

Sustainability in the agricultural sector in the Netherlands

Drivers and motivations behind a sustainable choice

MSc Thesis—Sustainable Development

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SUMMARY

This research looks at the motivation for farmers to adjust their practices to prevent damage to natural ecosystems, benefit flora and fauna or to become more sustainable in any other way. The research focusses on the non-animal part of agriculture, to give a holistic perspective of factors and actors that stimulate or demand sustainable practices of farmers. Factors such as environmental degradation of groundwater, fertile soil, but also social factors such as pressure of consumers, push farmers to adjust their practices to be able to still cultivate crops. Not only external, but also internal drivers stimulate farmers to adjust their practices, for example strong norms and values, or when it is a good business case to use less pesticides or artificial fertiliser. The landscape of agricultural perspectives in the Dutch agriculture is widespread. From common farmers who use common pesticides and artificial fertiliser, to organic farmers who only use organic and natural products on the crops, and biodynamic farmers who see agriculture in connection to the rest of the cosmos and have even more strict practices than organic farmers. All different types of farmers were concluded in the research, with different main crops. Thirteen respondents in total, farmers and experts are interviewed from different agricultural organisations. Several external, internal and connecting drivers are found. The most important external drivers are pressures of different stakeholders, such as supermarkets, NGOs, and the government. Due to a recent campaign of Greenpeace, a lot of farmers are pushed to comply with the requirements of the PlanetProof certification mark, or they will lose certain supermarkets as customer. Intrinsic motivation and collaboration between farmers within a sector and between different sectors are the most important internal and connecting drivers for sustainable agriculture, combined with technological innovation and new research and knowledge. Obstacles such as higher costs, more labour and an unfamiliarity of organic pesticides prevent farmers to change their practices. A higher price for more sustainable crops would stimulate the road to sustainability, but supermarkets and consumers are not willing to pay a higher price and it is difficult for farmers to ask for a higher price. This research shows the complicated world of sustainable agriculture; the struggle to make profit as an agricultural company with corporate interests, and the challenge to work together with nature and maintain natural ecosystems.

ABBREVIATIONS

ACM	Authority for Consumers and Markets
CAO	Collective Arbeids Overeenkomst (Collective Labour Agreement)
CAP	Common Agricultural Policy
CBS	Centraal Bureau voor de Statistiek (Statistics Netherlands)
CBT	Centraal Bureau van de Tuinbouwveilingen (Central Bureau of Agricultural Auctions)
CLM	Centrum voor Landbouw en Milieu (Centre for Agriculture and Environment)
FAO	Food and Agricultural Organization
GHGs	Greenhouse gasses
LTO	Land en Tuinbouw Organisatie (Dutch Confederation of Agriculture and Horticulture)
MDGs	Millennium Development Goals
NFO	Nederlandse Fruitteelt Organisatie (Dutch Fruit Grower Organisation)
SDGs	Sustainable Development Goals
SMEs	Small to medium sized enterprises
SMK	Stichting Milieukeur (Dutch Environmental Quality Label)

PREFACE & ACKNOWLEDGEMENTS

As the daughter of a fruit grower, I see the daily energy and effort that goes into the cultivation of a healthy and beautiful product. The energy it takes, but also the drive to work together with nature. To survive severe weather circumstances of heavy rainfall, hail, or seasonal drought, and other pests and diseases. And not only climatic circumstances, but also the ever-changing field of legislation, sustainability awareness and public opinion; this is the world in which farmers need to cultivate their crops, and maintain their families. The world that I see every day made me wondering what drives change, to listen, to open up for alternatives, and to become more sustainable. Therefore I conducted this research, to gain insight into the world of sustainable agriculture. To discover the different drivers behind sustainability, to identify the obstacles and difficulties, but also to give insight into the enablers and to give recommendations on how to move forward. I would like to invite you into this world by reading my thesis. To understand what is going on and to move forward together.

Hereby, I would like to use the opportunity to thank all the people that supported me throughout this research. A big thanks to all the respondents for sharing their opinions, their lifework and their interesting insights. Furthermore, I would like to thank my supervisor Griet Steel for her feedback, my peer Jimmy Mulkens for the interesting exchanges and my family and friends for their mental support and vivid discussions on the subject of sustainable agriculture.

INTRODUCTION

The production of food has seen many developments, from the industrial revolution to the technical revolution, which has increased yields through the growth of modern technologies; irrigation, improved seeds, fertiliser, tractors and pesticides. Increasingly more food is produced, but the global population is also growing. With the improving technologies, the agricultural food production has been growing faster than the global population, thus the food production per capita is still increasing (Hazell & Wood, 2008). This growth of yield has been possible through an increasing intensification of agricultural activities and input per hectare (ha) of cropland. Especially the amount of fertiliser stands out, with a large increase in amount used per ha. This is above all visible in the Global North, where richer countries have more available means (Hazell & Wood, 2008; Tillman et al., 2011).

Yields as well as the food production per capita are still growing. However, there is accumulating evidence that the growth in yield is declining (Hazell & Wood, 2008). Combined with environmental problems regarding soil quality, water scarcity and contamination, productivity and imbalances of pest populations, a pressing urgency is created to move towards more sustainable agricultural practices in order to ensure a sufficient food production for the growing population (Lightfoot & Noble, 2001). Sustainable agricultural practices entail, depending on the specific context, practices that improve soil fertility, less contamination of water and soil and other measures that do not harm the productive capacity of the soil and natural ecosystems. A clear distinction can be made between richer countries and poorer countries. Richer countries have more access to advanced technology, efficient use of nutrients and better soil fertility, and therefore their agriculture is quite intensive, as is the case in the Netherlands. When trying to increase the food production, main crops will meet yield ceilings in the future, when a production growth is no longer possible. Poorer countries do not have the means for intensive agriculture, due to a lack of advanced technology, fertilisers and pesticides, or financial resources. The development of global agriculture can move in two directions; intensification of agriculture through the adoption of advanced technology, fertilisers, pesticides, pest-resistant crops, or extensification, which would entail more land-clearing to make land available for extensive agriculture. The latter however would involve a severe effect on the environment, due to a lower capacity of GHG intake by the original vegetation (Tillman et al., 2011). Therefore, a balance should be found between intensification of agriculture, especially in poorer countries to ensure a sufficient food production to feed the population, without affecting the productive capacity of the land.

The United Nations incorporated agriculture and sustainability of agriculture in the Sustainable Development Goals (SDGs), the successor of the Millennium Development Goals (MDGs). Issues such as hunger and malnutrition, but also land degradation, climate change and non-renewable resources are addressed with the SDGs aimed at the year 2030. In 2030 there should be zero hunger, attention needs to be given to responsible consumption and production, to sustainable agriculture, to decent work and economic growth, to life below water and on land, and industry, innovation and infrastructure. These subjects of the SDGs can all be connected to the agricultural sector, addressing issues in the agricultural field and promoting sustainable growth (United Nations, n.d.). The main difference between the MDGs and the SDGs is the more global focus. The MDGs were mainly concentrated on the poorer countries, also referred to as the global South, to develop basic needs such as access to food, education and health care. However, the SDGs are targeting all countries to take care of the wellbeing of the entire earth, North and South, and preserve the earth for future generations, as stated in the definition of sustainable development (Brundtland, 1987;

Sachs, 2012).

Also in the Netherlands, attention is given to the achievement of the SDGs. The national government collaborates with companies and NGOs to realise the SDGs, and the progress of the SDGs is monitored by Statistics Netherlands (CBS). The Netherlands was the first country in 2016 to be monitored, to judge the current state on the SDGs. From the 192 official indicators as established of the UN, 34 were used to judge the state of the Netherlands (Statistics Netherlands, 2018).

Although the Netherlands shows a small positive development on a majority of the indicators, there are still improvements to be made to achieve the SDGs of for example, sustainable agriculture (SDG2). These improvements entail for example a surplus of nutrients in the soil, especially of phosphorus and nitrogen, both substances used as fertiliser in the Dutch agriculture. These surpluses can lead to contamination and damage of soil, water and air, which in turn is harmful for all crops and animals, also outside farmland (Milieuceentraal, n.d.; Statistics Netherlands, 2018). The amount of nitrogen and fertiliser used per square kilometre is significantly higher than the average use in OECD countries (OECD, 2015). Furthermore, agriculture, especially irrigated agriculture, is one of the causes of dehydration of the ground. In fact, the agricultural sector in the Netherlands contributes for 60% to the dehydration of the ground, which in turn causes a decrease in biodiversity (Milieuceentraal, n.d.; Statistics Netherlands, 2018). In addition, the agricultural sector in the Netherlands contributes substantially to GHG emissions; in fact the agricultural sector causes 27% of all Dutch GHG emissions. Most of the CO₂ emission comes from the under-glass sector, due to their large energy use to heat the greenhouses (Milieuceentraal, n.d.). All of the above mentioned aspects create lots of opportunities for improvement. This, in combination with the fact that around 60% of the land in the Netherlands is used for agriculture and therefore of great importance to not only landscape management but also the Netherlands in general, create the motivation of this research to focus on the Netherlands instead of any other country.

The Netherlands has an extensive environmental policy, including the development of agriculture. The Dutch policy is in line with the European policy, Common Agricultural Policy (CAP). This policy has as target to secure a food production that is sufficient for all people in Europe. All countries in the EU are able to formulate their own policy, as long as it is in alignment with the CAP. The Dutch programme of 2014-2020 focuses on three targets; an increase of sustainable food production, a reduction of GHG emissions, and to prepare the agricultural sector for the upcoming climate change (Rijksoverheid, n.d.).

The Dutch policy on sustainable agricultural growth creates a motivation for farmers to adjust their agricultural practices to less harmful practices, more beneficial for people, planet and profit, the three pillars of sustainability (Brundtland, 1987). Behind the motivation to make a more sustainable choice, different drivers exist. However, we still need to gain a better understanding of agricultural companies' motivation to make a more sustainable choice in their agricultural practices and the possible challenges and opportunities to promote sustainability. Therefore, the following research question is formulated in order to contribute to the understanding of sustainability drivers:

'What drives Dutch non-animal agricultural companies to make their practices more sustainable in environmental, social and economic perspectives?'

To answer the research question, the following sub questions are formulated:

- What are the external sustainability drivers that play a role in agricultural companies in the Netherlands?

- What are the internal sustainability drivers that play a role in agricultural companies in the Netherlands?
- Which obstacles and challenges do the respondents face and what would help farmers to become more sustainable?

SOCIETAL AND SCIENTIFIC RELEVANCE

At this moment, much is known about sustainability drivers in general, but little is known about sustainability drivers specifically aimed at the agricultural sector. This research fills in part of this literature gap, and is therefore scientific relevant. Agriculture is relevant for the entire society due to the necessary food production and the endangerment of the food producing capacity of the land. Therefore this research also has societal relevance, since it clarifies what drives farmers to give attention to sustainable agriculture. With these gained insights, the different stakeholders in society such as the government and (agricultural) organisations can stimulate a more sustainable choice by creating more drivers, removing obstacles or helping farmers in other ways to become more motivated for sustainability. As Lozano puts it, “it is important to recognize which drivers have the highest importance and influence for each type of organisation, in order to foster them and make each type of organisation more sustainable” (Lozano, 2017, p. 509). With the right knowledge and understanding of the drivers and factors that influence the sustainability in the agricultural sector, intervention strategies for improvement can be targeted in an appropriate and efficient way (Ebanyat et al., 2010).

STRUCTURE THESIS

To answer the research question, the sub questions are answered first. Firstly, literature research is conducted to describe corporate sustainability drivers; general corporate sustainability drivers and sustainability drivers specifically focused on agricultural companies as far as known. This literature entailed academic articles, but also Dutch policy, and reports and articles of environmental and agricultural organisations, such as the FAO (Food and Agricultural Organisation) and LTO (Land- en Tuinbouw Organisatie). After this literature research, the same sub questions guide the empirical analysis of the practical research. As primary data sources, farmers and experts are interviewed, which is further elaborated in the methodology. To diminish the scope of this research and come up with more in-depth results, the decision has been made to focus on non-animal agriculture, and only food producing companies.

THEORETICAL FRAMEWORK

To understand and answer the research question and subquestions, different concepts and theories are used in the theoretical framework. The concept of sustainable agriculture and aspects determining the sustainability of agriculture are explored. After that, general sustainability drivers, both internal as well as external, are defined and explored. A driver is defined as a human or natural factor that directly or indirectly stimulates change within a company (Hazell & Wood, 2008). Special attention will be given to intrinsic motivation as a reason that drives adjustments in the agricultural practices, since intrinsic motivation is often seen as a determining factor for the success of change within an organisation (Newby & Alter, 1989).

SUSTAINABLE AGRICULTURE

A distinction in agriculture can be made between livestock farming and non-animal crop growing. Goodland (1997) argues that non-animal agriculture is per definition less harmful for the environment over livestock farming, due to the environmental impact of different diets. A vegetarian diet only needs 2500 kcal, but when 30% of the calories of a diet originate from animal products, 9250 kcal of crops grown are needed per day. Therefore, it is according to Goodland important better for the environment to eat food that is low on the food chain, such as vegetables, fruit and other crops. Another important aspect is the polluting character of livestock. Livestock is related or caused most of the damages to the environment after human damages, with damages such as overgrazing, desertification and soil erosion (Goodland, 1997). With this in mind, it can be argued that non-animal agriculture has a more sustainable nature. Since sustainability and sustainable agriculture the focus is of this research, the choice has been made to focus on non-animal agriculture, due to the already more sustainable nature compared to livestock farming.

In the past decades, agricultural sustainability issues mostly focused on problems of water scarcity and contamination, soil quality, imbalances of pest populations, low productivity and a number of social and economic equity issues (Lightfoot & Noble, 2001). Many definitions of sustainable agriculture can be found in the literature, with different foci such as a sufficient food production for the current and future population, environmental stewardship not only for agricultural areas but also for non-agricultural ecosystems, and economic and social concerns regarding equity of benefits of agricultural practices (Smit & Smithers, 1993). Therefore, the question arises if it is really possible to define sustainable agriculture. As Ikerd (1997) argues, we will never know when agriculture is completely sustainable. "Sustainability is a direction rather than a destination, like a star that guides the ships at sea but remains forever beyond the horizon" (Ikerd, 1997, p. 1). However, to gain insight into the sustainability performance of an agricultural company, three questions can be asked, reflecting the three dimensions of sustainability. These questions are about whether any agricultural technology, activity or company is ecologically sound, economically viable and socially responsible, and are often mentioned in literature regarding sustainable agriculture (Ikerd, 1997; Wall & Smit, 2005). All dimensions are discussed below, with some important differences between the Global North and South that can mainly be explained by different climatic, social or economic circumstances.

Sustainable agriculture should take the environmental aspect into account which means that agriculture should be "meeting the resource and services needs of current and future generations without compromising the health of the ecosystems that provide them" (Morelli, 2011, p. 6). In practice, this means that ecological and biological processes such as nitrogen fixation, soil regeneration, predation, competition, parasitism, nutrient cycling and allelopathy should be

integrated into food production processes. These processes are mainly present in the non-animal agriculture, due to the close connection to the soil and biological processes when growing crops. Also, the use of non-renewable inputs should be reduced to a minimum, to prevent causing harm to the environment or to the health of farmers and consumers (Pretty, 2008).

Regarding the social dimension, agriculture is inevitably social, due to the network of interactions and relations that emerge and at the same time influence all farming activity (Wall & Smit, 2005). Social capital consists of norms, values and attitudes of people which contribute to a better cooperation, relations of trust, reciprocity and obligation. Human capital consists of the abilities and knowledge of individuals. When both human and social capitals are strengthened, farmers are able to share their knowledge on sustainable agriculture and therefore become more sustainable (Pretty, 2008). Moreover, a successful agricultural business will contribute to employment generation which also contributes to the social dimension of sustainable agriculture (Hayati, Ranjbar & Karami, 2010). Social capital is important for both Global North and Global South; connectedness and relations of trust will increase the success and maintenance of project and developments (Pretty, 2003).

The economic dimension of sustainable agriculture focuses mainly on farmers' livelihood systems, competition, factor productivity, and the relative value of external inputs (Rasul & Thapa, 2003). All these aspects should contribute to the economic viability of an agricultural company, in order to ensure its survival by producing enough food and reducing the costs of external inputs. Agriculture is essential to the economic development of a country, although some argue that industrial development is more important than agricultural. After industrial development, an intensification of agriculture follows, a transfer from small-scale farming in developing countries to large corporate agricultural companies in developed countries (Johnston & Mellor, 1961).

The economic, environmental and social dimensions are according Ikerd inseparable; the natural ecosystems set the limits to growth and therefore the environmental dimension should be taken into account. An agricultural company has to be economically viable and make profit, to be able to survive. However, a company only focusing on making a short term profit without taking into account the environmental aspects is likely to degrade the ecosystem, making it impossible to make profit on the longer term. The social aspect is often undervalued, but without economic equity and social justice, human societies would become unstable resulting in an unsustainable situation over a longer term (Ikerd, 1997). Therefore, all three aspects are of vital importance to sustainable agriculture (Ikerd, 1997). Following the definition of Ikerd, for this research, sustainable agriculture is seen as a combination of ecologically sound, economically viable, and socially responsible agricultural practices.

There are different approaches to sustainable agriculture, with differences in which dimension should be seen as most important; for example, nature could be put as first and most important thing, above the economic and social aspect. Smit and Smithers (1993) argue that there are four prominent paradigms present in current literature; eco-farming, agroecology, food sufficiency and social equity. These paradigms will be discussed shortly, in order to give an overview of the possible foci when looking at sustainable agriculture. First of all, ecological farming is an approach to farming which focuses on keeping the environmental impact as low as possible, but maintaining high rates of crop yields and agricultural production. In this way, economic profits are ensured, also through low inputs of fertiliser, pesticide and cultivation (Smit & Smithers, 1993). A remark to this approach could be that low-input farming may suggest an environmental motivation, but also an economic motivation. Economic benefits may be temporary, which may lead to a shift to

less sustainable practices (Francis & Youngberg, 1990). The second approach is agroecology, which is more ecocentric compared to eco-farming. Agroecology focuses on optimising the ecosystem as a whole, without looking at maximising the production for the farmer (Smit & Smithers, 1993). However, it is a broad concept with multiple definitions and can therefore be used as a scientific discipline, agricultural practice, or political or social movement (Wezel, 2009). Although Smith and Smithers argue that agroecology does not focus on maximising production, Altieri (1989) argues that it does focus on securing a sufficient production with the use of technological development, but with certain ecological guidelines and attention to rural development, social and economic problems. A third approach to agriculture is social equity, which is mainly based on distributional aspects of food and resources. This approach emphasizes moral obligations and rights to provide access to food stock and the means of production for all, both over space and in time. An important detail is the focus on intergenerational equity as well as intragenerational equity, with the acknowledgement of right of future generations (Smit & Smithers, 1993). The fourth approach is food sufficiency, which concentrates on the overall productivity of regions and to what extent basic food needs are met. Concerns on the increasing global population play a role, as the world may face severe food shortages. "Given the limited physical and economic prospects for greatly increasing the size of agriculture's land base, the importance of preserving existing productive capacity is clear." (Smith & Smithers, 1993, p. 511). These four paradigms show the different approaches to sustainable agriculture, with a focus on different aspects. The first two approaches are mainly about farming methods and production units. The last two approaches are more philosophies on the protection of the capabilities of natural resources, the access to food and economic benefits, and sufficient food and resources supplies (Smit & Smithers, 1993).

One important aspect to emphasize is the adaptive capacity of the agricultural system. Agriculture should not only take into account the three dimensions named earlier, but also be able to adjust to climate change. Adaptive capacity can be defined as "the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities or to cope with the consequences" (McCarthy et al, 2001, p. 21). The more adaptive capacity a system has, the more resilient it is to climate change and the more sustainable it is (Costanza et al., 1992). In practice this would mean an adjustment in management strategies of agricultural practices to actual or expected climatic conditions and their effects (Smit et al., 2000). These adjustments of agricultural practices can be divided into different categories, consisting of a diversification of crops to ensure a yield and to improve the quality of the soil, a diversification of enterprises within one farming operation, land resource management with special attention to maintaining the soil quality, water resource management to ensure water quality and reduce drought and livestock management to reduce intensive grazing and protect livestock from droughts (Wall & Smit, 2005).

Although sustainable agricultural practices will most likely benefit the agricultural sector at a longer period, it does cost more knowledge, energy and possibly money. Therefore, farmers need to be motivated to change their practices and incorporate sustainable practices into their farm. The drivers behind this more sustainable choice are diverse and extensive, explained in the next paragraph.

INTERNAL AND EXTERNAL SUSTAINABILITY DRIVERS

A holistic perspective of corporate sustainability drivers has been given by Lozano (2015), as a result of his extensive literature review and empirical research. Figure 2 shows the found sustainability

drivers, with external on the outside, internal on the inside and connecting drivers in between. External sustainability drivers, or extra-mural drivers, are factors and actors outside a company that influence or pressure the company from the outside. Internal sustainability drivers, or inter-mural, comprehend all the processes, personal or corporate reasons within a company that stimulate sustainability within a company. Lozano considers corporations to be semi-open or semi-closed systems, with resources that enter the system (such as employees, energy and raw materials), resources that leave the system (such as products, emissions, waste energy) and resources that stay in the system (such as knowledge, intellectual property, patents). With this in mind, it is difficult to argue that the drivers behind sustainability can be divided into internal or external, due to the semi-open or semi-closed identity of a company. Therefore, the drivers are not only divided into internal and external, but with an overlapping category of connecting drivers, with drivers such as reputation, access to markets and customers and stakeholders expectations. Most important drivers according to Lozano (2015) are leadership and reputation (Lozano, 2015).

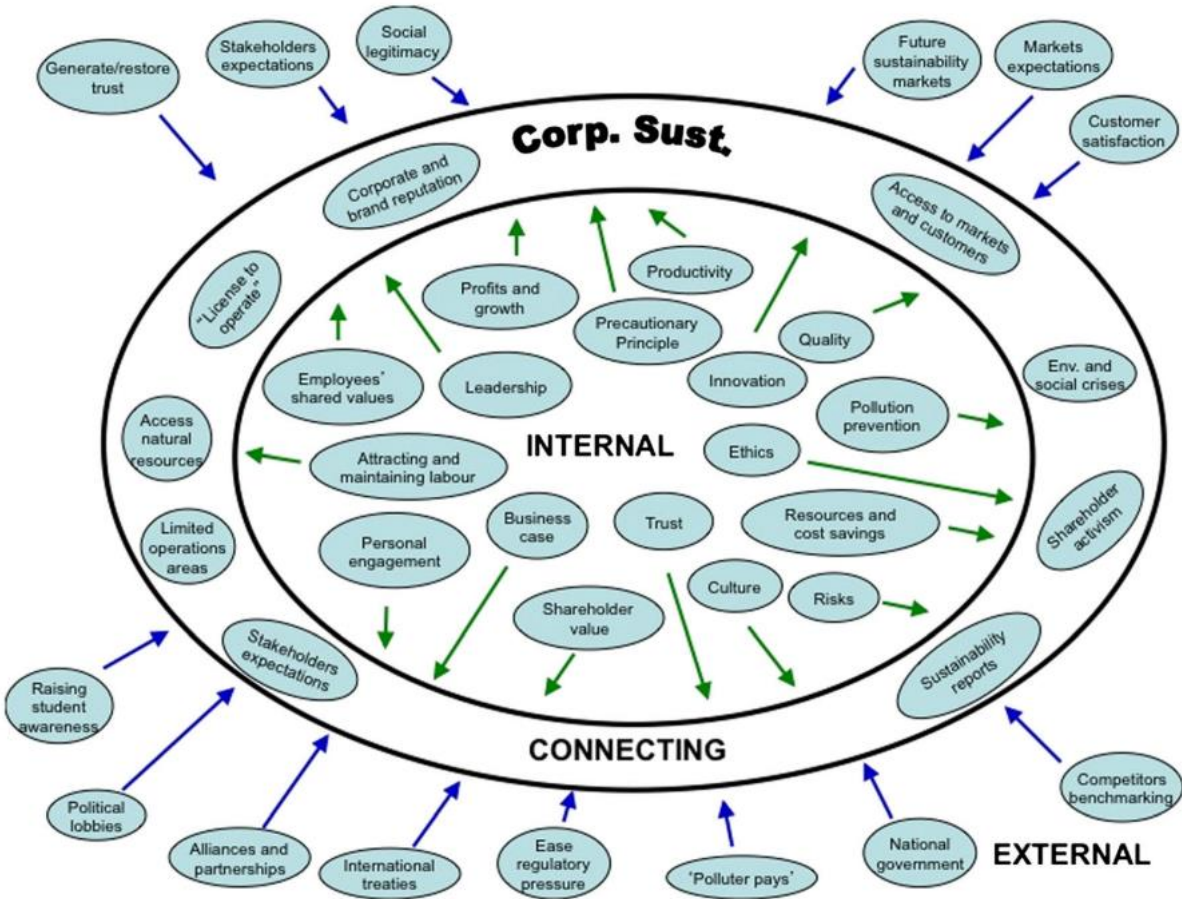


Figure 1: Corporate sustainability driver model. Source: Lozano, 2015.

The model of Lozano entails sustainability drivers who focus on a corporate level, without any specific focus of sector. When looking at the agricultural sector in the Netherlands, the sustainability drivers might differ from the model of Lozano, for example because of the size of most agricultural companies, or their dependency on the environment. Most agricultural corporations are small to medium sized enterprises (SMEs), and therefore their corporate sustainability is managed different than in large corporations. Agricultural companies are expected to be less complex in their hierarchy and structure, and the owner has a stronger role. Therefore, their societal impact and

sometimes environmental impact is likely to be regulated in a more intuitive and informal way than in large companies (C.E.C., 2002). Furthermore, environmental pressures are not mentioned separately in the model but are expected to play a large role, coming from among others water scarcity and contamination, access to natural resources, soil quality and control of pest populations. All these environmental aspects are of vital importance to agriculture, because without enough water and healthy soil, agricultural companies are not able to produce food. Seen on a global scale, including both Global North and South, food security can be seen as the main sustainability driver, to ensure the survival of mankind and provide sufficient food for the growing population (Smit & Smithers, 1993). In developing countries in the Global South, food sufficiency is still a persistent issue, with hunger and malnutrition. However, in the Netherlands, there is enough food available to feed the entire country. Therefore, on a national scale in the Netherlands, it is expected that other sustainability drivers are at stake compared to the Global South, ranging from economical drivers, regulatory pressure or personal engagement. These drivers are further examined during the research, using the model of Lozano as a starting point and guideline to further identify the specific sustainability drivers for the agricultural sector in the Netherlands.

INTRINSIC AND EXTRINSIC DRIVERS ON INDIVIDUAL LEVEL

One of the internal sustainability drivers is the personal motivation of individuals within a company, whether it is an employee or the owner. As mentioned above, intrinsic motivation is often seen as a determining factor for a successful change within a company (Newby & Alter, 1989). Individual motivation is not mentioned in the model of Lozano as a driver, but could be seen as part of other drivers such as ethics, personal engagement or employees' shared values. The motivation on individual level can be divided into two categories; intrinsic and extrinsic motivation. Extrinsic motivation is basically the same as external drivers, but the focus here is now on the individual instead of a company. Employees or individuals are mainly extrinsically motivated when they are able to satisfy their needs indirectly, often with monetary rewards. Extrinsic motivation serves to meet instrumental or indirect needs. From an extrinsically motivated approach, a job is mainly seen as a tool to satisfy the needs of an employee by means of the salary that the job pays (Frey & Osterloh, 2001). For a company to achieve its goals, it should link the employees' monetary motives to the goals of the firm (Osterloh, Frey & Frost, 2001).

Intrinsic motivation comes from the ability for the employees to satisfy their needs immediately, comparable to the satisfaction someone will have after climbing a mountain (Osterloh & Frey, 2000). This means that the participation in the task itself is already rewarding, next to the results of the task (Newby, 1989). The results of a research conducted at task motivation by Newby and Alter show that the removal of extrinsic rewards will lead to a return to the behaviour before the extrinsic reward was adopted. Therefore, it can be argued that intrinsic motivation of all employees is needed to make a change sustainable (Newby & Alter, 1989). Personal motivation, especially intrinsic motivation, is expected to be an important driver for agricultural companies to become more sustainable. In order to innovate and become more sustainable, farmers need to be willing to take risks. A higher intrinsic motivation is expected to be connected to more willingness to take risks. Furthermore, the intrinsic motivation of employees is expected to be important, because all employees need to be willing to cooperate with changes in a company in order to make them successful.

RESEARCH FRAMEWORK

Following the structure of the research, the following research framework is proposed, and shows clearly the different phases of the research, which all start with the theory on sustainability drivers and sustainable agriculture.

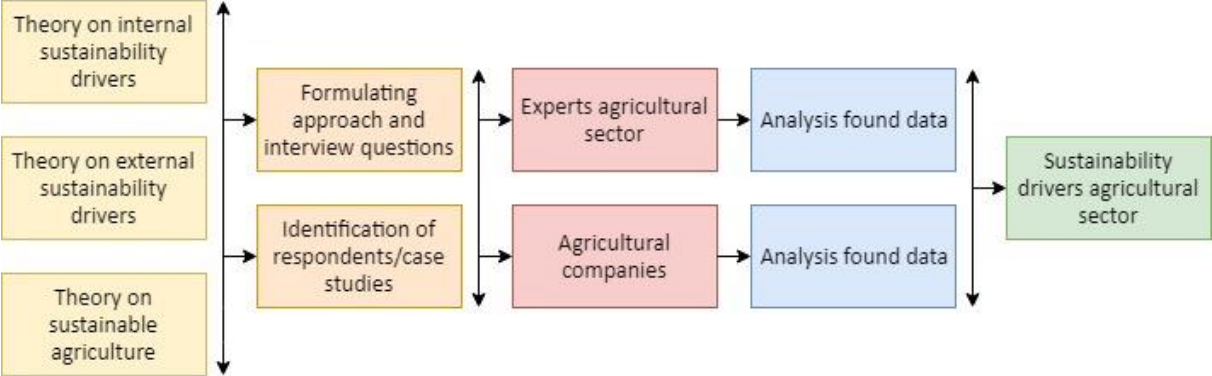


Figure 2: Research framework.

Sustainability drivers, mainly individual motivation, are expected to lead to a higher sustainability performance, following the literature. However, it is unclear which sustainability drivers are relevant for the agricultural sector. This research looks into sustainability drivers for the agricultural sector, as well as possible differences between the different groups of stakeholders. For example, in the perspective of farmers other drivers could be relevant than in the perspective of sustainable food experts. With the data collected during the interviews and shown in the results chapter, it is possible to determine and identify more clearly the drivers for a sustainability transformation in the agricultural sector. With this information it is possible to formulate recommendations, in order to stimulate the agricultural sector to become more sustainable in the Netherlands. Before going to the results, the methodology of the research is explained in the next chapter.

METHODOLOGY

The following chapter explains the research strategy, design and data sources, and what reasons motivated these choices. The research strategy incorporates the general orientation of the research, while the research design refers to the framework for the collection and the analysis of the data (Bryman, 2012). With the chosen research design and data collecting methods, attention is given to the aspects of validity and the reliability, to ensure that the results are reliable and valid.

RESEARCH STRATEGY & DESIGN

As a general orientation of the research, a qualitative approach is chosen to collect in-depth knowledge and generate a new theory on the specific sustainability drivers in the agricultural sector in the Netherlands. Since not much is known on these drivers, an inductive approach helps to formulate new theory, although the theory of Lozano is used as a starting point for the interview questions. Furthermore, a qualitative approach allows incorporating the different opinions of the respondents and their interpretation of the agricultural sustainability drivers (Bryman, 2012).

Regarding the research design, a comparative design is chosen. This design allows drawing a comparison between two or more cases, in the case of this research, between the 13 different respondents and their different opinions, and the information gathered through literature review (Bryman, 2012). The different opinions help construct the theoretical conclusion. To collect these opinions, an appropriate research method is chosen; semi-structured interviews. With this interview technique, a general script is followed and a list of topics is covered, but the questions were open ended and therefore with the possibility to ask for more explanation (Bernard, 2011). The data collected from previous interviews are used as extra interview topics for the other interviews. For example, one respondent pointed out that Greenpeace started a campaign to promote sustainable agriculture. This campaign affected almost all respondents interviewed, and is therefore added to the topic list to find out what the different opinions were on this specific matter.

DATA SOURCES

Different employees or owners of agricultural companies were the respondents of this research, and chosen using purposive sampling. This method of sampling enables that the respondents are chosen in a strategic way, to ensure that they are relevant to the research question. To be more specific, criterion sampling is used with the criteria; agricultural companies with different types of crop and different perspectives. In practice this also involved some convenience sampling. Because of the distance and travel time, respondents were chosen that are located close to Utrecht. These were mainly common farmers. Farmers with another perspective such as organic or biodynamic were often located throughout the Netherlands. The locations of the respondents are visible in figure 3. The farmers were found through personal contacts, but mainly by using the search engine Google. Respondents were sometimes approached by email and sometimes by phone. By trying, it became clear that farmers often do not respond on their email, therefore the phone was mainly used to get into contact with farmers. Most of the respondents contacted were willing to cooperate with the research, there were few who declined due to practical circumstances. For example, one farmer said she would like to participate, but could not do so due to her pregnancy.

Furthermore, expert interviews are conducted with sustainable food experts from organisations such as LTO (Dutch Confederation of Agriculture and Horticulture), and Platform Verduurzaming Voedsel (platform sustainable food). The experts are all contacted by email, and when possible by phone. Several agricultural organisations and farmers are interviewed, until data

saturation has been reached. This is determined due to the overlapping responses of the respondents. The main aspect that differed in the answers was the story behind the personal motivation of a farmer.

All respondents with corresponding function, main crop (when relevant) and date of the interview is mentioned in figure 4.

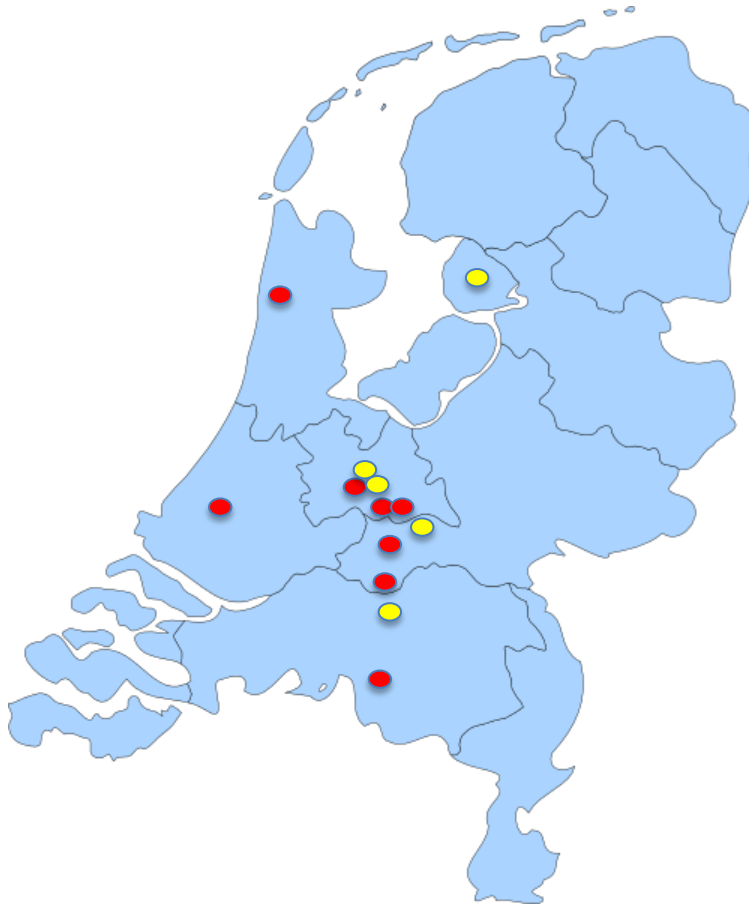


Figure 3: Locations of farmers (red) and experts (yellow). Source: adapted from clkr.com, n.d.

Respondent number	Function	Main crops	Date
R1	Common farmer	Apple, pear	17/5
R2	Common farmer	Apple, pear	23/5
R3	Common farmer	Soft fruit	24/5
R4	Organic farmer	Cucumber, bell pepper	29/5
R5	Common farmer	Mushrooms	30/5
R6	Common farmer	Apple, pear	30/5
R7	Biodynamic farmer	Vegetables	1/6
R8	Chairman department greenhouse horticulture LTO (Dutch Confederation of Agriculture and Horticulture)		11/6
R9	Employee Bureau de Helling (Research Agency for political party GroenLinks)		18/6
R10	Senior advisor Louis Bolk Institute		19/6
R11	Advisor Centre of Agriculture and Environment		20/6

R12	Common farmer	Tomatoes	27/6
R13	Knowledge coordinator foundation Veldleeuwerik		12/7

Figure 4: List of respondents, main crop and date interviews. Source: Author's own.

All interviews are audio-recorded, the mobile phone. Before the interviews, all interviewees are asked for consent to audio-record the interview, in order to record all relevant information and to be able to give full attention to the interviews. All respondents gave their consent to record the interviews, without any hesitation.

A remarkable fact of the research is that all respondents were male. This is not done deliberately, but all respondents just happened to be male when contacting different farmers and experts. It is not in the scope of this research to discover why there are more male farmers; however, it may have an effect on the research findings. One respondent argued that women are more socially involved and conscious of societal issues, but this cannot be derived from this research.

In addition to the interviews, more information and data is acquired through literature review. This is done by reading academic articles, but also by reading articles and other sources of the relevant Dutch agricultural organisations and analysing the European policy (CAP - Common Agricultural Policy) and the Dutch policy that is in line with this European policy. This information is used during the interviews, to be able to go more into depth.

THEMES INTERVIEW GUIDE

With the use of an interview guide (appendix I), semi-structured interviews are conducted. The interview guide incorporates topics that are derived from the literature. All topics are treated in every interview, the line of questioning or the exact formulation of the question differed slightly per interview, depending on how the conversation went and in which direction. Depending on the knowledge and expertise of the interviewee, in-depth knowledge is asked; questions regarding their personal perspective and opinion, but also questions on objective background information regarding the interview topics. Depending on the answer of the farmer or expert, follow-up questions are asked to provide more explanation, information and why certain things are the way they are.

DATA ANALYSIS/DATA PROCESSING

Several analysis methods are used to analyse the data. All literature, including articles and documents are analysed with qualitative content analysis. With this method, themes can be extracted (Bryman, 2012). These themes represent the different sustainability drivers and background information, to gain insight and knowledge before and during the interviews. Especially news articles regarding events that relate to developments in the agricultural sector in the Netherlands were found to be useful, and used for remaining interviews.

The recorded audio of the interviews is all transcribed using the programme Nvivo, in order to code all the data and not miss any detail. All interviews took at least one hour, to transcribe all interviews took several days, and was done simultaneously during the period of the interviews. The transcripts of the interviews are analysed using grounded theory. Grounded theory is defined as "theory that was derived from data, systematically gathered and analysed through the research process. In this method, data collection, analysis, and eventual theory stand in close relationship to one another" (Strauss & Corbin, 1998, p. 12). Since grounded theory is an iterative approach, which means going back and forth between data and theory, it is possible to fine-tune the interview guide and ask different questions when necessary to achieve theoretical saturation (Bryman, 2012).

Therefore, theory could be developed simultaneously during the data collection process. With this technique, it is easier to determine when theoretical saturation is reached, which means that all categories are well developed and relationships are established between the categories. In practice, this iterative process was mainly useful for all events happened in history that had an effect on the current practices or choices in the agriculture regarding sustainability. The history of agriculture in the Netherlands is an extensive history, with many events. However, during the interviews became clear which events had an effect on the current practices, such as the formulation of the 'Milieubewuste teelt keurmerk' (MBT, environmental conscious cultivation certification mark) during the 80s and the upswing of the PlanetProof certificate in the last decade.

After transcribing the interviews, all interviews are coded in Nvivo. With the process, the data is broken down into smaller pieces and given a name, in order to identify recurring themes and categories (Bryman, 2012). Codes are hereby defined as "shorthand devices to label, separate, compile, and organize data" (Charmaz, 1983, p.186). The codes are designed during the coding process; by reading the transcripts, sustainability drivers were recognized, a label was designed and assigned to a specific piece of data. The different codes are divided into sustainability drivers, obstacles and enablers. Due to these three categories, it is easier to answer the different subquestions and therefore the research question. Some of the codes could both be seen as enabler and as sustainability driver, such as collaboration within a sector; both an enabler as well as an external sustainability driver and therefore assigned to both categories.

RELIABILITY AND VALIDITY IN METHODS

Reliability and validity can be divided into internal and external factors. External reliability of the research is mainly determined by the question whether the results of the study are repeatable (Bryman, 2012). Therefore, special attention is given to the transparency of the methods of the data collection and data analysis. The transparency of the data collection is ensured by the use of an interview guide, since all interviewees answer the same questions and no topics are left out, which provides comparable qualitative data (Bernard, 2011). Furthermore, the way the respondents were found and contacted is described, for transparency. The codes which are based on existing literature and on the transcripts of the interviews, all raw data are still available when more transparency is required. Internal reliability is only relevant for researches with multiple researchers, and therefore left out of this research (Bryman, 2012). Validity consists of internal validity and external validity. Internal validity concerns the question whether the developed theoretical ideas reflect the observations and whether a conclusion that two variables have a causal relationship holds water (Bryman, 2012). To cover the internal validity, preliminary conclusions are used during the interviews to check whether the drawn conclusion is valid. External validity refers to the degree to which the research findings can be generalized to other social settings (Bryman, 2012). In the theoretical framework, differences between the Global North and South are described. These differences show that most of the conclusions from this research regarding sustainability drivers will differ, especially when it comes to the details. For example, environmental pressures will influence agriculture in every setting possible, due to the dependency of agriculture on nature. However, the climatic circumstances in the Netherlands differ greatly from most of the other countries in the world, and therefore the specific circumstances are likely to differ, such as nutrients abundance in the soil and water management.

ETHICAL ISSUES

For this research, no severe ethical issues are encountered. Informed consent is asked of all respondents in advance of the interviews. The topic of sustainable agriculture is not that sensitive, this is also visible by the fact that none of the interviewees hesitated to give consent for the recording of the interviews. Naturally, all data derived from the interviews is treated confidential and anonymous, only stakeholder position is mentioned and relevant facts regarding the agricultural company, but only if these are relevant for possible conclusions. Furthermore, all respondents are able to withdraw themselves from the research whenever they want to, and receive the report when finished.

CONTEXT DUTCH AGRICULTURAL SECTOR

Before going to the results of the research, it is important to understand the context of the agricultural sector in the Netherlands; some relevant historical developments, the political landscape in the Netherlands and Europe, the context of organic and biodynamic agriculture, and the origin of different sustainability certification marks that influence the Dutch agriculture.

POLITICAL LANDSCAPE

Both the Dutch political landscape, as well as the European, shapes the legal context of the agriculture in the Netherlands. In 1962, the European Economic Community, precursor of the current EU, formulated the Common Agricultural Policy (CAP) with as main goal affordable prices for farmers and food security. Through the decades, the CAP shifted its focus several times. In the 1970s and 80s, the policy was focused on supply management, due to and surplus in food production. During the mid-90s, CAP started to focus on food quality and from 2000 onwards, CAP concentrated on the development of rural Europe in economic, cultural and social sense. Farmers started to become more market oriented and received income aid. The current reform of CAP concentrates to strengthen the economic and ecological competitiveness of the agricultural sector. It tries to support growth and development in rural Europe, to combat climate change and to promote innovation (European Commission, 2012). From 2007 to 2013, the CAP invested more than €7,5 billion in the Dutch agricultural sector and rural development. These investments were aimed at securing the supply of safe, affordable and healthy food, stabilising the income of farmers and promoting innovation and increasing sustainability of Dutch farmers. For 2014 to 2020 another €6 billion will be assigned to the Dutch agricultural sector. The new priorities will be jobs, growth, sustainability, modernisation, innovation and quality (European Commission, 2016).

The Dutch agricultural policy is completely in alignment with the CAP. With the Paris Agreement in mind, the new Dutch Coalition Agreement of 2017 has as one of the goals to reduce GHG emissions of the agricultural sector with 3,5 Mt compared to the emission pathway of the current policy; 1,5 Mt less by a smarter use of land, 1 Mt through reduced methane emissions and 1 Mt with the use of energy-producing greenhouses (Government of the Netherlands, 2017). How these goals should be achieved is not entirely clear, the government will work together with water authorities and different agricultural sectors to investigate the possibilities. However, technical measures are preferred over measures aimed at curbing volumes. European funds such as the Renewable Energy Grant Scheme (SDE+) can be used by farmers to innovate and reduce their environmental footprint and GHG emissions. Furthermore, the Coalition Agreement states that the Authority for Consumers and Markets (ACM) will ensure that farmers will be paid higher prices when buyers set standards regarding sustainability that go beyond legal requirements (Government of the Netherlands, 2017).

The goals of the Coalition Agreement are quite ambitious and it is not completely clear how they will be achieved. Therefore, the exact effects on Dutch farmers are not clear yet, what they will need to do to contribute to the achievement of the reduction of 3,5 Mt GHG emissions.

SUSTAINABILITY CERTIFICATION MARKS

In addition to the legal obligations set by the Dutch government and European Union, farmers often need or want to comply with certain sustainability certification marks due to external pressure or economic benefit. In 1991, a new certification was released, the 'Milieubewuste Teelt' (MBT; environmental conscious cultivation). This new certification was designed by the Central Bureau of

Agricultural Auctions (CBT) and aimed at the use of more environmental friendly pesticides and fertilisers, natural enemies such as insects and resistant crop types (Van de Minkelis, 1992). During this period, the fruit sector in the Netherlands was reviving from a recession that was mainly caused by a surplus of apples and pears from other EU countries. The only way to win from this competition was to aim at a higher quality. The extreme pesticides that were used before the environmental conscious cultivation killed most of the insects, including the ones that were useful for the farmer due to their natural behaviour to eat harmful insects. Farmers were taught to use fewer pesticides or less harmful pesticides to prevent unnecessary damage. This became a success and therefore a lot of farmers adopted this approach. Farmers that adopted this certification were naturally hoping to receive a better price for their products, because the new cultivation method required more expertise and research. However, this economic benefit was difficult to achieve due to a similar price of the regular products (Van den Berge, 1992). One of the main criticisms to this certification mark was the fact that it was designed in such a way, that many farmers could comply with the certification. Therefore, it was difficult to earn more with certificated products, since the products were not that unique.

In the same period, the 'Stichting Milieukeur' (SMK, Dutch environmental quality label) was founded by the Ministry of Housing, Spatial Planning and the Environment to support sustainable entrepreneurship. As a successor of the MBT certification, since a couple of years the certification mark 'Milieukeur' is also available for fruit and vegetables. This certification, which will be named 'On the way to PlanetProof' from 2019 onwards, also referred to as 'PlanetProof', tries to have a holistic view on the production process of different products. The different themes the certification addresses incorporate biodiversity, water quality, pesticide use, soil fertility and other environmental themes, but also social themes such as labour conditions (Milieukeur, n.d.). With all these different themes, the certification mark addresses sustainable agriculture.

Another actor that is addressing sustainable agriculture is the NGO Greenpeace. Greenpeace target ecological agriculture with seven corresponding themes; food sovereignty, strengthen farmers, smart food production, biodiversity, healthy soil, no chemical pesticides and climate resistant (Greenpeace, 2015). According to Greenpeace, the intensification of the agriculture is the cause of all the severe issues. A retreat from nature in the rural area combined with intensive use of pesticides cause death among bees and other pollinating insects. The way Greenpeace wants to target these themes is among other by stimulating consumer to eat less meat and dairy and to buy organic products. By promoting smaller crops field, diversity in crops, less genetic modification and a fair price for sustainable products, Greenpeace hopes to enhance the situation on a global scale (Greenpeace, n.d.). These targets might contradict the goals of Dutch farmers, for example, large crop field and monocultures are often ways to intensify agriculture and enlarge the yield. A recent development is the campaign of Greenpeace to promote sustainable agriculture, especially targeted at farmers in the Netherlands and the supermarkets that are supplied by farmers. Supermarkets decided to address the theme of sustainability agriculture due to the campaign of Greenpeace. Several supermarkets decided that the farmers that supply the supermarkets should have the PlanetProof certificate within two years (Greenpeace NL, 2018). This is still an ongoing process, and therefore the success or impact is not yet known. A factor that might contribute to the success of this project would be the quality of the standard. In contradiction to the Milieubewuste Teelt, it is expected that the standard of the PlanetProof certification will not be lowered in order to make it easier for farmers to comply. If the quality and the standard remains high, the certification mark may actually contributes to the economic value of a certificated product, but this is yet unknown due to

the timeframe of the developments. Although the certification mark does incorporate some organic measures, it is not the same as organic or biodynamic agriculture (Sosef, 2017).

ORGANIC AND BIODYNAMIC AGRICULTURE

When talking about sustainable agriculture, people often assume that organic agriculture is the most sustainable option due to the use of more environmental friendly pesticides and fertilisers. The main difference between common agriculture and organic agriculture is the use of approved pesticides and fertilisers that are not chemical, rotation of crops, and cultivation in the soil instead of a substrate. When crops comply with the standard, the EKO certification mark may be put on the crops (Skal, 2018). Biodynamic cultivation has a different approach and looks at the cohesion between nature, culture and the human. Values such as a living soil, care taking of life forces, the integrity of the animal are central in this approach. All the work done to the soil and crops should be in service of wholeness and pureness, and therefore as little as possible is changed. To fulfil this approach, several guiding lines are in place, for example, at least 10% of the surface of the farm should be aimed at improving biodiversity, and the protection of the crops against diseases is done as much as possible by taking care of a healthy soil which in turn will provide enough nutrients to grow a resilient plant. When a farmer complies with all the guidelines of the biodynamic approach, the certification mark of 'Demeter' may be put on the crops (Demeter, 2017).

It does not fit in the scope of this research to determine which approach to agriculture is most sustainable; a lot of parameters such as damage to ecosystems, GHG emissions, but also social and economic parameters should be measured. However, looking at the use of pesticides and the care of the soil, it can be argued that organic and biodynamic agriculture is more beneficial for the environmental aspect of sustainability (NPO 3, 2018). An additional aspect which is not officially addressed as an obligation in the organic or biodynamic agriculture is the use of renewable energy. However, in 2014 a new project called 'Bio Duurzaam' (organic sustainable) was started in 2014 to develop a holistic approach to organic sustainable agriculture. This project is still an ongoing process, in order to make organic agriculture also sustainable in other perspectives than only the use of pesticides and the care of soil (Louis Bolk Instituut, 2017).

AGRICULTURAL CONTEXT

The political landscape together with the different certification marks create part of the world of farmers. These dimensions are partly the sources of the sustainability drivers for farmers. The context showed here will help understanding the results in the next chapter.

RESULTS - SUSTAINABILITY DRIVERS, OBSTACLES AND ENABLERS

During the semi-structured interviews with experts and farmers, different motivations, actors, obstacles and enablers to become more sustainable were discussed. To structure this chapter, first of all, a short overview of the definitions of sustainable agriculture according to the respondents will be given. Secondly, the motivations to become more sustainable will be discussed; both internal and external. Following the definition of Lozano (2015), organisations will be seen as semi-closed systems, and therefore a distinction can be made between internal, external and connecting drivers. Thirdly, the obstacles to become more sustainable will be discussed. The chapter will be concluded with a list of things seen as necessary by the respondents, to help the agricultural sector become more sustainable. Through this entire chapter, the role of all the different actors will be explained, as far as known.

DEFINITION SUSTAINABLE AGRICULTURE

During the interviews, several definitions of sustainable agriculture came up. Figure 5 shows the mentioned aspects and the number of respondents that mentioned this specific aspect.

Definition sustainable agriculture	Number of respondents
Environment in general	5
Creating a closed cycle	5
Biodiversity	4
Less use of pesticides	4
Renewable energy	3
Fertile soil	2
Less use of fertilisers	2
Organic agriculture	2

Figure 5: Definition sustainable agriculture and number of respondents that mentioned this aspect. Source: Author's own.

The aspects that were addressed by the respondents are also mentioned in the literature (Lightfoot & Noble, 2001). Terms that also came up were 'agroecology'; a comprehensive concept that incorporates environmentally and socially aspects in the approach of agriculture (FAO, 2018). As described in the theoretical framework, the working definition of agroecology as seen by Smit and Smithers (1993) is to maximise the ecosystem as a whole without looking at maximising the production for the farmer. However, the respondents did support the idea of a comprehensive approach of agriculture, but they also all had an economic interest at heart. Therefore, it can be argued that they do not agree with the definition of Smit and Smithers (1993), but more in line with the definition of Altieri (1989) who argues that agroecology entails securing a sufficient production with the use of technological development, but with certain ecological guidelines and attention to rural development, social and economic problems. Another concept that was mentioned by the respondents was 'integrated agriculture', an approach that looks into the different functions of agriculture, such as landscape, nature and environmental management. Integrated agriculture combines different agricultural systems to create closed cycles, for example by integrating livestock and cropping systems, which would enhance the nutrient cycling efficiency. A greater diversity of crops combined with crop rotation could spread the economic and production risks. This approach is in line with other mentioned aspects, such as creating a closed cycle, visible in figure 5 (Hendrickson et al., 2008).

A remarkable fact of the results on the definition of sustainable agriculture is that almost all respondents only mentioned the environmental aspect when giving their definition of sustainable agriculture. This deviates from the definitions found in the literature, where both environmental issues as well as economic and social issues are mentioned as part of sustainable agriculture (Smith & Smithers, 1993; Ikerd, 1997; Wall & Smit, 2005). The fact that most respondents only mentioned environmental issues may be explained by the daily activities of farmers, their daily work involves working with ecosystems in the outside environment. Furthermore, most of the regulations they need to deal with address environmental issues. The social aspect is more naturally; it is common sense for farmers to comply with the CAO (collective labour agreement) for their employees, so they do not see the social dimension as part of sustainable agriculture. Only one biodynamic farmer mentioned specifically also the other two P's (people and profit) as being part of sustainable agriculture. However, this can be explained by the fact that biodynamic agriculture has an extensive spiritual background, and this respondent read a lot on sustainability and spirituality behind agriculture.

EXTERNAL DRIVERS

As stated above, the motivations to become more sustainable can be divided into internal, external and connecting factors and actors. The contextual chapter above explained the origin of the MBT certification mark, which was also aimed at creating a higher value for the certificated products. However, this higher value was never realised, due to a high supply of high quality, non-certificated products that could be sold at a lower price. Moreover, as one respondent stated,

“the boards of the auction told me ‘we want to have a certificate, of which 80% of our farmers can comply with’. I told them, I wish you luck, but then you will not have a brand, if everyone can comply” (Senior advisor Louis Bolk Institute, Bunnik, 19/6/2018).

Although this development did not create a higher value for the products, farmers did start to experience that this new of cultivating crops did work. They needed fewer pesticides to combat pests and diseases in their crops, and were less dependent of these means. Therefore, the practices of the certification mark did find its way into the current agricultural practices, but the certification mark is not used anymore. Due to the lack of an additional economic value of a MBT certificated product, this certification mark did not hold on. The certification mark did accomplish something; it had a beneficial effect on the environment which was an important step in the direction of environmental conscious and sustainable cultivation of crops.

In contradiction to the MBT certification, the PlanetProof certification that works as a successor of the MBT certification is becoming more and more used in the Netherlands. Farmers are adopting this certification mark, and are trying to find an additional economic value, but the latter is difficult. One of the respondents stated that he found a customer that was willing to pay more for a certified product, and therefore he choose to implement the practices of the certificate in his company. However, up until now, this seem to be an exception since almost all respondents are not yet able to find a better price for their certificated product. Either supermarkets do not want to pay extra, or consumers do not want to pay extra, which is in contradiction to the public opinion that farmers need to become more sustainable and use less pesticides.

“The public opinion says something and consumers react and yes, consumers do want to have a more sustainable product, but they don’t want to pay extra” (Fruit grower, Het Goy, 17/5/2018).

With a campaign two years ago, Greenpeace reached out to consumers to create more awareness on sustainable agriculture. As a result, supermarkets negotiated with Greenpeace and decided to obligate farmers to comply with the PlanetProof certification before 2020, if they want to keep supplying to supermarkets. Supermarkets want to attract customers by having a sustainable green image. However, one respondent indicated that supermarkets always have an economic interest; they prefer to buy the products as cheap as possible and sell them with a high profit. Although Greenpeace also promotes a fair prices for farmers, all farmers interviewed indicated that they are still waiting to receive this higher price for their certificated product. In the coalition agreement is mentioned that farmers that need to meet requirements that go beyond legal requirement should receive a higher price for their products. This should be controlled by the consumer and market authority (ACM), but until now there has been no monitoring.

Most farmers interviewed were not satisfied with these requirements that go beyond the regular legal requirements, due to the absence of a higher price. They feel like it is not fair that the regulation is changed as the result of pressure from the public opinion and a NGO. These external pressures of supermarkets and Greenpeace are reason for farmers to become more sustainable, but some farmers still doubt about the requirements set by the certification mark. It is unclear whether the requirements of the certification mark stay the same. As mentioned in the contextual chapter, the easement of the requirements of the MBT certification mark is seen as one of the reasons why the MBT certification is no longer effective, or never really became widely used. One respondent argued that the same was happening to the PlanetProof certification.

“A lot of supermarkets ask for Milieukeur [PlanetProof], like Jumbo, so they want that more farmers and fruit growers transfer. So they [Milieukeur, PlanetProof] eased a few requirements” (Fruit grower, Cothen, 23/5/2018).

If the requirements of PlanetProof would become easier to comply with, the certification could lose part of its value. When more farmers will comply, a certificated product will not be that unique anymore and have less value on the market. This is in contradiction with the aim of Greenpeace, to take care that as much farmers as possible adopt the sustainable practices of the certification. Therefore, Greenpeace is trying to stop certifications institutions to ease the requirements of the certifications, in order to maintain the foreseen effects of the certification process on the environment.

Along with the pressures of NGOs such as Greenpeace and the supermarkets, the national government and regional governments have legislature to restrict the use of pesticides and artificial fertilisers. The national legislature is in line with the Common Agricultural Policy (CAP) of the EU, and tries to benefit both the environment and the corporate life. However, they often differ from the regulations of the certificates and supermarkets. For example, national legislature restricts the amount of actives substances in kilos, while the regulations of certificates often state how many different types of actives substances may be used on the product. Many respondents argued that these different types of regulations therefore make it even more difficult to comply with everything. The cause of all these differences seems to be a difference in the perspectives of the actors. A concrete example of the differences in perceptions is the perception of pesticides. NGOs such as

Greenpeace see pesticides as a harmful substance, which kills bees and destroys ecosystems. Common farmers mostly see pesticide as a necessary evil; no one likes to spray pesticides, but in order to grow crops it is sometimes needed. Supermarkets and governments understand this need, but try to restrict the use of pesticide as much as possible by drafting laws that restrict the use or by obligating the compliance to specific certificates, which in turn requires a limited use of pesticides.

In figure 6 an overview is given of all the external drivers with the corresponding amount of respondents that mentioned this driver and the times it was mentioned in total.

External drivers	Respondents	Times mentioned
Legislation/regulations	11	25
Market demands or expectations	11	23
Supermarket demands	9	24
NGO campaign (environmental movements)	8	23
Pressure of consumer	7	23
Advocate organisations (such as LTO, NFO)	5	10
Competition with competitor	4	9
Political lobby for agriculture	4	9
Expectations/demands sector	4	8
Municipality	2	4
Province	1	1

Figure 6: External drivers, with number of respondents and times mentioned. Source: Author’s own.

INTERNAL DRIVERS

In addition to external drivers, there is even a wider variety of internal drivers to become more sustainable. First of all, respondents stated that they do not like spraying pesticides; they would all prefer to not spray anything due to the potential damage to the environment, but also due to higher costs and more labour. The pesticides are expensive, and it is labour intensive to spray the pesticides, sometimes multiple times a week.

“Because yes, I prefer to spray as little as possible, as little as possible pesticides, as little as possible artificial fertilisers, I do that yes, but it does have to grow” (Fruit grower, Tricht, 24/5/2018).

Most respondents mentioned intrinsic motivation as an important driver to become more sustainable; for example by looking at more sustainable options such as less use of pesticides, renewable energy and more sustainable types of cooling mechanisms. The respondents indicated that when they due to a high sense of connection to the society or neighbourhood, combined with an awareness of global or national sustainability issues, they felt more intrinsically motivated to change their practices. This can be explained because of a higher sensibility to public opinion from for example, the direct neighbourhood, the people in the surrounding village will most likely prefer as less pesticide use as possible. Many respondents indicated that another source of intrinsic motivation is the willingness to prevent damage to human health or the environment. This willingness to prevent damage is also beneficial for farmers, since useful insects have the chance to survive and therefore fewer pesticides are needed. In this willingness to prevent damage to the environment is the environmental aspect of the definition of sustainable agriculture visible (Ikerd, 1997). Depending on personal preferences, farmers work in a nature-integrating way, using the natural ecosystems, or in a more independent way, relying on artificial fertiliser and pesticides.

To what extent the farmers are intrinsically motivated differed highly. One biodynamic respondent had a strong belief that pesticides were highly damaging to the environment and human health, and therefore was willing to put everything aside and to start a biodynamic company. This respondent acted only out of his beliefs and could not believe that there are so little companies or people that share his opinion.

“Or it [use of chemical pesticides] causes cancer, I dare say that that type of substances, affect your cell structure and immune system, that chemicals contribute to different types of cancer” (Biodynamic farmer, Sint Maarten, 1/6/2018).

To have a company with such specific norms and values, a high intrinsic motivation is required. The biodynamic farmer told that he built his company from scratch to a company of 75 hectares, which shows his determination to build something successful. This is in alignment with the argument of Newby and Alter (1989) that intrinsic motivation is a determining factor for the success of an organisation. To be able to have such a company, it is important to have employees that share this opinion. Also other respondents mentioned a related factor, to keep their employees by always improving labour conditions and sustainability performance. In this latter aspect, the social dimension of the definition of sustainable agriculture is visible; to improve the labour conditions. Together with the connectedness to the society and surrounded social environment, these two aspects form the social dimension as far as visible in the results of this research.

According to all the respondents, agricultural practices should always be economically viable, which connects to the definition of sustainable agriculture of Ikerd (1997). An agricultural company might continue existing without being ecologically sound or socially responsible. However, it has to be economically viable in order to ensure its continuing existence. Therefore, both farmers and experts argued that the changes always need to be feasible in a financial way. It should either increase the value of the yield or the amount of yield, or the costs should remain the same, but most respondents were not willing to lose money in order to become more sustainable. If it is a proper business case to become more sustainable, all respondents are prepared to change. However, it might be a challenge to find the appropriate business case for sustainability. Some respondents choose to transfer to organic agriculture, but it depends per company whether this is possible. For example, according to the fruit growers, it is difficult to cultivate organic apples in the Dutch climate due to the wet conditions which causes easily fungi.

In addition to finding a proper business case, there is also a certain amount of preparedness to take risks needed. An extreme example of this is the expensive construction of a heat pump to extract geothermal heat from the ground to heat the greenhouses. This innovative technique has a great potential of reducing GHG emissions and is seen as one of the technical solutions for a more sustainable future. However, it is still a quite new technique and therefore not without any risks. For example, it is difficult to determine where exactly heat can be distracted. It has to be in the right location in the earth and on the right depth. One interviewed farmer was determined to construct such a heat pump. This innovation costed around 12 million, but the bank found it too risky to loan the money for such an investment. Therefore, the respondent chose to invest a large part himself, accepting the risk that it could fail. This willingness to accept risks was also visible among other respondents, mainly in reference to the acceptance of a certain amount of damage. Respondents argued that before the new method of cultivation became popular, it was common to use violent pesticides for every insect they saw. This mindset changed due to the awareness of the damage it caused and nowadays it is common practice to observe better and only spray pesticides when it is

really needed. Several farmers mentioned the accuracy this requires and the willingness to take risks, since the risk exists that a certain level of insects or pests is exceeded and severe damage is caused. This willingness to take risks or accept damage is even more present at organic or biodynamic farmers, since they have less effective pesticides available to use and some damage is therefore unavoidable.

Figure 7 gives a schematic overview of all the internal drivers mentioned by the respondents, with the corresponding amount of respondents that mentioned this driver and the times it was mentioned in total.

Internal drivers	Respondents	Times mentioned
Willing to take risks	9	21
Technological innovation	8	25
Intrinsic motivation	8	24
Additional value product	8	23
Awareness sustainability issues	8	18
Damage prevention (environment, human)	8	14
Progressiveness	6	13
CO ₂ reduction	5	8
Socially concerned	5	16
Certificate acquisition/retention	4	8
Cost savings	2	2
Strong vision/goal	1	4
Sustainable attitude employees	1	1

Figure 7: Internal drivers, with number of respondents and times mentioned. Source: Author's own.

CONNECTING DRIVERS

Because of the semi-closed identity of organisations, there are certain motivations that connect internal and external factors. Collaboration between different actors is by the respondents indicated as essential. Knowledge exchange within a certain sector such as fruit cultivation through collaboration can stimulate and accelerate the process of sustainability. Many respondents see sustainable agriculture as a closed cycle, where all the materials can be reused, without any waste left. To achieve this, collaboration between different sectors may be needed, for example, an organic respondent that grows vegetables uses the manure of the goat farmer next door. This is in alignment with the argument of Avery (2015) who argues that “firms have to collaborate with others to address the complex sustainability issues they face” (Avery, 2015, p. 44), and “the greater the number of collaborations, the higher the success rate of those partnerships” (Avery, 2015, p. 44). All motivations are listed in figure 1, with the number of respondents that mentioned the factor and the amount of times mentioned.

Connecting drivers	Respondents	Times mentioned
Collaboration colleagues	8	11
Green image/reputation	7	19
Collaboration product chain	4	7
Collaboration among sectors	4	5
License to operate	3	9

Figure 8: Connecting drivers, number of respondents and times mentioned. Source: Author's own

All sustainability drivers found in this research can be used to design a new theoretical framework, in alignment with the framework of Lozano (2015), but aimed at sustainable agriculture. Figure 9 shows the proposed theoretical framework, based on the results found in this research. The framework visualizes the different types of drivers that together promote sustainable agriculture.

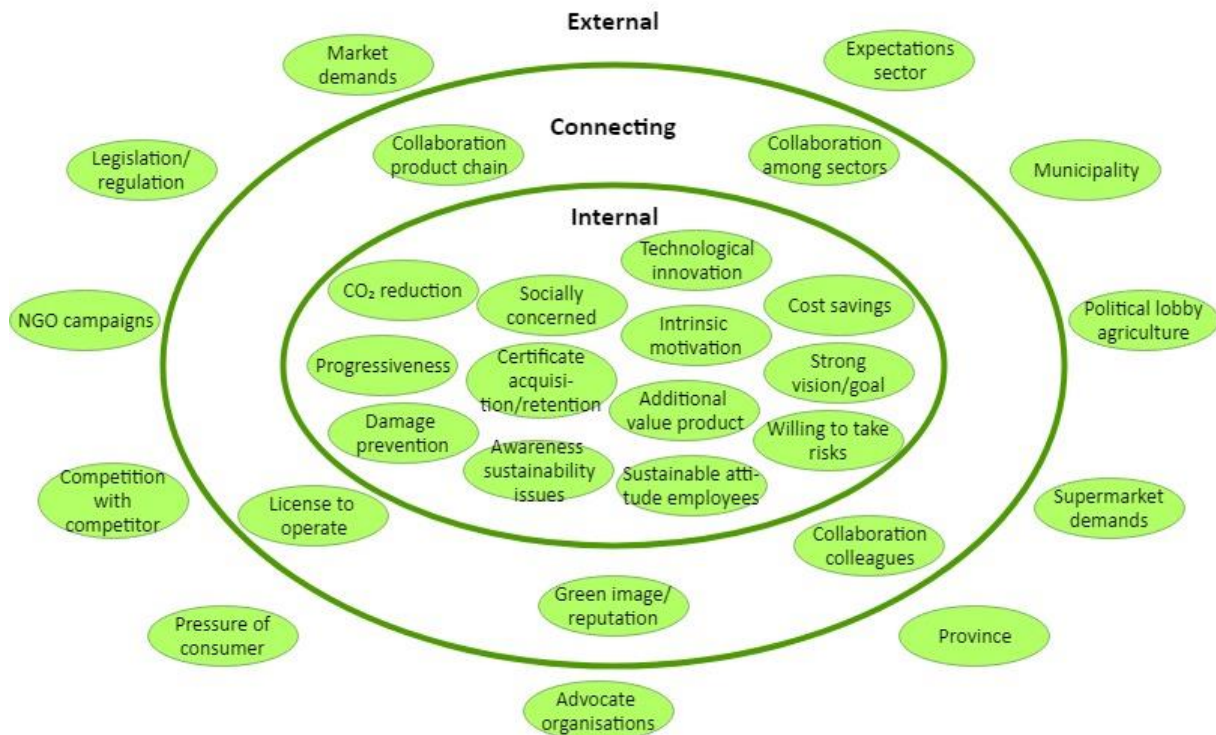


Figure 9: Drivers; external, internal and connecting. Source: Author's own.

OBSTACLES

Next to the motivation that farmers have to become more sustainable, they also come across a lot of obstacles. As made clear in the section above, the recent developments of supermarkets demanding certain certificates, complicates the practices of the interviewed farmers. In the current situation, farmers will need to pay the extra costs and labour, without receiving a better price. Certification comes usually with a large amount of paperwork and administration, which means again extra work.

“And that’s why they [farmers] hate it so much, because all kinds of things are asked; they need to do all kind of administrative things to show they comply with the certification. But in reality they see that there is no financial benefit for them. It [comply with certification mark] only costs money. That is not an incentive” (Senior advisor Louis Bolk Institute, Bunnik, 19/6/2018).

Furthermore, respondents indicated that cultivating crops without using pesticides and artificial fertilisers is more complicated, and will also have an effect on the shelf life of a product. Knowledge on organic cultivation is not widespread, and therefore a lot of prejudices exist on organic cultivation. Moreover, in the current market the demand for sustainable certificated products is not that high yet, it does grow slowly, but according to the respondents there are not enough consumers aware of the sustainability of the products they buy.

“That market [organic market] is too limited. My company, even if it is not that big, we produce 30.000 kilos mushrooms per week, which is already way too big to transform to switch over too organic product. I think the market, or I don’t think, the market will definitely be flooded. So that is not a possibility” (Mushroom grower, Ammerzoden, 30/5/2018).

In addition to the limited market demand, the respondents find it difficult to change the behaviour of the consumers and difficult to charge a higher price for products. Consumers will not accept this price and choose a cheaper product. This is also because farmers are not capable of making price agreements since this goes against the Competition law, and therefore not able to protest against the prices of the supermarket. Politics could play a role here, to enhance the position of farmers.

“Besides, the politics should pay attention to the power relations within the food chain, a common heard complaint is that supermarket chains and food processors have too much power and can impose unilateral conditions to farmers” (Employee Bureau de Helling, Utrecht, 18/6/2018).

The proposed measure of the Coalition Agreement of 2017 to let the ACM control a fair price for farmers could be a possible solution to enhance the position of farmers. Another solution would be to compose a law that states that crops cannot be sold for a price below the cost price.

The different obstacles with the corresponding amount of respondent and times mentioned are displayed in figure 10, where it is visible that extra costs and extra labour are seen as the most important obstacles.

Obstacles	Respondents	Times mentioned
Extra costs	8	21
Extra labour	8	16
Difficulties organic cultivation (prejudices, uncertainties)	7	16
Paperwork (administration)	5	11
Behavioural changes consumers	5	10
Unfamiliarity certificate	5	9
Supermarket does not give additional price	4	8
Shelf life crops	4	5
Lack of awareness sustainability	3	6
Dutch climatic conditions	3	5
Complicated cultivation	3	5
No recycling waste possible	3	4
Consumer does not want to pay more	2	3
No difference taste organic product	2	2
Uncertain future market	2	2
Uncertainty market	2	2
Fragmented sector	1	1

Figure 10: Obstacles, number of respondents and times mentioned. Source: Author’s own.

ENABLERS

In addition to political measures to ensure a better price for sustainable products, other enablers and solutions were mentioned during the interviews. Firstly, a constant development of new knowledge for farmers is needed to keep improving practices and to have a strong position on the global market. Respondents indicated that this knowledge may involve knowledge on pesticide use, useful insects

and how to maintain them, more sustainable ways of cooling and transporting products, knowledge on more disease resistant crops and knowledge on how to create and maintain a fertile soil. This knowledge may come from independent research organisations, such as Centre for Agriculture and Environment (CLM). However, these researches are often paid by agricultural companies who have a specific question and the results of these researches will only be accessible to the paying agricultural companies. Knowledge that is accessible to all agricultural companies would benefit a general development of the agriculture in the Netherlands. The government does not fund as much fundamental research as it used to do, some respondents argued that fundamental information lacks.

“There are also some questions; those are mainly in the common interest for everyone. But universities don’t receive the money to conduct general research, just research that is connected to the corporate life. So the more fundamental work is not done anymore” (Advisor Centre of Agriculture and Environment, 20/6/2018).

More subsidies should go to universities or other research institutions, to create new knowledge accessible to all agricultural companies. This could accelerate the overall development of knowledge, which is accessible for everyone and can be used as a base for further research. This is consistent with the argument of Pretty (2008) that sharing knowledge would enable farmers to become more sustainable.

Furthermore, legislature should be based on decent research, with measures that are achievable for farmers. Some of the respondents that they feel that legislature changes under the influence of mass media or public opinion, without grounded research or reasonable measures. All enablers and actors that could mean something in the easement of sustainable agriculture are mentioned in figure 11, with the corresponding amount of respondents and times the factor or actor was mentioned.

Enablers	Respondents	Times mentioned
Technological innovation	8	25
Collaboration colleagues within sector	8	9
Subsidy	7	14
Knowledge insects and diseases	5	13
Knowledge pesticides	5	11
Advocate organisations	5	10
Collaboration with nature	5	10
Lobby agriculture	4	9
Knowledge organic cultivation	4	8
Collaboration entire chain	4	7
Beneficial environmental circumstances	4	7
Collaboration between sectors	4	5
Observation and experiments	3	9
Municipality (collaboration)	2	4
Diversification activities farmer	2	3
Research, subsidy of government	2	2
Vision or goal	1	4
Knowledge resistant races	1	2
Customised advice	1	1
Province	1	1

Figure 11: Enablers, number of respondents and times mentioned. Source: Author’s own.

The enabling factors and actors indicated by the respondents will help to resolve the obstacles for sustainable agriculture. In the following chapter, a concluding answer will be given to the research question.

CONCLUSION

This research aimed at answering the research question: ‘What drives Dutch non-animal agricultural companies to make their practices more sustainable in environmental, social and economic perspectives?’ Semi-structured interviews are conducted with respondents from different non-animal agricultural sectors and different agriculture-related organisations, to collect information on motivation to become more sustainable, the obstacles that farmers face and things that would provide help to become more sustainable.

The theoretical framework showed four different paradigms of sustainable agriculture, some paradigms are recognizable in the perceptions of the different actors. The paradigm that is most seen in the results is ecological farming, or eco-farming. This approach tries to work together with nature, but with economic interests in mind. Although agroecology is mentioned by some of the respondents, none of the respondents, except for the biodynamic farmer, is willing to lose money to become more sustainable. The paradigms of food sufficiency or social equity are less recognizable in the results. There is sufficient food available in the Netherlands, and the farmers that are interviewed were not or not much preoccupied with questions regarding global food security or food sufficiency. They are mainly preoccupied with running their own business, and do pay attention to the global market, but mainly to look for market opportunities to sell their products.

The empirical analysis shows that interest or actions of parties involved seem to conflict; the economic interests of both supermarkets and farmers, the dependency of farmers on the environment, which is in turn the main interest of NGOs. The national government comes in between these interests with measures that should both benefit the environment as well as the corporate life. They respond to the public opinion, which is also partly formed by campaigns of NGOs or stories of farmers, but also formulate legislations that comply with CAP and international climate agreements. All of the different parties try to influence the government through lobbying, to formulate legislation that is in alignment with the interest of that specific party. Independent research institutions such as Louis Bolk Institution or universities are likely to be most independent, although their research is financed by a certain actor with a certain interest at stake.

All actors have sustainability in mind, but they consider sustainability to be different things or do not agree on the steps that need to be taken in order to arrive at sustainable agriculture or even another option, they are less preoccupied with sustainability than others. The diverse interests and interpretations of sustainability seem to be the source of the difficulties to achieve sustainable agriculture, together with a need for more knowledge on how to cultivate crops in the current Dutch climate in a sustainable way.

All actors mentioned above, pressure farmers to adjust their practices to comply with the interest of a specific actor. All of these pressures from different parties, including the consumers, are external motivations; reasons from outside to change practices regarding sustainability. Connecting drivers such as having a green image for the outside world, building a reputation and in this way acquiring and maintaining a ‘license to operate’ are clearly visible in the results and connect external actors with internal drivers of farmers. Other internal drivers are about setting certain goals or having a certain vision. If a farmer has a good business case and is able to save costs or create an added value for his product, it is likely that he will transfer. A strong awareness regarding environmental or social issues may cause a high intrinsic motivation to transfer. This intrinsic motivation is more present when looking at organic farmers, or even more when looking at biodynamic farmers. Sustainability is often seen in combination with technological innovation;

nieuwe techniques may lower the input of pesticides, fertilisers or cultivation. The willingness to take risks that are sometimes related to technological innovation is a determining factor for becoming more sustainable. The willingness to take risks is, in combination with technological innovation, one of the most mentioned internal drivers. After this, a strong intrinsic motivation is seen as a determining factor for sustainability, and of course an additional value for a more sustainable product, which would make sustainability a better business case.

The internal and external drivers combined create the motivation for farmers to adjust their practices, or even transfer to a completely different system of cultivating crops. However, in this process of transition, obstacles will always be met. Change will always require a certain amount of effort, in the sense of extra costs, extra labour or extra administration. With a lack of an additional value for products or the willingness of supermarkets or consumers to pay more for the crops, it will be difficult to change practices. Also, a lack of knowledge or research can complicate the transformation, as well as the fact that it may be difficult for consumers to recognize sustainable certifications on their agricultural products.

Most important enablers to overcome the obstacles to sustainability include technological innovation, collaboration between farmers in a specific sector and between different sectors, subsidy for technological innovation or research and knowledge on new technologies, types of crops, and nature friendly ways of pesticides and herbicides. To achieve sustainable agriculture, based on this research, certain solutions or recommendations can be done which are mentioned in the discussion.

DISCUSSION

To discuss the limitations of this research, the concepts of reliability and validity are used, as described in the methodology section. For the external reliability, the research is expected to be repeatable, with the same respondents or with other respondents. Depending on which respondents are interviewed, the results are expected to differ slightly, but with the same overall conclusions. This is due to the personal aspect of the research; every farmer may have a different personal motivation, but overall there is a certain pattern visible in drivers behind sustainable choices and obstacles experienced.

Also related to the repeatability of the research is the personal interpretation of the researcher when analysing the data. To analyse the data of the interviews, the programme Nvivo was used. For this programme, certain labels or nodes are created and given to different phrases of the transcripts of the interviews. These labels are partly based on the article of Lozano (2015), but also on the personal interpretation of the data by the researcher. This is done as objectively as possible to avoid observer error, but when conducted by another researcher these labels may slightly differ due to personal interpretation.

Regarding the external validity, the question can be asked to what extent the research findings can be generalized to other social settings. A major aspect that influences farmers here are European and national legislature. Therefore, the findings are relevant for the Netherlands. Some of the results are also relevant for other countries in Europe, due to the corresponding circumstances in society, politics or climate. However, in countries such as Spain or Italy with a warmer climate, it is likely that other obstacles are experienced. Furthermore, the context of this specific timespan of the research also influences the research findings. For example, the campaign of Greenpeace to promote sustainable agriculture by using less pesticides and artificial fertiliser is quite recent and had therefore a great influence on farmers nowadays since supermarkets demand certain certifications as a result of this campaign. When this research is repeated, other developments of that specific period in the society or legislation might influence the drivers or obstacles.

Regarding the internal validity; the developed theoretical framework of sustainability drivers reflects all the drivers mentioned by the interviewed respondents, and therefore represents the observations. The theoretical ideas reflect the framework of Lozano (2015), and are partly overlapping, but the drivers are more focussed on agriculture, more in line with recent developments and complemented with drivers specifically relevant for agriculture.

THEORETICAL IMPLICATIONS

The argument mentioned above is also the added value of this research. This research specifically shows the different actors and factors that drive farmers to become more sustainable, and propose a framework for these drivers. The most important differences between the existing literature on sustainability drivers and this research are firstly the pressures coming from a wide variety of stakeholders, such as NGO campaigns and advocate organisations that defend the interests of farmers. Secondly, collaboration within and between sectors are not mentioned in the framework of Lozano, this research proposes to include this as a connecting driver. Thirdly, intrinsic motivation is not mentioned separately in the framework of Lozano. It could be seen as part of personal engagement, but this driver seems to play a large role in sustainable agriculture, especially when farmers decide to transfer to an organic or biodynamic way of cultivating crops. These methods require more effort and energy, and therefore also more intrinsic motivation. On the other side, there seem to be some drivers that are not often mentioned by the respondents, but are present in

the framework of Lozano. These entail mainly the employees' shared values and to attract and maintain labour. In the agricultural sector employees are of main importance, because they are the ones doing the work. However, these two drivers only seem present in the cases of the organic or biodynamic respondents. Looking at common farmers, no one mentioned the values of employees as a sustainability driver. A lot of farmers arrange their employees through an employment agency, often with Polish employees. One respondent argued that they will just do whatever they are told to do, and therefore their values do not matter that much.

As main theoretical implication of this research, the new framework, partly derived from the framework of Lozano, but mainly based on the research findings, are captured in the new proposed framework, as visible in the results, figure 9.

RECOMMENDATIONS

Based on the research findings on sustainability drivers, obstacles and enablers, the following recommendations can be done in order to arrive at a more sustainable agriculture. These recommendations are relevant in the current period, but may change over time due to a fast developing technology, knowledge, climatic changes, changes in legislature and changed obligations from retail or other customers.

- Open access to all available knowledge and research outcomes; research done by an independent agency without any interests in a certain company can provide useful and basic knowledge, accessible to all farmers. To accomplish this, government has to fund research institutions such as universities or research agencies.
- Distribution of expertise and knowledge of organic and biodynamic farmers among common farmers. Although it might be an alternative way of cultivating crops, much can be learned of organic or biodynamic farmers. Their expertise on low input of pesticides or more use of natural enemies such as insects can also be used in the common agriculture, to improve practices. To achieve this, advocate organisations such as LTO could work together with other organisations such as Demeter (certification organisation of biodynamic agriculture), to organise information meetings and lessons for common farmers, and to put common farmers into contact with alternative farmers.
- Regulation of price agreements; it is now forbidden by law to agree on a minimum price as group of farmers. However, a regulation or agreement that states that products should at least be sold for the cost price would be a beneficial agreement for farmers. In this way, the expenses made to become more sustainable will be paid by the retail or consumers instead of farmers.
- Proactive attitude instead of a reactive attitude for all stakeholders involved, especially farmers. Having a proactive attitude will lead to a more ambitious plan for the future, with a higher chance of reaching certain goals instead of waiting for external actors to demand something and then react to this obligation. This connects to the argument of DeSimone & Popoff (2000) that external drivers will lead to reactive measures, while internal ones will lead towards more proactive change.
- Be transparent about the story behind a product. When a consumer buys a product and knows the story behind the product, the consumer will understand the costs and the energy it takes to cultivate a crop, and therefore be willing to pay more for a conscious and sustainable product. Not only the appealing side of the story should be told, but also the

difficulties. A good example is the recent drought in the Netherlands. Due to a long warm period without rain, a plum grower was not able to sell his plums to the supermarkets because they remained too small due to the drought (35 mm instead of the obligated 38 mm). He almost had to throw away 60.000 kilos of plums, but due to publicity to the story, citizens and even a few supermarkets want to buy the plums, which prevented a lot of food waste (“Consumenten willen ‘onverkoopbare’ pruimen wel”, 2018).

- A recommendation for further research may be to investigate the differences in drivers between the different perspectives in agriculture. This research already showed differences in drivers between common, organic and biodynamic farmers. These differences can be more thorough investigated in a follow-up research, to formulate customised intervention strategies for improvement that are most efficient and appropriate for the specific case.

All of these recommendations are just a start for an agricultural system that takes into account the environmental, social and economic dimension. To control and limit damage to the environment, to restore and maintain ecosystems, keep the food producing capacity of the land, and provide healthy food for the population. To provide economic growth for the Netherlands, creating jobs, and an income and welfare for many people. Overall, to pay attention to all aspects and in this way create an integrated agriculture that is ready for the future and prepared for climate change.

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APPENDIX I – INTERVIEW GUIDE

- FARMERS: Introduction in agricultural company;
 - What is the focus of the company (crop type, size company)?
 - What are current practices that are already taking into account sustainability aspects?
 - Does the company/farmer have future plans regarding sustainability?
 - Which improvement could be done regarding sustainability in this specific company?
- FARMERS: Sustainability drivers;
 - Which internal and external drivers motivate the company to improve sustainability performance? Which are most important, play the largest role as driver for sustainability?
 - Do all the intended sustainability measures (such as legislature) really contribute to sustainability performance?
 - Which drivers would help which are not present yet (such as subsidy or other funds)?
 - To what extent is the farmer personally motivated to enhance the sustainability performance? And why/why not?
 - Which actors (within and outside of the company) are important in the story of sustainable agriculture? What is their role and how do they influence the agricultural company?
 - What is your opinion on the recent campaign of Greenpeace on sustainable agriculture? Did this campaign affect you, and how?
- EXPERTS: Sustainability drivers;
 - Which sustainability drivers motivate farmers to enhance their sustainability performance?
 - Which drivers play the largest role as driver for sustainability according to the expert respondent?
 - What are the differences in drivers between different crop sectors/sizes of agricultural company, according to the expert respondent?
 - Do all the intended sustainability measures (such as legislature) really contribute to an enhanced sustainability performance, according to the expert respondent?
 - Which internal/external drivers should be present but are not present yet (such as subsidy or other funds)?
 - What is your opinion on the recent campaign of Greenpeace on sustainable agriculture?
 - Which actors play a role in the process of sustainable agriculture in the Netherlands, what are their roles and what is your opinion on these roles?