Effects of environmental policies on the Dutch livestock industry

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Summary

Climate change is one of the most serious threats that the human race has ever faced. There has been a need for action in the fight against it. After the signing of the Paris Agreement in 2015, the last decade has seen an increase in sustainable mitigation policies. The main objective of this agreement is to limit global warming to a maximum of 1.5 degrees Celsius. One way to do this is to reduce emissions in different sectors in different countries. With the Climate Agreement that was presented in 2019, the Netherlands is trying to accomplish this. Using different instruments and goals, a variety of sectors is targeted. One of the biggest contributors to greenhouse gas emissions is the agricultural business. Various types of livestock and arable farming contribute to global warming. They are suffering the effects of climate change themselves and are under pressure to move towards a more sustainable future. This paper presents a detailed analysis of the impact of the Climate Agreement on dairy farmers in the Netherlands, where this group produces the most emissions of all the types of the farming community. This analysis is done by outlining the challenges that dairy farmers face in order to achieve a sustainable future with the ultimate goal of reducing greenhouse gas emissions.

The Dutch government presented the Climate Agreement in 2019 with the ultimate goals to become energy neutral in 2030 and climate neutral in 2050. Because these are only deadlines, it will be tried to be reached by using all kinds of different policy instruments. This research used Policy Instrument Theory to identify the sticks, carrots and sermons in the Climate Agreement to see which elements might affect the daily lives of farmers. Farmers themselves experience climate change through heat stress, but also through the use of irrigation systems to keep pastures usable during long periods of heat. But how does the Climate Agreement affect the daily practices of dairy farmers? How are they compelled, advised or motivated to become more sustainable?

Elizabeth Shove's Social Practice Theory is used as a framework to identify social daily practices and technical daily practices. A feedback mechanism is also added to learn how the daily experiences of dairy farmers can influence the design phase of new policies. The social daily practices are divided into know-how, meaning and techniques. The technical daily practices focus on the effects on the soil, on barns and on farming systems. This has been done using semi-structured interviews with 8 different dairy farmers, separated into biological and non-biological, as this is the only approved typology to separate them.

The conclusions of this research can be seen in three main directions. First, biological farmers have already made the transition to a sustainable business plan, while non-biological farmers

face high costs if they want to change. These high costs create a high degree of uncertainty about the future. This contradiction limits the full impact of the Climate Agreement.

Second, the totality of a farmer's background is crucial in innovation processes. Motivation is linked to social, local and technical elements that influence decision-making in different ways. The Climate Accord focuses on disseminating information, such as farmer-learns-from-farmer pilots, that use these social relationships of farmers to transition to sustainability. Third, translation into policy can be influenced by the experiences of dairy farmers, both biological and non-biological. This can be done by measuring emissions, implementing the food strategy to secure the position of agriculture, and informing society to create acceptance for more expensive, environmentally friendly food.

Preface

Dear reader,

First of all, I would like to thank you for reading this bachelor thesis on the impact of sustainable policies on the daily practices of dairy farmers in the Netherlands. In a country where farmers are restricted in many ways, from phosphate rights to new number plates, they all face new policies. But Mother Earth is also facing challenges, from rising temperatures and oceans to extreme weather. This is affecting the daily practices of both civilians and farmers. Animals are experiencing heat stress, soils are experiencing droughts. All of this is negative, and yet farmers are trying to find new systems to deal with it. They are trying to stay positive. This research uses interviews to find out what problems they are facing and how dairy farmers are trying to use their experiences in new policies. I hope you will be able to learn from this research. Finally, I would like to thank Dr Kaufmann for supervising this research and the dairy farmers interviewed for their time and knowledge.

Yours sincerely,

Job Mogezomp

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1. Introduction

The context of the problem under investigation is described in the first chapter. It describes the general view of how the Dutch Livestock Industry works and who is involved in it, and which environmental policies exist in general. It then describes the problem, question and objective. In addition, there will be an explanation of the relevance of this research. Finally, in order to see what is included in this research, a general overview of the thesis has been given.

1.1 Climate change and SDGs

Climate change is one of the most serious problems that the human race has ever had to face. Climate change is estimated to cause the death of 250.000 people in the world between 2030-2050 per year due to for example heat stress and diarrhea. (WHO, 2021). Besides that, climate change will directly cost 2 to 4 billion globally to human health per year between 2030-2050. (WHO, 2021). One of the major effects of climate change is the rise of the global temperature of at least 1.5 degrees. It causes dramatic effects on the global ecosystem, biodiversity and many other areas worldwide. (United Nations, n.d. -a). For example with a rise of 1.5 degrees, 70-90% of the coral reefs will vanish and 4% of the mammals will lose half of their habitat. Climate change will influence more periods of droughts and wet periods, water quality will decrease and the amount of people with access to drinking water will decrease. (Caretta et al., 2022). All these negative impacts of climate change are reasons to act.

With that major effects in mind the United Nations introduced the Millennium Goals in the year 2000. This goals were announced to fight high poverty in poor countries and it helped preserve fragile states. (International Monetary Fund & World Bank, 2007 ;Pogge, 2004). After a period of time people realized the Millennium Goals were missing certain crucial fields, such as sustainable aimed goals. (Sachs, 2012). Sachs describes how the need for Sustainable Development Goals (SDGs) could not be denied. Finally in August 2015, the United Nations introduced the SDG's and included poverty-based goals, including sustainability-based ambitions. (United Nations, n.d. -b).

1.2 Environmental policies

This basis of the SDGs was just the start for a new set of policies and regulations of the United Nations. In December 2015 the Paris Agreement was signed by 196 countries from all over the world. The Paris Agreement aims to limit global warming to maximum of 2 degrees Celsius in 2100. Besides that it provides the opportunity to increase the possibility to adapt to global warming and third to make economic possibilities from the above possible. (Horowitz, 2016).

The main objective is to reach the highest level of gas emissions in the world as soon as possible.

The European Union has used this new legally binding framework as the basis for new policies. All members have signed the Paris Agreement, so they can force all countries to implement certain policies. (European Commission, n.d.). In the Netherlands, the Climate Agreement of 2019 is a direct implementation of the Paris Agreement. (Rijksoverheid, 2019). In the Climate Agreement, many different new restrictions and targets are added to reduce emissions in a wide range of sectors. In general, the line of argument is that the effects of climate change have forced the United Nations to implement this issue in new regulations, such as the SDGs in the Paris Agreement. National governments signed the Paris Agreement and therefore national policies are also forced to reduce emissions, such as the Climate Agreement does in the Netherlands.

To illustrate, the restrictions on agriculture in the Climate Agreement affect many sectors, such as agriculture. This is because of agriculture's impact on climate change. According to Aydinalp & Cresser 2008) the agriculture globally contributes 20% of the increase of 'anthropogenic greenhouse gasses' each year, such as carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O). This pollution has many different causes in various parts of agriculture facilities, such as 'flooding rice fields and land conversion'. (Aydinalp & Cresser, 2008). The livestock industry, which is highlighted in this research, contributes 5-10 percent to the total global warming.

The Climate Agreement distinguishes between several types of farming, such as livestock farming and arable farming. Due to the focus of the research on dairy farming, specific content in the Climate Agreement is analyzed and described specifically for this kind of farming. Below are examples of the content of the agreement focused on dairy farming (Rijksoverheid, 2019):

- The goal of being climate neutral in 2050
- Increasing farmers' knowledge
- Reducing emissions in the feeding process
- Carbon sequestration with nature

The targets and restrictions are further analyzed in this study. The regulations and targets set may affect the daily lives of farmers, who will have to change their farming practices to meet the goals of the Climate Agreement. The research by Piñeiro et al. (2020) explains the role of policies. They describe how day-to-day practices and decision-making are influenced by policies. For short-term changes on farms, economic motivations are far more important, but in the long term, both economic and environmental motivations work if they are focused on in

policies. Piñeiro et al. (2020) show how, in general, daily practices can be affected by policies, as is done in this research. The daily practices that are affected can be divided into social and technical daily practices. Social practices are about knowledge, meaning and farmers' point of view. The technical daily practices include innovation processes and daily techniques that are affected, such as milking the cows or mowing the meadows. Dutch farmers have experienced a lot of upheaval in the past due to restrictive regulations. For example, the Milk Quota in 1990 completely changed the Dutch livestock industry. The European Union introduced the milk quota to limit the total number of dairy cows within its borders. The total number of dairy cows within the EU-10 countries, including the Netherlands, was reduced from 25.8 million in 1983 to 16.3 million in 2014. (Eurostat, 2018). This period almost corresponds to the entire period of the milk quota, from 1990 to 2015. Dairy farmers were limited to the number of animals they wanted. (Helming & Peerlings, 2002). This resulted in a lower number of dairy cows in the Netherlands until 2015, when the Milk Quota was abolished. Several dairy farmers decided to expand because the restrictions were gone. (Groeneveld et al., 2016). As a result, the number of dairy cows decreased, as can be seen in Figure 1. This change in policy is just one of many examples that paint a picture of how Dutch agriculture is affected by the policies and regulations of the national government. With this in mind, the research problem can be drawn.

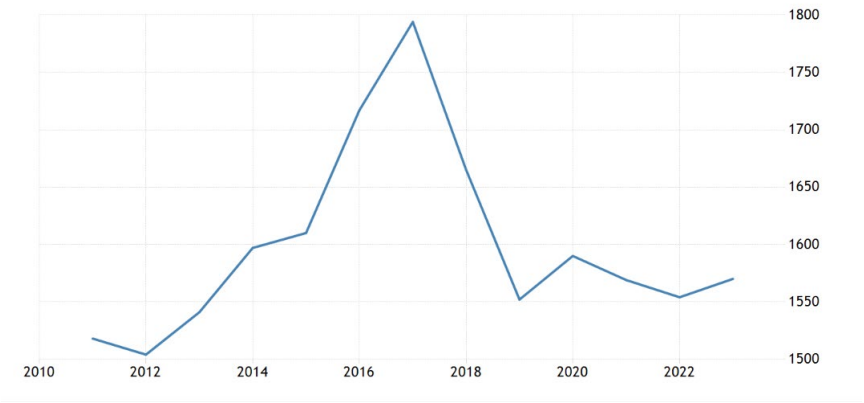

Figure 1: Dairy cows Netherlands in thousands (Eurostat, 2023)

The agricultural sector produces a lot of emissions and is therefore taken into account in policy-making. But how are dairy farmers' daily practices affected by these sustainable policies? This is being researched because understanding the impact of sustainable policies can help to better define farmers' morale. Also, the effectiveness of certain policies can be explained with a better understanding of how farmers are affected in their daily practices. On the other hand, in recent years there have been farmer protests in the Netherlands for various reasons, such as nitrogen policy or climate change policy. (Van der Ploeg, 2020). The protests show that

farmers disagree with national policies that affect Dutch agriculture. This view on the policies and how the farmers' experiences can contribute to the creation of these policies is taken into account in this research.

This gap in research, which is explained in the literature review, has been explored using the theoretical framework of Elizabeth Shove's Social Practice Theory. This was done to provide information on how farmers perceive sustainable policies. It also focuses on the impact of policies on farmers' daily social and technical practices.

1.3 Research questions and aim

This study tries to answer the question to what extent sustainable policies influence the practices of dairy farmers in the Netherlands. This was done using the Climate Agreement of 2019. This research provides more insight into the interrelationships between dairy farmers' daily farming practices and the Climate Agreement. This contributes to the understanding of the effectiveness of this policy. By providing information on the effects of sustainable policies, dairy farmers' experiences can be incorporated into future policy-making. In order to find an appropriate answer to this relationship, several research questions are used, which are discussed below.

Topic question:

How does the Climate Agreement influence the dairy farming practices in the Netherlands?

Sub questions:

1. *What specific policy instruments in the Climate Agreement affects the dairy farming?*
2. *In what way does the Climate Agreement influence certain elements of the farmers practices?*
3. *In what way are dairy farmers part of the creating process of sustainable policies?*

What specific policy instruments in the Climate Agreement affects the dairy farming?

The first sub question aims to understand which elements of the 2019 Climate Agreement directly and indirectly influence dairy farmers in their daily farming practices. The policy instrument theory described by Bemelmans-Videc et al. (2003) has been used to analyze the Climate Agreement to determine which targets and restrictions can be categorized as sticks, sermons and carrots. This was done by using a qualitative coding method of the Climate Accord as a primary document.

- ***In what way does the Climate Agreement influence certain elements of the farmers practices?***

The focus of this sub question is to understand which specific elements of the Climate Agreement influence certain practices of dairy farmers. Elizabeth Shove's Social Practice Theory is used to analyze these practices, which are divided into social and technical daily practices. This relationship is explored using the qualitative method of semi-structured interviews. The interviews are systematically coded using three different levels. Quotes are used to support arguments to ensure the validity of the research.

- **In what way are dairy farmers part of the creating process of sustainable policies?**

This research question examines the feedback mechanism. Can dairy farmers give feedback on the policy? Can farmers take part in the debate on policy development? This part focuses on how farmers feel about being involved in the process of creating or innovating current and future policies. The feedback mechanism added to Shove's social practice theory is used to find out what experiences have been and will be made. This was done using semi-structured interviews. In these interviews dairy farmers were asked how their experiences have been taken into account in policy making in the past and how they expect their position to be in this process in the future.

1.4 Relevance of research

This part discusses the relevance of this research. Firstly, there will be an explanation of the societal relevance in terms of the ways in which farmers can learn from this research. It will also discuss how dairy farmers' understanding of sustainable policy can be improved. The scientific relevance explains what new aspects in this research contribute to the general scientific world.

1.4.1 Societal Relevance

The food chain is made up of many different players, from consumers to industries that process products that originate on farms. But it all starts on farms, which vary from dairy farms to horticulture. If there is a change at the first stage of the food chain, it will affect all the others. Bradbear and Friel (2013) describe how consumers are affected by climate change through food prices. Climate change can lead to poor harvests, which directly affects food prices. It can even affect the health of these consumers. (Bradbear and Friel, 2013). On the other hand, it is not only consumers who are affected, as farmers will earn less if their harvests fail more often. In the last decades, new rounds of climate change policies have been introduced, such as

the Paris Agreement, but there are also new United Nations conventions every year to come up with new agreements. Bryant and Garnham (2014) explain in their research that farmers more often experience difficulties with policies and the mental effects of them. They describe how the poor economic situation can lead to low morale among farmers or even worse situations.

Other sources confirm the impact of climate change policies on farmers. One type of policy is to provide financial support to farmers through various types of subsidies or other mechanisms. Coyne et al. (2021) describe how private schemes can help farmers to towards a more sustainable business plan. More public financial support systems would work less well because of a lack of willingness on the part of farmers themselves. They prefer more private financial support in the transition process. The acceptance of different types of financial support is a result of the different policies that exist. This can affect farmers' morale and this is where this research can help. It will focus on how the financial support Dutch policies affect the view of the farmers themselves and how they need or do not need certain financial support. Yazd et al. (2019) confirms this impact of the financial situation of farmers on mental health. In this study, they focused on many different articles and summarized the main topics that negatively affect the mental health of farmers. Financial insecurity is one of the four main issues that have an impact on the farmers in the study. The financial support described by Coyne et al. (2021) could help with this. Yazd et al. (2019) also describe how climate change affects the mental health of farmers. This combination of climate change effects and financial insecurity is used in this study to explain how the morale of dairy farmers in the Netherlands is affected by sustainable policies. Combining the inconsistency of agricultural policies and the low morale of farmers, it is necessary to do more research on the effects of climate change policies. This could help to understand farmers better and, on the other hand, give dairy farmers a helping hand.

1.4.2 Scientific Relevance

In this part the focus will be on the scientific relevance. A lot has been written about climate change and their policies, as well as agriculture contribution with emissions that increase climate change. Dairy farmers are a really big component in this, because they take a big part in the world wide pollution. Because of that, many climate change based policies are focused on this type of farming. The focus is mostly on the climate change and not on the farmers themselves. First it is good to mention Barnes and Toma (2012), who describe how different six types of farmers were divided and only one of them said that they wanted to adapt to climate change based policies. This shows that different types of farmers have different types of views. A possible explanation can be found, is by using and researching it with different theories.

Several researches focused on how farmers experience practices in general. For example Glover (2015), who researched farming families with the Social Practice Theory of Bourdieu. This researcher only focused on how farmers join the field of agriculture and their positions and reasons. This lets out important aspects related to this research as policies and daily practices. Also this research did not include the reproduction mechanism that is taken into account into this research. Nash et al. (2017) are really close to my research, because they use the Social Theory of Shove. Also they implemented spillovers between different social practices. That means that for example the dairy farmers also influence other sorts of farmers. Essential for my research is that the focus is on how farmers experiences or practices can help in the policymaking.. Other researches only focus on the relation between policies and the practices of farmers. This research also focus on the relation the other way around. In other words, how the farmers experiences can be used in creating new sustainable policies. This relationship is not included in many researches. This insight of feedback mechanisms towards policy making processes is one of the topics this research can contribute to the general scientific world.

2. Theoretical Framework

This chapter contains the published scientific literature that relates to this research. The literature is discussed and a correlation is made as to how it is significant. It also discusses the key concepts, develops a conceptual model and explains the operationalization.

2.1 Literature review

This part discusses the known relationships in other research in relation to this research. The focus is on related research where interesting relationships are explored. This defines the position of this research in relation to those that have already been carried out. First, the relationship between farmers and climate change is explained, followed by the position of agro-ecological farming. Then the relationship between policies and agriculture is explained and used to explain what burden there is and what might be needed in the effectiveness of policies to be obtained in order to work.

As mentioned above, climate change is one of the biggest problems humanity has ever faced. The effects of climate change affect all different sectors and working areas around the world. In this research, the focus is on the agricultural sector, as it is one of the most polluting sectors. Also it has been the main topic in many researches. Many studies describe this relationship between agricultural pollution and its impact on climate change. Balogh (2020) is a researcher at the University of Budapest, where he carried out a review of 'agriculture-based determinants

of climate change'. For example, he looked at crop production and manure management and how they are affected. The agricultural sector is affected in a number of different ways. This can be concluded from the large amount of research that has been done on the subject. The position of farmers can be influenced by the effects of climate change. This change in perception could influence future innovation projects if they are prompted to change because of the effects they themselves are suffering. This is confirmed by Chatrchyan et al. (2017), where they state that the effects of climate change could motivate farmers to change. This would have an impact on the innovation projects a farmer is planning.

A relevant example of hybrid agricultural approaches is the agroecological approach. It is discussed in the paper by Van der Ploeg et al. (2019), where they describe how many economic benefits it brings. Furthermore, they describe how it can be the guideline for other research in Europe, but also that it can be the basis for the transition to a more sustainable agriculture. One cautionary note about the paper is that it gives only a one-sided view of the benefits of this agro-ecological way of farming. Van der Ploeg et al. (2019) do not describe how farmers are socially transformed by the implementation of a new strategy. This will be partly answered in this research by interviewing farmers who have already changed to agroecological farming.

Other research, such as Singleton & Law (2013), looked at the role of specific devices in the agricultural sector. They looked at how the Cattle Tracing System in the UK is essential in the livestock sector because every farm, big or small, has to deal with it. It is based on IT databases, so it is a very intellectual and technical machine. They describe how the daily business of farmers can also be seen as a machine by repeating it every day. They ask themselves how this is achieved. This research is only carried out in the UK, but it can be generalized. In the Netherlands, for example, the Climate Agreement is also an unavoidable policy for the future. In this sense, the idea of how it works in the Netherlands is central, because the Climate Agreement is less mechanical.

Another similar study was conducted by Sorvali, Kaseva & Peltonen-Sainio (2021). They looked at farmers of all types in Finland who are experiencing climate change and how they are prepared to adapt to it. They conducted a survey with 2000 different types of farmers from all kinds of backgrounds. It concluded that farmers should be more involved in climate change policy discussions. Sorvali, Kaseva & Peltonen-Sainio (2021) also concluded that opportunities and risks should be discussed more because this would help farmers to move more quickly towards a more sustainable farming strategy. The difference with my research is that it was a survey of all types of farms in Finland, including farms that do not pollute much, for example horticulture farmers. Another Finnish study by Puupponen et al (2022) looked at specific dairy

farmers in the country. They looked at the extent to which dairy farmers were willing to change to a carbon neutral farm. They also found that farmers have problems with profitability and blame other citizens for their problems. This profitability is really important, according to Jayasundara et al. (2019), because it can help reduce the carbon footprint of intensive dairy farmers. A remake of the study by Puupponen et al. (2022) is that they did a very specific case study among dairy farmers of a specific company. Furthermore, they only interviewed non-transitioning farmers. Despite the fact that both Finnish studies did not include social practice theory, the studies are still relevant to this research. They suggest the importance of financial elements in decision making.

This financial aspect could lead to a socio-economic burden between the decisions farmers make to become more sustainable. Reidsma et al. (2015) investigated how the impacts of climate change affect the socio-economic experiences of farmers in the Netherlands. Social, economic and environmental aspects need to be taken into account in policy making, as farmers are not always willing to change. The environmental effects of climate change are often negative, the social effects are mixed and the economic effects cannot be separated. This implies a choice between production and income on the one hand and social and environmental services on the other. (Reidsma et al., 2015). This choice is also described in this study as a burden between the social and economic effects of policies.

This explained socio-economic burden can lead to the infectiousness of policies that try to reduce CO2 emissions. Vermeulen et al. (2012) outline two main approaches for the adaptation of policies in the daily life of farmers. First, they explain that the time frame needs to be accelerated in order to make a timely transition to a more sustainable agricultural sector. This can be done by implementing agronomic practices or technology packages. Second, to adapt to the increasing impacts of climate change, major changes are needed in policy-making processes, but also in farming systems. Changing food systems is relevant to this research, where food strategy is an important issue in the transition to more sustainable agriculture. Vermeulen et al. (2012) suggest that big changes in adapting to the impacts of climate change need to be multi-targeted. This food strategy includes many different aspects, such as adaptation, but also social acceptance to change the sector. Mehrabi, Mesa & Giagnocavo (2022) confirm this consumer position. They describe how previous research has positioned consumers in an inactive position, whereas their research focuses on the position of consumers as active. Consumers can play a crucial role in the acceptance of farmers. The relationship between farmers and consumers needs to be re-established in order to adapt to climate change. This position of consumers in the food strategy is also explained in this research. It is therefore discussed in the literature review.

With this in mind, it is necessary to understand how the Climate Agreement as a policy is experienced by dairy farmers and how it might influence their practices.

2.2 Theoretical Concepts

This part explores the theoretical concepts and discusses why they were chosen for this research. Firstly, Social Practice Theory is introduced and explained in general terms, after which Shove's Practice Theory is discussed in relation to this research. Also the Policy Instrument Theory is discussed with the elements of sticks, sermons and carrots.

2.2.1 Social Practice Theory

General overview Social Practice Theory

The Social Practice Theory has been discussed for several decades. It was first discussed by Pierre Bourdieu in 1977 in his book 'An Outline of a Theory of Practice'. In this book, he laid the foundations for decades of research on Social Practice Theory. After him many other researchers like Giddens (1984), Cetina et al. (2001), Shove et al. (2012) and Reckwitz (2002) described this Social Practice Theory. The definitions differ slightly from researcher to researcher. The following quote from Giddens (1984) may help to explain the definition:

- "Social practices ordered in space and time. Human social activities, like some self-reproducing items in nature, are recursive'. (p. 123)

This is the basis of Giddens' Structuration Theory as well as Social Practice Theory. In his book, Giddens explains how agency and structure are interrelated. In other words, the quote above means that social structures influence human social practices, but also that human practices influence social structures. In doing so, Giddens rejects the idea of the experience of an individual actor or of the social whole. (Giddens, 1984, p.3). This loop in which one creates another is a process that takes time and space and reproduces itself over and over again. Giddens' social theory differs from Bourdieu's. Bourdieu describes how habitus, fields and capital are essential in social theory. Bourdieu describes these aspects in all his work. People in fields are structured in different hierarchies, where the amount of capital, for example social capital, explains which level you are in the hierarchy. (Bourdieu, 1977, p. 35). Habitus is the knowledge and perception that each person has. Habitus increases over a lifetime because you gain more knowledge as you grow up. More of these habitus form networks, which can be called structures. (Bourdieu, 1977, p. 78). Due to the fact that social theory is a very broad theory with different views and different perceptions, not all of the researchers mentioned above will be explained. Bourdieu and Giddens will now be briefly explained to give a general overview of Social Practice Theory.

Introducing Social Theory of Shove

In Shoves book 'Dynamics of Social Practice' (2012) that she wrote with researchers Pantzar and Watson, they describe how the ongoing processes in the Social Practice Theory are important. They describe how earlier research tried to define it and explain it to the audience. What they think is missing from the definitions of Giddens and Bourdieu can be explained by the following quote:

'With each transition, elements, including the shape of the board, the details of the know-how, the meanings and purposes of the practice and the characteristics … have been reconfigured. (Shove et al., 2012, p. 8).

This quote explains that an experience as a practitioner exists out of more than just 'one' aspect, but out of different elements. With this in mind the focus can be on their introduced new elements in the Social Practice Theory: materials, competences and meanings. Materials are what we need, for example technologies and 'physical entities'. The focus with competence is about knowhow and techniques. The meanings is about how ideas and aspirations. They also describe how these elements can interfere with each other. Elements are separate, but also often linked to each other. (Shove et al. 2012, p.31). Because this needs a specific explanation, this part is explained more broadly in the literature review for research question 2 where the focus is on how the elements are influenced by the Climate Agreement. Because of the fact that Shove et al. (2012) give examples how policies can be defined as structures, there can be concluded that the Climate Agreement can be taken into account for research. It aims to reduce emissions in general, also for the livestock industry. This results in different effects for dairy farmers, on material, but also on meanings and competences. That is why this Social Theory of Shove fits really well. In this research the focus relies on a more abstract view of the effects of the agreement resulting in cow-care practices, as well as more business-running practices. This research tries to keep a solid, systematic level of practices.

Not only the focus is how structures influence the elements of the Social Practice Theory, but also the other way around. In other words how these elements co-create the structures. In Shove et al. (2015, p. 3) they explain with an example how this works. This can be called reproduction. If you drive a car, you have materials, competences and meanings. After driving one more time, you gain more experience. This experiences can be used to set up new policies for example. This reproduction leads for example for new materials, that can increase the happiness of the practitioners. In other words, the loop of reproduction is explained with an easy example, but can help to gain a different experience. (Shove et al., 2015, p. 3). This loop has been discussed in the sub question 3 where the focus is how practices of dairy farmers can shape new restrictions and policies.

2.2.2 Policy Instrument Theory

This section explains the Policy Instrument Theory as developed by Bemelmans-Videc et al. (2003). First, the general elements of the Policy Instrument Theory are outlined, and then the specific elements are explained.

General overview

There are many different types of policy instruments, from innovative to traditional, from which a policy maker can choose the most effective to achieve his or her objectives. According to Bemelmans-Videc et al. (2003), Policy Instrument Theory provides three types of instruments that can be chosen when designing policies: regulations (sticks), subsidies (carrots) and information campaigns (sermons). Regulatory instruments form the basis of many international governments. The general task is to 'define norms, acceptable behavior or limit activities in a given society'. (Bemelmans-Videc et al, 2003, p. 56). Economic instruments are there as a tool to provide help or to get money, but to take away all responsibility from people. (Bemelmans-Videc et al, 2003). When you give subsidies, people do not have to pay the costs, but they still get the money. Information campaigns are seen as a modern form of intervention. By providing knowledge, you can influence certain groups to act in a certain way. This can be seen as democratic politics in its most ideal form. (Bemelmans-Videc et al, 2003). It is now very important to compare the three different instruments with the policy chosen in this research.

Sticks

As explained, sticks are the regulatory instruments that can be used in the design of policies. They can be used to force society towards the standard that you, as a government, want to maintain. Bemelmans-Videc et al. (2003, p. 59) focus on a literature review where they conclude that overtime regulatory instruments are "ineffective and excessively costly". The financial aspect is a result of pushing certain regulations to the point where the costs incurred are greater than the actual benefits of a regulation.

Carrots

The financial element of carrots is the second instrument of the policy instrument theory to be discussed. This financial instrument can be used in different ways: subsidies, taxes and grants. There are positive and negative carrots. (Bemelmans-Videc et al., 2003, p. 77). Positive carrots provide money to invest in subsidies or grants, whereas negative carrots focus on loans and taxes. Bemelmans-Videc et al. also focus on the Netherlands to show that in 1993 alone they spent 43 billion guilders on subsidies. This is about 19 billion euros. Today, this amount has increased to 34.3 billion euros in 2020. (Centraal Bureau voor de Statistiek, 2022).

Sermons

The final element is the information campaign that is possible using the sermon instrument. According to Bemelmans-Videc et al. (2003) the sermon instrument is a cheap way to use as a government. This input does not cost that much. Information campaign also do not need to be evaluated that much, because of the fact that it is that cheap. This leads to the paradox where information campaign do not have direct effects and are in that way difficult to control, but it does not need to, because of the low costs. Other policy instrument are more experience, with for example 34.3 billion euro in the Netherlands each year going towards subsidies. (Centraal Bureau voor de Statistiek, 2022).

The three instruments are related to the Climate Agreement below in the resulting part.

2.3 Conceptual model

The conceptual model shows the important relationships between the actors studied. It is shown in Figure 2.

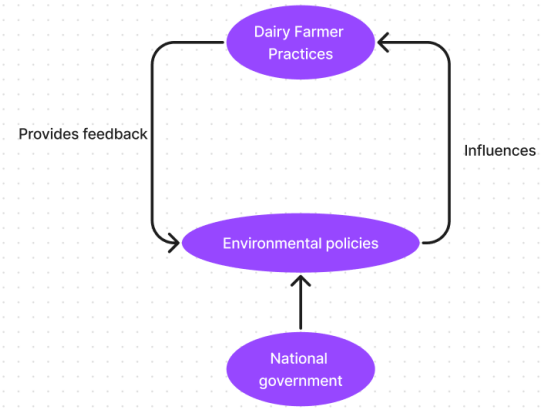

Figure 2: Conceptual model

The conceptual model shows the two main actors in the research: sustainable policies and dairy farmers' practices. The structure is based on Shove's Social Practice Theory. On the one hand, the influence of sustainable policies on dairy farmers' practices is explained, while on the other hand, the reproduction or feedback mechanism is included. This is explained in 2.2.1 Social practice theory. Thirdly, the arrow is drawn from the national government to the sustainable policies because they create them.

2.4 Operationalization

All research needs to have an operationalization that shows how all the key concepts will be explored. In the conceptual model there are two main concepts: sustainable policies and dairy farmer practices.

Firstly, sustainable policies, which are grounded in climate change, are very comprehensive. As mentioned above, the Paris Agreement aims to limit global warming to a maximum of 2 degrees Celsius. Bodle et al. (2016) focus on how countries are forced to present their plans every five years. Therefore, countries are focused on creating new policies to fight climate change. The Climate Agreement is a result of the Paris Agreement. It can be broken down into the different elements of the Policy Instrument Theory: sticks, carrots and sermons. The concepts are also explained in this part.

Secondly, in 2.2.1 the three elements of the Social Practice Theory of Shove are briefly explained. These are materials, competences and meanings. Dairy farmers' practices include all three elements. The material is the farm and the machinery, but also the farm soil. The competences focus on the skill level of the farmers. In what way are they able to own and manage a farm? The last part is the importance of the farmers' ideas and aspirations. How are they prepared to adapt to the Climate Agreement? These three elements give a complete picture of what practices are affected by the agreement. A focus of this research is to look at which specific elements are affected and how they relate to each other.

Theory	**Mechanism**	**Description**
Farming practices	Competences	Social part; Skill-level farmers and strategies
	Meaning	Social part; Idea and aspirations farmers
	Materials	Technical part; Barn, soil and farming systems
Policy aim types	Sticks	Restrictions; Policies and regulations to force farmers into certain measures
	Carrots	Financial part; Governmental money for subsidies or other ways to affect farmers
	Sermons	Information campaign; Used to inform farmers to indirect affect them

Table 1: Concepts and variables research

3. Methodology

This chapter includes the research design, which explains what kind of research was done. Secondly, the data collection methods are critically discussed and the strategy is explained. Thirdly, the analysis strategy is explained and discussed, after which the reliability and validity of this research are discussed. The appendices present the interview guide and other important information.

3.1 Research design

This section presents the design of this research. First, the research questions are discussed and then the design template is shown.

Sub questions:

1. *What specific policy instruments in the Climate Agreement affects the dairy farming?*
2. *In what way does the Climate Agreement influence certain elements of the farmers practices?*
3. *In what way are dairy farmers part of the creating process of sustainable policies?*

To answer these different questions, different types of qualitative data analysis are used. First, semi-structured interviews are conducted with different farmers. This is followed by a deductive coding analysis in Atlas.ti. In addition to the interviews, a literature review will support the interviews by using different types of sources to answer the sub-questions.

Sub question	**Method**	**Aim**
Question 1	Literature review Primary document analyses	To collect specific data and elements in the Climate Agreement.
Question 2	Literature review Semi-structured interviews	Relation between Climate Agreement elements and daily practices farmers.
Question 3	Semi-structured interviews	Discusses feedback loop from practices towards agency.

Table 2: Methods per sub question

Below is an overall research design showing the literature sources used in the research. The different theories are also shown. Furthermore, the main stages in the research to fulfill the design are presented.

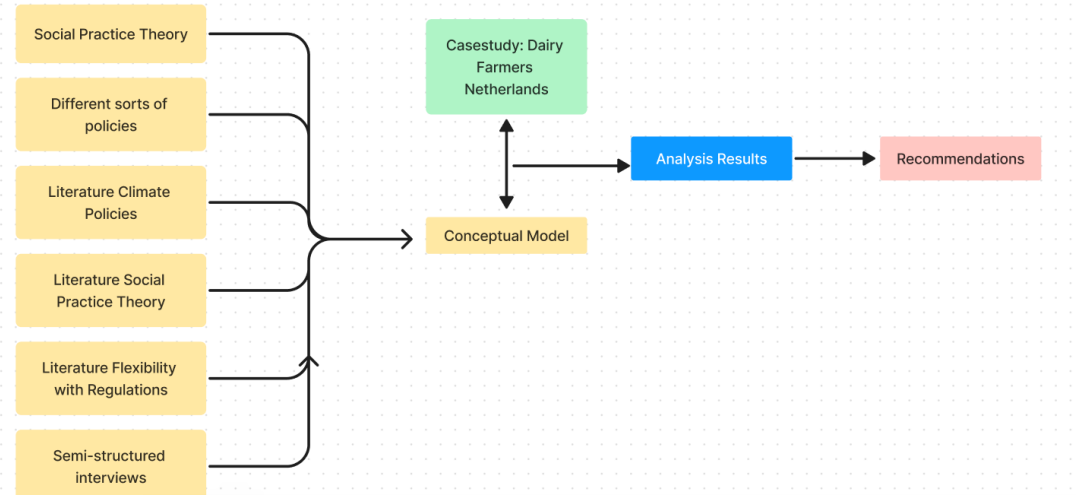

Figure 3: Research Design

Qualitative research

In general there are many different ways to construct a qualitative research, that has been chosen in this research. First it is important to define why in this research qualitative methods are constructed. According to Creswell (2013, p. 22) qualitative research 'is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem.' In this way the underlying background and motivations of respondents can be investigated. This qualitative research can be done in many different ways: from narratives to ethnographic research. The case that has been chosen is 'dairy farmers in the Netherlands'. In the Netherlands there are many different types of farmers in the agriculture, but one of the most polluting branch are the cattle farmers. (Centraal Bureau voor de Statistiek, 2020). They graphed how the dairy farmers in the last decennium are polluting the most phosphate and nitrogen. This is shown in figure 4 and figure 5. The figures show the high proportion of emissions from dairy farmers in the total agricultural sector.

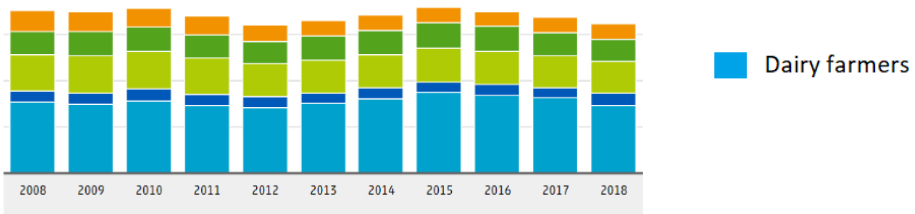

Figure 4: Phosphate emissions agriculture Netherlands

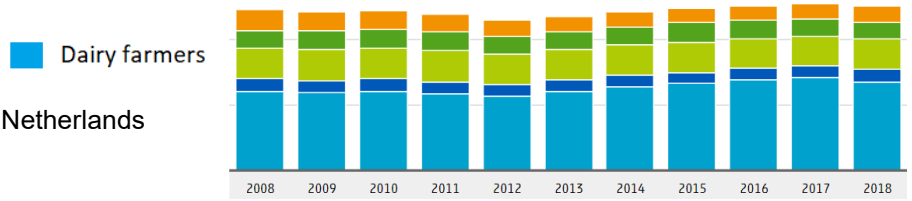

Figure 5: Nitrogen emissions agriculture Netherlands

Dairy farmers are still divided into different types of animals, such as cows and goats. In this study, cow farms were chosen because they produce the most liters of milk in the Netherlands: 1.6 billion liters per year. The second group of farmers, goat farms, produce much less with 370 million liters per year. (COKZ, 2023). Cow farms also produce far more emissions than goat farms.

To understand the relation between dairy farmers and sustainable policies, the Social Practice Theory of Shove is used. The social and technical practices that are part of this practices theory, are very difficult relationships between the elements that are part of it. Qualitative research fits when learning about the background of the dairy farmers and the interrelations.

Qualitative methods have a number of advantages, but they also have drawbacks. Firstly, there are four main reasons to choose qualitative research. (Creswell, 2013, p. 102).

1. Not enough known theory
2. Existing knowledge may be incorrect or false
3. Willingness to discover new relationships
4. Not suitable for quantitative methods

The element of lack of theory fits the topic that is researched in this study. Dairy farmers are often interviewed and researched, but the relationship between sustainable policy and Dutch dairy farmers was not mentioned often. Also, the need to discover new relationships between daily practices and the design phase of new policies is only possible with qualitative research. Quantitative research tends to focus on relationships that are already known. Words like cause and effect are known in quantitative research. (Creswell, 2013, p. 126). In other words, qualitative looks at new, open relationships, whereas quantitative focuses on known relationships. This is one of the reasons why qualitative methods are chosen in this research.

A major negative aspect of qualitative research is the idea of always focusing on the ethical part of research. (Creswell, 2013, p. 95). Ethics can go wrong in many different ways such as:

1 Power can be abused
2 Stressful for respondents
3 Potentially harmful and intimate information

Creswell describes how ethical issues need to be considered in qualitative research. The interaction with respondents is deeper than in quantitative research. The power of the

interviewer can be abused in a way that the researcher draws the wrong conclusions, but the respondent does not react because of their position. This can also be stressful for respondents. Information from respondents can also be intimate and therefore misused. This research tries to defend this by using the privacy of the respondents and asking whether they are comfortable with the use of their quotes, for example.

Single Case Study

In this research, the single case study method (Kennedy, 1979) is used, as shown in Figure 3. The single case study method is one example of a case study. As explained in Kennedy's work, there are two options: disaggregated studies of multiple events and studies of single events. According to Kennedy (1979), disaggregated studies of multiple events can be seen as 'it is conceivable that an evaluator might study more than one case, but study the cases individually, rather than averaging or otherwise pooling data across cases'. (Kennedy, 1979, p.664). This means that there are multiple event studies. For example, if you were doing research on migration, you would also focus on the country of origin and the country to which the migrant is going. In this way you study multiple events in different countries. With disaggregated studies you study the cases side by side. According to Kennedy, disaggregated studies are supposed to compare different cases or countries. This is not the case in this research and therefore a single case study is perfect because the data from the interviews with the dairy farmers are compared. In this sense, the interviews can be seen as single events. Single case studies can be explained using Creswell's definition of case studies in general. Data collection involves a variety of procedures as the researcher builds an in-depth picture of the case. (Creswell, 2007, p. 148). A single case study outlines and explores the in-depth picture of a case. In this research this is the dairy sector in the Netherlands. Several farmers are interviewed, but they are combined into one case: the dairy sector in the Netherlands.

Single case studies can be used for many different reasons, so it is necessary to explain what the disadvantages and advantages are. According to Creswell (2013, p. 171), case studies contain an accurate picture of the interviewees. In this way, the background of the respondents can be used to explain certain specifications that occur. This helps to understand the relationships provided by the interviews. Another advantage of single case studies is that 'a single case study produces additional and better theory'. (Gustafsson, 2017). The focus on theory can be broadened because the background can be part of the research. With multiple case studies, the amount of relationships is limited because it is time consuming, according to Gustafsson.

On the other hand, understanding is better when a multiple case study is used. By using different cases, it can help to describe a complete phenomenon. (Gustafsson, 2017).

Gathering more information leads to more knowledge about the context of a particular relationship. In the context of this research, this would mean, for example, that the other types of farmers in the agricultural sector would also be interviewed. This would probably lead to more knowledge about the relationship between climate change policies and the impact on farms. Another disadvantage is that the information from a single case study is not very generalizable to other contexts. Gustafsson (2017) confirms this by suggesting that case studies are "sufficiently scientific". The information gained from the research has many different contexts and different backgrounds. This makes it difficult to transfer knowledge from this research to other sectors, for example.

Finally, it is vital to categorize the single case study used as a critical or typical case study. A typical case study 'highlights what is normal or average' and a critical case study 'allows for logical generalization and maximum application of information to other cases'. (Creswell, 2007, p. 143). This research focuses on several dairy farmers. Their information is used to generalize to other cases and to see if there are common and regular patterns among the farmers. Therefore, this research fits into the typical case study design.

3.2 Data collection

For the data collection there are two different types of sources used. First the semi-structured interviews will be explained, whereafter the desktop research is outlined.

3.2.1 Semi-structured interviews

Semi-structured interviews were chosen as the method of data collection. These are interviews in which an interview guide is used to guide the conversation, but the respondents are given freedom. (Galetta & Cross, 2014). Semi-structured interviews are used to combine empirical and theoretical findings. In this research, the empirical findings are the results of open-ended questions answered by the respondents. The theoretical evidence was gathered through the literature review. This combination provides a complete picture.

Semi-structured interviews are also used for the possibility of directing an interview beforehand by making an interview guide and structuring different topics you want to discuss. (Galetta & Cross, 2014). First, there are questions that introduce the topic of interest and then move on to more detailed questions with more dimensions. This also gives interviewees the opportunity to reveal the deeper meaning behind general statements. This option can open up a more constructivist view, where the respondent's view can become clearer. (Flick, Kardoff, & Steinke, 2004, p. 180).

The categorization of the different farmers is really important to mention. As mentioned earlier, the dairy sector uses many different stakeholders. However, for the purposes of this research, two different types of farmers were interviewed. The first intention was to use the maximum variation approach to provide all the different types of farmers. Firstly the intensive dairy farmers, secondly the biological farmers and thirdly the circular livestock farmers. This wide range of different dairy farmers would give a complete impression. According to Zach (2020), the maximum variation approach can help to get the most accurate picture possible to draw accurate conclusions. The problem with the types of farmers is that they cannot be determined. The interviewees explained that circular, intensive and extensive farmers are not regulated terms, apart from the type of biological farming. This is regulated by the title SKAL. This organization is the only one approved by the national government to name who fulfils to be biological and which farmer does not. Therefore, in this research, the maximum variation approach only includes biological and non-biological farmers. According to Galetta & Cross (2014), sampling in qualitative research does not have to be done randomly or in a "statistical sense" (p. 33). Due to the background of the researcher, the two different types are sampled by contacting them by mail and, if necessary, by snowball sampling. (LeCompte & Schensul, 1999, p. 55)(Creswell, 2013, p. 119). Snowball sampling can be done by asking respondents who have already been interviewed for close contacts who might be interested in the research, or interesting for the research. In addition, the researcher collected more information on topics such as specific restrictions and objectives for dairy farmers specifically in the Climate Agreement.

The semi-structured interviews focused mainly on the social and technical daily practices of the dairy farmers interviewed. First they were asked about the impact of climate change on their farm, then about their opinion on it and its impact on social aspects such as meaning, competence and knowledge. This was followed by the technical part, where they were asked about future innovation projects and why they were or were not planning them. Finally, the farmers were asked about their position in the debate on policy design. They were also asked whether the farmers' experiences would help in this debate in the future.

3.2.2 Desktop research

To support the semi-structured interviews with theories and sources, desk research of primary documents can be used. According to Ajayi (2017), collecting primary data is a way of conducting research to provide new information that no one has been in possession of before. Primary data is data collected by a researcher for the first time. Secondary data is data that has been collected by others and you use it to support your research. Desktop research gives the opportunity to evaluate a specific document to see where interesting and relevant elements

can be found within the primary document. This primary document is specific primary data used in this research. This allows the specific research questions to be answered with the correct data. It helps to get a deeper knowledge of the literature you need for the research.

The different types of sources examined in this study come from a wide range. Firstly, search engines such as Google Scholar and RuQuest are used. News articles will also be examined to look for certain trends in the dairy farmers' perspective. This information can be used as an aid to the interview guide. The primary document to be researched is the Climate Agreement. According to Rowley & Slack (2004), this broad view can be used as a guideline for a proper literature review. In this research, difficult theories are investigated, the Social Practice Theory and the Climate Agreement.

The desk research that has been in to receive primary data out of the Climate Agreement may look a lot like the literature review that has been done in the theoretical framework, but there are a lot of differences. The main difference is that the theoretical framing part focuses on exploring general relationships and theories. This part of the desk research is used to clarify the Climate Agreement in terms of the most relevant elements it contains that have not yet been discovered.

3.3 Data analysis

3.3.1 Coding analysis

First, it is useful to show how the data from the semi-structured interviews with dairy farmers is processed. For interviews in particular, there are two different ways of coding. First, there is the possibility of inductive coding. Grounded theory analysis is a relevant example of this. Oktay (2012) describes how interviews can be analyzed using grounded theory analysis, which involves three stages of coding. The first phase is open coding, which is followed by two phases of coding where, among other issues, the concepts are related to each other. This means that the researcher does not have codes beforehand, but comes up with them during the coding process. This is very time consuming and because of the short time period this research had to be done, a deductive coding analysis was chosen.

Deductive coding analysis can be defined as starting with an idea or theory that has already been tested and implanting it in a new context. Deductive coding analysis is explained in the work of Elo & Kyngäs (2008). They have briefly explained how to do deductive analysis. They describe how you start with a certain theory or other evidence that proves that a certain relationship already exists. Then you can make a categorization matrix, after which you start

coding. In this research, the following themes were used as a starting point for the interview guide and coding process:

- Climate change
- General climate regulation
- Climate Agreement
- Material impacts of the climate agreement
- Social impacts of the climate agreement
- Societal perspective
- Business innovation
- Translating into policy
  - Protest
  - LTO of Water Authorities
- Perspectives for the future

The themes are based on elements of the Climate Agreement and Shove's Social Practice Theory. The Translating into Policy theme also focuses on how farmers' experiences can be used in policy-making processes. These themes were the starting point for the coding process. The first interview was coded using this categorization matrix. Thereafter, the categorization matrix changed with the information from interview 1. After each interview, the matrix changed slightly as each interview provided new information. Once all the interviews had been coded, the conceptual network was drawn to show the relationships between important concepts. The final coding matrix can be found in the appendix. In short, in this research:

1. Interviews are transcribed.
2. The categorization matrix is created.
3. The first interview is coded.
4. The categorization matrix changes.
5. Further interviews are coded.
6. The final coding matrix is formulated.
7. The conceptual network is created.
8. Conclusions are made.

After processing the coding phase there have been formulated an coding lists with the minor topics that occurred during the interviews. This is shown below in table 3.

Code group	Different codes layer 2	Total quotations per group
Background	4	238
Climate Change	2	60
Point of view	2	34
Policy	7	275

Social	5	137
Technical	3	165
Translation to policy	5	182

Table 3: Code groups and the total quotations

In table 3 the 7 different code groups are shown per total quotations and different codes of layer 2. First there are 3 different layers in this categorization matrix. The first layer consists of code groups that are listed in table 3. The second layer includes of themes per code group, such as Policy: Climate Agreement. In this way it is possible to show what kind of policies there are. The third layer consists of specific codes as Policy; Climate Agreement: Climate neutral in 2050. As you can see the most quotations were connected to policy related quotes and quotes that included background information of the interviewed farmers. The complete categorization matrix with all codes are included in the appendix. The conclusions are made in the resulting part of this research.

3.4 Validity and Reliability

This section describes and explains the validity and reliability of this research. In general, for both qualitative and quantitative research, it is necessary to show how certain norms and values are secured and how the rights of the respondents are handled. First of all, it is relevant to mention that validity consists of two general parts: internal and external validity. The validity of a research ensures that if the research is done again, no mistakes will be made. (Creswell, 2013, p. 141). Internal validity explains which relationship that has been studied can be influenced by unknown other factors. The external part explains how the results of the research can be generalized to other research. (Creswell, 2013, p. 152). Reliability explains how trustworthy the research is. (Creswell, 2013, p. 141). In this research, an attempt has been made to ensure all three components.

The internal validity is ensured by triangulating the data. As mentioned earlier, different types of data have been used: primary document analysis, semi-structured interviews with dairy farmers and desktop research. In this method, the sources are different and mixed. (Thurmond, 2001). This research outlines why data triangulation can help to ensure the validity of research. Essential to this is that the information gained from different methods tends to be essential. A researcher needs to be able to work out why each method is crucial to the research. The primary document analysis tries to find all essential elements in the Climate Agreement that affect dairy farmers. possible actors that might be overlooked. Semi-structured interviews are used to obtain information from the dairy farmers themselves. In this way, social and technical day-to-day practices are explored. The interviews will also help to understand how the farmers' experiences could be used in future policy-making processes. Desktop research is used to

support the key findings of this research. This is to ensure that conclusions are not drawn that are not valid.

External validity is needed to ensure the aim of the research. It " arises when experimenters draw incorrect inferences from the sample data to other persons, other settings, and past or future situations. (Creswell, 2013, p. 152). Firstly, this was ensured by using different types of farmers. Dairy farmers are divided into two types: biological and non-biological farmers. In this way, other types of dairy farmers are not excluded. Another specific method to ensure external validity is to use the same settings for each interview. This is done in a natural setting. (Creswell, 2013, p. 163). The natural setting involves interviewing respondents in the location where they experience the problems and issues being interviewed. In this case, that place is the farmer's property, if that was possible. With this in mind, other researchers may find similar results.

According to Gibbs, reliability can be defended in a number of ways. (2007). The first procedure is to check that the transcripts are free of major errors. The method of systematically writing down the exact words spoken was also used in this research. In this way, reliability remains strong. The second procedure is to systematically focus on the codes used. If they change a lot, by changing names, the value can be lost. (Gibbs, 2007). This essential procedure is also followed precisely. The deductive coding process that is used includes a pre-prepared list of codes to start with. During the coding cycle this changed, but not too much. By repeating the coding rounds several times, fewer mistakes are made. Both procedures tend to keep reliability at high levels.

4. Empirical findings

In this resulting part, the sub-questions of this research will be answered by combining the empirical findings collected in the interviews and the primary document of the Climate Agreement.

4.1 Specific policy instruments in the Climate Agreement

In the past, various agreements and policies have been signed to combat climate change and limit global warming. The Paris Agreement, as mentioned in the introduction, is the basis for various national policies. The Climate Agreement in the Netherlands is also a policy aimed at reducing emissions. The agreement describes how the reduction of greenhouse gas emissions is an objective. It also explains the position of nature: 'Nature, trees, plants and farmland not only provide us with a valuable landscape, but also sequester carbon (CO2) and thus form the natural basis for preventing climate change. (Rijksoverheid, 2019, p. 117). One way to reduce greenhouse gases in the atmosphere is to add more nature.

In the document of the Rijksoverheid (2019), there are various visions and goals that focus on the dairy industry. For example, the restrictions focus on how farmers can focus more on sustainability and climate change. Concrete impacts of the Climate Agreement are the focus on circularity, harmony with biodiversity and the goal to reduce the use of fertilizers. Circularity focuses on how to close systems on farms with little input and output. For example, this helps to reduce energy losses from fertilizer. The use of fertilizers is a technique to provide the soil with enough nutrients to grow plants. Reducing this also benefits the circularity of farms. This circularity can be maintained in combination with a good harmony with biodiversity. The agreement also focuses on the importance of biodiversity in the Dutch countryside.

In this Climate Agreement, the visions and objectives can be divided into the three instruments of Bemelmans-Videc et al. (2003). The sticks, carrots and sermons are used to divide the main objectives of the agreement into restrictions, financial policies and information campaigns. Table 4 shows the list of objectives divided into the policy instruments they can be seen as. The policy instruments are then explained and discussed in relation to the objectives of the agreement.

Policy Instrument	Aims of Climate Agreement
Sticks:	Regulation of soil boundation system
	Regulation to lower emissions
Carrots:	Subsidies to switch to circular farming
	Other financial options
Sermons:	Providing knowledge in between dairy farmers
	Learning about position agriculture
	Monitoring of farms
	Learning about CO2 capturing processes

Table 4: Policy Instruments and the aims of the Climate Agreement

4.1.1 Sticks

The first policy instrument to be explained and discussed is the stick element, which is represented in the 2019 Climate Agreement. There are two main objectives that can be categorized under this instrument. The first is to reduce emissions and the second is to maximize the amount of livestock per hectare. This can be referred to as maximum land use. As both are objectives, the agreement is examined for specific regulations that could affect dairy farmers in the future in order to achieve the objectives described above.

Regulation to lower emissions

One of the main goals of the Climate Agreement (2019) is to reduce the high level of emissions recorded in recent decades. By 2030, the goal is to reduce emissions to 49 percent below current levels. 2050 is even further away and can be seen as an optimal deadline to achieve many different elements of the Climate Agreement. 2030 is used to define certain developments and to have a realistic deadline that is close at hand. The year 2050 is used for general purposes, such as complete circular agriculture and the reduction of greenhouse gas emissions. Since the reduction of emissions is only a target for the future, the question of how the agreement will achieve this is essential. One way of tackling this problem is to sequester CO2 in the soil. This can be done by investing in nature around farms. This is explained in

4.1.3 Sermons below. Another way to achieve the goal of reducing emissions is to regulate the 'adaptation of stables, whether or not in combination with methane oxidation in an outdoor storage or mono-fermentation of manure. (Rijksoverheid, 2019, p. 130). Wageningen University (2020) researched this and concluded that methane can be converted to CO2 via oxidation processes, which is 25 times less polluting than methane. This can help to reduce farm emissions. Mono-fermentation can be explained as converting methane gas into biofuel without producing CO2. Winqist et al (2021) looked at how mono-fermentation could help to produce more green energy, thereby reducing emissions. Encouraging this mono-fermentation, or restricting it as a norm, can help achieve the goal of the agreement. If mono-fermentation is regulated, it can be linked to the stick instrument. These techniques can be regulated through restrictions to force farmers to implement them in their barns. At the moment there is no regulatory policy that focuses on this, but in the future this stick instrument could be the norm.

Regulation of soil boundation system

Another goal of the Climate Agreement is the use of the soil boundation instrument. (Rijksoverheid, 2019). Soil boundation means that there is a limit on the number of animals per hectare per farmer. If a dairy farmer owns 100 head of dairy cattle on 40 hectares of land, the limit is 2.5 head of cattle per hectare of land. LTO, one of the largest agricultural organizations in the Netherlands, explained the general aim of this soil boundation. LTO (2020) outlines that in the history of dairy farming in the Netherlands, the aim has always been to have enough land to collect food for the cattle. It helps to close the cycles on dairy farms. This can be done, for example, by cooperating with other arable farmers. In the end, the figure will be lower if a dairy farmer uses the arable farmer's total number of hectares when calculating the land boundary.

This instrument of limiting the number of animals per hectare can be categorized as a stick. The goal of reducing greenhouse gases in the Climate Agreement can also be achieved with this stick. Limiting the number of livestock on farms will reduce the total number of livestock. If the farm is fully landlocked, the products used will come from the farm's own land. This combination leads to a reduction in greenhouse gases by limiting the total number of livestock. According to the LTO (2020), soil boundation could be the future, and therefore a stick, if it is officially regulated.

4.1.2 Carrots

In the theory of policy instruments, the focus of the carrot is on the financial impact of the policy. As described in 2.2.2, this can take the form of subsidies or grants, but also, for example, the provision of loans.

Subsidies to switch to circular farming

The Climate Agreement sets various targets to reduce emissions and focus on more circular agriculture. Circular agriculture is mentioned several times as a goal for the future of Dutch dairy farmers. (Rijksoverheid, 2019). The aim of circular agriculture is described as follows:

> - 'To use as little energy as possible and as much renewable energy as possible.' (p. 118).

This describes how farmers are instructed to use less energy and, if they do, to use renewable and green energy. This goal cannot be achieved in a very short time, so the agreement focuses on how circular processes need to be taken into account in policy making, but also by informing farmers by providing them with essential elements of circular agriculture. This will enable them to make the transition to a more sustainable future. This goal of becoming circular does not directly affect dairy farmers. One solution is to provide subsidies to dairy farmers to motivate them to move towards circular agriculture. This fits well under the carrot instrument. In this way, the financial instrument is used to achieve the goals of the Climate Agreement. The subsidies are not yet defined and explained, but they are a possible solution.

Other financial options

In general, the Climate Agreement (Rijksoverheid, 2019) has mechanisms to support farmers to switch to more sustainable business plans, one of which is subsidies. This is the definition of a carrot to guide the dairy industry.

> - Existing government budgets are an important starting point, and therefore an important basis for private funding ambitions. Where possible, existing budgets are linked to the realization of climate goals. (p. 122).

These budgets can be used for subsidies or other financial support. The subsidies will be used to achieve the goals set out in the Climate Agreement. The goal of focusing on circularity is just one way of providing financial support to dairy farmers. For example, the SDE subsidy is mentioned, which already exists. It is not known, but it is mentioned again in the Climate Agreement. (RVO, 2023). This subsidy provides financial support to companies in major transition processes. This happens when companies want to invest in emission reduction and renewable energy projects. Again, financial support is used as a tool to achieve the goals of the agreement. Financial support can encourage organizations, such as dairy farmers, to become more circular or to reduce emissions. This helps to achieve the goals set out in the Climate Agreement. In this way, the overall objectives described above can still be achieved.

4.1.3 Sermons

According to Bemelmans-Videc et al. (2003), the future of policy instruments is mainly focused on sermons. Sermons are the information campaigns mentioned in the policies. There are various information campaigns described in the Climate Convention. The CO2 capture process is described, monitoring of farms could help, the position of agriculture is crucial, and stimulating dialogue between dairy farmers is described.

CO2 capturing processes

One of the most effective ways to reduce emissions is to increase the amount of green space around dairy farms. In this way, CO2 can be captured in plants, reducing CO2 emissions.

- Trees, forests and nature already capture a lot of carbon (CO2). An increase in trees, forests and nature (compared to the business-as-usual scenario) therefore leads to 'climate gains' that contribute to the declaration for 2030 and definitely also for 2050. (Rijksoverheid, 2019, p. 140).

As reducing emissions is the main goal of the agreement, a way to regulate or motivate is necessary to achieve this. This can be done by providing subsidies or other financial support to encourage increasing the amount of forests, trees and other nature. But the most important tool is the use of information campaigns. By promoting the process of CO2 capture in the dairy industry, future business plans can be more focused on planting more nature.

The Climate Agreement explains that the process of CO2 capture needs an information campaign to achieve the goal. Natural CO2 sequestration is a long-term process. The parties are working on climate-inclusive nature policy and management, each with its own role and responsibilities'. (Rijksoverheid, 2019, p. 140). If dairy farmers want to implement this mechanism, they need to take the time to develop a business plan that incorporates it. The use of sermons could influence farmers' decisions on where they choose to capture CO2.

Position agriculture

Much has been written in the past about the position of Dutch agriculture. (Van Grinsven et al., 2019) (Van Der Heide, C. M., Silvis, H., & Heijman, W., 2011). These articles are an example of how the position of the agricultural industry has changed through policy, but also through prices and exports. The focus in the Climate Agreement is on the general position of agriculture for the future. (Rijksoverheid, 2019).

- A strong chain with strong ambitions, healthy companies and a biodiverse nature form the basis for the sustainable production and management of food,

> wood and biomass, which we are proud to pass on to future generations. (p.118)

Biodiversity in nature and sustainability are really crucial aspects to keep in mind when designing new policies. In this way, a strong food chain can be seen as an ambition, with a lot of information to be disseminated to consumers to become more aware of how food is produced and not to buy the cheapest but also more sustainable products. The aim of making society more aware would mean that they are better able to choose to reduce their food consumption, but also to choose more locally produced food (Van Grinsven et al., 2019). If society is more aware of where food is produced and how the food chain works, more sustainable choices can be made, as this will help to achieve the ultimate goal of the Climate Agreement. That is to reduce greenhouse gas emissions in the Netherlands. This information tool is used to ensure a strong food chain. The information process focuses on society and not so much on the farmers.

Providing knowledge in between dairy farmers

One of the most recurring points in the Climate Agreement is the aspect of information dissemination, which can be done through information campaigns. (Rijksoverheid, 2019). This can be accomplished through the demonstration projects described in the agreement. An approach is the farmers-learn-from-farmers pilots, where farmers learn from each other. Experience is key for new innovation projects, but it is also seen as an opportunity for change. Other examples of how this can be done are the use of consultants and other 'advisory agents'. (Rijksoverheid, 2019, p. 126). These types of people can inform farmers to choose more sustainable methods or make other important decisions. The title of the element sermons fits this very well, as the dissemination of knowledge is essential for farmers to have the opportunity to become more sustainable.

Monitoring at farms

Feeding is a key issue in the Climate Agreement. 'Research on experimental farms provides insight into the relationships between animal-specific (nature and nurture) and ration-specific management measures.' (Rijksoverheid, 2019, p. 130). This process of observing which emissions occur with different feed compositions for the animals can provide information on which feeds can be used to reduce certain emissions. The information obtained can be passed on to dairy farmers. In this way, they gain the knowledge to change to a more sustainable feeding process. This example in the agreement falls under the policy instrument of sermons, which focuses on the dissemination of information.

In conclusion, the Climate Agreement is a very broad policy instrument that does not fit into a specific instrument category. The focus is on reducing greenhouse gases in a variety of methods. This can be done through the use of low emission stables, but also through CO2 sequestration processes. The upcoming second sub question focuses on how the respective sticks, sermons and carrots relate to the daily practices of the dairy farmers who were interviewed.

4.2 Relation Climate Agreement and the farmers practices

This section explains the social and technical daily practices of dairy farmers in the Netherlands in relation to the 2019 Climate Agreement. It is relevant to note that the previously discussed division between farmers is only between biological and non-biological. Farmers identify themselves in many different ways, but there is no hard criterion for dividing farmers into specific groups other than biological and non-biological farmers.

4.2.1 Social daily practices

In this section everyday social practices and their relation to the Climate Agreement and other important sustainable policies are outlined. According to Shove's Social Practice Theory, there are several major aspects of social practices. First, there is know-how, which explains what knowledge people have and how it is perceived. Also the techniques people use to make decisions are relevant. In this research, the techniques of making decisions for the future business plans will be investigated. After that the meaning that farmers have is explained. All these elements are divided into biological and non-biological farmers.

Knowhow

One of the key objectives of the Climate Agreement is to improve farmers' knowledge and skills. In this way, dairy farmers will be able to gain the knowledge of certain modern systems that will be essential to implement in the future. This can be done in a number of different ways, and this research shows that there are two main reasons for this: the position of children and the position of women. The family is the most common theme in the interviews. The position of the children is explained first to give a general picture of how the farmers acquired the knowledge they already have. Children can influence dairy farmers in a certain way, so that when they leave, you can learn if you then collect new information elsewhere.

- So, I think I have become even more realistic, partly prompted by our own children. (Biological farmer, April 2023)

In this situation, the children of the dairy farmer interviewed have studied elsewhere in the country and often come back to the farm to visit their parents. When the children do this, they influence the farmer's knowledge. He is exposed to new ideas and views, which he can then implement on his farm. This position of the children directly influences the knowhow of the farmer. The other effect children can have is that children are seen as the future successors of farmers. The interviewees pointed out that 3 out of 8 of them do not have a successor. This is usually the clearest link between dairy farmers and children. The issue of succession came up in almost every interview and several interviewees said that the combination of their age and not having a successor was really important.

- It is not that we are going to worry ourselves or have sleepless nights. But if it… If the regulations become so limited, then we stop. (Non-biological farmer, April 2023)

In this case, the link is made to restricting policies. The carrots in general policy, such as sustainability, could affect the dairy industry in the future. For this farmer this would mean that he would have to stop. The importance of not having a successor is the reason for this. Other dairy farmers said that there is no clear future and that they can wait for a longer time because they will do big investments anymore. One of the only options is to focus on efficiency. This can be seen as a social effect of the lack of successors.

- We continue to optimize the farm we have without expanding. (Biological farmer, April 2023)

The difference between biological and non-biological farmers cannot be seen in this topic, because having a successor has nothing to do with the type of farm, as can be concluded from this research. However, having a successor is an influencing factor in decision making. 2 of the 8 farmers interviewed did not say a word about having a successor or not. But they were optimistic about the future. For example, we are thinking about agroforestry... Trees, hedges, which I am sure are better for biodiversity and eventually for everything. (Biological farmer, April 2023).

The third possibility is that the farmers already have a successor, or that they can continue farming for a long time without any problems. 3 of the 8 respondents fall into this category. In conclusion, farmers who have a successor are more positive about future business plans. The Climate Agreement does have an impact on dairy farmers who do not have a successor, because they have to focus on whether new innovations are financially viable. But there is no difference between biological and non-biological farmers. The lack of a successor does affect decision making and therefore the know-how to implement new systems on the farm. Chisswell (2014) confirms that this is essential for business decisions. The researcher also focused on

how important it is for the agricultural sector to have enough young generation to keep the sector going. Having a younger generation helps with decision-making.

The influence of families is broader than just having a successor or not. The position of women farmers can also be very important. Earlier research by Bock (2004) describes how women farmers use different strategies to find a perfect place for themselves on a farm. This can vary from doing some activities in addition to working on the farm, or choosing to stay away from the farm altogether. Bock describes how taking on new activities related to the farm can be financially and emotionally moving. Different positions of women were discussed in the interviews. Some farmers described the balance between men and women in the business plan as equal. “We do that together. Yes.” (Non-biological farmer, April 2023). On this farm they both work on the farm all day, the farmer's wife having changed jobs after a period of living on the farm. This is in line with what Bock (2004) describes as the search for new activities and new approaches. Another interview with a non-biological farmer describes how her position as a farmer's wife has changed over time. She even wrote an article about it, discussing the position of women on a farm and how it can change the perspective of the farmer himself.

- What is the role of women in transition in the primary sector? And really everywhere it was clear that women really do have a key role to play. (Non-biological farmer, April 2023).

This position changed her husband's knowledge in many ways, as he gained new insights. This is a good example of the relationship between men and women on farms.

The relationship between dairy farmers' knowledge and the Climate Agreement can be drawn. The Climate Agreement focuses on farmers' knowledge and how it can be used. Farmers' knowledge can change depending on whether they have certain family ties, or with a successor or a wife. The agreement can focus on this in future sustainable policies, using information campaigns to interact with this knowledge approach. Successors and wives can influence the farmer's knowledge.

Techniques for business plan

Experiences with the social background play a role in the origins of decision-making techniques on dairy farms. Other possible relationships can be with other colleagues where they can exchange knowledge. For example, when looking at other systems to implement on their farm. Wood et al. (2014) investigated the position of colleagues in knowledge gathering. They analyzed how and with whom farmers networked to obtain information. Their main finding was that most farmers connected mainly with other farmers to get more information. The 2019

Climate Agreement taps into this relationship. As described above, the agreement focuses on providing new techniques through different methods. One of them is the farmers-learn-from-farmers principle, which is fully in line with Wood et al. (2014). The farmers-learn-from-farmers principle is also explored in this research.

- So then I will soon have a demonstration project. But the next group of farmers who come to see because they think it is amazing, and it says: yes, how do you start. (Non-biological farmer, April 2023).

This farmer suggests that demonstration projects can be very effective in convincing other farmers to change something on their farm. This exchange of knowledge takes different forms. Some farmers are looking for information on specific elements, for example if they want to buy a machine for the small shop on the farm (Biological farmer, April 2023). Another reason is that farmers want to learn more in general and almost all of them are members of study clubs. They are there to be informed by the members about certain topics that are challenging. These study clubs are often discussed and can be defined as important, but sometimes they are put in a more skeptical light.So in recent years I have seen him looking for new groups in which he can look further than just how many kilos of supplementary feeding does that cow need per 100 L (milk). (Non-biological farmer, April 2023).

- And then you sometimes see things, oh yes, he is busy with that, or he is busy with that. (Non-biological farmer, April 2023).

When farmers want to learn more about their type of farming, for example biological farming, they often do not fit in well with many intensive farmers. (Biological farmer, April 20-23). Interviewees sometimes looked for new clubs or groups of farmers where they would fit in better. The Climate Agreement tries to encourage farmers-learn-from-farmers by providing subsidies for organizing meetings or building the demonstration projects mentioned earlier. This is provided by the government to calculate certain emissions to see what works best or not. Farmers shared their experiences in general:

- That you try a bit yourself. Then you know how it works and what you have to pay attention to ... if it might look bigger later. (Non-biological farmer, April 2023).

In this way, demonstration projects are of interest both to the farmer hosting the project and to other farmers who want to learn from it. The host farmer also gets a lot of information about his emissions, which is explained in more detail in the technical section. Finally, the position of fellow farmers influences the techniques of decision-making. The Climate Agreement also focuses on this, with farmers-learn-from-farmers principles and subsidies for study groups in

which many farmers are involved. The difference between biological and non-biological is that biological farmers look for different study groups to fit in better.

Another main aim of the Climate Agreement is to provide subsidies to support certain sustainable projects. This helps the aim to change into a circular agricultural sector. Various farmers have agreed to this because it gives them the opportunity to switch to a more sustainable business plan..

- Well, if that can be calculated economically, you could get started with that. (Non-biological farmer, April 2023).
- It provides subsidies, yes, and you still get food from it, but the yield is much lower. ... So yeah, then the subsidies are such that you say, okay, then you want to try to get those subsidies. (Non-biological farmer, April 2023).

These quotes suggest that the will to change is usually there. But first a farmer needs to know whether something is costing more than it is earning. The various farmers had different views on subsidies when the subject was discussed. It is worth noting that most of the farmers who said that subsidies were effective in encouraging a shift to more sustainable and circular farming were non-biological. The biological farmers just do not always need subsidies to change their business, because they are already moving towards the sustainable goals.

- And so we also have to hand in animals, it is not because of nature, because our colleagues cannot hold back. (Biological farmer, April 2023)

The only restrictions they face are general policies on phosphate rights, which have kept the cattle industry busy for a long time. Subsidies are clearly different for each type of farmer. In conclusion, the Climate Agreement uses carrots and sermons to trigger the techniques of the dairy farmers interviewed. The aim to become a circular agricultural sector as described in 4.1 comes back in the techniques used by farmers. A distinction is made between biological and non-biological. The farmers-learn-from-farmers principle works for both, but the subsidies only induces the non-biological farmers to switch. Using subsidies, more non-biological farmers would change towards more circular systems.

Meaning of farmers

The meaning of farmers can be defined in what the aspirations and opinions the farmers have. Mostly it can be divided in biological and non-biological farmers. Aspirations and point of views differ a lot in relation to policies in general, but also towards the Climate Agreement. First it is good to sketch the image of how biological farmer experience sustainable policies. The farmers that are interviewed are already transitioned into a sustainable business plan. In this way they are not affected much by the new Climate Agreement. “I never had like for my company, oh,

now I have to do something because it is in the agreement." (Biological farmer, April 2023). This gives the possibility for them to look even further. Thakur et al. (2022) explains really well how 'organic systems of farming', such as biological farms, already focus on a future with more sustainability and more Sustainable Development Goals (SDG's) with ecological goals. In this interview this focus can be confirmed, because for example with the following quote:

- If they have that biological that they just have in mind that we get more organic. If we get more organic, less fertilizer is needed, less plant protection products are needed, because that is the big crux, because there is the big money. (Biological farmer, April 2023)

This farmer already focuses on the future with more environmental goals. This optimistic view towards policies can be seen as opportunistic, because the effects on the farmer are not very present. He also suggests that big companies should get less influence, because they play to big a role in the agricultural sector.

Second it is interesting to focus on the non-biological farmers. In earlier research of Sattler & Nagel (2010) there were interviewed different farmers in Germany where they experienced kinds of sustainable policies. They were asked about whether they were hold back with changing their farm. The results were mostly about the effectivity of policies, the risks it has, the costs that are included with change and the effort it takes are important. In this research the dairy farmers also concluded the same hold backs in changing to more sustainable methods. The financing part seems more relevant in this research, as discussed before.
The perception of non-biological farmers towards policies is that it causes insecurity, but also some negative views about the need of these restrictions are given. First the insecurity is important to explain. "I can handle it for some time. But that turns out not to be the case." (Non-biological farmer, April 2023). And thereafter the farmer said this: "I am a bit expectant." (Non-biological farmer, April 2023). This relation is common with the non-biological farmers that are interviewed. This insecurity results in an awaiting strategy of farmers. This does not help with the view towards policies. It affects the farmers in a certain way that they get skeptical and wait even more. Also negative views on this policy become even more.

- So in that sense I am also negative about it. It is perhaps such a book, the Climate Agreement, and anyone can find something what suits him. (Non-biological farmer, April 2023)

Also the personal health of non-biological farmers is interesting to take into account. The insecurity whether the farmers have a normal future, can be seen as negative influences of the policies.

- You can get really heated about everything. But yes, you also have to relax a bit, be able to do your work. (Non-biological farmer, April 2023)
- That's what made me sick to my stomach during the years we struggled with it. A bank that no longer wants to, a government to which you can demonstrably say: 'Guys, you have given us too little. (Non-biological farmer, April 2023).
- Of course you just have to keep using common sense and don't do crazy things. (Biological farmer, April 2023).

The other interviewed farmers, non-biological and biological, also mentioned effects of policies on their personal health. As quoted above, farmers are actively thinking about how to deal with policies. There were many different negative comments about the sustainable policies, but this quotes show how the farmers dealt with it. The Climate Agreement does influence the meaning of farmers, where the personal health is affected negatively. This results in a more awaiting position to change. The difference between biological and non-biological is that non-organic farmers do have to change if sustainable policies forces them. The awaiting position does not help.

Link biological/non-biological

In conclusion, a kind of boundary can be drawn between biological and non-biological farmers. This boundary is made up of the differences between the perceptions of organic farmers and the strategy they need to implement in their business plan. Biological farmers are already so far along in using sustainable methods that they do not need to change much. On the other hand, nonorganic farmers feel more negative about the policy. They also have to spend more money on the transition, which puts them in a wait-and-see position when it comes to innovation. The instruments of the Climate Agreement that work, are the sermons and the carrots, as shown in table 5.

Element of social practices	**Biological Farmer**	**Non-biological Farmer**
Know-how	Significant influence of children and woman.	Significant influence of children and woman.
Techniques in business plan	• No effect of carrots • Working farmers-learn-from-farmers principle. (Sermons)	• Often an effect of carrots • Working farmers-learn-from-farmers principle. (Sermons)
Meaning	• Negative effects of policies on personal health.	• Negative effects of polices on personal health.

	• Already organic, no need to change	• More awaiting to change

Table 5: Relation biological and non-biological farmers in social daily practices

4.2.2 Technical daily practices

In this part the technical daily practices of dairy farmers are discussed. First the focus is on how climate change effects the technical daily practices. This helps to explain certain innovation projects that have been done on dairy farms. After that the three main technical parts of daily practices are discussed: the barns, the soil and the systems. In this part, the link between biological and non-biological dairy farmers is also focused on.

Effect policy on soil

The reason for the creation of the Climate Agreement is that there are many impacts on society as well as on the agricultural sector. This relationship has already been described, for example, in the introduction. Sustainable policies have influenced previous innovation projects of the dairy farmers interviewed. Soil-related innovation projects are described several times.

Soil boundation is the first instrument described in the Climate Agreement that politicians and large organizations are working on these days. (Nieuwe Oogst, 2023). This newspaper confirms that the Minister of Agriculture focuses on the soil boundation target in the new agreement. This important issue is also highlighted in the interviews. The general opinion of both organic and nonorganic farmers was that if soil boundation regulations were to be implemented in the future, there would have to be clear regulations as to what standards would apply.

- We trade with the land, our manure goes there, and we get products back from their products. And so we try to close the circle again. (Non-biological farmer, April 2023).
- So yes, it is becoming more and more important, I think, to mention it in your profile. (Non-biological farmer, April 2023).

The farmers interviewed explained how working together would reduce their total number of cattle per hectare. For example, if a farmer has 50 hectares of grassland on which he applies 60 per cent of his manure. But if that farmer worked with arable farmers who used the rest of the cattle farmer's manure, the total number of cattle per hectare would be many times lower. This is a threat to some of the farmers interviewed. "But now I have the feeling that the bank will ask me about it when I apply for a loan". (Non-biological farmer, April 2023).

This can lead to uncertainty for future technological innovation processes, as it is not clear how they will be treated financially. The soil boundation restrictions will use the stick instrument to limit farmers in the future, affecting both organic and non-organic farmers.

Secondly, a specific goal of the Climate Agreement is to focus on CO2 sequestration processes. This carrot instrument focuses on increasing nature around farms in order to reduce emissions on farms. Only one of the farmers interviewed is already actively using this method.

- We were busy capturing CO2 via healthy soil and then supplying it or, for example, to industry. (Non-biological farmer, April 2023)

This farm has implemented the strategy in its technical practices. The other farmers interviewed did not mention this issue. In other words, this instrument of the Climate Agreement could be used to inform more biological and non-biological farmers about CO2 capture processes. The sermon instrument can be used for this purpose.

Effects of policy on barns

Barns on farms have been part of innovation projects in the past and will be part of innovation projects in the future. The dairy farmers interviewed mentioned this several times. The dairy farmers interviewed have experienced many different innovation projects in the past, from solar panels to low emission barns. Organic and non-organic farmers used sustainability as a reason for at least one specific innovation on their farm:

- But the most important thing, I think, is that which has to do with climate. I can give more water per hour there, so I can keep up with it more easily. (Non-biological farmer, April 2023)
- Be careful what you do, because you invest excessively on sustainability and that you do not lose your competitive position. Um well, the past two years have worked out very well. (Non-biological farmer, April 2023)
- We are now going to work on social acceptance and NWV barn, neatly complying with the rules, the laws, all perfect for each other. (Non-biological farmer, April 2023)
- And we didn't do it for um, afterwards they turn out well from the tests at least. (Non-biological farmer, April 2023)
- We also do apply non-inversion tillage, so that is less CO2, or carbon, yes, carbon is lost. (Non-biological farmer, April 2023)
- That is not because of the Paris Agreement, but I would like to be like that myself. (Biological farmer, April 2023)

- You can lay solar panels. I am now self-sufficient or something for ¾. (Biological farmer, April 2023)
- But just with the idea of yes, as we are doing now, we don't want that either. We have been comfortable with this for a long time. (Biological farmer, April 2023)

This list of quotes shows why farmers chose to include sustainability in their business plan. The low emission barns that are being built on several farms are an example of how some of the farmers have incorporated the sustainability rationale. Both biological and non-biological farms use them. The instrument of sticks influenced one of the farmers interviewed to change to a low emission barn: "Otherwise you won't get it licensed." (Non-biological farmer, April 2023). It is not clear whether there is a difference between the two types of farmers on this issue.

Another link between the Climate Agreement and the impact on the barns is the instrument of emission monitoring described above. Two non-organic farmers explained why they had included monitors in their business plan and how they could help in the future. Well, if there's something positive for us, we'll think about giving something back, but the most important note with a study like this is to find out what the impact is on our business. (Non-biological farmer, April 2023).

- it is then a piece of optimization. But something that is not rewarded by the market. Well, you can't do much then. It has to be somewhere, either in your mineral cycle or in a financial cycle, must have a benefit. (Non-biological farmer, April 2023).

The knowledge they gain from monitoring emissions provides them with information that can help them economically, but also to make the farm even more circular. The sensors are paid for by government pilots. In this way, it can be said that the monitoring instrument in the agreement is not only a sermon, but also a carrot. This instrument helps to achieve the goal of reducing emissions because of the possibilities it opens up for future feeding practices on farms. "What can we do with this to bring things back?" (Non-biological farmer, April 2023). This farmer is already focusing on future projects on how to use feeding to reduce emissions. Both types of farm agree that calculating emissions can help to reduce emissions. If this is the case, the Climate Agreement's tool for monitoring emissions in barns could in the future help both types of farmers to achieve the goal of reducing emissions.

Effects policy on farming systems

Farming systems are the strategies farmers use to achieve these goals in day-to-day technical practice. Reducing emissions by 2050 is the main goal of the Climate Agreement. The first deadline is 2030, with a reduction of 49 percent, after which emissions should be even lower in 2050. There are already many elements in the technological innovation processes of the farms surveyed that are aimed at reducing emissions. It is very difficult to define circular farming processes in monetary terms, because circular farming means that farming systems are completely closed. All the food would have to be produced on the farm and all the output would be used for other purposes.

- Then people have to go to the supermarket with their stool. And then you get it circular. Before that happens, I don't see that happen. (Non-biological farmer, April 2023)

This is not the only farmer discussing the term 'circular'. Another farmer interviewed also questioned whether this term could be used in research. ("Biological farmer", April 2023). In this research, circular agriculture can be seen as a way of describing how processes can be closed to a certain extent. For example, you become more circular by using energy-efficient machinery. Some farmers have cooperations with colleagues nearby, where they exchange manure for grain. (Non-biological farmer, April 2023). Others have some circular energy systems or recycle waste locally. (Biological farmer, April 2023). This goal of the Climate Agreement can be seen in many different ways, but some of them are reflected in many different technical daily practices. Both types of farming, biological and non-biological, use circularity in their daily technical practices, for example to optimize energy cycles. (Biological farmer, April 2023).

As discussed earlier in this section, financial aspects play an important role in decision-making for future innovation projects. The Climate Agreement focuses on this carrot instrument to influence dairy farmers to become more sustainable. The strategy of some of the farmers interviewed is mainly based on the search for subsidies, as this is a major part of their strategy. (Non-biological farmer, April 2023). In this case, it can help to reduce certain emissions on farms, for example with non-inversion tillage, which is supported by subsidies. This method reduces the number of times the soil is ploughed. This leaves the organic layer in place and new plants have more nutrients with which to grow. (Morris et al., 2010). The subsidy for non-inversion tillage is just one example of how non-organic dairy farmers are influenced to become more circular or sustainable. The farmers surveyed who use subsidies are mostly nonorganic farmers. One explanation is that organic farmers are already moving towards more sustainable systems. (Biological farmer, April 2023).

Link biological/non-biological

In this section the effects of the Climate Agreement and the technical daily practices have been discussed. The difference between biological and non-biological dairy farmers is only in two aspects. The instrument of carrots particularly influences the non-organic farmers, because it is used as a motivation to switch to more sustainable practices. In addition, sustainability has been used as a motivation for organic farms for a longer time. Non-biological use in the present innovation projects as motivation, but often in a combination with financial aspects.

Elements of technical practices	**Biological farmers**	**Non-biological farmers**
Effects policy on soil	Skeptic view on soil boundation	Skeptic view on soil boundation
Effect policy on barns	• Positive on measuring emissions • Use sustainability as motivation (already biological)	• Positive on measuring emissions • Use sustainability as motivation (becoming more sustainable)
Effects policy on farming systems	• Subsidies not big motivation • Already focuses on circularity	• Subsidies can motivate new innovation projects • Already focuses on circularity

Table 6: Elements of technical daily practices and the (non-)biological farmers

4.3 Position dairy farmers creating process of sustainable policies

This section discusses the ways in which dairy farmers influence sustainable policy. Dairy farmers have different ways of making their voices heard in public, which can be called channels. Examples are protests or meetings. Then the farmers' experiences are explained to show the different views and the link to society that was illustrated in the interviews. Finally, the food strategy is discussed as a mechanism for explaining the position of agriculture to society or consumers in the Netherlands.

Different channels

In a country like the Netherlands, there are many ways to make your voice heard. Every week there are protests somewhere in a city to express people's views and opinions. The agricultural sector has also held many demonstrations, some of which have been quite large. The dairy farmers interviewed are not entirely united on this issue. On the one hand, there are farmers who think that the purpose of the protests is necessary and good, but who no longer take part themselves.

- Politicians also need to keep an eye on practice. This could be achieved through these actions... But it's not like I'm going to The Hague with all the bells and whistles. (Non-biological farmer, April 2023).

Protests can still be useful to address certain difficulties. On the other hand, there are farmers who do not think they are a good idea. One of the interviewees was even threatened by other people because this farmer expressed her opinion. In this case, the farmer does not at all agree that protests are a good way to express your opinion. (Non-biological farmer, April 2023). Overall, all the farmers interviewed discussed the issue of protests and their position. The organic and nonorganic farmers have very different views on the nature of protests. On the one hand, some biological and non-biological farmers agree that it would be good to have protests for the first time since 2019. On the other hand, different biological and non-biological farmers also agree on the fact that protests are not positive or not necessary.

- Then you can drive a tractor many times in circles. But then it won't be any different. (Non-biological farmer, April 2023).

But this is not the only way dairy farmers can influence new policies, if protesting works. Protests can be seen as aggressive and may not always work, while others try to have influence through meetings and discussions with consumers or on talk shows. "Through social media, we do our best to show what happens here, how we do our farming. (Biological farmer, April 2023). Others would try to be part of the production phase of new policies. In the Netherlands, a new agriculture agreement is being discussed. This agreement will affect the entire agricultural sector, as it is an outcome of the Climate Agreement of 2019. (NOS, 2023). Each respondent has their own reason why they are included or excluded in these in these talks. For example, there are farmers who do not want to be at the forefront, such as:

- "But I am not on the podium." (Biological farmer, April 2023)
- "Not in politics, I stay away from that." (Biological farmer, April 2023)

These are some examples of reasons why farmers are not always at the forefront. Reasons for staying are mostly similar, because they are not the type of farmers who like to speak out. There is also no difference between biological and non-biological farmers. Both agree that they do not feel in a position to teach others.

- “You'll never hear me say that. Because I don't know. I don't think we'll be able to say for 25 years whether organic farming was the answer or not. (Biological farmer, April 2023).
- That feels like arrogance to me, say if I… (Non-biological farmer, April 2023).

Most of the farmers agreed on the sentence 'I prefer not to pull the cart, I just follow the cart'.

It can be concluded from this that farmers often do not want to take part in discussions with the government in general or in particular. Already large organizations such as LTO or Biohuis are already involved in discussions about new policies, such as the Agreement, which they are working on. The farmers suggested that these organizations are a very good way of expressing the opinions of dairy farmers, because they can represent the of many farmers. They are already in a position to speak up when they disagree, for example. disagree. This suits them very well. Both organic and nonorganic farmers support this.

Position of food strategy

As mentioned above, the experience of dairy farmers in their daily practice can be part of future policy. Many different views were expressed and discussed in the interviews. Different farmers have different reasons and essences, as discussed before. Some farmers think it is good to have a diversity of dairy farmers.

- I think it is very difficult to make a policy on that. I like it, but a very intensive dairy farmer can have a completely different approach. (Biological farmer, April 2023).

This quote is just one example of how dairy farmers think. What it shows is that each farmer's experience can be appreciated by other dairy farmers.

In addition to the acceptance of farming between different types of dairy farmers, a theme that emerged was that society also needs to accept the experiences and practices that happen on a farm. "We hear children saying: "Milk comes from the factory." (Biological farmer, April 2023). If this could be improved, society would have a more positive view of farming and probably appreciate it more. Introducing them to the daily life of a farmer would help, just by selling products in a small shop (Biological farmer, April 2023), or just by giving presentations to classes of students who may not know anything about dairy farms. (Biological farmer, April 2023). This missing link between society and agriculture is probably the link to a more accepting society. This is essential for policy making, because once consumer acceptance has increased, politicians would have a more realistic view of how farms work.

In addition to the aspects mentioned above, which are essential for future policy-making, the concept of a food strategy should be mentioned. Firstly, according to Muilwijk, de Krom and Westhoek (2018), food systems can be defined as an inseparable food chain from the farmer to the consumer. A small change can have many different effects. For example, an increase in the price of soil can lead to an increase in the price of products that the consumer has to buy. This chain is relevant when considering the food strategy. This food strategy is explained by one of the interviewees:

- That we will also produce much more in balance with the demand for food, for example, because I also think that now all our food is just available at any time. That will also come to an end. (Non-biological farmer, April 2023).

This quote helps to understand how the food strategy works. The Netherlands must focus on whether food is accessible to everyone and whether we produce enough. This farmer wonders if this situation will remain the same. She suggests that the focus should be on the amount of food we produce, consume and export.

The next question is how to incorporate farmers' experience to ensure a perfect food strategy. One respondent said

> - I think agriculture is very much undervalued. And I see that as a problem in the last 10 years, that we have a lack of farmers and a lack of food producers here. (Non-organic farmer, April 2023)

According to this interviewee, the position of farmers in the Netherlands is fragile. But the experience of farmers can help them to become more efficient and to produce even better. This can be understood in terms of producing more food, but also in terms of producing more sustainable food. Another farmer stated that in the Netherlands we have to keep in mind that we have to produce 'good and healthy' food. In this sense, this is only possible if there is a dialogue between dairy farmers and the Dutch government. Experiences can help to make policies more effective. In this way they can help to adapt food policies with their experience of efficient production, and society would accept the farmers' activities even more. It is worth noting that there is no difference between biological and non-biological farmers on this issue, as they all agree on the lack of acceptance by society, but also on the position of agriculture in politics.

Link biological/non-biological

In translation of daily experiences of dairy farmers towards the designing phase of new policies, there is also the link between biological and non-biological farmers made, the same as the part of social and technical daily practices. This is showed in table 7. First the different channels are pretty the same for both organic and non-organic farmers. They prefer not to tell other farmers what to do, but also are not on front in policy making. The view is mixed whether the essence of protests is supported or not. The food strategy is discussed many times in the interviews, where the experiences of farmers are discussed to use to increase the acceptance of consumers. This can be done using small stores or guiding tours, for example. There is no big difference between organic and non-organic farms.

Element of translation to policies	Biological farmers	Non-biological farmers

Different channels	• Not in front in teaching position • Mixed view on essence of protests	• Not in front in teaching position • Mixed view on essence of protests
Food strategy	Need more acceptance of society	Need more acceptance of society

Table 7: Elements of the translation of policies and biological/non-biological farmers

5 Discussion, limitations and recommendations

This section includes the conclusion, discussion, limitations and recommendations. The conclusion outlines three main findings that can be learnt from the information gathered in this research. The discussion explains what can be improved in the research with reference to relevant articles. The limitations are outlined to explain what limited the research process, but also to provide further recommendations. This is also explained in this part where the main findings contribute to other research or society.

5.1 Conclusion: Main findings

In the past, dairy farmers have had to deal with many different policies focusing on sustainability, but also on other major issues. In 2019, the Climate Agreement was signed in the Netherlands, again with a focus on dairy farmers. The agreement shows what specific targets and possible restrictions there are for other new policies in the future. Today, politicians are working on the Agricultural Agreement, which is a result of the goals of the Climate Agreement. This research focuses on the impact of the first agreement on the daily practices of dairy farmers, as they are one of the largest contributors of various emissions in the agricultural sector. This has been done by using Elizabeth Shove's Social Practice Theory with the following question:

- *How does the Climate Agreement influence the dairy farming practices in the Netherlands?*

Firstly, the Climate Change Agreement was explained and broken down into different main elements that will affect dairy farmers in the future. There are three types of policy: sticks, carrots and sermons. Through regulation, financing and information campaigns, farmers can be directly and indirectly forced into a more sustainable business plan. The Climate Agreement contains mainly sermons and carrots to influence farmers, because the regulatory sticks are 'coercive' tools. The agreement describes tools and targets for the future, for other policies. These future policies are likely to include these regulatory sticks. The thematic question

focuses on the social and technical daily practices, as well as the feedback mechanism, how the farmers' experiences can be used to create the new policies. This is done with the two types of farmers used in the research: biological and non-biological. This is because it is the only regulated license that is controlled by SKAL.

Socio-economic burden biological/non-biological farmers

The types of farmers interviewed were biological and non-biological dairy farmers. In terms of social and technical day-to-day practices, the focus was on how decision making is affected by the Climate Accord. On the one hand, the biological farmers discussed how their know-how and farming systems are already at a certain level, so the agreement does not have that much of an impact. On the other hand, the social and technical daily practices of non-biological farmers are not so far advanced. They describe how their decision making is mainly focused on financial opportunities, in the use of subsidies or other financial support. The need to collect information is also discussed. The Climate Agreement focuses on these carrots and sticks, including subsidies for switching to sustainable innovations and a focus on farmer-learns-from-farmer pilots. In this way, dairy farmers are directly and indirectly supported to reduce their emissions. This socio-economic difference between organic and non-biological farmers tends to be the biggest difference between the two types of farmers. The difference can be seen as a burden, as the trigger for transition for non-biological farmers is significantly different from that for biological farmers.

The background of dairy farmers

Secondly, the totality of a farmer's background is crucial in innovation processes. Motivation is linked to social, local and technical elements that influence decision-making in different ways. The Climate Agreement focuses on disseminating information, such as farmer-learns-from-farmer pilots, that use these social relationships of farmers to transition to sustainability. This sermon instrument of the Policy Instrument Theory is accepted by many farmers because it gives them the freedom to learn or not.

Soil boundation is one of the key stick instruments in the Climate Agreement. There was skepticism from both types of farmers, as this constraint can affect both. The number of cattle per hectare differs from farmer to farmer, also with colleagues. The local background of the dairy farmers in this case affects the effectiveness of the land boundary regulations, regardless of the type of farmer. The stick instrument does not help to force farmers.

The last instrument, the carrot, comes back with subsidies to become more circular. Organic farmers do not need much financial support to make the transition because they are already

oriented towards sustainability. On the other hand, non-biological farmers need some financial support to change their business plan. This carrot instrument could work to achieve the goals of the Climate Agreement.

Translation towards policies

Thirdly, translation into policy can be influenced by the experiences of dairy farmers, both biological and non-biological. This can be done by measuring emissions, implementing the food strategy to secure the position of agriculture, and informing society to create acceptance for more expensive, environmentally friendly food.

The translation of farmers' experiences into new sustainable policies can go in different directions, depending on who you ask. Each farmer has their own reason to protest, to speak out, to wait or to teach. The experience of dairy farmers can help to shape new policies through organisations like LTO, but also by educating a society that knows little. The food strategy is also a very interesting topic that came up during the interviews. The position of Dutch agriculture can change over time, and by improving the efficiency of farmers, this can help future policy. Each farmer has his own view on this, but in general it can be said that they agree that the Netherlands needs to focus on the relationship between society and agriculture.

5.2 Discussion

Any research must show where it can be improved. This is why the discussion is drawn in this part. Previous sources used in this research are perfect to discuss why this research works or not.

The relationship between the Climate Agreement and the dairy farmers can be seen as a spillover. These spillovers are the effects that the affected person feels and deals with. This can be positive or negative, according to Nash et al. (2017). They describe how positive spillovers lead to positive effects, which is what the policy is intended to do. Nitrogen policies with positive spillovers lead to lower nitrogen emissions. Negative spillovers would have the same nitrogen policy, but it would affect a different element, such as carbon emissions. The spillover between the Climate Agreement and dairy farmers cannot be drawn at this stage because of the possible future regulatory elements in the agriculture agreement, which has not yet been agreed. For the future, Nash et al. (2017) can be very interesting in relation to this research.

The number of interviews conducted is not enough to generalize much to a wider context. Barnes and Toma (2012) describe how their group of respondents reacted to the effects of climate change. Despite the time that has passed since the research was conducted, half of the respondents did not believe in rising temperatures. Similarly, Barnes and Toma's (2012) research described how win-win situations and different strategies would help the change towards acceptance of more sustainable projects. The view of what could be better could have been included in this research. Only the land boundary was discussed and how it could be improved. Mostly the focus was only on the effects of the agreement and not very much on possible changes to the agreement to really adapt it.

The future of agriculture in the Netherlands is in the hands of politicians, but also in the hands of the farmers themselves. Sometimes it is possible to change to other, more sustainable systems, such as agroecology. Van der Ploeg et al. (2019) describe how the change to this type of farming is needed in the future. This research was carried out in different countries in Europe. They looked at farming systems to see what the benefits of agroecological farming are. They describe how farmers can earn more money with this new system, but also how it is needed because of the high pollution status of agriculture. This research already focuses on this link to agroecology, but the focus could be more on what specific content the nonorganic dairy farmers would trigger towards more sustainable systems. Some are explained, also with the farmers' essences, but it could be more focused.

5.3 Recommendations

The link between sustainability policy and the daily practices of dairy farmers in the Netherlands has been demonstrated in this study. This was done by interviewing 8 different farmers, biological and non-biological. The Climate Agreement is used as a policy to refer to during the research. The recommendations for future research focus on three different directions: location options, types of farmers and other policies.

Location options

The interviews in this research are carried out in depth, by questioning the interviewees on a deeper level to learn about their wider situation. This is also relied upon in this text and to understand more about it. In order to better understand the general motivations and impacts of dairy farmers, future research can be carried out on a larger scale, nationally or internationally. These general motivations can be used to learn more about why policies are accepted and how policies are used by farmers to transform. The new links that are presented in this research can be used to inform and build on future research. The small scale of this research can be extended to learn about general motivations in one country. Other countries

also have completely different restrictions and policies. This can be studied to understand their relationship.

Types of farmers

Prior to the interviews, the focus of this research was on three types of farmers: intensive, organic and circular. During the interviews, the focus began to shift to biological and non-biological dairy farmers, as this was the only difference allowed between dairy farmers. This research revealed new relationships between the position of biological and non-biological farmers, which are the result of getting the full picture of farmers. Otherwise these relationships would not have been captured because the nature of the farmers became clearer by asking about different issues and different policies. This result shows that other researchers need to focus on this in their research. The nature of farmers influences their behavior and this is something that other researchers can learn from. Future research can focus specifically on this context, because previous research has been done in other countries with different regulations on types of farmers. Also in the Netherlands, the concentration can be on all types of farmers, except the term 'circular', because literally everything can be called circular.

Other policies

In this research, the Climate Agreement was used as the policy to be researched and relied upon when interviewing. The problem was that this agreement does not act directly on farmers and mostly forms the basis for future restrictions, like the Agriculture Agreement, which the politicians work on with the large organizations, such as LTO. Other researchers can learn from this by making more use of older policies and asking farmers about them in interviews. The policy must be relevant, but should not be researched if it does not already affect farmers. Future studies could concentrate more on historic, rigid constraints like phosphate rights or milk quotas. Farmers are well placed to communicate the direct effects and opinions of these policies because they have experienced them.

5.4 Limitations

No research can be considered perfect. Every research has some limitations that need to be secured but also acknowledged. There are three major limitations to this research.

First of all, the time frame is a problem. Because it was only April, hopes were high at the beginning. But it was during this period that the harvesting period started and part of this research was collected. Dairy farmers were not very willing to spend or plan time to help with this research. Therefore, the researcher is grateful to the farmers who helped him by providing information.

Second the possibility to do a very broad research was also disturbed by the timestamp. For this reason, the number of interviews with 8 different dairy farmers can be seen as not a large number. The ability to generalize the conclusions is not helped by this.

Finally, the fact that the Climate Agreement consists only of goals and targets for the future can be seen as a limitation of this research. This is difficult to question at the level of the farmers. They do not feel much of these new goals already. Of course, they can think about it for the future. New policies can have an impact. But this can go in different directions. The farmers' views are being surveyed now and not after the implementation of certain new innovations, which will give them a different view. For example, the same farmers may provide different information next year. That is why timing the research is really important.

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7. Appendix

7.1 Interview guide

Intro

- Begroeten van respondent. Vragen hoe het met diegene gaat.

(reageert hierop). Laat ik mij als onderzoeker eerst voorstellen. Mijn naam is Job Mogezomp en ik studeer aan de Radboud Universiteit de bachelor studie Geografie, Planologie en milieu. Als zoon van een melkveehouder ben in geïnteresseerd geraakt in de effecten van landbouwbeleid op het leven van de boer, en daarom ben ik voor mijn Bachelor scriptie/thesis het verband tussen klimaat regelgeving in Nederland en de dagelijkse werkzaamheden van melkveehouders aan het onderzoeken. Dat is ook de reden dat ik u als melkveehouder graag zou willen interviewen.

Het doel van dit interview is ten eerste om te praten over uw inzichten over klimaat regelgeving, de opzet van uw bedrijf en de invloed van deze regelgeving op uw bedrijf. Daarbij gaat ook deels de focus op hoe uw inzichten en ervaringen wellicht kunnen helpen in het maken van klimaatbeleid. Het interview zal naar schatting ongeveer één uur duren, indien u hiermee instemt. U kunt er ook tevens op ieder moment mee stoppen.

Voor dat het interview begint, zou ik u een aantal, belangrijke vragen willen stellen. In hoeverre bent u akkoord om het interview te laten opnemen? De opnames zullen uiteraard alleen voor de thesis gebruikt worden, zodat naderhand specifieke citaten terug kunnen worden gevonden. Hierdoor kunnen makkelijker en beter conclusies getrokken worden. Indien het nodig is, kan mijn scriptiebegeleider hier ook naar luisteren. Alles zal anoniem blijven, indien u dit belangrijk en nodig acht. Indien nodig, is het ook mogelijk om de opnames onder codenamen op te slaan.

Het doel van het onderzoek is om een beter beeld te schetsen van het moraal van melkveehouders die mogelijk enorm belast worden door klimaatmaatregelen in het algemeen. Het zou mogelijk kunnen zijn dat de scriptie gepubliceerd wordt op een zoekmachine voor ander onderzoek.

Dit is de informatie vooraf, heeft u al vragen voordat het interview begint?

Basisvragen:

Als onderzoeker is het handig om een algemeen beeld te krijgen over u en uw bedrijf. Dus kunt u zichzelf en uw bedrijf kort voorstellen?

- Hoe groot is uw bedrijf? (bedrijfsoppervlakte, hoeveelheid totale geleverde melk)
- Hoe zit de organisatie van het bedrijf in elkaar?
- Hoe ziet u de toekomst van het bedrijf? (klimaat technisch?)
- Intensieve melkveehouderij, zo ja, hoezo? (boven 4 Grootvee-eenheden per hectare)
- Biologische melkveehouderij, zo ja, hoezo? (voldoen aan de eisen van SKAL-bio controle)
- Circulaire melkveehouderij, zo ja, hoezo? (zelfvoorzienend in ruwvoer)
- Anders…. hoezo? (definitie)

Kunt u mij wat meer vertellen over de locatie waar de melkveehouderij is gevestigd?

- Specifieke beperkingen/regelgeving?
- Grondwaterstand?

- Beschikbaarheid van derden? (loonwerkers, leveranciers technologie)
- Natuurgebieden in de omgeving?
- Veel collega boeren in de buurt? (Zo ja, samenwerking?)
- Andere belangrijke aspecten die u te binnen schieten?

Klimaat regelgeving

Zoals u waarschijnlijk bekend is, is er in Nederland naast de stikstof crisis ook een enorme discussie over klimaatverandering. In hoeverre bent u met het begrip klimaatverandering en de gevolgen hiervan bekend? (droge zomers, hoosbuien, minder stookkosten …)

- En wat merkt u van de gevolgen van klimaatverandering met uw bedrijf?
    - Droge zomers…
    - Tekort aan bepaalde producten…
    - Tijdens de dagelijkse bezigheden…

Deze klimaatverandering zorgde in het verleden vaker voor verschillende soorten maatregelen. In hoeverre bent u hiermee bekend?

- Kunt u mij daar wat meer over vertellen?
- Bent u daar dagelijks of wekelijks mee bezig? (media..)
- Europese Green Deal (afname 55 procent CO2 in 2030)…
- Wet Milieubeheer (belemmert mestafscheiding en afval)…
- Andere wetgeving die u kent?...

In welke mate heeft uw bedrijf van deze regelgeving direct of indirect de gevolgen ervaren?

- Kunt u mij daar wat meer over vertellen?
- En denkt u dat dit specifiek zo was voor uw bedrijf, bijvoorbeeld door de grootte of locatie?
- Zouden er nog andere factoren dan locatie en grootte van toepassing kunnen zijn?
    Type bedrijf?
    Soort veevoer?
    Gewassen bestrijding?
    Effect op het persoon?
    Subsidies?

Beschrijft hetgeen dat verteld is als samenvatting.

Effecten op dagelijkse leven

In hoeverre hebt u een gevoel bij maatregelen van landbouwbeleid in het algemeen?

- En hoe komt dat zo?
- Kunt u voorbeelden noemen?
- Stikstof maatregelen?
- Fosfaatquotering?
- Andere typen maatregelen?

Dan een ander meer recente wetgeving specifiek voor de landbouw sector is het klimaatakkoord van 2019. De richtlijnen uit dit akkoord zullen in de toekomst het beleid bepalen dat u als boer zal beïnvloeden. Daarom ben ik benieuwd naar wat de effecten hiervan op uw dagelijkse bezigheden zijn.

In hoeverre bent u bekend met het klimaatakkoord dat in 2019 is opgesteld?

Het Klimaatakkoord is een beleidsinstrument uit 2019 die beschrijft aan welke richtlijnen de landbouw en ook daarbij voor de melkveehouderij voldoet. 2 van de belangrijkste punten voor de gehele sector zijn een klimaat neutrale situatie in 2050 en energie neutraal te zijn in 2030. Daarnaast zijn er specifieke richtlijnen voor de melkvee sector aan de hand van meer duurzame, emissiearme stallen. Ook meer duurzaam energie gebruik, denk aan koelsystemen is een richtlijn. Ook vermindering van methaan en ammoniak uitstoot door andere voeding. Bepaalde demobedrijven zouden het mogelijk maken om het 'boer leert van boer' principe te bewerkstelligen. Melkveehouders zouden hierbij zelf verantwoordelijk zijn

Nu u het ongeveer gehoord heeft, vraag ik mij af: In hoeverre beïnvloeden deze richtlijnen uit het klimaatakkoord de technische delen van uw bedrijf?

- Technische aspecten als: Uw grond (totaal oppervlakte, mest mogelijkheden)?
    - … Grondwaterstand?
    - … Machines?
    - … Stallen?
    - Zo niet, hoe bepaalt u het dan? En hoe werkt dat dan?
- En in hoeverre beïnvloedt dit u economische kant van het bedrijf?
  En de groei/krimp van het bedrijf?
    - En hoezo dat?
    - Zo niet, hoe bepaalt u het dan? En hoe werkt dat dan?
- Transformatie naar intensief? Zo ja of nee, hoezo?
- Transformatie naar biologisch? Zo ja of nee, hoezo?
- Transformatie naar circulair? Zo ja of nee, hoezo?
- … Anders?

In hoeverre beïnvloedt het recente klimaatbeleid in het algemeen uw sociale kant? U kunt hierbij denken aan bijvoorbeeld kennis die u heeft opgedaan…

- En hoe bedoelt u dat?
- Invloed op uw sociale welzijn?
    - En hoezo dat?
- Beleidsmatige technieken die u gebruikt…
    - En hoezo dat?
- Invloed op uw sociale leven?
    - En hoezo dat?
- Positie van de gezelschap?
    - En hoezo dat?

Op welke manier denkt u dat uw standpunt over klimaatregelgeving door datzelfde klimaatbeleid is veranderd?

- En hoezo is dat?
- Bij collega boeren…?
- En op welke manier denkt u dat dit komt?
    - Door een stroom aan informatie? Zo ja, hoezo?
    - Door belemmeringen? Zo ja, hoezo?
    - Door subsidies? Zo ja, hoezo?
    - Anders?

Het klimaatakkoord focust zich ook op kennis verspreiding onder boeren. U kunt hierbij denken aan onder andere RVO-artikelen, Vakbladen en bijeenkomsten van de Vereniging Kringloop Achterhoek. In hoeverre bent u hiermee bekend?

- Voedselstrategie ook belangrijk? (korte en lange termijn)

- Bufferzones…
- Dichte vloeren…
- Mono-vergisting…
- En op welke manieren vergaart u zelf deze informatie?
- Bent u zelf ook deel van deze kennis verspreiding? Zo ja, hoezo dat?

Beschrijft hetgeen dat verteld is als samenvatting.

Innovaties op het bedrijf

Naar aanleiding van hetgeen dat net besproken, zou ik graag wat meer willen weten over mogelijke innovaties en investeringen in uw bedrijf. In hoeverre heeft uw bedrijf klimaat gerelateerde innovaties/investeringen gedaan in verleden?

- En hebben deze innovaties specifieke oorzaken?
- In welke mate ervaart u deze investering? (succesvol, of niet)
- In welke mate denkt u dat uw eerdere investeringen een relatie hebben met het beleid van de overheid?

In hoeverre bent u dezer dagen bezig met mogelijke innovaties voor in de toekomst voor uw bedrijf?

- Wat voor innovaties zijn dit?
- Wat is de urgentie om deze nu te doen?
    - Overheidsbeleid?
    - Een andere oorzaak?
- En mogelijke andere innovaties als:
    - Mogelijke energietransitie?
    - Komst van zonnepanelen of iets dergelijks?
    - Transitie naar bijvoorbeeld …. boerderij.
    - Andere locatie? Zo ja, mogelijkheid tot verduurzaam daar mogelijk?
- Collega boeren met innovatieve projecten?
    - Zo ja, wat voor projecten zijn dit?
    - Heeft u de intentie om hieraan deel te nemen?
    - In hoeverre heeft u kennis van de urgentie van deze innovatie?

Beschrijft hetgeen dat verteld is als samenvatting.

Mogelijke vertaling naar beleid

Nu de effecten van het beleid op uw bedrijf beschreven zijn en mogelijke innovaties behandeld zijn, zou ik graag meer willen weten over uw mogelijke deelname in het politieke gesprek over klimaatregelgeving. (*U beschreef al hoe uw maatschappelijke standpunt gevormd en veranderd wordt door klimaat regelgeving).* In hoeverre u in de afgelopen jaren/decennia heeft deel genomen aan gesprekken over klimaatbeleid?

- Zo ja, welk type gesprek was dat? (talkshow, protest, krant, LTO, Waterschappen)
    - Waarom heeft u deze manier gekozen?
    - Hoezo heeft u besloten het gesprek aan te gaan?
    - Denkt u dat deze manier heeft geholpen?
    - Zou u het nu anders doen?

In welke mate bent u bekend met op klimaat verandering/regelgeving gerelateerde protesten?

- Zo ja, wat vindt u hiervan?

- Zo nee, hoe zou dat kunnen komen?
- En in welke mate bent u bekend met de ‘stikstof’ protesten?
    - Zo ja, wat vindt u hiervan?
    - Zo nee, hoe zou dat kunnen komen?

En in hoeverre denkt u dat ervaringen van de ‘boer’ kunnen helpen bij het maken van beleid?

- En hoezo denkt u dat?
- Op welke manier zou het meest zinvol zijn om een ‘stem’ te laten horen?
- Kunt u mij nog meer vertellen over mogelijke ervaringen die zouden kunnen helpen met betrekking tot klimaat beleid en het creëren hiervan?

Beschrijft hetgeen dat verteld is als samenvatting.

Toekomstperspectief

Het laatste onderwerp dat ik graag zou willen aansnijden, is het toekomst perspectief van u en uw bedrijf. Dit is al kort aangehaald aan het begin, maar nu zou ik er graag specifiekere vragen over willen stellen. In hoeverre denkt u dat het huidige klimaatbeleid, waaronder het Klimaatakkoord en haar richtlijnen, uw toekomst zal beïnvloeden?

- En hoe komt dat zo?
- Door de krimp van de veestapel? Zo ja of nee, hoezo?
- Door extra regels omtrent grondgebruik? Zo ja of nee, hoezo?
- Door specifieke locatie eisen (Natura 2000)? Zo ja of nee, hoezo?
- Een mogelijke opvolger? Zo ja of nee, hoezo?

Einde:

Dat waren alle vragen die ik als onderzoeker had voorbereid. Zijn er bepaalde onderwerpen of opinies die u onderhandeld acht, en daarom nog dienen te worden besproken?

Nogmaals dankuwel voor de tijd en informatie die u hiermee mij doet vergaren. Ik waardeer het enorm dat u deelneemt aan het onderzoek. Als laatste vraag zou ik graag willen weten of het mogelijk is om eventuele vragen naderhand nog te kunnen stellen, mocht iets niet duidelijk zijn. … Tevens is het voor u mogelijk ten aller tijden mij te contacteren met mogelijke vragen of extra informatie. Hierbij wil ik nogmaals benadrukken dat het interview anoniem zal worden verwerkt in de resultaten, indien u dit wil. Als u het fijn vindt, kan ik de finale scriptie versie u toezenden, zodat u het kunt inzien. Nogmaals bedankt en een fijne dag!