

A landscape photograph of a Dutch farm. In the foreground, a calm river flows from the bottom left towards the center. The middle ground features a large green field, with a section of dark, tilled earth showing curved furrows. In the background, a large blue-roofed barn and other farm buildings are visible, surrounded by a line of trees. The sky is filled with soft, white clouds against a pale blue background.

# The future of farming

Effects of the agricultural transition on the young Dutch farmer

*Kirsten Valkenier*

*S4527488*

*Bachelor Thesis 2023-2024*

*Human Geography & Planning*

*Faculty of Spatial Sciences*

*Rijksuniversiteit Groningen*

*Supervisor: Prof. Dr. T. Haartsen*

*22-01-2024*

## Abstract

The Netherlands aims to move towards a circular agriculture practice; the 'Agricultural Transition'. Generally this differs greatly from the current business models and methods of farming, thus requiring radical changes from the farmers and ensuing great economic and social impact on them.

11% of current farmers is under 40 years of age, while over double this percentage are past retirement age. Combined with only 41% of all farmers having a successor, aging is an upcoming challenge in the agricultural sector. While young farmers are important for the future of farming, little research was conducted on young Dutch farmers specifically.

This research looks at the following research question: *"How does the agricultural transition influence the future prospective on farming of young (prospective) farmers in The Netherlands?"* A survey was conducted amongst young (prospective) farmers, to learn about their views on the agricultural transition and aspects that influence their decision whether or not to continue farming.

Following a quantitative approach, results show that how people feel about the agricultural transition is influenced by variables such as gender, having grown up on a farm, economic worry and seeing a future towards nature inclusive farming. A spatial distribution was also visible among farmer's responses, with more 'very negative' answers in areas with higher agricultural land use. Respondents stated that an important factor during their decision whether or not to continue farming is the love for the profession.

The research shows that aspects of the agricultural transition and the uncertainty of the directions of this transition negatively influence young farmer's future perspectives, however no direct link between aspects of the agricultural transition and generational renewal was found.

Further research would be interesting into specific aspects that motivate young farmers to farm or not, the effect of gender(roles) on how policy implementation is experienced among farmers on a family farm and if there is a difference, as well as possible impact of Natura2000 on farms during the agricultural transition.

# Table of Contents

Abstract .....	2
Introduction.....	3
Research Problem.....	5
Structure .....	5
Theoretical Framework.....	6
Conceptual Model.....	8
Hypothesis.....	8
Methodology .....	9
Results.....	11
Effects of the Agricultural Transition .....	11
Generational Renewal and the Agricultural Transition.....	13
Spatial Analysis and Natura2000 .....	15
Discussion.....	16
Conclusion .....	17
References.....	18
Appendices .....	22
Appendix I: Survey Questions.....	22
Appendix II: Material used for survey distribution .....	30
Appendix III: Ordinal Logistic Regression - Agricultural Transition.....	31
Appendix IV: Ordinal Logistic Regression - Generational Renewal.....	33
Figure 1: Conceptual Model.....	8
Figure 2: Aspects of the agricultural transition.....	11
Figure 3: Natura2000 in The Netherlands - Buffer 25km.....	15
Figure 4: Postcode Respondents Agricultural Transition .....	15
Figure 5: Postcode Respondents Generational Renewal .....	15
Table 1: Survey Respondents .....	9
Table 2: Which type of agricultural business are you interested in? .....	10
Table 3: Crosstabulation Agricultural Transition & Generational Renewal .....	13
Table 4: Survey Questions - Translated to English .....	22
Table 5: Survey Questions - Original in Dutch.....	25

## Introduction

Upside down flags, tractors protesting on the highway, political unrest around the 'agriculture agreement'<sup>1</sup>, many questions about subsidies and the buy-out of one farmer after the other: These are topics of headlines that dominated the Dutch media regarding agriculture for the past few years. The 'farmer protests' arose from uncertainty regarding implementation and (expected) consequences of the circular agriculture vision proposed in 2018 by the Dutch Ministry of Agriculture, Nature and Food Quality (LNV) (Walther, et al., 2023). The circular agriculture vision strives towards more sustainable and nature inclusive farming (De Lauwere & Dagevos, 2021). Following targets of European Directives on for example soil and water quality, nitrogen deposition and biodiversity, as well as United Nations Sustainable Development Goals (SDGs), two main paths towards a new dominant agriculture practice were proposed; The transition towards nature inclusive agriculture and extensification or towards sustainable intensification, through for example technology and (circular) reuse of by-products (Walther, et al., 2023; De Lauwere & Dagevos, 2021).

These rapidly ongoing fundamental changes to the agricultural sector, as well as proposed upcoming changes that are still without clear structure, commonly referred to as the 'agricultural transition', impact the Dutch farmers both financially and socially, as the vision would require radical changes to the current culture, method and structure of farming in the Netherlands (Walther, et al., 2023). Studies among farmers mention feelings of uncertainty, lack of future perspective and mental health issues rising from the changes that need to be made to existing business models (Walther, et al., 2023).

On average, 54% of land use in the Netherlands is allocated to agriculture (CBS, 2020). The provinces of Drenthe and Overijssel score the highest percentage at close to 70%. The exact amount of people working in the agricultural sector is difficult to measure, as it varies heavily per season and different sources in- and exclude different sub-sectors. Considering both people working in agriculture and the approximately 600.000 people working in non-agriculture businesses that are directly dependent on the sector for staying in business (Vogels, 2019), the impact of the agricultural sector on Dutch society is noteworthy.

The Netherlands is home to about 50.000 agricultural businesses (CBS, 2023), with the biggest sub-sector being grazing livestock farms, followed by arable farming. The businesses strongly vary in size, most having between 2 to 50 employees (CBS, 2020). A demographical measurement that stands out in the agricultural sector is (the distribution of) age. Young farmers, under the age of 40, are currently responsible for managing only 11% of farms across the European Union (Europese Commissie, sd), while over double this percentage is already past retirement age. The aging of people employed in the agricultural sector is an upcoming challenge in the EU (European Commission, 2021). The lack of young farmers poses challenges regarding sustainability of farms, farm succession and can negatively impact the innovation naturally occurring by generational renewal (May, et al., 2019).

The agricultural transition does not only impact the current generation of farmers, but also affects young farmers, as well as their decision whether or not to continue farming (Walther, et al., 2023). As the number of agricultural businesses is currently decreasing on a daily basis (Vogels, 2019), for example through buy-out processes related to the circular agriculture vision as well as related to challenges of an aging population and lack of successors, it becomes more and more important for the young generation of farmers to choose to continue farming. The future of agriculture depends on

---

<sup>1</sup> Agriculture Agreement, Dutch; Landbouwakkoord, an attempt at making a set of mutual agreements between representatives of farmers, organisations and government on steps towards the Dutch circular agriculture vision for 2040 (Secretariaat Landbouwakkoord, 2023).

the people working in the sector (Coopmans, et al., 2020), thus it is important to find out what impacts young (prospective) farmer's future prospectives.

## Research Problem

The future of Dutch farming seems uncertain, but considering both the Dutch rural landscape and the position of the Netherlands as second-largest exporter of agricultural goods (Schelfaut, 2020; Pols, et al., 2005), the Netherlands would not be the same without agriculture. While rapid fundamental changes expected during the current agricultural transition impact farming (Walther, et al., 2023), a lack of generational renewal and aging within the sector are currently resulting in an additional decline in farmers (Coopmans, et al., 2020), increasing the importance of motivated successors in order to preserve the future of farming. Thus far, little is known about the effects of the uncertain direction of the agricultural transition on specifically young farmers.

The main research question for this research is:

*“How does the agricultural transition influence the future prospective on farming of young (prospective) farmers in The Netherlands?”*

Sub Questions following from this are:

- *“What are the specific effects of the agricultural transition?”*
- *“What other factors influence young (prospective) farmers during generational renewal?”*
- *“Does the agricultural transition have an effect on young farmers' decision whether or not to continue farming?”*
- *“Is there a relationship between the effect of the agricultural transition on young (prospective) farmers in combination with their farms proximity to Natura2000 areas?”*

## Structure

Having read the introduction and the research problem, the thesis continues with a theoretical framework by means of a literature review and discussion of the key concepts using relevant sources, this is followed by a conceptual model providing a clear overview. Next the hypotheses are presented and the methodology of the research is explained.

The results of the research are structured per topic and include interpretation and analysis. In the discussion the possible effects of the results are debated, as well as limitations of the research. The conclusion combines the results and analysis of the research questions, argues the research objective and recommends future research topics.

# Theoretical Framework

## *Agricultural Transition*

In line with the European Common Agricultural Policy (CAP) Strategic plan (Directorate-General for Agriculture and Rural Development, 2023), the Dutch ministry of Agriculture, Nature and Food Quality (LNV) announced the vision for the Netherlands to become a leader in circular agriculture (De Lauwere & Dagevos, 2021). The vision realization plan focusses on appreciation of the farmer and food, sustainable connection between nature, animals and agriculture, high innovative capacity and a strong international market position (Ministerie van Landbouw, 2019). Although the vision is in line with European Green Deal, the EU Sustainable Development Goals and Dutch circular economy ambition, the desired result is often very different from how most business models currently function in the agricultural sector (De Lauwere & Dagevos, 2021), requiring rapid change to the culture, methods and structure of businesses (Walther, et al., 2023). Commonly referred to as the 'agricultural transition', these changes impact the people employed in agriculture, as they have both financial and social repercussions. The intended scale of change of the agricultural sector, combined with the urgency and pressure in which this is implemented, justifies the use of term 'transition' (Walther, et al., 2023).

One of the changes towards the circular agriculture vision 2030 was the passing of the law in 2021 ordering a 50% reduction of Nitrogen deposition in Natura2000 areas by 2030 (Natuurmonumenten, sd; Aanpakstikstof.nl, sd), aiming at nature restoration and increasing biodiversity following CAP objectives (Directorate-General for Agriculture and Rural Development, sd). Towards this reduction the government appointed 'peak loaders', businesses with high nitrogen emissions in close proximity to Natura2000 areas (within 25 km from N2000 emitting above 2500 mol Nitrogen deposition), many of these businesses being farms (Aanpakstikstof.nl, sd). While the circular agriculture vision applies to all farmers, these 'peak loaders' are the main target of current and proposed structural change policies and transition paths. While participating is currently voluntary it has been announced that future laws requiring changes in locations close to Natura2000 areas are to be expected.

This 'agricultural transition' towards a more sustainable way of farming has quickly become a contested topic. While most farmers are not necessarily against more sustainable innovative agriculture, the transition process is unclear, not only to farmers having to implement changes (Walther, et al., 2023), but even provinces responsible for creating an area plan within the vision complain lack of rules and an agricultural agreement is causing delays (ANP, 2023). The changes that are expected of farmers, combined with the uncertainty regarding the process, are responsible for the financial impact of the agricultural transition. In an already difficult market economy, the uncertainty about the future perspective is making the required high investments towards innovation riskier (Walther, et al., 2023), also resulting in banks becoming hesitant in financing projects (Everaart, 2023). Extensification is shrinking production, thereby often lowering profit (Walther, et al., 2023), as well as causing unemployment in the sector among workers that do not own their own business (CNV, 2021).

As part of reaching the Water Framework Directive goals, the EU Nitrates Directive aims to reduce nitrate pollution of ground- and surface water from agricultural practices to maximum 170kg nitrogen of animal manure per hectare by 2026 (Directorate-General for Environment, sd). Each country has to declare Nitrate Vulnerable Zones (NV-areas), monitor the situation and make an action programme with codes of conduct. Since 2006 the Netherlands has been part of an exception rule, for countries with a long grass growing season and a higher nitrogen uptake, this 'derogation' can enlarge the 'budget' to 230kg (or 210kg when in a NV-area) (Rijksoverheid, 2023). Dairy farmers with a minimum of 80% grassland are eligible for derogation (Wageningen University & Research,

2022), with the exception of land in (or within 250m of) Natura2000 areas and groundwater protection areas (Rijksoverheid, 2023; Piet Groenendijk, 2023). While reducing eutrophication, lower derogation will increase fertilizer usage, negatively impacting circular agriculture and causes a manure surplus, both increasing costs for the farmer (Wageningen University & Research, 2022). If by 2026 the extra 75% manure processing capacity is not available (domestically or through export), there will not be enough land per cow and the amount of cows will have to decrease (Melkveebedrijf, 2016; Hallema, 2022). When derogation ends and the 80% grassland rule disappears, the expectation is that due to costs- and protein-efficiency many dairy farmers will produce more corn than grass, negatively impacting biodiversity and water quality. Subsidies attempt to prevent this (RVO, 2023), however the predicted additional costs from losing derogation are way higher than the subsidy budget (Hallema, 2022).

The agricultural transition does not only have financial impact, but also high social impact on the lives of farmers, even openly discussed as the reason behind multiple farmer suicides (Everaart, 2023). Research into the social impact mentions lack of trust, feelings of uncertainty and no viable future perspective for their business (Walther, et al., 2023). The decreasing of society's appreciation for the agricultural trade is a common complaint, also in relation to successors' motivation to continue the trade.

#### *Generational Renewal*

Succession is crucial to the future of farming and with only 41% of current farms having a successor the need for young farmers to continue the trade is urgent (Bakker, 2021). The most common method of generational renewal in the agricultural sector is farm continuity by family members (Coopmans, et al., 2020). It is also known that farms with high generational or technological investment are more likely to have successors (May, et al., 2019).

Generational renewal takes place in three stages; the formation of the successor identity (the personal decision to farm or not), the take-over process (practical and legal process of farm transfer) and the farm development stage. During this farm development stage the successor implements his own vision on the farm after takeover (Coopmans, et al., 2020), which often brings an increase in natural occurring innovation (May, et al., 2019). Disruption during either of these stages can prevent farm succession (Coopmans, et al., 2020). The challenges and needs of young farmers regarding succession and business development are discussed in the CAP objective on generational renewal (Directorate-General for Agriculture and Rural Development, sd).

Over 20% of farmers have already passed retirement age (Europese Commissie, sd). The relatively large 'babyboomer' generation (born 1946-1955) that is part of this age group, is part of a double greying process; the percentage of old people grows every year but people also reach older ages (Generatie Storm, sd), meaning this generation often also stays in their function for a longer period of time. Studies have shown a hesitant stance towards farm transfer among older people, partly due to non-existent retirement plans and fear of losing social recognition and lifestyle / identity (May, et al., 2019). Another explanation for the low generational renewal in the agricultural sector can be the lack of a suitable successor, as only 41% of farmers claim to have a successor (Bakker, 2021). While the low percentage of young farmers can possibly be explained by the high percentage of people over the age of 55 that are still running the farms, the percentage of farmers under 40 is significantly lower than the percentage of young people in the Dutch population (47% under 40) (CBS, 2023).

#### *Young Farmers*

With only 11% of farmers within the EU being under 40 years of age (Europese Commissie, sd), the age which is used as a limit for most young farmer support policies, only a small percentage of

current farmers is considered a young farmer. Studies show the lack of young farmers can be traced back to several factors, personal and/or company characteristics, for example the difficulty of entering the agricultural market for economic reasons, the social context and higher paid employment opportunities outside of the agricultural sector after education (May, et al., 2019).

There are several policies in place to support succession by young farmers in the EU (European Commission, 2021), as well as funds specifically targeting Dutch farm succession (Rijksoverheid, 2023). Studies on the effect of support policies on generational renewal have shown effects ranging from positive to negative to missing the intended aim of the initial policy (Coopmans, et al., 2020). CAP Generational Renewal Measures seem to mostly benefit young farmers attempting to take over the business from the older generation through family succession (European Commission, 2021), by increasing financial stability during the development stage of generational renewal. The measures have proven less suitable for farm succession outside of family ties.

Research on young farmers often targets either case studies outside of the European union, in lower developed countries or looks at the specific effect of the young farmer support policies in place in multiple EU countries (Coopmans, et al., 2020; May, et al., 2019). A research gap is noticeable when looking at the effect of non-specific agricultural policies combined with young farmers, as well as young farmers and farm succession in a Dutch context.

### Conceptual Model

The conceptual model showcases causal relationships between core concepts of this research as discussed in the theoretical framework in one clear overview (Figure 1), providing a basis for the hypotheses. The model also outlines the general scope of the research.

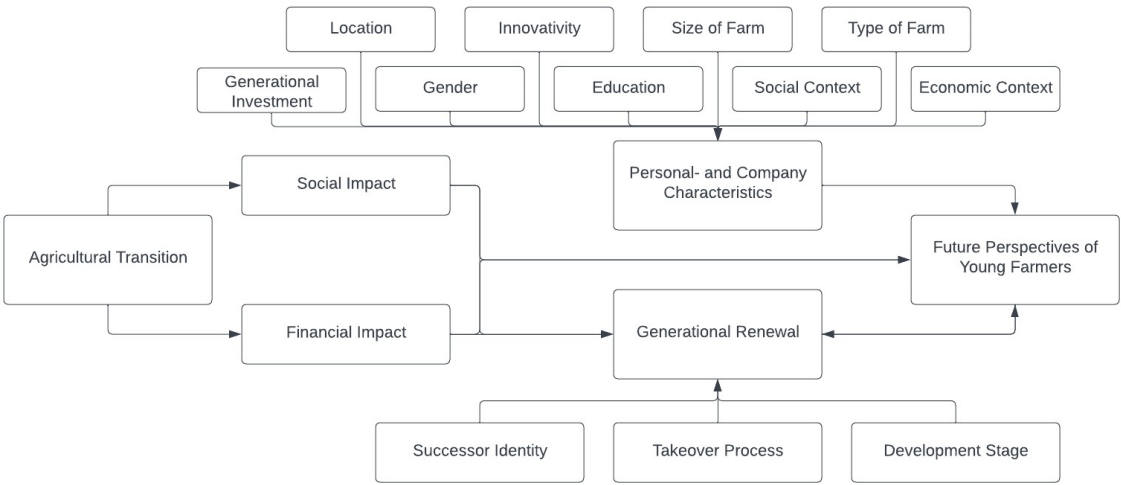


Figure 1: Conceptual Model

Source: Made by Author

### Hypothesis

Both social, financial and policy factors are expected to impact young (prospective) farmers, their view on the agricultural transition, as well as their decision whether or not to continue farming. For statistical analysis through ordinal logistic regression the hypotheses are:

- H0 = There are no statistically significant factors among the variables that influence how people feel about the agricultural transition.
- H0 = There are no statistically significant factors among the variables that influence people’s decision to become / stay a farmer.



## Methodology

The research uses a quantitative approach. This methodology has been chosen in order to capture the responses of as many young (prospective) farmers as possible, as opposed to only targeting a few representatives. This choice was made due to the diverseness of the young farmer population and expected diverseness of the influence of the agricultural transition, for example throughout different sectors, ages and stages of farm succession. The aim is to capture a broad perspective of the effects of the agricultural transition on young farmers in the Netherlands.

Data is collected through means of a survey (Appendix I). The survey consists of multiple choice questions, for example using the Likert scale of agreement, binary questions and multiple answer questions. An open question is available for respondents wanting to offer additional information, in depth understanding or provide background information to be used as context during data analysis. Questions regard demographic factors, economic-, social- and policy impact, as well as different perspectives towards change and innovation. To prevent participation barriers, the survey was distributed in Dutch (Appendix II).

For this research the age of 'under-40' as a standard for 'young farmers', was chosen with regard to the EU standard for young farmer support policies (Europese Commissie, sd). This means the target group of the survey is people under the age of 40 with a clear interest, background or employment in the agricultural sector. The survey contains a question about age in order to properly filter data before analysis.

Distribution of the survey relied on snowball sampling through social media, spreading the surveys to several organisations with ties to the topic and target population and approaching attendees at several agricultural events. While helping to reach a wide group of people, this sampling method can unfortunately create some bias in the respondents (more respondents from one branch of the agricultural sector than another).

Data analysis is conducted through statistical analysis using SPSS. The significance level of testing is set at  $\alpha = 0.05$ . Due to the types of variables gathered, the test used is Ordinal Logistic Regression. Spatial analysis uses geographical analysis software; GIS, to analyse the effect of a farms proximity to Natura2000 areas on the responses of the sample group.

The survey received 226 valid responses (see Table 1). Regarding data quality and representativity, the sample contains a relatively high amount of females, 42,9% in the sample compared to 3% of overall farmer population (Europese Commissie, sd).

*Table 1: Survey Respondents*

*Source: Made by Author*

<b>Survey Respondents</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Valid n	226	100
Male	129	57,1
Female	97	42,9
Grew up on a farm	158	69,9
Did not grow up on a farm	68	30,1
Farmer	81	35,8
Wants to become a farmer	123	54,4
Does not want to become a farmer	22	9,7

The type of farm that the respondents are interested in (see Table 2), is also slightly different in proportions regarding the largest sectors, with especially many dairy farmers among the respondents. However the largest sectors (livestock farming, dairy farming and arable farming) do correspond (CBS, 2023).

Table 2: Which type of agricultural business are you interested in?

Source: Made by Author

Response	Frequency	Percentage of respondents %
Arable farming (open cultivation, closed cultivation)	31	13,7
Dairy farming	180	79,6
Livestock farming (beef cattle, pigs, sheep, poultry, horses, other farm animals)	65	28,8
Agricultural companies without production (petting zoo, care farm)	10	4,4
(Glass) Horticulture	4	1,8
Agricultural Contracting companies	16	7,1
Fish farming	0	0
Other	7	3,1

Ethical considerations are carefully taken into account during data collection and data analysis. This research follows the scientific core values of the Code of conduct for Research integrity (NWO, 2018); Honesty, Scrupulousness, Transparency, Independence and Responsibility. The survey was anonymous, keeping the privacy of the respondent safeguarded. Informed consent about the research was given to the participant before filling out the survey, participating is voluntary and the participant can decide to withdraw from the study at any time during the survey. Collected data will be stored following General Data Protection Regulations. Stored raw data will be used only for research purposes, following GDPR article 5 (European Parliament, 2016).

Before presenting results, it is important to mention positionality. I am a 23 year old Dutch woman and although I grew up in a rural community surrounded by animals, agriculture and nature, my farming experience is limited to working on a care farm (social work, agricultural without production). Therefore my prior knowledge on the topic of the agricultural transition was limited. It is possible that I have a more rural/agrarian view of the countryside compared to people from an urban background. During the research my positionality might have helped me reach the agricultural community easier, by making the survey feel more approachable and increasing the amount of people willing to respond, however I do not believe it influenced the results in any way.

## Results

### Effects of the Agricultural Transition

The agricultural transition consists of many aspects and changes and impacts all sectors of farming (De Lauwere & Dagevos, 2021; Walther, et al., 2023), but some rules hit harder than others. Survey respondents were asked to pick the aspects of the agricultural transition that they considered most complicated (multiple answer question). The aspects offered were chosen based on the theoretical framework and additionally the option was given to write your own answer to this question. Results show that nitrogen deposition rules is by far the most common response (see figure 2).

Own answers provided by the respondents mentioned Natura2000, Derogation, implementation and content of policies, uncertainty and the economic impact.

Nitrogen deposition programmes are a big part of reaching the agricultural transition's goals, for example the 50% reduction in Natura2000 areas and the EU Water Framework Directive goals. This comes with increasing costs for the farmers and limitations to farm growth and production or forcing farmers to decrease the amount of livestock (Melkveebedrijf, 2016; Hallema, 2022). As dairy farmers are specifically hit by the nitrogen deposition rules (Wageningen University & Research, 2022), it is possible that the high amount of dairy farmers in the sample (Table 2) affects the results of these chosen aspects (Figure 2).

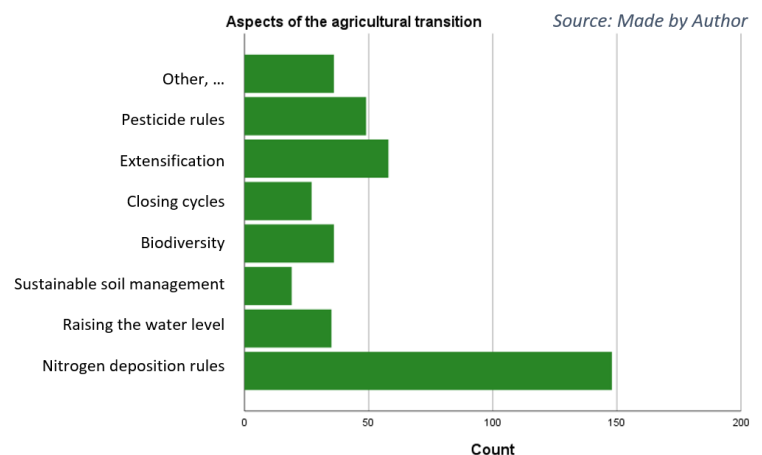


Figure 2: Aspects of the agricultural transition

Uncertainty plays a big role during the agricultural transition (Walther, et al., 2023; ANP, 2023). The survey data corresponds with previous studies, with 77,2% of respondents agreeing with the statement: *“During the agricultural transition I have the most concerns because of the uncertainty”*. Of the respondents, 75% state that they are worried about the future of their business due to the agricultural transition and 56% say they experience mental complaints such as stress, negative thoughts/feelings or a feeling of stalemate when thinking about the agricultural transition and the future of their business. The social impact of the transition is also visible in the additional information provided by the respondents:

*“I am a future successor, but it is very uncertain if this will still be possible. I have to say it causes a lot of stress, and I have noticed other young farmers around me are also experiencing this.”<sup>2</sup>*

*“.. Also the influence of lending institutions is too big, where livelihood security is no longer a given. This causes a lot of stress”<sup>3</sup>*

<sup>2</sup> Original: *“Ben toekomstig opvolger, maar het is erg onzeker of dit gaat lukken. Moet zeggen dat dit allemaal een hoop stress oplevert, merk dat jonge boeren in de omgeving hier ook veel last van hebben.”*

<sup>3</sup> Original: *“... Ook de invloed van leningsverstrekking is te groot waarbij bestaanszekerheid niet zo zeker meer is. Dit veroorzaakt veel stress”*

All choices the farmer makes (or has to make) during the agricultural transition have economic impact (Melkveebedrijf, 2016; Walther, et al., 2023; De Lauwere & Dagevos, 2021). Whether the farmer decides to make technological investments or choose a nature-inclusive route, both come with costs. It is interesting to note that 85% of respondents state that the current policies make them feel misunderstood as a farmer and 72% agrees they feel limited in running their business, however with 82,6% of respondents agreeing, willingness to change or innovate their business remains high. This is also visible in written responses:

*“.. It could be so easy, but is made complicated by the government. Changes fine, but realistic..”<sup>4</sup>*

*“Young farmers are willing and able to adapt, but you are stuck in the current banking system because of Basel standards, return figures become more important. If you extensify, you will have fewer cows per hectare, so less turnover, so you will not achieve any returns”<sup>5</sup>*

Statistical analysis using ordinal logistic regression shows significant differences in response based on gender ( $p = 0,004$ ) and whether or not a respondent grew up on a farm ( $p = 0,017$ ) in relation to the question: *“How do you feel about the agricultural transition?”* ( $p = <0,001$ ), See Appendix III). Given all other variables are constant, women are 72,5% more likely to respond negative than men and respondents who did not grow up on a farm are likely to respond 3 times more positive than those who did. Additionally, people who do not wish to be(come) a farmer (anymore)( $p = 0,033$ ), are 87,5% more likely to respond negative than respondents that are a farmer, people who are not worried they cannot make ends meet due to the changes expected of them (disagree,  $p = <0,001$  and neutral  $p = 0,016$ ) are respectively 7,5 and 3 times more likely to feel positively towards the agricultural transition when compared to respondents that do feel economic worry and people who do not see their future towards extensification ( $p = 0,002$ ) are 75,5% more likely to think negatively about the agricultural transition compared to those who do.

When answering the question: *“What are specific effects of the agricultural transition?”*, it is important to keep in mind that each farmer’s situation is different. However the policies related to the agricultural transition have both economic- and social impact on most farmers. Effects range from increasing costs, losing a sense of autonomy over your business and dealing with uncertainty while choosing which path to follow, to worrying about the future perspective and profitability in general.

---

<sup>4</sup> Original: *“.. Het kan zo makkelijk maar wordt moeilijk gemaakt door de overheid. Veranderingen prima wel realistisch..”*

<sup>5</sup> Original: *“Jonge boeren zijn welwillend en hebben aanpassingsvermogen maar je zit vast in het huidige bancaire systeem vanwege Basel normen gaan rendementcijfers zwaarder tellen. Ga je extensiveren dan heb je minder koeien per hectare dus minder omzet daarmee ga je dus ook geen rendement halen.”*

## Generational Renewal and the Agricultural Transition

Generational renewal happens in three stages (Coopmans, et al., 2020), with the current low generational renewal on farms (Bakker, 2021), it is interesting to look at what other factors influence the young (prospective) farmer during the formation of the successor identity and the takeover process. A multiple response survey question asked the respondents to check all factors that influenced their decision to become a farmer.

The most given answer (61% of respondents) was *“I've always thought it is a fantastic profession!”*. This was followed by *Education* and *Type of farm*, both with 50%. Literature states that higher education is often referred to as having a negative impact on succession (May, et al., 2019), as it provides possibilities to higher paid opportunities, but since it was not asked of the respondents to state negative or positive influence no statements can be made.

*Size of the farm (44%), Location (44%) and Generational Investment (My father / grandfather / great-grandfather etc. also did this) (39%)* were also popular choices. Older farms with higher level of investment, greater human capital and farming skills that are transferred through generations have a competitive advantage in the market and a positive relationship with generational renewal has been stated (May, et al., 2019; European Commission, 2021). Farming is often part of family tradition, farms that are in the family for generations are more likely to find successors within their youngest generation.

Own additions of respondents included brothers taking over the family farm and a love for nature and being outdoors. This corresponds with literature stating that in the agricultural sector traditional gender norms during succession are often still upheld (May, et al., 2019).

In agreement with previous studies (May, et al., 2019; European Commission, 2021; Coopmans, et al., 2020), farm succession outside of family ties is also mentioned by respondents as a more difficult path.

*“As a lateral entrant you are often not taken seriously or forgotten and I think that needs to change.”<sup>6</sup>*

*“... I am most likely switching to Veterinary Medicine. This is because the government makes it impossible to become a farmer without a business in the family.”<sup>7</sup>*

From crosstabulation (Table 3) of the questions *“How do you feel about the agricultural transition?”* and *“Has the agricultural transition influenced your decision to become / stay a farmer?”*, it is visible that the negative-negative response is the biggest category (23,2%). Followed by respectively negative-neutral. This trend also shows in overall answers, many respondents state

Table 3: Crosstabulation Agricultural Transition & Generational Renewal

		How do you feel about the agricultural transition?			Total	
		Negative	Neutral	Positive		
Has the agricultural transition influenced your decision to become / stay a farmer?	Negative	Count	43	19	12	74
		% of Total	23,2%	10,3%	6,5%	40,0%
	Neutral	Count	40	34	19	93
		% of Total	21,6%	18,4%	10,3%	50,3%
	Positive	Count	8	3	7	18
		% of Total	4,3%	1,6%	3,8%	9,7%
Total		Count	91	56	38	185
		% of Total	49,2%	30,3%	20,5%	100,0%

Source: Made by Author

<sup>6</sup> Original: *“Als zij-instromer wordt je vaak niet serieus genomen of vergeten en dat moet anders vindt ik.”*

<sup>7</sup> Original: *“..hoogstwaarschijnlijk doorstromen naar Diergeneeskunde. Dit omdat de overheid het onmogelijk maakt om zonder bedrijf in de familie nog boer te kunnen worden.”*

feeling negative about the agricultural transition (almost 50%), but for influence on their decision to become/ stay a farmer, the biggest category is 'neutral' (50%). While 20% of respondents do feel positive about the agricultural transition, only 9% state a positive influence on their decision to farm or not.

When looking at the question: *"Has the agricultural transition influenced your choice to become / stay a farmer?"*, ordinal logistic regression shows that women are 50% more likely to respond negative compared to men ( $p=0,028$ )( $p=0,026$ ), See Appendix IV). And people who did not grow up on a farm are 2 times more likely to respond positive than those who did ( $p=0,023$ ). Unfortunately when adding additional variables to the regression, results come back insignificant, meaning the model can no longer detect differences in responses between groups.

Although 40% of respondents stated negative influence of the agricultural transition on their choice to become or stay a farmer, 50,3% replying 'neutral' and 9,7% reporting a positive influence, statistical testing cannot conclude significant effects between the agricultural transition and the effect on young farmers' decision whether or not to continue farming with the variables used in this research. This does however also not mean there is no effect. Therefore answering: *"Does the agricultural transition have an effect on young farmers' decision whether or not to continue farming?"*, with a simple yes or no is not possible.

The additional information given by respondents does provide some insights into difficulties experienced by young farmers, some but not all related specifically to the agricultural transition. The high percentage of respondents stating to 'love the profession', can also be one of the reasons for the results: for example although people respond feeling negative about the agricultural transition, they still want to be(come) a farmer.

## Spatial Analysis and Natura2000

Originally the aim was to use the 25km buffer zone around Natura2000 areas, as appointed by government as a spatial qualification for ‘peak loader’ status (Aanpakstikstof.nl, sd), to compare the responses based on a location within or outside of this boundary. To answer the question: *“Is there a relationship between the effect of the agricultural transition on young (prospective) farmers in combination with their farms proximity to Natura2000 areas?”*

It turned out that this 25km buffer zone contains the whole of the Netherlands (Figure 3). While this meant a change in approach for this question, it is interesting to note the way of communication in policies. Technically peak loader status is thus only determined by Nitrogen Deposition of above 2500 mol, rather than a spatial aspect.

Starting 2024, derogation is stated to use a 250m buffer zone around Natura2000 as a disqualification feature (Rijksoverheid, 2023). But as the new rules were published after the data collection period (thus not influencing data), as well as 250m not being a big enough margin when comparing against farms within a postal code, this does not provide a valid alternative to the 25km buffer zone for analysis of the effect of Natura2000 proximity.

71 farmers provided valid postal codes, to compare their responses from a spatial perspective (Figure 4 and 5).

Natura2000 areas in the Netherlands with a 25km buffer zone

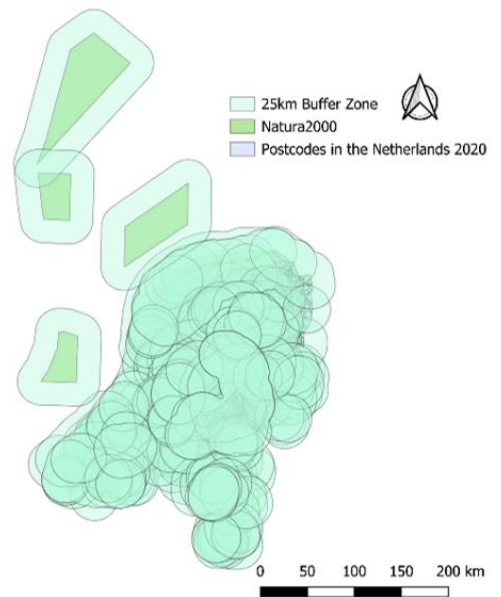


Figure 3: Natura2000 in The Netherlands - Buffer 25km  
Source: Made by Author

How do you feel about the Agricultural Transition?

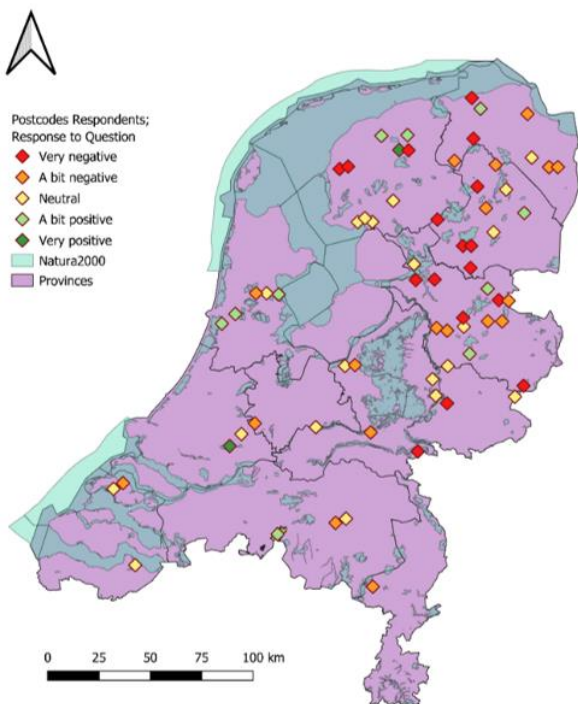


Figure 4: Postcode Respondents Agricultural Transition  
Source: Made by Author

Has the Agricultural Transition influenced your choice to become / stay a farmer?

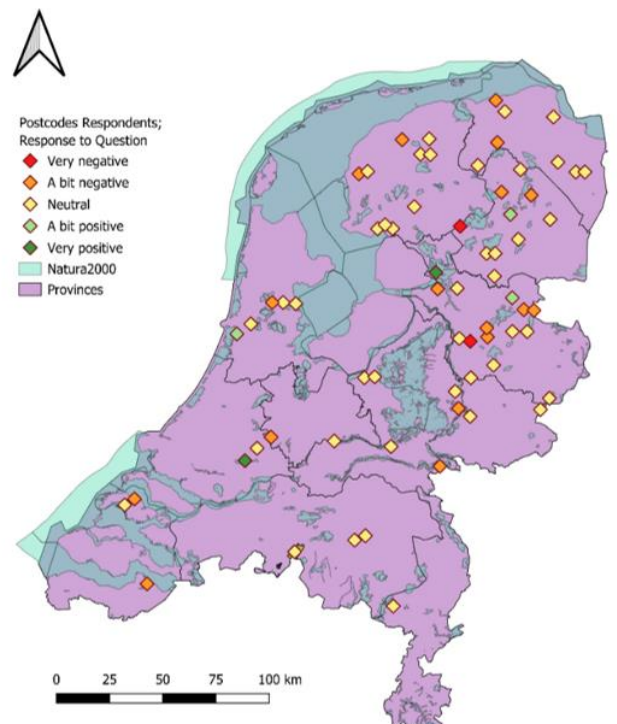


Figure 5: Postcode Respondents Generational Renewal  
Source: Made by Author

While not showing a visible relationship between answers given and proximity to Natura2000, the map (figure 4) shows an uneven spatial distribution among respondents that answered 'very negative' to the question: *'How do you feel about the agricultural transition?'*. Most 'very negative' responses are from the northern provinces and Overijssel. This corresponds with provinces where the percentage of agricultural land use per province is highest (CBS, 2020). Only Friesland does not have as high agricultural land use, but does have the highest percentage of nature (50%).

Comparing both maps (figure 4 and 5), it is visible that fewer farmers respond 'very negative' to the question: *'Has the agricultural transition influenced your choice to become / stay a farmer?'*. 63,9% of farmers answer 'neutral' influence, cumulatively 30% respond either 'a bit negative' or 'very negative' and only 7,2% report a either 'positive' or 'very positive' influence. No specific spatial distribution is visible for this data (figure 5).

Asked about the agricultural transition itself, cumulatively 49,3% respond feeling 'a bit negative' or 'very negative' and 31% of respondents answered 'neutral'. However, this question also includes a higher category of cumulatively 'a bit positive' or 'very positive' respondents (19,7%).

## Discussion

The research has shown several significant factors among variables that influence how people feel about the agricultural transition, such as gender, growing up on a farm, economic worry and a future in nature inclusive farming. During spatial analysis a higher amount of 'very negative' responses in the provinces that have high agricultural land use was visible among farmers responses. The significant results of the research are in line with most previous studies on the agricultural transition and answers given by the respondents relate closely to theory.

I still believe it is very interesting and important to get the information straight from those impacted by the agricultural transition; the (prospective) farmers. The willingness to participate in the survey was great. With a valid n of 226, I am pleased with the data collection process, the amount of (prospective) farmers willing to provide their opinion and the large amount of voluntary additional information provided, that proved very useful during analysis.

Unfortunately statistical analysis using Ordinal logistic regression with the question on generational renewal as the dependent yielded almost solely insignificant results. Due to the type and amount of variables no other test is suitable for this type of data, thus limiting the ability to draw conclusions. It is possible that the insignificant results are caused by homogeneity in the dataset; on many questions a high percentage of respondents provided the same answers, limiting the model in detecting differences between given responses.

In the survey, the question 'Gender' originally included the answer option 'Other / Do not want to say', 3 people chose this option. During analysis it was decided to remove these from the sample, as it heavily influenced all statistical output and only formed a very small part of the sample.

Additionally, two postcodes given by respondents were not spatial, but post-boxes. For the spatial analysis the decision was made to leave these two responses out, rather than picking the nearest spatial postcode.



## Conclusion

The research aimed to find out how the agricultural transition influenced the future prospective on farming of young (prospective) farmers. Using a quantitative approach and targeting directly at young (prospective) farmers, in order to get the information as close to the source as possible.

The research shows nitrogen deposition rules and derogation influence the farmers' future prospective. The economic implications and uncertainty around (future) policies are stated as important aspects. Additionally, over half of respondents experience mental complaints such as stress. How people feel about the agricultural transition is significantly influenced by gender, having grown up on a farm or not, the desire to farm, economic worry and whether or not a (prospective) farmer sees a future towards nature-inclusive farming for their business. The results of the study corresponded to literature.

Responses to the question: *"Has the agricultural transition influenced your decision to become / stay a farmer?"*, were visibly less negative than how people felt about the agricultural transition. Statistical analysis on generational renewal showed significant influence by gender and having grown up on a farm. Other important factors considered by respondents during potential generational renewal were the love of the profession, education and the type of farm.

Determining a relationship between the effect of the agricultural transition on young (prospective) farmers and proximity of Natura2000 proved difficult, after finding out that the buffer zone used in the 'peak loader' qualifications contains the whole of the Netherlands. Previous studies, responses in the survey and the new qualifications for proximity to Natura2000 and Derogation, do show that Natura2000 is a big factor in the agricultural transition. Spatial analysis also showed that farmers in the provinces with the highest agricultural land usage tend to feel more negative towards the agricultural transition.

*"How does the agricultural transition influence the future prospective on farming of young (prospective) farmers in The Netherlands?"*

This research showed aspects of the agricultural transition that make the future prospective of young farmers increasingly difficult. While no direct effect on generational renewal was found, it showed the agricultural transition and the uncertainty surrounding it has effects on the young farmers and their business and thereby the future of farming.

Further research would be interesting into specific aspects that motivate young farmers to farm or not, the effect of gender(roles) on how policy implementation is experienced among farmers on a family farm and if there is a difference, as well as possible impact of Natura2000 on farms during the agricultural transition.

## References

- Aanpakstikstof.nl, sd *Aanpak Piekbelasting*. [Online]  
Available at: <https://www.aanpakstikstof.nl/aanpak-piekbelasting>  
[Opened 06 10 2023].
- Aanpakstikstof.nl, sd *De stikstofaanpak*. [Online]  
Available at: <https://www.aanpakstikstof.nl/de-stikstofaanpak>  
[Opened 06 10 2023].
- ANP, 2023. *Gebiedsplannen: meeste provincies denken de deadline te halen*. [Online]  
Available at: <https://www.binnenlandsbestuur.nl/ruimte-en-milieu/meeste-provincies-denken-deadline-gebiedsplannen-te-halen>  
[Opened 22 09 2023].
- Bakker, K., 2021. *'Gebrek aan jonge boeren is een groot probleem'*. [Online]  
Available at: <https://www.boerenbusiness.nl/agribusiness/artikel/10890648/gebrek-aan-jonge-boeren-is-een-groot-probleem>  
[Opened 06 10 2023].
- CBS, 2020. *Feiten en cijfers over de landbouw*. [Online]  
Available at: <https://www.cbs.nl/nl-nl/achtergrond/2020/19/feiten-en-cijfers-over-de-landbouw#:~:text=In%202018%20waren%20er%20196%20duizend%20personen%20werkzaam%20in%20de%20landbouw.>  
[Opened 4 10 2023].
- CBS, 2020. *Nederland in Cijfers; Hoe wordt de Nederlandse bodem gebruikt?*. [Online]  
Available at: <https://longreads.cbs.nl/nederland-in-cijfers-2020/hoe-wordt-de-nederlandse-bodem-gebruikt/#:~:text=Van%20de%20totale%20oppervlakte%20van,voornamelijk%20uit%20woon%2D%20en%20bedrijventerreinen.>
- CBS, 2023. *Landbouw; gewassen, dieren en grondgebruik naar hoofdbedrijfstype, regio*. [Online]  
Available at: <https://www.cbs.nl/nl-nl/cijfers/detail/80783ned?dl=5F5C2>
- CBS, 2023. *Leeftijdsverdeling*. [Online]  
Available at: <https://www.cbs.nl/nl-nl/visualisaties/dashboard-bevolking/leeftijd/bevolking>  
[Opened 06 10 2023].
- CNV, 2021. *Gevolgen krimp veestapel voor werknemers in agrarische sector*. [Online]  
Available at: <https://www.cnv.nl/nieuws/cnv-analyse-inkrimping-veestapel-kost-tot-30000-banen/>  
[Opened 22 09 2023].
- Coopmans, I. et al., 2020. Policy directions to support generational renewal in European farming systems. *Eurochoices*, 8, pp. 30-36.
- De Lauwere, C. & Dagevos, H., 2021. Circular Business Models and Circular Agriculture: Perceptions and Practices of Dutch Farmers. *Sustainability*.
- Directorate-General for Agriculture and Rural Development, 2023. *CAP 2023-27 on track? Check it online!*. [Online]  
Available at: [https://agriculture.ec.europa.eu/news/cap-2023-27-track-check-it-online-2023-04-05\\_en](https://agriculture.ec.europa.eu/news/cap-2023-27-track-check-it-online-2023-04-05_en)  
[Opened 17 9 2023].

Directorate-General for Agriculture and Rural Development, sd *Key policy objectives of the CAP 2023-27*. [Online]

Available at: [https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-2023-27/key-policy-objectives-cap-2023-27\\_en](https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-2023-27/key-policy-objectives-cap-2023-27_en)

[Opened 06 10 2023].

Directorate-General for Environment, sd *Nitrates*. [Online]

Available at: [https://environment.ec.europa.eu/topics/water/nitrates\\_en](https://environment.ec.europa.eu/topics/water/nitrates_en)

[Opened 07 12 2023].

European Commission, 2021. *Summary of evaluation of the impact of the CAP on generational renewal, local development and jobs in rural areas*, Brussel: sn

European Parliament, 2016. REGULATION (EU) 2016/679 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL. *Official Journal of the European Union*, 16 04.

Europese Commissie, sd *Jonge Boeren*. [Online]

Available at: [https://agriculture.ec.europa.eu/common-agricultural-policy/income-support/young-farmers\\_nl#definitie-van-jonge-boeren](https://agriculture.ec.europa.eu/common-agricultural-policy/income-support/young-farmers_nl#definitie-van-jonge-boeren)

Everaart, C., 2023. *Zelfdodingen onder boeren zetten politici op scherp: "Beseffen niet altijd wat de impact van ons beleid is"*. [Online]

Available at: <https://www.rtvoost.nl/nieuws/2262551/zelfdodingen-onder-boeren-zetten-politici-op-scherp-beseffen-niet-altijd-wat-de-impact-van-ons-beleid-is>

[Opened 17 9 2023].

Generatie Storm, sd *Babyboomers*. [Online]

Available at: <https://www.generatiestorm.nl/tag/babyboomers/>

[Opened 06 10 2023].

Hallema, T., 2022. *Derogatieverlies is zware klap voor sector*. [Online]

Available at: <https://www.nieuweoogst.nl/nieuws/2022/09/10/derogatieverlies-is-zware-klap-voor-sector>

[Opened 07 12 2023].

May, D., Arancibia, S., Behrendt, K. & Adams, J., 2019. Preventing young farmers from leaving the farm: Investigating the effectiveness of the young farmer payment using a behavioural approach. *Land Use Policy*, pp. 317-327.

Melkveebedrijf, 2016. *Wegvallen derogatie heeft flinke financiële gevolgen*. [Online]

Available at: <https://www.melkveebedrijf.nl/wet-en-regelgeving/derogatie/wegvallen-derogatie-heeft-flinke-financiele-gevolgen/>

[Opened 07 12 2023].

Ministerie van Landbouw, N. e. V., 2019. *Realisatieplan Visie LNV: Op weg met nieuw perspectief*. [Online]

Available at: <https://www.rijksoverheid.nl/ministeries/ministerie-van-landbouw-natuur-en-voedselkwaliteit/documenten/publicaties/2019/06/17/realisatieplan-visie-lnv-op-weg-met-nieuw-perspectief>

[Opened 22 09 2023].

Natuurmonumenten, sd *Impact Landbouwtransitie*. [Online]  
Available at: <https://www.natuurmonumenten.nl/jaarverslag-2022/landbouwtransitie>  
[Opened 06 10 2023].

NWO, 2018. *Netherlands Code of Conduct for Research Integrity*. [Online]  
Available at: <https://www.nwo.nl/en/netherlands-code-conduct-research-integrity>  
[Opened 27 09 2023].

Piet Groenendijk, H. K., 2023. *Expertbeoordeling "Breedte van een zone rondom Natura 2000-gebieden waar vanaf 2024*. [Online]  
Available at:  
[https://www.tweedekamer.nl/kamerstukken/brieven\\_regering/detail?id=2023Z19666&did=2023D47901](https://www.tweedekamer.nl/kamerstukken/brieven_regering/detail?id=2023Z19666&did=2023D47901)  
[Opened 07 12 2023].

Pols, L., Daalhuizen, F., Segeren, A. & Van der Veeke, C., 2005. *Waar de landbouw verdwijnt, het Nederlandse cultuurland in beweging*, Rotterdam: NAI Uitgevers.

Rijksoverheid, 2023. *Aanwijzing nutriënten verontreinigde gebieden: samen werken aan schoner water*. [Online]  
Available at: <https://www.rijksoverheid.nl/actueel/nieuws/2023/12/05/aanwijzing-nutriënten-verontreinigde-gebieden-samen-werken-aan-schoner-water>  
[Opened 07 12 2023].

Rijksoverheid, 2023. *Troonrede 2023*. [Online]  
Available at: <https://www.rijksoverheid.nl/documenten/toespraken/2023/09/19/troonrede-2023>  
[Opened 22 09 2023].

RVO, 2023. *Subsidie Behoud grasland bij afbouw derogatie*. [Online]  
Available at: <https://www.rvo.nl/subsidies-financiering/behoud-grasland>  
[Opened 07 12 2023].

Schelfaut, S., 2020. *Nederland is de op een na grootste landbouwexporteur ter wereld*. [Online]  
Available at: <https://www.ad.nl/koken-en-eten/nederland-is-de-op-een-na-grootste-landbouwexporteur-ter-wereld~a555352f/>  
[Opened 05 10 2023].

Secretariaat Landbouwakkoord, 2023. *Vragen en Antwoorden*. [Online]  
Available at: <https://www.landbouwakkoord.nl/vragen-en-antwoorden>  
[Opened 05 10 2023].

Van Gameren, F., 2023. *200 boeren willen zich laten uitkopen, stikstofuitstoot gaat hierdoor flink omlaag*. [Online]  
Available at: <https://wnl.tv/2023/07/14/200-boeren-willen-zich-laten-uitkopen-stikstofuitstoot-gaat-hierdoor-flink-omlaag/#:~:text=De%20stopregeling%20is%20sinds%203,1%2C5%20miljard%20euro%20beschikbaar>  
[Opened 05 10 2023].

Vogels, P., 2019. *Zo belangrijk zijn boeren: 'Elke boer houdt tien mensen aan het werk in Nederland'*. [Online]  
Available at: <https://www.ad.nl/binnenland/zo-belangrijk-zijn-boeren-elke-boer-houdt-tien-mensen->

[aan-het-werk-in-nederland~a3ac5bc1/](#)

[Opened 17 9 2023].

Wageningen University & Research, 2022. *Wat betekent 'einde derogatie' voor de Nederlandse landbouw en natuur?*. [Online]

Available at: <https://www.wur.nl/nl/show/wat-betekent-einde-derogatie-voor-de-nederlandse-landbouw-en->

[natuur.htm#:~:text=Derogatie%20is%20een%20verruiming%20van,grond%2D%20en%20oppervlakte water%20te%20verminderen.](#)

[Opened 07 12 2023].

Walther, C., Stomph, D. & Van Dam, R., 2023. *Social impact van de landbouwtransitie*, Wageningen: Wettelijke Onderzoekstaken Natuur & Milieu.

## Appendices

### Appendix I: Survey Questions

Below is a list of all survey questions and possible answer options, for readability the questions have been translated to English. The original version as published in Dutch can be found below.

Table 1: Survey Questions - Translated to English

Survey Question	Response
<p>Dear farmers and other stakeholders,</p> <p>My name is <b>Kirsten Valkenier</b>, I am 23 years old and I was raised on a farm in Veenoord (Drenthe). I grew up surrounded by agriculture and animals and have always had a big interest in the countryside. I am studying Human Geography and Planning at <b>Rijksuniversiteit Groningen</b>. And at the moment I am working on my <b>Bachelor Thesis</b>, the final part of my study. The following survey is part of said bachelor thesis and consists of only <b>15 questions</b>; these are multiple choice questions and statements</p> <p>My research is about the effects of the <b>Dutch agricultural transition</b> on the future perspective of the <b>young (prospective) farmers</b>. The agricultural transition has been a hot topic among farmers. The fundamental changes that are and will be asked, will have an effect on the agricultural way of life. Young farmers are part of the future of agriculture, hence my interest in specifically your views on the agricultural transition and the future of your <b>(future) farms</b>.</p> <p>Participation in my research is completely <b>voluntary</b> and you can choose to withdraw from the survey at any given moment (not hand in your results).</p> <p>Personal data will be safely and securely stored and will only be used for my <b>research</b>. Analysed data from the survey will be completely <b>anonymized</b>. Outside of me and my supervisor, the raw data will not be shown to or shared with third parties. The data will be stored according to EU <b>GDPR guidelines</b>, data for research purposes: <a href="https://gdpr-info.eu/">https://gdpr-info.eu/</a>.</p> <p>A few questions in this survey discuss the effects of the agricultural transition on your <b>mental health</b>. As a researcher and as a person I can understand that this can be a difficult topic to discuss. This will of course be handled with care. I would like to explicitly stress that responses to these questions are also anonymous and that answering is completely voluntary.</p> <p><i>Are you experiencing any (mental health) issues after filling out this survey? Organisations such as <a href="http://deluisterlijn.nl">deluisterlijn.nl</a>, <a href="http://taboer.nl">taboer.nl</a>, <a href="http://113.nl">113.nl</a> (or call 0800-113) are offering support 24/7.</i></p> <p>I would like to ask your <b>permission</b> for <b>analysing, processing and storing</b> the answers provided by you during this survey. <b>Thank you</b> for your participation and helping me with my research!</p> <p>Do you have any <b>questions</b> regarding the survey? Or do you want to be updated on the <b>results</b>? Send me an email: <a href="mailto:k.i.valkenier@student.rug.nl">k.i.valkenier@student.rug.nl</a></p> <p>I hereby do / do not consent to participation in the research:</p>	<p>-Yes, I agree.</p> <p>-No, I don't agree and am ending my participation.</p>
Are you currently under 40 years old? (Born after 1983)	<p>-Yes</p> <p>-No</p>

I am a..	-Man -Woman -Other / Don't want to say
Did you grow up on a farm?	-Yes -No
At the moment...	-I am a farmer -I want to become a farmer -I don't want to become a farmer
Which type of agricultural business are you interested in? <i>Multiple responses allowed.</i>	-Arable farming (open cultivation, closed cultivation) -Dairy farming -Livestock farming (beef cattle, pigs, sheep, poultry, horses, other farm animals) -Agricultural companies without production (petting zoo, care farm) -(Glass) Horticulture -Agricultural Contracting companies -Fish farming -Other..
What are the 4 numbers of your Postal Code? <i>The information will be used to create a map to analyse the influence of proximity to Natura 2000 areas in combination with the answers given.</i>	
How do you feel about the agricultural transition?	-Very negative -A bit negative -Neutral -A bit positive -Very positive
Has the agricultural transition influenced your choice to become / stay a farmer?	-Very negative -A bit negative -Neutral -A bit positive -Very positive
These aspects of the agricultural transition I find the most complicated: <i>Multiple responses allowed.</i>	-Nitrogen deposition rules -Increase in water level -Sustainable soil management -Closing cycles -Extensification -Rules surrounding pesticide use -Other..
I am worried about the future of my business due to the agricultural transition.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
It will soon no longer be profitable to just be a farmer, without a side activity or second job.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree

Due to the changes expected of me, I can no longer make ends meet.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
I am willing to change/innovate my business.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
I see the future of my business in the direction of (technological) innovation.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
I see the future of my business in the direction of extensification / nature-inclusive agriculture.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
I am willing to change/innovate my business, but I see no financial options for doing so.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
I am willing to change/innovate my business, but I do not see any options for this due to the policy.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
I am willing to change/innovate my business, but I do not see any options for this due to the land available to me.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
As a farmer I feel valued by society.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
I feel limited in running my business, I cannot live up to my own insights.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
I experience mental complaints (e.g. stress, negative thoughts and/or a feeling of stalemate) when I think about the agricultural transition and the future of my company.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
I worry about whether I can continue my way of life satisfactorily.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree



During the agricultural transition, I have the most concerns because of the uncertainty.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
I feel limited in running my business, I can't act on my own insights.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
The policy choices make me feel misunderstood as a farmer.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
I understand the policy choices during the agricultural transition.	-Completely disagree -Somewhat disagree -Neutral -Somewhat agree -Completely agree
What personal or business factors have influenced your decision to become a farmer or not? <i>Multiple responses allowed.</i>	-Education -Location -Type of farm -Size of the farm -Social context, what others think of it -Economic context (e.g. financial, tax rules upon takeover) -Technological investments -Generational investment; 'My father/grandfather/great-grandfather etc. also did this' -I've always thought it is a fantastic profession! -Other...
Do you have anything else you would like to add or say?	

Source: Made by Author

The original questions as published in Dutch during the survey:

Table 2: Survey Questions - Original in Dutch

Survey Questions in Dutch	Response
<p>Beste boeren en andere belanghebbenden, Mijn naam is <b>Kirsten Valkenier</b>, ik ben 23 jaar oud, ik ben opgegroeid tussen de dieren op een boerderij in Veenoord (Drenthe) en ik heb altijd al grote interesse gehad in het platteland. Ik studeer Sociale Geografie (aardrijkskunde) aan de <b>Rijksuniversiteit Groningen</b>. Momenteel ben ik bezig met de allerlaatste loodjes van mijn opleiding; <b>Mijn afstudeerproject</b>, waar onderstaande enquête onderdeel van is. De enquête bestaat uit <b>15 vragen</b>, dit zijn meerkeuze vragen en stellingen.</p> <p>Mijn onderzoek gaat over de invloed van de <b>Nederlandse landbouwtransitie</b> op het <b>toekomstperspectief</b> van <b>jonge (toekomstige)</b></p>	<p>-Ja ik ga akkoord. -Nee ik ga niet akkoord en beëindig mijn deelname.</p>

<p><b>boeren.</b> De landbouwtransitie houdt de gemoederen van veel boeren bezig. De fundamentele veranderingen die gevraagd worden zullen een effect hebben op het boerenbestaan. Jonge boeren maken deel uit van de toekomst van de landbouw en juist daarom ben ik geïnteresseerd naar jullie kijk op de landbouwtransitie en de toekomst van jullie <b>(toekomstige) boerenbedrijven.</b></p> <p>Deelname aan mijn onderzoek is geheel <b>vrijwillig</b> en je kunt op ieder moment tijdens de enquête besluiten toch niet deel te nemen / je antwoorden niet in te leveren. Persoonlijke gegevens worden zorgvuldig en veilig bewaard en zullen alleen gebruikt worden voor mijn <b>onderzoek.</b> Geanalyseerde data uit de enquête zal <b>geanonimiseerd</b> verschijnen in het onderzoeksrapport. De onbewerkte data wordt, buiten mij en mijn begeleider om, niet gedeeld of door anderen bekeken. De data zal bewaard worden volgens EU <b>GDPR richtlijnen</b>, data voor onderzoeksdoeleinden: <a href="https://gdpr-info.eu/">https://gdpr-info.eu/</a>.</p> <p>Een aantal vragen in deze enquête gaan over de effecten van de landbouwtransitie op je <b>mentale gezondheid.</b></p> <p>Als onderzoeker en als mens begrijp ik dat dit een moeilijk onderwerp kan zijn. Hier wordt uiteraard zorgvuldig mee omgegaan. Graag wil ik expliciet benadrukken dat ook bij deze vragen de antwoorden anoniem zijn en dat antwoorden geheel vrijwillig is.</p> <p><i>Ervaart u na het invullen van deze enquête onverhoopt toch klachten? Organisaties zoals bijvoorbeeld deluisterlijn.nl, taboer.nl, 113.nl (of bellen met 0800-113) leveren 24/7 een luisterend oor.</i></p> <p>Heel graag wil ik vragen om hieronder uw <b>toestemming</b> te geven voor het <b>analyseren, verwerken en opslaan</b> van de door jou gegeven antwoorden in deze enquête.</p> <p><b>Bij voorbaat dank</b> voor het deelnemen aan deze enquête en mij zo verder op weg te helpen.</p> <p>Heb je <b>vragen</b> naar aanleiding van deze enquête of wil je <b>op de hoogte worden gehouden</b> van mijn onderzoek? Stuur me dan een mailtje via: : <a href="mailto:k.i.valkenier@student.rug.nl">k.i.valkenier@student.rug.nl</a></p> <p>Hierbij geef ik wel/niet mijn toestemming voor deelname aan het onderzoek;</p>	
Bent u op dit moment minder dan 40 jaar oud? (geboren na 1983)	-Ja -Nee
Ik ben een..	-Man -Vrouw -Anders / Wil ik niet zeggen
Bent u op een agrarisch bedrijf opgegroeid?	-Ja -Nee
Momenteel...	-Ben ik boer -Wil ik graag boer worden - Wil ik geen boer worden
Bij welk type agrarisch bedrijf ligt uw interesse? <i>Meerdere antwoorden toegestaan.</i>	-Akkerbouw (open teelt, gesloten teelt)

	<ul style="list-style-type: none"> <li>-Melkveehouderij</li> <li>-Veehouderij (vleesrunderen, varkens, schapen, pluimvee, paarden, overige landbouwhuisdieren)</li> <li>-Agrarische bedrijven zonder productie (kinderboerderij, zorgboerderij)</li> <li>-(Glas) Tuinbouw</li> <li>-Loonwerkbedrijven</li> <li>-Visteelt</li> <li>-Anders, namelijk..</li> </ul>
<p>Wat zijn de 4 cijfers van de postcode van uw bedrijf?  <i>De informatie zal gebruikt worden voor het creëren van een kaart om de invloed van nabijheid van Natura2000 gebieden te analyseren in combinatie met de gegeven antwoorden.</i></p>	
Hoe denkt u over de landbouwtransitie?	<ul style="list-style-type: none"> <li>-Heel negatief</li> <li>-Een beetje negatief</li> <li>-Neutraal</li> <li>-Een beetje positief</li> <li>-Heel positief</li> </ul>
Heeft de landbouwtransitie invloed gehad op uw keuze om boer te worden / blijven?	<ul style="list-style-type: none"> <li>-Heel negatief</li> <li>-Een beetje negatief</li> <li>-Neutraal</li> <li>-Een beetje positief</li> <li>-Heel positief</li> </ul>
<p>Deze aspecten van de landbouwtransitie vind ik het meest ingewikkeld:  <i>Meerdere antwoorden mogelijk.</i></p>	<ul style="list-style-type: none"> <li>-Stikstofdepositie regels</li> <li>-Verhoging van de waterstand</li> <li>-Duurzaam bodembeheer</li> <li>-Sluiten van kringlopen</li> <li>-Extensivering</li> <li>-Regels rondom pesticiden gebruik</li> <li>-Anders, namelijk..</li> </ul>
Ik heb zorgen over de toekomst van mijn bedrijf vanwege de landbouwtransitie.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Het is straks niet meer rendabel om alleen nog boer te zijn, zonder nevenactiviteit of tweede baan.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Door de veranderingen die van mij verwacht worden kan ik niet meer rond komen.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Ik ben bereid mijn bedrijf te veranderen / innoveren.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> </ul>

	<ul style="list-style-type: none"> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Ik zie de toekomst van mijn bedrijf in de richting van (technologische) innovatie.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Ik zie de toekomst van mijn bedrijf in de richting van extensivering / natuur inclusievere landbouw.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Ik ben bereid mijn bedrijf te veranderen / innoveren, maar zie hier financieel gezien geen mogelijkheden toe.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Ik ben bereid mijn bedrijf te veranderen / innoveren, maar zie hier vanwege het beleid geen mogelijkheden toe.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Ik ben bereid mijn bedrijf te veranderen / innoveren, maar zie hier vanwege de voor mij beschikbare grond geen mogelijkheden toe.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Als boer voel ik mij gewaardeerd door de samenleving.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Ik ervaar mentale klachten (bijvoorbeeld stress, negatieve gedachten en/of een gevoel van patstelling) als ik denk aan de landbouwtransitie en de toekomst van mijn bedrijf.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Ik maak me zorgen of ik mijn manier van leven naar tevredenheid voort kan zetten.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Tijdens de landbouwtransitie heb ik de meeste zorgen door de onzekerheid.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Ik voel me beperkt in het runnen van mijn bedrijf, ik kan niet mijn eigen inzichten naleven.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Door de beleidskeuzes voel ik me als boer onbegrepen.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> </ul>

	<ul style="list-style-type: none"> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
Ik heb begrip voor de beleidskeuzes tijdens de landbouwtransitie.	<ul style="list-style-type: none"> <li>-Helemaal oneens</li> <li>-Een beetje oneens</li> <li>-Neutraal</li> <li>-Een beetje eens</li> <li>-Helemaal eens</li> </ul>
<p>Welke persoonlijke of bedrijfs- factoren hebben invloed (gehad) op uw beslissing om wel/niet boer te worden?  <i>Meerdere antwoorden toegestaan.</i></p>	<ul style="list-style-type: none"> <li>-Opleiding</li> <li>-Locatie</li> <li>-Type boerderij</li> <li>-Grootte van de boerderij</li> <li>-Sociale context, wat anderen er van vinden</li> <li>-Economische context (bijvoorbeeld financieel, belastingregels bij overname)</li> <li>-Technologische investeringen</li> <li>-Generatie investering; 'Mijn vader/opa/overgroot opa etc. deed dit ook al'</li> <li>-Ik heb het altijd al een fantastisch beroep gevonden!</li> <li>-Anders, namelijk..</li> </ul>
Heeft u verder nog dingen die u graag wilt toevoegen of vertellen?	

Source: Made by Author

## Appendix II: Material used for survey distribution

### Beste boeren en andere belanghebbenden,



Mijn naam is **Kirsten Valkenier**, ik ben 23 jaar oud, ik ben opgegroeid tussen de dieren op een boerderij in Veenoord (Drenthe) en ik heb altijd al grote interesse gehad in het platteland. Ik studeer Sociale Geografie (aardrijkskunde) aan de **Rijksuniversiteit Groningen**. Momenteel ben ik bezig met de allerlaatste loodjes van mijn opleiding; **Mijn afstudeerproject**, waar onderstaande enquête onderdeel van is.

*De enquête bestaat uit **15 vragen**, dit zijn meerkeuze vragen en stellingen.*

Mijn onderzoek gaat over de invloed van de **Nederlandse landbouwtransitie** op het **toekomstperspectief** van **jonge (toekomstige) boeren**. De landbouwtransitie houdt de gemoederen van veel boeren bezig. De fundamentele veranderingen die gevraagd worden zullen een effect hebben op het boerenbestaan. Jonge boeren maken deel uit van de toekomst van de landbouw en juist daarom ben ik geïnteresseerd naar jullie kijk op de landbouwtransitie en de toekomst van jullie **(toekomstige) boerenbedrijven**.

**Ben jij boer (geweest), wil je graag boer worden, ben jij opgegroeid op een boerderij of had jij boer kunnen worden maar heb je gekozen om dit niet te doen? Én ben jij onder de 40 jaar oud?**



*Source: Made by Author*



### Appendix III: Ordinal Logistic Regression - Agricultural Transition

Ordinal Logistic Regression – Agricultural Transition	Estimate	Odds Ratio	p-value
Model_Fit			<0,001
Pearson			0,249
Test Of Parallel Lines			0,566
Gender = Female	-1,290	0,275	0,004
Gender = Male			*
Background = Did not grow up on farm	1,130	3,097	0,017
Background = Did grow up on farm			*
Farmer = I do not want to be a farmer	-2,081	0,125	0,033
Farmer = I want to become a farmer	-0,814	0,443	0,064
Farmer = I am a farmer			*
I am worried about the future of my business due to the agricultural transition = Disagree	0,063	1,065	0,913
I am worried about the future of my business due to the agricultural transition = Neutral	0,636	1,890	0,304
I am worried about the future of my business due to the agricultural transition = Agree			*
Due to the changes expected of me, I can no longer make ends meet = Disagree	2,014	7,495	<0,001
Due to the changes expected of me, I can no longer make ends meet = Neutral	1,163	3,201	0,016
Due to the changes expected of me, I can no longer make ends meet = Agree			*
I am willing to change/innovate my business = Disagree	-0,429	0,651	0,606
I am willing to change/innovate my business = Neutral	0,394	1,483	0,596
I am willing to change/innovate my business = Agree			*
I see the future of my business in the direction of (technological) innovation = Disagree	0,709	2,033	0,160
I see the future of my business in the direction of (technological) innovation = Neutral	-0,005	0,995	0,993
I see the future of my business in the direction of (technological) innovation = Agree			*
I see the future of my business in the direction of extensification / nature-inclusive agriculture = Disagree	-1,406	0,245	0,002
I see the future of my business in the direction of extensification / nature-inclusive agriculture = Neutral	-1,515	0,220	0,006
I see the future of my business in the direction of extensification / nature-inclusive agriculture = Agree			*
I experience mental complaints (e.g. stress, negative thoughts and/or a feeling of stalemate) when I think about the agricultural transition and the future of my company = Disagree	-0,197	0,821	0,701
I experience mental complaints (e.g. stress, negative thoughts and/or a feeling of stalemate) when I think about the agricultural transition and the future of my company = Neutral	0,854	2,350	0,088
I experience mental complaints (e.g. stress, negative thoughts and/or a feeling of stalemate) when I think about the agricultural transition and the future of my company = Agree			*

I feel limited in running my business, I can't act on my own insights = Disagree	1,581	4,859	0,024
I feel limited in running my business, I can't act on my own insights = Neutral	0,258	1,295	0,638
I feel limited in running my business, I can't act on my own insights = Agree			*
I understand the policy choices during the agricultural transition = Disagree	-1,826	0,161	0,017
I understand the policy choices during the agricultural transition = Neutral	-1,487	0,226	0,081
I understand the policy choices during the agricultural transition = Agree			*

Source: Made by Author



## Appendix IV: Ordinal Logistic Regression - Generational Renewal

Ordinal Logistic Regression – Generational Renewal	Estimate	Odds Ratio	p-value
Model_Fit			0,026
Pearson			0,286
Test Of Parallel Lines			0,133
Gender = Female	-0,692	0,501	0,028
Gender = Male			*
Background = Did not grow up on farm	0,787	2,196	0,023
Background = Did grow up on farm			*
Farmer = I do not want to be a farmer	-0,559	0,572	0,359
Farmer = I want to become a farmer	-0,431	0,650	0,168
Farmer = I am a farmer			*

Source: Made by Author