addition to the previously discovered drivers of top-down advice (o.a. Skrimizea et al., 2020), personal world-views (Petersen-Rockney, 2022) and ecological realities (Petersen-Rockney, 2022).

To give a concise overview, the data of the interviews shows that diversified farming may be an alternative for conventional (industrial) farming, for diversified farming has been showing promise in contributing to re-interweaving farming and the environment, while at the same time promoting livelihood security and creating a new space for farmers in the food system. How did farmers in Drenthe have been making decisions regarding farming amidst pressure to change? This may be explained through understanding the politics of farmer decision-making. Namely, world-views, values, and good farmer identities have been driving farmer decision-making in Drenthe over other aspects such as economic rationality, educational training and, most importantly, top-down advice. In addition, top-down advice and new ecological realities have been shaping current farming practices. Overall, participation of farmers in Drenthe that are currently engaged in diversified farming are relies on attitude, agency and motivations, but turning around how farmers are making decisions is decided by both strong world-views and ecological realities, as by the five drivers of: 1. Moral sense of responsibility for future generations, 2. Unique characteristics and values of the individual, 3. Entrepreneurial spirit, 4. Taking advantage of political opportunities, and 5. Out of obligation (for different reasons).

To conclude, the results provide a new insight in the relationship between the internal and external dimension of decision-making. Gaining a deep understanding of how farmers are making decisions is important to ensure that the elements of diversified farming will be able to intervene in the debate on nature versus farming. The data suggests that diversified farming may contribute to resolve the current ecological and political challenges by inviting people to an alternative instead of inviting people to conclude their businesses. This is important, because in the interviews farmers have emphasized that being a farmer is not a profession, but in fact being a farmer is their identity. Therefore, the ability of being a farmer is crucial and irreplaceable to them. That is why the respondents have been questioning why buying farmers out is the solution for sustainability in the production-side of the food system. Furthermore, according to farmers, currently policies are discouraging sustainable decision-making. To elaborate on the opportunities of DFS, diversified farming shows promising opportunities in reuniting farming and the environment, ensuring farmers livelihoods and creating a new space for farmers in the food system. Hereby may reducing the gap between top-down political advice on sustainable farming practices and farmer realities. However, diversified farmers described in the interviews that there are certain things missing that are needed to convince other farmers to join the shift. Listening to recommendations of farmers on how moving towards sustainability may be attainable may ensure getting farmers to shift.

6.4 Limitations

Turning now to the reflection of the limitations of this research, the generalizability of the results is limited by the methodological choice of conducting a case study on diversified farming in Drenthe in The Netherlands. Consequently, the sample was limited to a specific group of people. As previously discussed, farmers that have decided to engage in diversified farming are outliers within a region dominated by conventional agriculture and where almost no space to experiment is present. The farmers that have been interviewed in this study are part of this particular group of outliers. Because the sample size was small and this research mainly focused on people who are outliers compared to norms of conventional farming, the findings are not representative for all farmers in The Netherlands. While this may be true, the insights from this study on how farmers are making decisions are important to ensure that, if the opportunity arises, elements of diversified farming will be able to intervene in the debate on nature versus farming, thereby may providing a starting point to understand how the food system can be changed from the production-side.

Additionally, finding enough possible respondents willing to participate in the research has been an anticipated obstacle when gathering data. Initially, the researcher aimed to interview eight to twelve interviews for this study. Eight participants were willing and were able to free up time for an interview, however, even after multiple to get in contact, the researcher never heard back from one particular farmer. Ultimately, seven farmers were interviewed to obtain insights on how they are engaging with diversified farming through gaining an understanding of their world-views, realities and perceptions of top-down advice.

Further, is should be mentioned that the farmers in the sample are not all engaged in diversified farming through the same approach of farming, some farmers have adopted a more extensive approach, some a more intensive approach and one farmer adopted a biological farming approach. The reliability of the data may be impacted by the variation of farming approaches of the farmers in the sample.

In addition, after doing the initial open coding of the data, the researcher encountered the problem of having to critically reflect on an interpret which codes really touched base with the core of the research while analyzing data in Atlas.ti. Because there are no strict rules on how this should be done, the analysis of the research is mainly depended on the interpretation of the researcher. This may have affected the research outcomes and the conclusions that have been drawn from these outcomes.

What is more, is that this research assumes that DFS may be an alternative to conventional farming because this is suggested in existing literature on DFS (o.a. Kremen, 2015; Berkeley Food Institute, 2018). However, a limitation in this research is that there is no possibility to unambiguously determine the credibility of diversified farming and who may decide this, but critically reflect on the research outcomes.

Also, potentially, there could be unanticipated variables that may affect the research outcomes, but that have not been accounted for in the study itself. Therefore, it is beyond the scope of this study to unequivocally conclude how diversified farming practices of Dutch farmers emerge in a region dominated by conventional agriculture. Nonetheless, even though it is beyond the scope of this study to provide a definite answer on how diversified farming has emerged in a region dominated by conventional agriculture; by accurately describing in the results section what is going on in the current realities of farmers, what they have been experiencing, and how they make up their minds, the results of this research are still valid for the purpose of answering the research question for this study by potentially providing a starting point of understanding how diversified farming may have been emerging in Drenthe and how DFS may be increased.

6.5 Recommendations

Moving on, avenues for future research will be discussed next. On the grounds that the generalizability of the results of this research is limited because the sample size was small and limited to the specific group of diversified farmers, further research is needed to establish if farmers indeed may up their mind by the previously suggested drivers of world-views, top-down advice and ecological realities; as by the five newly discovered potential drivers of: 1. Moral sense of responsibility for future generations, 2. Unique characteristics and values of the individual, 3. Entrepreneurial spirit, 4. Taking advantage of political opportunities, and 5. Out of obligation (for different reasons). Future studies should take into account that farmers expressed that they cannot find much connection with existing research, therefore, avenues for further research may be improve the connection between scientific research and farmer realities. Also, future studies should particularly consider how farmer realities are affecting their decisions, and how much these realities may differ between individual farmers.

Turning now the avenues for resolving the political friction, diversified farmers described in the interviews that there are certain things missing that are needed to convince other farmers to shift, potentially, listening to recommendations of farmers on how moving towards sustainability may be attainable promote getting farmers to shift. The data shows that, in contrast with current government strategies of focusing on negatives and prescribing means to achieve objectives, that the key lever of getting farmers to change potentially is to simply draw up preconditions and let the farmers work out themselves how to work towards what is expected of them while adhering to these preconditions at the same time. For this it is necessary for the government and political domain to determine clear goals.

The research outcomes shows that diversified farming may be a good alternative to conventional farming, because diversified farming shows promising opportunities in reuniting farming and the environment, ensuring farmers livelihoods and creating a new space for farmers in the food system. A deeper investigation may provide insight on how diversified farming may contribute to reducing the gap between top-down political advice on sustainable farming practices and farmer realities. According to farmers, future farms may be shaped by opportunities of diversified farming such as reducing monoculture, collaboration, producing energy and creating livelihoods through additional business operations. However, this may depend on the government approval of zoning changes.

Finally, following the recommendations on how the political friction may be solved, society should take into account how grave uncertainty and facing challenges and adversities are impacting farmers' lives, especially considering that farmers believe that being a farmer is not simply a profession, but rather an identity. As a result, creating and protecting a space for farmers to be who they are is necessary for an inclusive society.

7 Conclusion

In conclusion, by analyzing farmer decision-making amidst pressure to change in a region dominated by conventional agriculture, this thesis has shown how political values, norms and identities haven been shaping seemingly apolitical horticultural and agronomic practice in The Netherlands. In particular, this research has been focused on Drenthe. The researcher gathered insights on how farmers make decisions by engaging in in-depth interviews, or rather conversations, with seven farmers from Drenthe. In Drenthe politics are strongly present but ecological reality also severely have been pushing down on farmers. To find an answer on the question whether a diversified farming system is possible in this place, a case study has been conducted of farmers who are involved in diversified farming within a region that is known for the pushbacks to certain green agenda's. Through these interviews several key findings have been obtained on how farmers make decisions by identifying which world-views are presents and if these world-views have been shaping how farmers engage with the elements of diversified farming. In addition, findings have been obtained about how world-views have been seeping into the lived experiences of farmers and farmer realities compared to top-down advice. The importance of understanding how world-views, values, and good farmer identities have been shaping farmer decision making, is that we need to understand the politics of farmer decision-making to ensure that the elements of diversified farming will be able to intervene in the debate on nature versus farming (Petersen-Rockney, 2022).

Overall, the research outcomes follow the argumentation line that has been set out in the introduction and the other parts of this thesis. To sum up the results, the data of the interviews shows that diversified farming may be an alternative for conventional (industrial) farming, as indicated by Kremen (2015), the Berkeley Food Institute (2018) and others, for diversified farming has been showing promise in contributing to re-interweaving farming and the environment, while at the same time promoting livelihood security and creating a new space for farmers in the food system (o.a. Kremen, 2015; Kremen and Merenlender, 2018). However, the outcomes of this research should be interpreted with caution due to the limitations of this research.

In all, the answer to the research question of *"How do diversified farming practices of Dutch farmers emerge in a region dominated by conventional agriculture?"*, may be answered by through describing how farmers in Drenthe have been making decisions regarding farming amidst pressure to change. In particular, the research question may be explained through understanding the politics of farmer decision-making, as indicated by Petersen-Rockney (2022). Namely, world-views, values, and good farmer identities have been driving farmer decision-making in Drenthe over other aspects such as economic rationality, educational training and, most importantly, top-down advice. In addition, top-down advice and new ecological realities have been shaping current farming practices (o.a. Skrimizea et al., 2020; Petersen-Rockney, 2022). Importantly, this research discovered five potential additional drivers of farmer decision-making, these will be explained next. In short, participation of farmers in Drenthe that are currently engaged in diversified farming are relies on attitude, agency and motivations, but turning around how farmers are making decisions is decided by factors of strong world-views and ecological realities together with the previously undiscovered potential drivers of: 1. Moral sense of responsibility for future generations, 2. Unique characteristics and values of the individual, 3. Entrepreneurial spirit, 4. Taking advantage of political opportunities, and 5. Out of obligation (for different reasons).

Based on the conclusions of the outcomes of this research, further research is needed to establish if farmers indeed may up their mind by the previously suggested drivers of world-views, top-down advice and ecological realities; as by the five newly discovered potential drivers. Another key recommendation is that future studies may improve the connection between scientific research and farmer realities, by gaining a deeper understanding of these realities. Next, the avenues for resolving the political friction potentially are listening to recommendations of farmers on how moving towards sustainability may be attainable promote getting farmers to shift. To illustrate, a key lever of getting farmers to change may be to simply draw up preconditions and let the farmers work out themselves how to work towards what is expected of them while adhering to these preconditions at the same time. Future studies may establish insights on how diversified farming may contribute to reducing the gap between top-down political advice on sustainable farming practices and farmer realities.

To conclude, the research outcomes suggest that diversified farming shows promising opportunities in reuniting farming and the environment, ensuring farmers livelihoods and creating a new space for farmers in the food system, as previously indicated by Kremen (2015), Kremen & Merenlender (2018) and others.. According to farmers, future farms may be shaped by opportunities of diversified farming such as reducing monoculture, collaboration, producing energy and creating livelihoods through additional business operations. Following the recommendations on how the political friction may be solved, society should consider how grave uncertainty and facing challenges and adversities are impacting farmers' lives, especially considering that farmers believe that being a farmer is not simply a profession, but rather an identity. To ensure an inclusive society, the Dutch society may have the assignment to create a space for farmers to be who they are, for diversity provides a place for everyone.

8 reference list

Adger, W. N. (2000). Social and ecological resilience: are they related? *Progress in Human Geography*, *24*(3), 347–364. https://doi.org/10.1191/030913200701540465

Banack, S. A., & Hvenegaard, G. T. (2010). Motivations of Landowners to Engage in Biodiversity-Friendly Farming Practices in Alberta's Central Parkland Region. *Human Dimensions of Wildlife*. https://doi.org/10.1080/10871200903096171

Berkeley Food Institute. (2018, 7 november). *What Are Diversified Farming Systems? - Berkeley Food Institute*. https://food.berkeley.edu/about-us/centers/dfs/what-are-diversified-farming-systems/

Blair, M. J., & Mabee, W. (2020). Resilience. In *Elsevier eBooks* (pp. 451–456). Elsevier BV. https://doi.org/10.1016/b978-0-08-102295-5.10754-1

Boer Burger Beweging. (2023). BBB BoerBurgerBeweging. *BBB*. https://boerburgerbeweging.nl/

Brunson, M. W., & Huntsinger, L. (2008). Ranching as a Conservation Strategy: Can Old Ranchers Save the New West? Rangeland Ecology & Management, 61(2), 137–147. https://doi.org/10.2111/07-063.1

Carr, S., & Tait, J. (1991). Differences in the attitudes of farmers and conservationists and their implications. *Journal of Environmental Management*. https://doi.org/10.1016/s0301-4797(05)80058-1

Constance, D. H. (2009). 2008 AFHVS presidential address. *Agriculture and Human Values*, *26*(1–2), 3–14. https://doi.org/10.1007/s10460-008-9187-0

Drenthe In Cijfers. (2022). *Kengetallen | Dit is Drenthe | Feiten en cijfers* https://www.drentheincijfers.nl/kengetallen/

Fischer, J., Brosi, B. J., Daily, G. C., Ehrlich, P. R., Goldman, R. L., Goldstein, J. N., Lindenmayer, D. B., Manning, A. D., Mooney, H. A., Pejchar, L., Ranganathan, J., & Tallis, H. (2008). Should agricultural policies encourage land sparing or wildlife-friendly farming? *Frontiers in Ecology and the Environment*, *6*(7), 380–385. https://doi.org/10.1890/070019

Flood, K., Mahon, M., & McDonagh, J. (2022). Everyday resilience: Rural communities as agents of change in peatland social-ecological systems. *Journal of Rural Studies*, *96*, 316–331. https://doi.org/10.1016/j.jrurstud.2022.11.008

Gorman, M., Mannion, J., Kinsella, J., & Bogue, P. (2001). Connecting environmental management and farm household livelihoods: The Rural Environment Protection Scheme in Ireland. *Journal of Environmental Policy & Planning*, *3*(2), 137–147. https://doi.org/10.1002/jepp.76

Hermans, F., Horlings, I., Beers, P. J., & Mommaas, H. (2010). The Contested Redefinition of a Sustainable Countryside: Revisiting Frouws' Rurality Discourses. *Sociologia Ruralis*, *50*(1), 46–63. https://doi.org/10.1111/j.1467-9523.2009.00501.x

Holling, C. S. (1973). Resilience and Stability of Ecological Systems. Annual Review of Ecology and Systematics, 4(1), 1–23. https://doi.org/10.1146/annurev.es.04.110173.000245

IPBES. (2019). Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. 1148 pages. https://doi.org/10.5281/zenodo.3831673

IPCC. (2019). Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.-O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)]. In press.

Karki, S., Burton, P., & Mackey, B. (2019). The experiences and perceptions of farmers about the impacts of climate change and variability on crop production: a review. *Climate and Development*, *12*(1), 80–95. https://doi.org/10.1080/17565529.2019.1603096

Kleijn, D., Biesmeijer, K. J. C., Klaassen, R. H. G., Oerlemans, N., Raemakers, I., Scheper, J., & Vet, L. E. M. (2020). Integrating biodiversity conservation in wider landscape management: necessity, implementation and evaluation. *The Future of Agricultural Landscapes, Part I*, *63*, 127–159. https://doi.org/10.1016/bs.aecr.2020.08.004

Kremen, C. (2015). Reframing the land-sparing/land-sharing debate for biodiversity conservation. *Annals of the New York Academy of Sciences*, *1355*(1), 52–76. https://doi.org/10.1111/nyas.12845

Kremen, C., Iles, A., & Bacon, C. M. (2012). Diversified Farming Systems: An Agroecological, Systems-based Alternative to Modern Industrial Agriculture. *Ecology and Society*, *17*(4). https://doi.org/10.5751/es-05103-170444

Kremen, C., & Merenlender, A. M. (2018). Landscapes that work for biodiversity and people. *Science*, *362*(6412). https://doi.org/10.1126/science.aau6020

Make It in the North. (2023, January 12). *Drenthe - Make it in the North*. https://www.makeitinthenorth.nl/drenthe/

McCombes, S. (2023). What is a research design | Types, Guide & examples. *Scribbr*. https://www.scribbr.com/methodology/research-design/

Ministerie van Algemene Zaken. (2022, 18 juli). *Perspectieven voor agrarische ondernemers*. Ministerie van Landbouw, Natuur en Voedselkwaliteit | Rijksoverheid.nl. https://www.rijksoverheid.nl/ministeries/ministerie-van-landbouw-natuur-en-voedselkwaliteit/perspectieven-voor-agrarische-ondernemers

Ministerie van Landbouw, Natuurbeheer en Voedselkwaliteit. (2023). *Demobedrijven in de melkveehouderij*. Demobedrijven per sector | Groeien naar morgen. https://www.groeiennaarmorgen.nl/demobedrijven-per-sector/melkveehouderij

Ministerie van Landbouw, Natuur en Voedselkwaliteit. (n.d.). *Natura 2000*. Natura 2000. Accessed on 26 April 2023, from https://www.natura2000.nl/

NOS. (2022, 24 juni). Boerenprotesten door het hele land, ook bij op- en afritten van snelwegen. *NOS*. https://nos.nl/artikel/2433958-boerenprotesten-door-het-hele-land-ook-bij-op-en-afritten-van-snelwegen

NOS. (2023a, 15 March). Bekijk hier alle uitslagen van de Provinciale Statenverkiezingen. *NOS*. https://nos.nl/collectie/13923/artikel/2467604-bekijk-hier-alle-uitslagen-van-de-
provinciale-statenverkiezingen

NOS. (2023b, 15 March). Ontevredenheid over kabinet was belangrijke drijfveer voor kiezers. *NOS*. https://nos.nl/collectie/13923/artikel/2467627-ontevredenheid-over-kabinet-was-belangrijke-drijfveer-voor-kiezers

Paris Agreement to the United Nations Framework Convention on Climate Change. (2015, 12 December). T.I.A.S. No. 16-1104.

Perrings, C. Resilience in the Dynamics of Economy-Environment Systems. *Environ Resource Econ* 11, 503–520 (1998). https://doi.org/10.1023/A:100825561427

Petersen-Rockney, M. (2022). Farmers adapt to climate change irrespective of stated belief in climate change: a California case study. Climatic Change, 173(3–4). https://doi.org/10.1007/s10584-022-03417-9

Petersen-Rockney, M., Baur, P., Guzman, A., Bender, S. F., Calo, A., Castillo, F., De Master, K., Dumont, A., Esquivel, K. E., Kremen, C., LaChance, J. C., Mooshammer, M., Ory, J., Price, M. J., Socolar, Y., Stanley, P. L., Iles, A., & Bowles, T. M. (2021). Narrow and Brittle or Broad and Nimble? Comparing Adaptive Capacity in Simplifying and Diversifying Farming Systems. *Frontiers in sustainable food systems*, *5*. https://doi.org/10.3389/fsufs.2021.564900

Ricciardi, V., Mehrabi, Z., Wittman, H., James, D., & Ramankutty, N. (2021). Higher yields and more biodiversity on smaller farms. *Nature sustainability*, *4*(7), 651–657. https://doi.org/10.1038/s41893-021-00699-2

Pimm, S. L. (1984). The complexity and stability of ecosystems. *Nature*, *307*(5949), 321-326.

Safi, A. S., Smith, W. L., & Liu, Z. (2012). Rural Nevada and Climate Change: Vulnerability, Beliefs, and Risk Perception. Risk Analysis, 32(6), 1041–1059. https://doi.org/10.1111/j.1539-6924.2012.01836.x

Schewe, R. L., & Stuart, D. (2017). Why Don't They Just Change? Contract Farming, Informational Influence, and Barriers to Agricultural Climate Change Mitigation. Rural Sociology, 82(2), 226–262. https://doi.org/10.1111/ruso.12122

Scribbr. (n.d.). *Een introductie tot onderzoeksmethoden | Wij helpen je kiezen*. Accessed on 25 April 2023, from https://www.scribbr.nl/category/onderzoeksmethoden/

Skrimizea, E., Lecuyer, L., Bunnefeld, N., Butler, J. R. A., Fickel, T., Hodgson, I., Holtkamp, C., Marzano, M., Parra, C., Pereira, L., Petit, S., Pound, D., Rodríguez, I., Ryan, P., Staffler, J., Vanbergen, A. J., Van den Broeck, P., Wittmer, H., & Young, J. C. (2020). Sustainable agriculture: recognizing the potential of conflict as a positive driver for transformative change. *The Future of Agricultural Landscapes, Part I*, *63*, 255–311. https://doi.org/10.1016/bs.aecr.2020.08.003

Statistics Solutions. (2022, 7 november). *Validity in Qualitative Research - Statistics solutions*. https://www.statisticssolutions.com/academic-research-consulting/qualitative-results-chapter/conducting-qualitative-research/validity-in-qualitative-research/#:~:text=When%20the%20study%20permits%2C%20deep,appear%20to%20be%20research%20results.

Trendbureau Drenthe. (2023, March 7). *Trendbureau Drenthe*. https://trendbureaudrenthe.nl/

Van Der Ploeg, J.D., R. van Broekshuizen, G.B.R. Sonnino, K. Knickel, T. Tisenkops and H. Oostindie (2008) Towards a framework for understanding regional, rural development. Pp. 1–28 in J.D. van der Ploeg and T. Marsden Unfolding webs; the dynamics of regional, rural development (Van Gorcum: Assen)

Van Der Ploeg, J. D., Barjolle, D., Bruil, J., Brunori, G., Madureira, L., Dessein, J., Drąg, Z., Fink-Kessler, A., Gasselin, P., De Molina, M. G., Gorlach, K., Jürgens, K., Kinsella, J., Kirwan, J., Knickel, K., Lucas, V., Marsden, T., Maye, D., Migliorini, P., . . . Wezel, A. (2019). The economic potential of agroecology: Empirical evidence from Europe. *Journal of Rural Studies*, *71*, 46–61. https://doi.org/10.1016/j.jrurstud.2019.09.003

Vennix, J. (2019). *Research methodology: An introduction to scientific thinking and practice.* Pearson Benelux B.V.

Westerink, J., Pleijte, M., Schrijver, R., Van Dam, R., De Krom, M., & De Boer, T. (2021). Can a 'good farmer' be nature-inclusive? Shifting cultural norms in farming in The Netherlands. *Journal of Rural Studies*, *88*, 60–70. https://doi.org/10.1016/j.jrurstud.2021.10.011

Willett, W. C., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S. J., Garnett, T., Tilman, D., DeClerck, F., Wood, A. G., Jonell, M., Clark, M. R., Gordon, L., Fanzo, J., Hawkes, C., Zurayk, R., Rivera, J. A., De Vries, W., Sibanda, L. M., . . . Murray, C. J. L. (2019). Food in the Anthropocene: The EAT–Lancet Commission on Healthy Diets from Sustainable Food Systems. *The Lancet*, *393*(10170), 447–492. https://doi.org/10.1016/s0140-6736(18)31788-4

9 Appendices

9.1 Appendix A. Research Schedule

When	Activity
Week 6 & 7	Working on the research proposal
Week 6: 6 Feb 2023	1st Meeting
Week 10 & 11	Writing the research proposal
Week 12: 20 Mar 2023	2nd Meeting
Week 12: 24 Mar 2023	**Hand in research proposal**
Week 15	Processing feedback and discussing the rewriting strategy
Week 16: 18 Apr 2023	3rd Meeting
Week 16 & 17	Working on the research proposal
Week 17: 26 Apr 2023	**Hand in rewritten research proposal**
Week 17: 28 Apr 2023	4th Meeting
Week 18: 2 May 2023	5th Meeting
I* (w18)	Processing feedback, writing operationalization and prepare field work
II (w20)	Elaboration of theoretical framework and methodology
Week 21: 24 May 2023	Setting new timelines for the thesis
III-VI (w22-25)	Collecting data / Field work
Week 24: 12 June 2023	6th Meeting
VII & VIII (w26-27)	Transcribing and coding data
VIII-X (w27-29)	Analyze & interpretate data
IX (w28)	Improving literature review, theoretical framework, and methodology
IX & XI (w28-29)	Writing results & limitations section of discussion
Week 29: 17 July 2023	**Hand in draft version Bachelor Thesis**
Week 30 (XII)	Improving results section and writing conclusion & discussion + supplementing recommendations, critical reflections and lay-out
Week 31 & 32 (XIII & XIV)	Improving and supplementing draft version Bachelor Thesis
Week 31: 7 August 2023	7th Meeting
Week 33	Extension
Week 33: 15 Aug 2023	**First opportunity final version Bachelor Thesis**

* Roman numerals = number of weeks from the approval of the research proposal

9.2 Appendix B. Interview Guideline Semi-Structured Interviews DFS

Voorafgaand aan het interview

- Vertel wat je gaat onderzoeken, waarvoor je komt.
- Vertel wat er met het eindverslag gebeurt.
- Bespreek anonimiteit, of de respondent anoniem wenst te blijven.
- Bespreek informed consent (dat de respondent op ieder moment mag stoppen zonder opgaaf van reden) en dat de respondent je altijd mag onderbreken voor vragen of verduidelijking, benoem dat er geen foute antwoorden zijn; sommige vragen zullen vergezocht lijken of niet van toepassing zijn.
- Vraag om toestemming om het interview op te nemen.

Tijdens/na het interview

- Probeer het interview binnen de duur van een uur te houden.
- Ga samen met de boer naar zijn/haar land kijken om observaties te maken (en maak hier aantekeningen van).
- Stuur achteraf het verslag op naar de boer wanneer gewenst (het wordt woordelijk uitgetypt).

Opening

Introductie.

- Bedank de respondent voor zijn/haar deelname.
- Informeer de respondent over duur van het interview.
- Voordat er wordt begonnen met de interview vragen, vraag de respondent om zich voor te stellen en zijn/of haar rol/functie te beschrijven.
- Introduceer het onderwerp waarmee het interview gestart wordt, en start het interview met een introducerende vraag

Interview vragen

Onderwerp	Vragen
Introductie/kennismaking	**Ervaring en identiteit** ❑ Hoeveel jaar bent u werkzaam als boer? ❑ Waarom bent u boer (op deze manier)? / (Waar doet u het voor/wat motiveert u)? ❑ Wat vindt u het leukste/het mooiste aspect aan uw werk? ❑ Hoe ziet (de toekomst van) uw bedrijf eruit? (Incl. pachtgrond/eigen grond, ligging, vee, gewassen, etc.) ❑ Op welke momenten bent u trots?
Natuur, een goede boer en landbeheer	**Goede boer** ❑ Wat is volgens u een goede boer? + Waar herkent u die aan? ❑ En een 'slechte' boer? **Boeren en goed landbeheer** ❑ Hoe ziet goed beheerd land (/een goed beheerde boerderij) er voor u uit? ❑ Hoe ervaart u de druk van buitenaf (door andere boeren en de maatschappij) voor boeren om te veranderen? Wat doet u daarmee? **Natuurinclusieve landbouw** ❑ Hoe deelt u zichzelf in met betrekking tot natuurinclusieve landbouw: o Voldoen aan de wettelijke eisen. o Agrarisch natuur-en landschapsbeheer (betaald of onbetaald, i.s.m. collectief of andere mogelijkheden). o Agrarisch natuur- en landschapsbeheer plus het stimuleren van bodemleven/natuurlijke (plaag-) bestrijding/sluiten van kringlopen (circulariteit). o Een bedrijfssysteem/bedrijfsvoering waarin natuur en landbouw zijn geïntegreerd.
Een andere aanpak voor boeren	**Rol en bewustzijn** ❑ Hoe denkt u over natuur en duurzaamheid? En over klimaatverandering? ❑ Hoe ziet u uw eigen rol (verantwoordelijkheid en invloed)? ❑ Hoe ervaart u de effecten en onzekerheid op uw beroep als gevolg van klimaat-veranderingen? ❑ Hoe gaat u om met deze veranderingen/ Hoe reageert u op deze veranderingen? **Opvatting** ❑ Wat verstaat u onder het diversifiëren van uw bedrijfsvoering? Wat denkt u dat verduurzamen is? ❑ In welk opzicht doet u het anders dan een conventionele (gewone) boer? ❑ Welke waarden zijn voor uw belangrijk? ❑ Hoe denkt u dat u een verschil kan maken? ❑ Wat doet u op dit moment voor of met de natuur? + Wanneer bent u hiermee begonnen? ❑ Bent u hierdoor anders over landbouw en natuur gaan denken? ❑ Wat is in uw opvatting/overtuiging een duurzame boerderij? ❑ Wat is voor u belangrijk voor de toekomst? **Bereidheid** ❑ Zou u meer willen doen voor of met de natuur? Zo ja, wat?/Zo nee, waarom niet? ❑ Wat zijn voor uw belangrijke redenen om aan de slag te gaan met verduurzaming? ❑ In hoeverre bent u bereid om te investeren in het verduurzamen van uw bedrijf? (Wat drijft u om dit te doen? Wat belemmert u hierin?)

	❑ In hoeverre draagt/bepaald uw beeld over natuur en duurzaamheid bij in de mate van actie die u onderneemt? **Participatie** ❑ Wat zou u helpen/ondersteunen om meer voor of met de natuur te (kunnen) doen? Wat belemmert u hierin (zoals beleid)? ❑ Als u landbouw/natuur beleid zou maken, wat zou u dan (anders) doen? (Bijvoobeeld 1 ding die u zou veranderen) **Politiek** ❑ In hoeverre bent u op de hoogte van waar de provincie over gaat en wat gemeentelijk/landelijk beleid is? ❑ Wat voor rol ziet u voor de (provinciale) politiek weggelegd? ❑ Hoe zou duurzaamheids-beleid eruit moeten zien om u te helpen? ❑ In uw opvatting, wat voor interventies moeten prioriteit krijgen? ❑ Hoe denkt uw over de druk op boeren om te veranderen?
Maatschappij en collega's	**Invloed van omgeving** ❑ Spreekt u weleens met anderen (boeren) over uw werk? Zo ja, waarover? En verder ook weleens met anderen (geen boeren)? ❑ Zijn er dingen die boeren in dit gebied samen-doen? ❑ Op welke manier probeert u als boer in contact te staan met/ betrokken te zijn bij de maatschappij? ❑ Bij wat voor dingen leert en laat u zich inspireren door collega's (kijkt u graag de kunst af bij collega's)? ❑ Wat zouden uw collega's ervan denken als u meer voor of met natuur gaat doen?
Slot	❑ Wat is nog niet aan bod geweest tijdens dit interview, wat u wel graag wilt vertellen?

Afsluiting

- Geef een kort overzicht of samenvatting van het interview.
- Vraag de respondent of hij/zij nog toevoegingen heeft, nog iets wil vertellen of nog vragen heeft.
- Bedankt de respondent nogmaals voor zijn/haar tijd en medewerking: 'Bedankt voor uw tijd en medewerking voor dit interview. Ik hoop dat u zich gehoord voelt en dat het mogelijk was om uw eigen verhaal te vertellen.'
- Deel contactgegevens, als u achteraf nog toevoegingen heeft kunt u deze nog mailen tot 30 juni, maar maak duidelijk dat de respondent echter niets meer aan de inhoud kan veranderen.

9.3 Appendix C. Summary of Interviews

9.3.1 Interview 1

The farmer has been working for 26 years and is now 46 years old. He is a dairy farmer with 200 cows and practices extensive livestock farming. He finds satisfaction in caring for the animals and enjoys the dynamic nature of the job. He maintains a work-life balance by hiring staff and taking occasional breaks with his partner. He strives to make himself dispensable and delegates responsibility to others. He stays active through sports and believes his sustainable and extensive farming practices make his farm future-proof. However, he acknowledges the pressure to scale up and intensify farming methods. The interview also discusses the reduction of methane emissions from cows through the addition of Bovaer to their feed. The importance of diversifying farming practices for sustainability is emphasized, as well as the need for openness to change and trying new methods. The mental health challenges facing farmers and the importance of community support are also highlighted. In this interview, the farmer also discusses the challenges and changes in the agricultural sector. He emphasizes the need for long-term planning and direction for farmers. He believes that there are currently too many changes happening, which can negatively impact farmers' mental health. He advocates for farmers to communicate and support each other in dealing with these challenges. The farmer values good care for animals, the land, and family. He actively participates in nature conservation projects and initiatives for diverse grasslands and reduced fertilizer use. He also expresses concern about the misuse of the term "sustainability" and believes that other sectors should take more responsibility for sustainability measures. He calls for more honest information about farming practices and recognition of farmers' efforts. The farmer is uncertain about the future but is committed to continuous sustainability efforts and leaves it up to his children to decide if they want to continue the farm. He critiques certain ideas, such as food forests, and highlights the high cost and land requirements associated with them.

9.3.2 Interview 2

In this interview, the researcher speaks with an organic dairy farmer from the Netherlands. He has been farming for about 30 years and switched to organic farming in 2018 because of his concerns about conventional farming. He is satisfied with his choice, but also has frustrations with permits and new regulations. He emphasizes the sustainability and benefits of organic farming, but has received mixed reactions from other farmers in his area. The farmer also discusses his views on working with nature and the importance of leaving a good farm for the next generation. He advocates simpler living and reducing the use of fossil fuels.

He is positive about the use of technology, but warns against dependence on diesel. Finally, he discusses his inspirations and his future plans for his farm.

9.3.3 Interview 3

The farmer from Diphoorn is active in dairy farming and has a farm with 280 dairy cows. He is involved in various activities, such as coaching and chairing various associations. He values the care of his cows and achieving good results through good feed. He experiences the effects of climate change as uncertainty in his profession. Although he is aware of the threats and demands coming his way, he also sees opportunities to improve sustainability and efficiency. Currently, he is not doing much in the area of conservation, but is working on using herb-rich pasture and reducing concentrate feed. He works with hunters to track nests and uses buffer strips and temporary grassland. He is willing to invest in sustainability, but wants clarity that the system is working. He feels it is important to show his actual numbers and be able to account for them. He thinks it is important to cooperate and understand different interests. He tries to stay positive and emphasize what is going well in his profession. He is actively involved in society and stays abreast of developments in the industry. He hopes there will be a change where "farmer normalcy" and "farmer common sense" are more appreciated.

9.3.4 Interview 4

The farmer thinks it is important for farmers to take responsibility for preserving nature and the environment by farming sustainably. She thinks politics can play a role in supporting farmers in sustainability goals and creating a fair milk price. The farmer also organized a farm opening day to show transparency and receive positive feedback. The farmer is inspired by young farmers and notes that their mindset is different from that of older generations. She feels that training should respond to this.

9.3.5 Interview 5

The respondent is a farmer from Anderen, Drenthe. She is married to a farmer and works on their dairy farm with an arable farming branch. She also works as a freelance project manager in the agriculture, water, and biodiversity sector. She became a farmer because of her relationship with a farmer and her interest in farming. They are motivated by their desire to have a form of circular economy on their farm and reduce their dependence on external inputs. They have plans to transition to natural inclusive agriculture and have submitted proposals to the province, but lack financial resources. They are involved in collaborations with Staatsbosbeheer and large companies like Agrifirm. They express the importance of collaboration, innovation, and recognizing the efforts of farmers in sustainable agriculture.

They also mention the challenges they face due to the limited number of farms in their area. They highlight the need for a comprehensive approach to nature and farming and the role of farmers in managing land for conservation. They emphasize the importance of soil health and advocating for a more targeted and supportive government policy. They discuss the challenges of securing funding for sustainable agriculture practices. They suggest a trial farm or learning network to facilitate collaboration and knowledge sharing among farmers. They express frustration about the lack of financial rewards for their sustainable practices.

9.3.6 Interview 6

In summary, the speaker is a farmer who enjoys their job and wants to produce milk in a socially responsible way. They emphasize the importance of leaving a sustainable farm for the next generation and ensuring that their employees enjoy their work. They believe that animals are essential for human nutrition and emphasize the importance of affordable food. The farm is currently focused on natural conservation efforts, increasing organic matter in the soil, reducing soil compaction, and utilizing renewable energy sources. They also mention the need for collaboration with the community and express their willingness to invest in sustainability. The speaker believes that the solution to sustainability is not always scaling up and highlights the importance of price and consumer demand. They also stress the need for clarity and long-term goals in the agricultural sector and advocate for stronger connections between nature and agriculture. They believe that the government has a role in supporting farmers in their journey towards sustainability. The speaker also discusses the challenges and opportunities in modern farming practices, emphasizing the importance of collaboration and representation. The interview ends with a discussion of farm sizes and the need for efficient management and continuous learning from others. The interviewer expresses their commitment to creating a comprehensive final product.

9.3.7 Interview 7

The interview discusses sustainability in agriculture, with a focus on the interviewed farmer's farm. The farmer explains the various sustainable practices they have implemented, such as planting flower mixes to attract insects and working towards a balanced farm with diverse soil life. They also express frustrations with government indecision and highlight the importance of dialogue and collaboration between different stakeholders. They emphasize the need for balance and adaptation in agriculture, as well as the importance of justice and fairness in the debate surrounding reducing livestock numbers. The farmer also mentions the importance of trust between farmers and the government, and the need for increased awareness and conscious consumer behavior. They advocate for a broader sustainable approach in the Netherlands, including both intensive and nature-inclusive agriculture, alongside energy production. The interview concludes with a discussion on food security, the challenges of climate change, and the farmer's hopes for innovation and support from the government.

9.4 Appendix D. List of Linguistic Changes in Interview Transcripts

Drents	**General Dutch**	**English (translation attempt)**
Döt [dat döt mie]	Doet	Do/does
Veul	Veel	Much
Bint	Zijn/bent	Are
Wilt	Willen	Want
Mut	Moeten	Must
Daj	Dat	That
Allemoal	Allemaal	Everyone
Bie	Bij	With
Wie	Wij	We
Bej	Ben je	Are you
‘t	Het	It
Mekaar	Elkaar (soms vervangen door)	Together
Aj	Als je	If you
Kuj	Kun/kan je	Can
Kunt	Kunnen	Can
Eem	Even	Shortly
Zegg’n	Zeggen	Say
Juust	Juist	Right
Maak’n, bedenk’n, hebb’n, geniet’n, buut’n/buit’n, zegg’n, … -‘n	Maken, bedenken, …en	Make, think, have, enjoy …
Kun	Kan	Can
Als	Dan	Than
Deurdat	Doordat	Because of
Ben d’r	Zijn er	Are there
Nuedig	Nodig	Needed
Mot dat	Moet dat	Must be
Lukt	Gelukt	Succeeded
Mien	Mijn	My
Kom’p	Komt	Come
Blieft	Blijft	Stay
Kiek	kijk	See
Krieg’n/kriegen	Krijgen	Get
Allèn	Alleen	Only/alone
Dizze	Deze	This
Letst	Laatst	The other day
Met	Mee (soms)	With
(Er moet iemand) Wezen	(Er moet iemand) Zijn	To be
‘daan/doan	Gedaan	Did